Appendix A Comment Responses

Identifying the Need for Change

Many sources were used to identify the need for change. After a list of issue/topic areas was generated from those sources, the topics were evaluated and sorted into categories. The sources, sorting process, and categories are described below:

Sources of Information

The need to change the current Management Plans came from the following sources:

- Experiences in implementing the Management Plans and working with the public.
- Public involvement in implementing projects.
- Need for Management Plan amendments as a result of implementing projects.
- Monitoring the effects of implementation.
- Understanding cumulative effects from implementing projects.
- Issues raised in appeals and litigation.
- Knowledge gained from research on prairie ecosystems.
- Discussions with employees.
- Coordination and input from other federal agencies, state agencies, and partners.
- Public feedback on values for these National Forest and Grassland units.
- Assessments which provided new information to refine revision topics.
- Changes in management philosophy for National Forest System lands.

Public Involvement

The Forest Service considers the public's understanding and direct involvement critical to the success of the management plan revision process. Involving the public in the revision was an ongoing, open, and equitable process. Public outreach efforts began well before any formal planning announcements. Forest Service employees began meeting with people both individually and in groups in 1995 to discuss the planning strategy and the need to revise the management plans.

Mailing lists from the three administrative units and their district offices were consolidated in the fall of 1995. In January 1996, the Forest Service sent the introductory issue of the *Revision Reporter* planning update newsletter to the combined mailing list. The publication discussed the planning revision strategy and the need to revise the management plans and asked for the public's input. Between February and May of 1996, the Forest Service hosted a series of public events. Most were open houses at which the Forest Service encouraged the public to discuss their interests with employees. Forest Service personnel recorded comments, if offered, or invited people to send in their comments. These early public contacts helped refine the major revision topics.

On February 26, 1997, formal public involvement was initiated with an announcement (Notice of Intent) in the *Federal Register* of the Forest Service's intent to prepare an environmental impact statement in conjunction with the revision of the management plans. In March, a special edition of the *Revision Reporter* was sent out to a mailing list of about 6,000 asking recipients to help define the scope of the analysis and identify related public issues. The newsletter included a comment form for the public's convenience. A news release requesting public participation was also sent to a regional media list. Again, the Forest Service hosted a series of public events across the four-state area (Nebraska, North and South Dakota, and Wyoming). In addition, Forest Service personnel made many contacts, briefings, and presentations. This formal phase for public comments, called "scoping," was open until July 31, 1997.

About 3,150 comment documents were recorded or received in response to public scoping. These comment documents included letters, comment forms, meeting notes, telephone messages, electronic messages, form letters, and petitions. Of the total comment documents, 65 percent were form letters.

Major Public Involvement Opportunities and Activities

The following is a list of major public involvement opportunities and activities conducted during initial scoping, and during the comment phase for the DEIS / Draft Plans. There were also numerous meetings and briefings with individuals; organizations; user groups; American Indian tribes; and county, state, and federal officials. The list of contacts is extensive.

Revision Reporter / News releases issued	January 1996
Public Open House in Pierre, SD	February 16, 1996
Public Meeting in Douglas, WY	February 29, 1996
Revision Reporter issued	April 1996
Public Open House in Rapid City, SD	April 16, 1996
Public Open House in Chadron, NE	April 18, 1996
Public Open House in Newcastle, WY	April 25, 1996
Public Open House in Thedford, NE	April 25, 1996
Public Open House in Lemmon, SD	May 6, 1996
Public Open House in Bismarck, ND	May 7, 1996
Public Open House in Lisbon, ND	May 9, 1996
Revision Reporter Issued	August 1996
Public Involvement Work Group	October 29-30, 1996
Revision Reporter issued	October 1996
Federal Register / Notice of Intent	February 1997
Lemmon, SD, Farm and Home Show (planning booth)	March 1-2, 1997

Black Hills Sports Show (planning booth)	Feb 27-Mar 2, 1997
Revision Reporter / News releases	March 1997
Public Workshop in Douglas, WY	April 21, 1997
Revision Reporter issued	May 1997
Public Open House in Wall, SD	May 19, 1997
Public Open House in Watford City, ND	June 9, 1997
Public Open House in Dickinson, ND	June 10, 1997
Public Open House in Bismarck, ND	June 11, 1997
Public Open House in Lisbon, ND	June 12, 1997
Public Open House in Halsey, NE	June 13, 1997
Public Open House at McKelvie NF Office, NE	June 13, 1997
Public Work Sessions on Wild / Scenic Rivers in western ND	June 25-26, 1997
Public Open House in Pierre, SD	June 16, 1997
Revision Reporter issued	July 1997
Public Workshop in Chadron, NE	July 22, 1997
Public Meeting in Halsey, NE	October 30, 1997
Public Workshop in Hot Springs, SD	October 30, 1997
Revision Reporter Issued	November 1997
Revision Reporter / News Release issued	March 1998
Public Meeting in Fargo, ND	March 4, 1998
Public Meeting in Minot, ND	March 5, 1998
Public Open House on Research Natural Areas in Bismarck, ND	March 24, 1998
Public Open House on Research Natural Areas in Medora, ND	March 25, 1998
Public Open House on Research Natural Areas in Amidon, ND	March 25, 1998
Public Open House on Research Natural Areas in Watford City, ND	March 26, 1998
Public Meeting in Minot, ND	April 20, 1998
Public Information Fair in Lemmon, SD	April 29, 1998
Public Information Fair in Dickinson, ND	April 30, 1998
Public Information Fair in Watford City, ND	May 1, 1998
Public Information Fair in Bismarck, ND	May 5, 1998
Public Information Fair in Fargo, ND	May 6, 1998
Public Information Fair in Lisbon, ND	May 7, 1998
Public Information Fair in Wall, SD	June 9, 1998
Public Information Fair in Pierre, SD	June 10, 1998
Public Information Fair in Rapid City, SD	June 11, 1998
Public Information Fair in Chadron, NE	June 23, 1998
Revision Reporter Issued	July 1998
North Dakota State Fair (planning booth)	July 24-Aug 1, 1998
Revision Reporter issued	July 1998
Revision Reporter issued	October 1998
Federal Register / Revised Notice of Intent	December 10, 1998
Postcard sent for public to request draft documents	December 1998
Public Open House in Minot, SD	July 15, 1999
Public Open House in Watford City, ND	July 27, 1999
Public Open House in Thedford, NE	July 28, 1999
Public Open House in Lisbon, ND	July 28, 1999
Public Open House in Dickinson, ND	July 29, 1999
Public Open House in Valentine, NE	July 29, 1999

Major Public Involvement Opportunities and Activities, cont.

Public Open House in Fargo, ND	August 3, 1999
Public Open House in Lincoln, NE	August 4, 1999
Public Open House in Grand Forks, ND	August 4, 1999
Public Open House in Bismarck, ND	August 5, 1999
Public Open House in Rapid City, SD	August 9, 1999
Public Open House in Wall, SD	August 10, 1999
Public Open House in Pierre, SD	August 11, 1999
Public Open House in New Town, ND	August 11, 1999
Public Open House in Sioux Falls, SD	August 12, 1999
Public Open House in McIntosh, SD (with event)	August 14, 1999
Public Open House in Chadron, NE	August 17, 1999
Public Open House in Douglas, WY	August 18, 1999
Public Open House in Newcastle, WY	August 19, 1999
Public Open House in Bison, SD (with event)	August 20-21, 1999
Public Open House in Hot Springs, SD	August 24, 1999

Topic Categories

Using issues gleaned from public comments during the initial scoping phase and other sources, the Planning Team grouped the issues into four broad categories, which were then further refined where appropriate.

- **Major Revision Topics** - This category includes topics for which changes in laws or regulations, resource conditions, technical knowledge, data improvement, or public opinion of National Forest and Grassland resource management have created a need for change in the Management Plans. Changes generally are important enough to affect large areas, change the mix of goods and services produced, and involve choices in management direction where there is no public consensus on the best course of action.
- **Other Revision Topics** - There are several topics that need to be addressed in Management Plan revision but do not meet the criteria for major revision topics. In general, these items represent inadequate or out-of-date Management Plan direction. These items would not require any significant amendments to the Management Plans, and rewriting and updating the direction during the revision process can best address them.
- **Legislative Topics*** - These include topics requiring Congressional action or an Executive Order to address the issue or concern. An example would be grazing fee changes.
- **Topics for Other Governmental Agencies*** - These are topics where another agency or governmental body has the primary jurisdiction required to address the issue or concern. An example would be re-introduction of native wildlife species, which is the responsibility of the US Fish and Wildlife Service.

*These topics fell outside the scope of the Revision process and were not addressed in the FEIS and Revised LRMPs.

Major Revision Topics

Seven broad topics, many with sub-topics, met the criteria to be considered Major Revision Topics:

- Community and Lifestyle Relationships
- Livestock Grazing
- Oil, Gas, and Minerals
- Plant and Animal Damage Control
- Rangeland and Forest Health
- Recreation and Travel Management
- Special Area Designations

Other Revision Topics

In addition to the Major Revision Topics, the following topics were addressed within the context of forest and grassland-wide direction or standards or guidelines in the Revised Plans.

- Fossils
- Land Use
- Heritage Resources, Treaty Rights, Tribal Relations
- Planning and Regulations
- Water Resources

Peer Reviewers and Working Groups

Three panels of peer reviewers were asked to review process and analysis methods for several topic areas, including economics, timber, and range.

Economic Peer Review Group

This group reviewed the process and methodology of the economic analysis. Members of the economic review panel are listed below:

- Dr. Marty Buetler, South Dakota State University, West River Agricultural Center
- Dr. Larry Leistritz, North Dakota State University
- Dr. Scott Stradley, University of North Dakota
- Dr. Garth Taylor, University of Nebraska
- Dr. Tex Taylor, University of Wyoming
- Dr. Fred Obermiller, Oregon State University

Range Peer Review Group

This group reviewed the Documentation of Range Analysis that was incorporated into Appendix B-Documentation of Analysis. Members of the range review panel are listed below:

- Dr. Pat Johnson, South Dakota State University, West River Agricultural Center
- Dr. Jim Johnson, South Dakota State University, West River Agricultural Center
- Dr. Jim Stubbendieck, University of Nebraska-Lincoln
- Dr. Pat Reece, University of Nebraska Panhandle Research and Extension Center
- Dr. Quentin Skinner, University of Wyoming
- Dr. Jerry Dodd, North Dakota State University
- Dr. Don Kirby, North Dakota State University
- Dr. Lee Manske, North Dakota State University, Dickinson Research Extension Center
- Ms. Kim Stine, Nebraska State Range Management Specialist, USDA-NRCS
- Mr. Rod Baumberger, USDA-NRCS, South Dakota
- Dr. Dan Uresk, USDA Forest Service, Rocky Mountain Experiment Station
- Dr. Lamar Smith, Division of Range Management, University of Arizona (retired)

Timber Peer Working Group

This group helped develop desired conditions for forest vegetation types based on the emphasis of each alternative using typical harvest removal levels. Information on this process is included in Appendix B-Documentation of Analysis. Members of the timber panel are listed below:

- Fred McCartney, Pope and Talbot Forest Products
- John Overstreet, Forester, Nebraska State Forest Service
- Doak Nickerson, Forester, Nebraska State Forest Service
- Roger Keepers, Forester, Nebraska National Forest
- Pat Irwin, District Ranger, Nebraska National Forest
- Liz Ohlrogge, Resource Coordinator, Northern Great Plains Planning Team
- Jeff Ulrich, Analyst, Northern Great Plains Planning Team
- Bob Sprentall, Range Ecosystem Coordinator, Northern Great Plains Planning Team
- Dave Cawrse, Team Leader, Northern Great Plains Planning Team

Draft EIS & LRMP Public Comment Content Analysis Process

DEIS Comment Period ended three times, to February 3, 2000, at the public's request. Nearly 25,000 commentors provided over 110,000 comments in response to these documents.

All comments postmarked or received from July 6, 1999 until February 3, 2000, the close of the comment period, were analyzed for content related to the Northern Great Plains Draft EIS and Land & Resource Management Plans. Comments received before or after this time period were not part of the content analysis process. Comments received before the release of the Draft EIS & LRMPs were not comments on these documents as they had not yet been released. Comments received after the comment period received a review for new issues but were not part of the comment analysis process.

DEIS Content Analysis

The comment analysis consists of seven parts

- Log in and number comments
- Enter the commentor's address in the mail data base
- Code substantive comments from each letter / comment received
- Enter comments in the comment data base
- Develop general or summarized comments
- Address summarized comments in the Final Environmental Impact Statement.
- As warranted by comments, reflect changes to the Draft Environmental Impact Statement in the Final Environmental Statement.

On June 2, 2000 the NGP ID Team was delivered the final set of action items from public and agency comments to incorporate into the FEIS and Final LRMPs. This list consisted of those summary comments slated for action and which had NGP Board concurrence. As each item was completed the ID Team went back to the summary comments and briefly summarized what had occurred and where in the documents the summary item was dealt with.

Comments and Responses on the Draft Revised Plans and Environmental Impact Statement

Community and Lifestyle Relationships

Comment: Manage the grasslands for multiple uses, not just commodities.

The sideboards for managing the national grasslands are defined in significant part by laws, regulations, and policies. The Bankhead-Jones Farm Tenant Act of 1937, as amended, which established the land utilization projects, many of which were later designated national grasslands, outlined the purpose for which they were established: "…in order thereby to correct maladjustments in land use, and thus assist in controlling soil erosion, reforestation, preserving natural resources, protecting fish and wildlife, developing and protecting recreational facilities, mitigating floods, preventing impairment of dams and reservoirs, developing energy resources, conserving surface and subsurface moisture, protecting the watersheds of navigable streams, and protecting the public lands, health, safety, and welfare, but not to build industrial parks or establish private industrial or commercial enterprises."

The Multiple-Use Sustained-Yield Act of 1960, which applies to national grasslands as well as national forests, also outlines that: "It is the policy of the Congress that the National Forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes."

Besides the Bankhead-Jones Farm Tenant Act of 1937 and the Multiple-Use Sustained-Yield Act of 1960, the National grasslands and forests are managed under a myriad of other laws including the National Environmental Policy Act of 1969, Endangered Species Act of 1973, Forest and Rangeland Renewable Resources Planning Act of 1974, National Forest Management Act of 1976, the Wilderness Act, the Wild and Scenic Rivers Act, the National Trails System Act, the Mineral Leasing Act of 1920, et al.

There are, in fact, no authorities that direct, or allow, the Forest Service to manage the national grasslands for commodities exclusively. The management area emphasis outlined in the revised plans is a comprehensive approach to integrating the various uses and values associated with the national grasslands and allocating areas to accommodate them.

Comment: Emphasize historical grassland uses—grazing, mining, hunting, etc.

Historical grassland uses such as grazing, mining, hunting will continue to be an important part of the spectrum of uses outlined in the revised plans. Because of changes in public awareness in, and expectations of, these lands, as well as changes in law, many historic uses will experience changes in the ways they are managed on the national grasslands.

Livestock grazing will remain a significant use on the vast majority of the lands within the planning area. Stocking levels may be increased in some areas to achieve specific management objectives, but overall grazing levels will be reduced somewhat in order to provide a wider range of values that are associated with more diverse vegetation composition and structure. This does not mean across-the-board reductions to all allotments. Stocking will be set to achieve desired conditions, and conditions will be monitored. Refinement of stocking will be based on monitored conditions.

Mining on the national grasslands is primarily in the form of oil and gas production and coal mining. Minerals produced from national grasslands provide important resources for the country as a whole as well as revenues to the states and counties where the extraction occurs. Mineral production will continue under the new plans.

The plans implement stipulations in the leasing agreements that allow production to take place in most areas while protecting other resources. A combination of approaches, including timing limitations (TL), controlled surface use (CSU), and no surface occupancy (NSO) will be used where appropriate to protect water, soil, fossil, and plant and animal habitats and populations, as well as reduce potential adverse effects to particular types of recreation uses, grassland scenery, and other values.

As the amount of private land available to hunting continues to diminish, and more and more private land is operated under a fee system, the public lands are becoming increasingly important as a land base for hunting related recreation. The variety of hunting experiences available on the public lands is considerable, and will be expanded by the plans. Hunters who prefer a walk-in experience will gain areas where non-motorized access will be the norm. Habitat for most game species will be positively influenced by vegetation management goals in the plans. Hunting will continue to be an important component in the mix of multiple uses available on the national grasslands and forests addressed by the plan***s.***

Comment: Focus on preserving natural appearing landscapes and amenity values when managing the grasslands.

Under previous plans only the Thunder Basin National Grassland and Little Missouri Grasslands (Northern and Southern Leasing EISs) had visual quality objectives (DEIS 3-202). With this plan revision effort, all of the planning units have been inventoried using the new Scenery Management System. Mapping under the new system incorporates viewing distances, concern level, scenic attractiveness, scenic class (determined by combining the previous three factors), and existing scenic integrity.

Scenic integrity levels were assigned to each management area based upon the intent of the management area direction. Scenic integrity levels are a set of measurable objectives that are incorporated into the management of forest and grassland resources. The five levels range from Very High—which generally provides for naturally occurring changes only; to High—where facilities and disturbance from human activities are not scenically evident; to Moderate—where the valued landscape character may appear “slightly altered”; to Low—where the valued landscape character “appears moderately altered”; and finally, to Very Low—where the landscape appears “heavily altered.” (FEIS Chapter 3, Recreation and Travel Management)

As specific activities and projects are planned under the revised plans, a detailed analysis will be required to determine the impacts to the scenic resource and whether the management activities will be permitted, or what types of mitigation will be required for the activity to comply with scenic integrity objectives. Examples of mitigation commonly used include revegetation of disturbed sites, materials and colors for structures that reduce their visibility, and placement of utilities underground.

Alternative 3 Final calls for the “High” scenic integrity level to include Dakota Prairie National Grasslands -- 176,850 acres; Thunder Basin National Grassland—35,170; and Nebraska National Forest and Associated Units—91,300. The Nebraska National Forest, Pine Ridge Ranger District includes 7810 acres in the “Very High” level. (FEIS Chapter 3, Recreation and Travel Management)

Additionally, these revised plans provide for a Management Area 3.65 Rangelands with Diverse Natural-Appearing Landscapes. Alternative 3 Final allocates 383,100 acres to MA 3.65 on the Dakota Prairie units and 83,400 acres on the Thunder Basin National Grassland. Also 23,600 acres of MA 4.22 Scenic Area, Vistas, Travel Corridors has been allocated for the Little Missouri River Corridor on the Little Missouri National Grassland in Alternative 3 Final.

Comment: Establish a large buffer zone to protect adjacent landowners from the effects of the proposed plan.

The national grasslands and forests in the Northern Great Plains plans revision process are a small part of the overall land base in the Northern Great Plains. Of the 250 million acres of prairie ecosystems in Montana, North and South Dakota, Nebraska and Wyoming, only 2.9 million acres, or just over one percent, are directly affected by the plan revisions. However, due to the intermingled nature of the land ownership, the public lands have many neighbors to consider when making land management decisions.

Since most changes brought about by the revised plans will be implemented at the project level, a separate and site-specific decision-making process will be required to determine the effects of proposed management activities. As required by NEPA, an environmental analysis of the effects of a proposed action must include a disclosure of those effects to the public and involve the public in the process. Issues brought up by the public must be addressed by the agency and alternatives considered. If possible, the agency must include mitigation measures to reduce or eliminate the adverse effects of the proposal.

While it may not be possible to completely eliminate the effects of management activities that occur on the public lands from having an affect on adjacent lands, the agency will conduct a thorough analysis to determine what they may be, and with the help of the affected parties, how to address these concerns.

Comment: Your analysis of economic impacts on individuals, communities, and states is inaccurate. It doesn't include the acres of private and state lands within the National Grassland boundaries.

The analysis has been expanded to include the impacts on intermingled commonly fenced lands. Private landowners have voluntarily given the Forest Service control of grazing use on these lands. This relationship can be ended at the private landowners discretion if they chose to fence their lands separately from National Forest System lands. The Forest Service controls grazing use on these lands because the state and private landowners have not exercised their right to fence their lands separately from National Forest System lands. The Final EIS (FEIS) determines the ratio of National Forest System (NFS) lands to state and private lands within intermingled land ownership grazing pastures. The FEIS, Chapter 3, Community and Lifestyle Relationships displays the job and income impacts on NFS lands plus the cumulative job and income impact on state and private lands. Other cumulative grazing impacts such as the impacts to ranch market value and loan value are discussed as well.

In addition oil and gas effects were considered on intermingled state and private lands through the RFD prepared for each oil and gas unit. The FEIS displays the job and income impacts from changes in oil and gas activity as well as the cumulative effects on adjoining state and private lands. The direct and cumulative effects on tax revenue are also discussed in the FEIS, Chapter 3, Community and Lifestyle Relationships.

Comment: Your economic analysis failed to address the following:

- *Private property rights of landowners with intermingled or adjacent land.*

Private landowners have the ability to exercise their ownership rights subject to other valid rights such as a right-of-way or mineral ownership by someone other than the surface owner. As explained above, the effects on adjacent private property owners are discussed in FEIS Chapter 3 Community and Lifestyle Relationships.

- *Impacts on landowners with grazing rights based on base property.*

A grazing permit does not give a rancher any permanent rights or title to National Forest System land (36 CFR 222.3 (c)). There are a number of economic impacts to grazing permittees from reductions in permitted AUMs, that are discussed in FEIS Chapter III Community and Lifestyle Relationships.

- *Impacts on ranchers operating on private land outside the grassland boundaries (e.g., effects of subsidies, grazing reductions, noxious weed programs).*

So-called grazing subsidies are not discussed in the FEIS as the absence or presence of the grazing permit system is outside the scope of the Land & Resource Management Plan decision.

Grazing reductions will benefit landowners who do not have federal permits and who are operating on private land outside the grassland boundaries, as there will be increased demand for forage, and possibly reduced available livestock at stock sales.

The success or failure in controlling noxious weeds on NFS lands can significantly increase adjacent landowner expenses, as the private landowner will then have to spend his funds to keep noxious weeds from impacting his or her land.

- *Impacts on existing ranching operations (increase transportation costs for livestock, having to lease private ground, property devaluation from AUM reductions, etc).*

Impacts on existing ranching operations are discussed in FEIS Chapter 3, Community and Lifestyle Relationships.

Reductions in NFS livestock numbers will cause an affected rancher to make adjustments to stay in business. Some ranches that are already close to going out of business may not be able to stay in business as a result a reduction in livestock numbers. “Permittees on the Bighorn National Forest were surveyed concerning adjustments they would make if USFS grazing permits were reduced by 25, 50, and 100%. The majority of permittees stated they would adjust their resources at the base ranch and keep ranching until they could no longer stay in business; then, they would sell out. A few stated they could improve some grazing lands (e.g., spray sagebrush), but the majority stated there were not many improvements they could make.” (Van Tassell et al, 1998)

Ranchers who chose to augment their operation with leased private lands may have to pay the increased cost to lease private ground, but it would a benefit to the landowner who puts the private grazing land up for lease. Numerous commentors indicated leased private grazing ground was not readily available. This type of arrangement may benefit the landowner who leases the private grazing land. Private land grazing leases would be more expensive than the federal grazing fee, but many grazing operations throughout the Midwest pay these fees.

Although a grazing permit does not give a rancher any permanent rights or title to National Forest System land (36 CFR 222.3 (c)), real property values are associated with a grazing permit by banks, real estate markets and other institutions. A grazing permit does add to the real estate value of a ranch. A study in Wyoming (Bastian et al, 2000) found a USDA Forest Service permit had an average real estate value of $68.00 per AUM with a range of $40 - $100 per AUM. The grazing permit real estate value will vary across the Northern Great Plains, but the key point is that various financial markets recognize this value. Further a rancher can obtain a loan based on a percentage of the real estate value of the AUMs in a Forest Service grazing permit. The ability to borrow working capitol may determine whether some ranches are able to stay in business.

- *Impacts of wilderness designation on ranching operations (increased operating costs due to motorized travel restrictions).*

Impacts of wilderness designation are discussed in FEIS, Chapter 3 and FEIS Appendix C. Depending on how wilderness legislation is written, wilderness designation may cause some ranchers to switch to non-motorized operations as was common when the grasslands were first grazed by domestic livestock. This may make it difficult to maintain watering facilities, maintain fences, and move livestock. Increased costs would be in the form of increased expenses for a horse herd, decreased efficiency of labor, and depend on a rancher's physical ability to ride and work off a horse or hire laborers who can.

- *Impacts to hunting and recreation and the jobs that depend on them when motorized access is restricted.*

Impacts to hunting and recreation are discussed in FEIS, Chapter 3, Recreation and Travel Management. Motorized hunting and motorized recreational use will be prohibited in wilderness, areas recommended for wilderness, backcountry nonmotorized areas, and some SIAs & RNAs; however other forms of nonmotorized recreation which currently do not exist are expected to occur in these areas.

Off-road motorized access restrictions are not expected to have a significant impact on hunting and other forms of recreation. Although people will not be able to drive off-road in many areas, there are still miles of roads and trails to enjoy.

- *Impacts to local communities, oil and gas industry, small businesses, small ranchers, mineral and the lumber industries, and the regional trade areas (e.g., declines in school enrollment, reduced funding for schools).*

The new management proposals for Alternative 3 will not cause serious economic loss to the economic impact areas where those National Grasslands are located or to Montana, Nebraska, North Dakota, South Dakota, or Wyoming. The FEIS job and income assessment indicates no economic impact area will experience increasing or decreasing impacts greater than 1% from National Grassland or Forest decisions. Generally communities that are in decline will continue to decline as communities that are growing will continue to grow independent of the alternatives. New management direction for National Grasslands, including those embodied in the more restrictive Alternative 4 are likely to support the ongoing diversification and development of the local and state economies. See the discussion in FEIS Chapter 3, Community and Lifestyle Relationships.

- *Impact of losing federal oil and gas revenues on affected North Dakota counties?*

Economic impacts are disclosed in the FEIS, Chapter 3 Community and Lifestyle Relationships. The Little Missouri National Grassland Reasonable Foreseeable Development Scenario (RFD) indicates that mineral rights outside the Federal Mineral Estate would be unaffected and the greatest impact of the alternatives would be the estimated 8% decline in payments to states and counties in Alternative 4 when compared to current management in Alternative 1. The RFD for the Thunder Basin, Buffalo Gap projects no change in payments to states and counties. The RFD's estimate the rate at which new wells are brought into production will equal the rate existing wells are closed. Generally, markets will

play a greater role in the variability of oil & gas revenues than will Forest Service decisions as has been seen in the increase in energy prices in 2000 and anticipated energy shortages in 2001. Energy price increases will not only bring more wells into production in a given period of time, but will increase royalty per-unit-of-energy payments to states and counties. Similarly a decline in price will have the opposite effect.

- *Impact of the proposed changes on tourism.*

Overall tourism is not expected to decrease; its expansion may slow somewhat but not decrease. There is considerable controversy as to whether or not restricting off-road travel to existing roads and trails will cause fewer people to visit the National Grasslands and Forests. Tourism is expected to grow (see FEIS Chapter 3 Recreation & Travel Management). In North Dakota, tourism has increased 20 to 25 percent annually over the last five years (Leistritz, 1999). The recently released Off-Highway Vehicle FEIS (USDA Forest Service, USDI Bureau of Land Management 2001, pp 51-52) indicates that out of the estimated 960 jobs dependent on off-road travel in 2005 that 9 jobs would be lost under the most restrictive assumptions. By 2015 off-road travel related jobs are estimated at 1,100 without restrictions and 1,089 jobs under the most restrictive assumptions. Tourism will continue to increase and the effect of off-road travel restriction will be to slow the growth in jobs and income related to off-road travel.

- *Benefits from eco-tourism and recreation associated with wilderness and wild and scenic rivers, non-motorized recreation, and wildlife viewing.*

See response above.

- *The relative contribution of permitted livestock use and wilderness uses.*

No wilderness is recommended in the Dakota Prairie and Thunder Basin LRMPs. This change was made to respond to public comments and the desires of the States. The relative contributions of wilderness and livestock use are dependent on the types of uses people are looking for. These two uses are compatible on the same piece of land, so it follows that an attempt should be made to provide the experience and uses that wilderness provides. This was done in all three plans though recommending wilderness was handled differently in each plan.

Many comments received during the DEIS comment period questioned how tourism could replace the livestock industry. A study in Wyoming examined this issue (Fletcher et all, 1998). The study compared the relative value of 1000 Animal Unit Months (AUM) of domestic livestock grazing versus 1000 Tourism Visitor Days (TVD). The study found that it takes roughly 1.2 TVD to equal 1 AUM on a personal income basis and roughly 1.07 TVD to equal 1 AUM on an employment basis. See the additional discussion in the FEIS, Chapter 3 Community and Lifestyle.

Comment: Projected tourism increases under Alternative 3 are not substantiated. In addition, the DEIS shows no tourism increase under current management when in fact it has increased 20-30% annually under current management in western North Dakota.

The FEIS does not project increases or decreases in tourism by alternative as there isn't supporting evidence that would indicate the management alternatives would significantly alter tourism levels. It does display the effects of projected increases in tourism including a projected 20% annual increase representative of the last 5 years in western North Dakota. (FEIS, Chapter 3, Community and Lifestyle Relationships.)

Comment: The plan doesn't recognize the following:

- *North Dakota section line law.*

It is true that the federal and state governments have different perspectives on this. However, it need not be a divisive issue. The Forest Service pledges to work with counties to grant county ROWs where they would be compatible with Land & Resource Management Plan direction.

In 1866, Congress enacted a statute offering states a statutory right through the following language: The right of way for the construction of highways over public lands not reserved for public uses, is hereby granted. This same law was repealed in 1976.

Roads which were constructed after land surveys were made under the Act of July 26, 1866 and roads existing at the time the Government acquired the lands are recognized as public roads unless the roads have since been vacated by the public road agency having jurisdiction.

The major question is whether section lines resulted in the establishment of road rights-of-way even where no construction has occurred remains a question. It is the Forest Service's opinion that the state cannot accept the federal offer by establishing highways pursuant to state laws that do not satisfy the requirements of the federal statute. In this case the unsatisfied requirement is construction of the road. (FEIS Chapter 3, Recreation and Travel Management)

- *The grasslands were acquired for the purpose of demonstrational grazing projects.*

The grasslands were acquired under a variety of authorizations beginning in the 1930's with the "land utilization program." This program started as a submarginal land purchase program and evolved and expanded into a program designed to manage land for its most suitable use. The Land Utilization Project culminated with the passage of Bankhead Jones Farm Tenant Act in 1937.

None of these acts refer to "demonstrational grazing" programs. To the contrary, Bankhead Jones Farm Tenant Act is one of this country's first conservation laws focusing on conserving a variety of resources. See response to first comment under Community and Lifestyle Relationships.

- *The reserved 6 1/4% royalty interest of minerals on lands purchased from the counties.*

The Forest Service acknowledges that Billings, Golden Valley, & McKenzie counties do have 6 ¼% royalty interest in the oil and gas production of certain mineral estates. Some of the decisions made in this plan may defer mineral leasing production on some parcels of land for long periods of time. In some cases, this could result in the deferment of royalty payments to the counties.

In the event that oil and gas development is deferred for extended periods of time in areas where the counties have a 6 ¼% royalty interest, the counties can either wait until the oil and gas production is developed, or suggest mineral exchanges from the federal government to areas where the oil and gas will be developed sooner. If mineral exchanges are requested, such exchanges will be based on appraised values and will be exchanged on an equal value for equal value basis. See FEIS Chapter 3, Community and Lifestyle Relationships for additional discussion.

Comment: Your economic analysis is flawed for the following reasons:

- *You didn't use a sound, peer-reviewed verifiable economic assessment model*

Peer review was used in the DEIS model. That model was further peer reviewed through comments received during the DEIS comment period. Further peer review occurred after the public comment period working with researchers in Wyoming. The economic model used in the DEIS and the FEIS does abide by standard economic methodology. Changes in total jobs, personal income, and number of residents, and total net economic value created are displayed. It is in those terms that the national economy is evaluated.

- *Your data is misleading and unsubstantiated.*

The IMPLAN modeling process is used by researchers, and county, state, and Federal economists across the country as part of accepted economic modeling methodology. Model parameters were tested against similarly constructed models using local data and found to be within 5 percentage points of the local models. The assumptions for data going into the IMPLAN model were the key element for change in the FEIS economic analysis, such as considering the indirect impacts on intermingled land for job and income impacts.

As a result of reviews by outside economic experts, the FEIS analysis uses updated industry data, includes indirect impacts, and was compared against available census data.

Refer to FEIS, Chapter 3, Community and Lifestyle Relationships and FEIS, Appendix B.

Comment: Your economic analysis should be reviewed by outside experts.

The DEIS and FEIS economic analyses were reviewed by outside experts as part of the DEIS development process, the DEIS comment period, and during the development of the FEIS. Comments were received from David T. (Tex) Taylor, Department of Agricultural Economics, University of Wyoming; Brett R. Moline, Extension Specialist, Department of Agricultural Economics, University of Wyoming; Martin Beutler, South Dakota State University; and F. Larry Leistritz, Professor, North Dakota State University. See FEIS, Chapter 3, Community and Lifestyle Relationships and FEIS, Appendix B.

Comment: The economic impact of the grazing cuts (in the DEIS) is incorrect. Based on an analysis by an Agricultural Economist at the University of WY, loss in AUMs under Alternative 3 will cause more than $3 million economic loss and a loss of 62 jobs in the local community. The FS figures show only a $100,000 economic loss and 8 jobs lost when comparing Alternative 3 with Alternative 1.

The analysis completed by the Agricultural Economist at the University of Wyoming overestimated the indirect impacts of National Forest and Grassland management by assuming all acres within the Thunder Basin National Grassland were influenced by Forest Service administered grazing. Within the National Forest or Grasslands in the Northern Great Plains there are many state and private pastures that are unaffected by Forest Service grazing decisions. The DEIS analysis did not consider this aspect of indirect impacts. The FEIS analysis does assess the effects associated with private and state lands within Federal pastures that are influenced by Forest Service administered grazing. The results of the analysis can be found in Chapter 3 of the FEIS in the Community & Lifestyle Relationships section. The analysis process used is documented in section II B, Appendix B of the FEIS.

Comment: Your method for calculating job losses and your job loss numbers are incorrect because you used the wrong cattle and sheep response coefficients in your analysis.

As explained in section II B of Appendix B in the DEIS and FEIS cattle coefficients were developed from county data.

Comment: Alternative 3 will cause an annual loss in state net revenues from energy taxes, royalties, general taxes, and leases/bonuses of 2.4 million. Direct energy-related employment will decrease by 69 FTEs, and secondary losses will be between 777 and 869 jobs. The livestock and energy losses will decrease the economic base by 7.5% on the Little Missouri National Grasslands. In Slope County, energy-related job losses are estimated at 15.8 FTEs direct employment and 87 FTE secondary job losses. Secondary grazing-related job losses in Slope County are estimated at 42-54 FTEs. The proposed 35-45%reduction in grazing in Slope County will put livestock producers out of business. North Dakota impacts would be $96 million in business volume.

"The Forest Service does not by itself control the level of oil and gas development on the National Grasslands. Energy market conditions, especially oil and gas prices, technological developments, and geological conditions, play the dominant role. … Between 1979 and 1985 an average of 175 wells were drilled each year within the boundaries of the Little Missouri National Grassland. In 1995 and 1996 an average of 12 wells were drilled each year. This decline in drilling and production was not due to changes in Forest Service management policy; it was due to dramatic changes in the market for petroleum, especially the decline in the price of crude oil" (Power, 2000). The FEIS estimates a decrease of 221 jobs and annual income of $3.9 million out of 208,691 jobs and $7,128 million in income across all the Northern Great Plains impact area; a change of less than 1% when compared to existing conditions.

Indirect & induced job (secondary) multipliers used in the Forest Service analysis from the Range Fed Cattle (sector 4) and Natural Gas & Crude Petroleum (sector 38) Sectors were no greater than 3.07 and no less than 1.797. Much of the labor for drilling comes from out of state, it takes relatively few people to run a producing oil and gas field given the value of the product, the raw material is processed out of state, and most of the profits go to out of state investors and corporations. Owners of mineral rights do usually get $1/8^{th}$ of energy related royalties and if they are local residents, corporations or governments, the local economy will likely benefit. The Federal Government returns 25% of its net $1/8^{th}$ royalty to counties. The energy industry is a significant source of local government revenues from royalties owned by local governments, profit sharing of Federal mineral receipts, severance taxes, income taxes, and property taxes on drilling and production equipment. The energy effects of Alternative 3 indicates at most 3% of jobs and 4% of income from future energy production growth would not be realized.

In 1992 approximately 16% of head months grazed in Slope County were grazed on National Forest System lands, in 1997 the percentage was approximately 12% (US Department of Commerce Census of Agriculture, 1997 & 1992). Eliminating all Forest Service grazing would only lead to a 12–24% reduction of head months in Slope County, depending on secondary impacts. (See FEIS Chapter 3 Community & Lifestyle Relationships for additional discussion).

Business volume is not an appropriate indicator of economic well-being (how people are affected) and is not reported in the FEIS. Jobs and income are appropriate indicators of economic well-being and do a good job of estimating how people will be affected by Forest Service decisions. Jobs and income are used by economists at a National level as a measure of economic well-being.

The FEIS uses the IMPLAN Input/Output model, an internationally recognized model, which is managed by the Minnesota IMPLAN Group (a private organization). The FEIS analysis developed an economic impact model using an aggregate of counties as the economic impact area for each administrative grassland unit. By doing this at the county level effects can be more accurately measured as transactions between counties are accounted for. It is unlikely that one county in this geographic region constitutes an economic impact area.

Refer to FEIS, Chapter 3, Community and Lifestyle Relationships, and FEIS, Appendix B.

Comment: The DEIS drastically underestimates economic impacts. According to a study by Dr. Larry Leistritz (NDSU), reductions in livestock and energy sector sales (from implementing the proposed plan) will decrease ND business volume by $96-100 (70 million in the Little Missouri region) million dollars annually; energy sector losses alone would be $50 million annually. This will be financially devastating to local communities and livestock producers who are already feeling the consequences of low product values and high input costs. It will also impact metropolitan areas lacking the infrastructure to handle large migration influxes. Leistritz' study says Alternative 3 will reduce livestock by 24-30 thousand head, with a corresponding decrease in gross business volume of $40-$50 million. The economic impact of the plans will be significant and adverse on a substantial number of small entities. A regulatory Flexibility Analysis should be required.

As stated above, gross business volume, which serves as the basis for the Leistriz model, is not an appropriate indicator of economic well-being and is not used in the FEIS. Also as stated above, the worst case for Alternative 3 energy impacts indicates that 97% of future job growth and 96% of future income growth from oil production would be allowed to occur under Alternative 3, but generally it will be the energy markets that will determine the level of energy production in the Northern Great Plains, not Forest Service regulations.

The DEIS and FEIS specifically calculate job & income effects at the economic impact area level (an aggregation of counties) using county level data and assert that they are valid calculations. Effects analysis at the county or community level is difficult and impractical to complete and can only be addressed in a qualitative way. Effects analysis at the county or community level in addition does not capture transactions between counties and communities. For example while Billings county does produce a relatively large volume of oil & gas when compared to other counties in the areas, there is very little employment and income generated in Billings County. A majority of the workers live in another county. The economic impact areas were designed to capture these cross county and community effects. Thus, the effects analysis discusses effects at the economic impact area level.

An updated version of the Reasonably Foreseeable Development Scenario for Oil and Gas has been prepared for the FEIS, and the economic impact analysis has been revised accordingly.

Refer to FEIS, Chapter 3, and Appendix B.

Comments on lost grazing revenues:

- *The proposed cuts in livestock grazing and other uses on the Sheyenne National Grassland would cost Ransom and Richland counties $2.5-2.7 million in revenue and 107-112 full time jobs. Business lost to surrounding communities would be $11-12.2 million. Reductions in livestock grazing could reduce state tax collection by $464,000 and $584,000 annually (Leistritz and Bangsund 1999).*

Proposed changes in grazing and the effects on jobs and income are estimated in FEIS, Chapter 3, Community and Lifestyle relationships and would under the most restrive alternative result in a loss of 70 jobs and $750,000 in income considering direct, indirect, & induced effects to the Sheyenne economic impact area. The Sheyenne National Grassland has many resource concerns which must be addressed (see FEIS, Chapter 3). To address these important resource issues, jobs, income and revenue will be affected.

- *The estimated reduction in livestock grazing will be 36 to 48 percent on the Little Missouri National Grasslands and 64 to 70 percent on the Sheyenne National Grasslands.*

The largest source of difference between grazing effects in the DEIS and the Heritage Alliance of North Dakota (HAND) analyses seems to be the use of the "no action" alternative (the grazing level recommended by existing plans) as a starting point in the DEIS as opposed to the level as shown on the grazing permit ("permit levels") used by HAND.

Traditionally, North Dakota ranchers have not been able to graze at permit levels because the conditions on the ground precluded that level of use. However, a more realistic approach is to look at the historical use patterns, which are the livestock numbers that are authorized each year by the Forest Service that can graze on the National Grasslands. In some years, the authorized numbers equal the permit levels, but in most years, they are lower than the permit levels. The FEIS effects analysis has been adjusted to use the historical authorized use levels as the reference or starting point for effects on livestock grazing.

The FEIS effects analysis now incorporates use of National Resource Conservation Service (NRCS) stocking recommendations. Applying the NRCS protocol, it is estimated that AUM reductions for the Little Missouri National Grassland would be 9% and for the Sheyenne National Grassland, 17%

A full discussion can be found in FEIS, Chapter 3, Livestock Grazing and FEIS, Chapter 3, Community and Lifestyle Relations.

- *Basic sector livestock revenues will be reduced by $1 million annually, with secondary losses estimated between $3.5 and $4.6 million. The reduced business activity will cause tax revenues to decrease by $52-69 thousand annually. A 10% reduction in AUMs would result in a private loss of $6,000. If $1.00 turns over 8 times in a small community, this equates to a community loss of $48,000.*

See discussion in ii above. Income and job multipliers for range fed cattle used in the FEIS are not greater than 2.7 (sector 4 range fed cattle) within the affected Northern Great Plains economic impact areas. See FEIS, Appendix B.

- *The Wyoming Farm Bureau Federation has determined a 1 AUM reduction in federal AUMs could cause a 3.3 AUM total reduction. Stocking rates on the 30% of federal land could determine stocking rates for 64% of private land and 6% of state land. Assuming every MAUM supports 1.16 full-time jobs on the Thunder Basin, Alternative 3 represents $2.7-$3.4 million loss in local economic activity and $722-$898 thousand loss in personal income.*

We agree that short-term effects could be realized on private lands as a result of the proposed management direction. However, it is also possible that there will be no long-term effect because grazing land of failed ranches if any, will eventually be grazed as ranches readjust and/or consolidate.

The Wyoming Farm Bureau Federation overestimated the indirect impacts to private land grazing levels by assuming all livestock stocking levels on private lands within the Thunder Basin National Grassland are determined by the Forest Service. The Forest Service makes stocking decisions only for fenced pastures with National Forest System lands (National Grassland) in them. There are many private pastures within the Thunder Basin National Grassland. The Forest Service makes no stocking level determinations for private land pastures.

When private or state lands are fenced in with National Forest System lands, the Forest Service sets the stocking levels for the entire pasture. Private or state land owners have the right to fence out their lands and would then be free to stock their lands as they see fit. When this has not occurred, stocking is determined by Forest Service decisions. The FEIS analysis indicates the Thunder Basin intermingled land effects multiplier is 2.3; put another way, for every 1 acre of National Forest System pasture, the Forest Service sets stocking levels on another 1.3 acres of private and state land

within those same pastures. See FEIS, Chapter 3, Community and Lifestyle Relationships for further discussion.

- *On the Sheyenne National Grassland, basic sector losses from grazing reductions will cost $9-11 million annually. On the Thunder Basin, the reduction in AUMs will cause the loss of 50-60 full-time jobs. It will be very difficult for the affected counties to replace these jobs.*

On the Sheyenne the alternative with the greatest decrease in AUMS (Alternative 4) projects a decrease in 60 jobs and $670,000 in income using direct, indirect, and induced factors. On the Thunder Basin the alternative with the greatest decrease in AUMS (Alternative 4) projects a decrease in 30 jobs and $621,000 in income using direct, indirect, and induced factors. Between 1990 and 1997 the Sheyenne and Thunder basin gained an average of 388 and 1,070 jobs annually (REIS).

Economic Impacts of Grazing in Wyoming Communities: An Interpretation (R. Fletcher et al. 1994, attached) was used to calculate loss of personal income to the affected ranching families and economic activity loss to the surrounding communities. One AUM represents $27.66 of direct and secondary personal income. One AUM represents $124.13 of direct and secondary economic activity. 1 AUM represents 0.00220 jobs. The 1995 Report of 161,000 AUMs minus 120,700 AUMs under Alt. 3 equals a reduction of 40,300 AUMs on the TBNG. The 40,300 AUM reduction x $27.66 = $1,114,698.00 annual loss of direct and secondary personal income to the individual permittees on the TBNG. The 40,300 AUM reduction x $124.13 = a $5,014,529.00 annual loss of direct and secondary economic activity to the local communities. The 40,300 AUM reduction x 0.00220 Jobs/AUM = a loss of 89 jobs.

Secondary personal income does not represent a loss to the permittees. Secondary income results from the rancher buying supplies, paying vet bills, etc. and the associated losses suffered by those vendors if the rancher's business is reduced. The rancher does not directly suffer these secondary personal income losses, only the direct personal income effects.

The FEIS does not present economic activity as this factor is not a good measure of economic well being.

A more recent study by Fletcher (Fletcher, 1998) indicates the direct income value of an AUM to be $31.53 with secondary income effects of an additional $32.14 per AUM, making an AUM worth approximately $63.67 / AUM. See FEIS, Chapter 3, Community and Lifestyle Relationships for a more thorough discussion. The FEIS uses .00258 jobs and $54.73 in income per AUM as total effects multipliers for the Thunder Basin. Thunder Basin grazing reductions are projected to be at most 11,560 AUMs in Alternative 4.

- *The Wyoming average value is $49.00/AUM. $49.00/AUM multiplied by the AUM reduction of 40,300 (40,300 X $49.00 = $1,974,700.00) equals a loss of value of TBNG grazing permits of $1,974,700.00 and possibly more, as this is 1986 data.*

Bastian (Bastian, 2000) indicates the average real estate value of a Forest Service AUM is now $68.00 / AUM with a low of $40 / AUM and a high of $100 / AUM. See FEIS, Chapter 3, Community and Lifestyle Relationships for a more thorough discussion. Thunder Basin grazing reductions are projected to be at most 11,560 AUMs in Alternative 4.

- *Reduction in grazing AUMs will affect the school district because of the loss of revenues 1) Bankhead-Jones payment 2) a reduction in the number of families and students living in the district because of a reduction in the number of viable ranches 3) and loss of taxable sales and income taxes.*

Some school districts would be affected by livestock reductions, especially those in South Dakota and Nebraska where Bankhead-Jones and National Forest 25% return funds are passed directly to school districts without a corresponding reduction in the Federal Payment in Lieu of Taxes payment as it does in Wyoming and North Dakota.

This may change for the counties of the Nebraska and McKelvie National Forests. Recent legislation (Secure Rural Schools and Community Self Determination Act) will give counties the choice of taking the average of the high three years of National Forest 25% return fund payments or continue with the current program. This new legislation does not affect the National Grasslands.

Many agricultural communities are in a state of decline in jobs, income, and population. This trend continues today and is most predominant in North Dakota. The AUM reductions may further accelerate this trend. Forest Service decisions will not affect more than 1% of the jobs and income in any of the Northern Great Plains economic impact areas. See FEIS, Chapter 3, Community and Lifestyle Relationships for a more thorough discussion.

- *On an average 200-cow ranch, the proposed 10% reduction in AUMs could mean a $6000 to $8000 reduction in calf sales that would come directly out of family living expenses.*

This issue is addressed in the FEIS in terms of jobs and income instead of gross sales. Jobs and income are a better measure of economic well being. See FEIS, Chapter 3, Community and Lifestyle Relations for a more thorough discussion.

Comments on lost oil and gas revenues:

- *Annual economic impact of revenue from oil and gas production in the Little Missouri Grasslands at $20/BO and $2/MCFG is as follows: Total Revenue of over $203,000,000; Royalties in excess of $25,000,000; Production and Extraction tax revenue of almost $15,000,000; More than 690 Full Time Jobs. Economic impact of oil and gas production from Federal lands in the Little Missouri Grasslands at $20/BO and $2/MCFG is as follows: Total Revenue of over $135,000,000; Royalties in excess of $16,000,000; Production and Extraction tax revenue of almost $10,000,000; More than 460 Full Time Jobs.*

Alternative 4 is projected to have the greatest impact on Little Missouri oil & gas production and will still provide 93% of existing conditions or Alternative 1. FEIS Alternative 4 projections are for a decrease of $900,000 in royalties and $300,000 to North Dakota and North Dakota counties.

The FEIS focuses on effects to personal income and local employment because those are the primary indicators that affect individuals as well as communities. Assessing the total revenue impacts solely without relating it to how it affects the individual can be misleading. By focusing primarily on total revenue, and relating lost jobs to that amount, the effects to the overall industry rather than the individual economic impact area are determined. Under a total revenue assessment, no determination is been made as to how local jobs and personal income are affected. This leaves an open-ended question on effects to local economic impact areas. Regardless, the commenter has assessed that Alternative 3 would create a 7.5% decrease in total economic base for the Little Missouri National Grasslands region over the next 10 years. This conclusion assumes that the affected industries would not change their actions to meet changes attributed to the Forest Service's proposal.

Energy markets and not Forest Service regulations will be the primary determining factor in future energy production.

See FEIS, Chapter 3, Community and Lifestyle Relationships, and Appendix B.

- *Oil and gas exploration and extraction would be reduced from 681,540 to 53,920 acres on the Little Missouri National Grassland. There would be no "no surface occupancy" restrictions on 162,650 acres.*

We agree that the level of supplemental leasing stipulations being applied will reduce oil and gas exploration and extraction. The Reasonable Foreseeable Development Scenario (RFDS) has been adjusted to account for the planned level of supplemental leasing stipulations and projects at most a 7% reduction in jobs and income from the federal mineral estate under Alternative 4. We also agree that the area to which NSO stipulations will be applied is increased over the existing situation. (FEIS Chapter 3, Oil and Gas).

When considering the impact of the level of leasing stipulations applied in the plans, there are two important points, which must be remembered. The first point is that much of the area is presently leased, and the stipulations in the new plan only apply to new leases. Existing lease rights will be honored. The new stipulations will only apply after the existing lease has expired and in the case of leases held by production this could be many years.

The second point is that a paleontological CSU stipulation applied to the Thunder Basin National Grassland and the Nebraska National Forest requiring paleontological surveys is applied to all class 3, 4 and 5 paleontological classes. This encompasses a very large area and is displayed in the FEIS as a very large amount of acreage affected by CSU stipulations. Although CSU stipulations will increase the cost of development, they do not prohibit development. Some marginal exploration activities may be forgone because of increased cost and this effect is reflected in the RFDS. Acreage affected by type of stipulation is displayed in the FEIS, Chapter 3, Oil and Gas.

In response to some public comment, the Forest Service has dropped the paleontologic stipulations in the final plan on the Dakota Prairie Grasslands and will use a lease notice to protect these resources.

Acres with No Surface Occupancy (NSO) stipulations in the DEIS represent a decrease in NSO stipulations over what is in the existing situation. These areas are larger than currently exists, and more areas are therefore unavailable for development given the current technologies. The larger areas exist primarily to preserve some areas in an undeveloped character and to protect occupied bighorn sheep and other sensitive species habitat areas. While this will reduce the area available for oil and gas development it will increase the land managers ability to provide for a diverse set of recreational experiences and meet the needs of sensitive plant and animal species and communities. In other words it will provide a more balanced mix of multiple uses on the grasslands.

- *Findings by the Oil and Gas Division show Alternative 3 will not lead to 111 more oil and gas jobs and a $3.1 million increase in oil and gas revenue over the present management plan. Leistritz and Bangsund (1999) indicate restrictions in the new management plan will result in 103 fewer wells being drilled during the 10-year span of the management plan and project a reduction in petroleum sector revenue of $26.5 million, a reduction of $24.5 million in secondary economic impacts, and a loss of about 388 secondary jobs.*

These effects are based on a different data set than the FS used. Therefore the effects will differ from those displayed by the FS. To remedy this situation, the Forest Service has worked with ND Oil and Gas commission in ND to resolve the differences in basic data sets.

The Reasonable Foreseeable Development Scenario has been adjusted to account for the level of lease restrictions applied in the Forest Plan stipulations and projects at most a 7% reduction in jobs and income from the federal mineral estate under Alternative 4. Focusing on the number of wells not drilled rather than on the number anticipated to be drilled with the planned level of stipulation fails to recognize the economic benefit to be derived from the oil and gas leasing program. Jobs, revenue and income are projected in the FEIS, Chapter 3, Community and Lifestyle.

- *Reductions in the energy sector would cause an estimated $51 million loss in gross business volume during the first 10 years under the proposed plan. Leistritz and Bangsund estimate that the state would have to recover between $35.5 and $37.7 million in annual recreation expenditures to offset basic sector losses.*

See response to comments above.

- *Use current management practices employed at the Fort Pierre National Grassland for the rest of the grasslands. Also refer to the conclusions in the study done by the Economic Chair at the University of Montana ("The Economic Impact of Changes in National Grasslands Management in North Dakota").*

Current management practices employed at the Fort Pierre National Grassland were considered in the DEIS and FEIS in the geographic area direction for the Land & Resource Management plans. The conclusions in the above mentioned paper (Power, 2000) were considered in the analysis. See FEIS, Chapter 3, Community and Lifestyle Relationships, Effects on Income and Employment. Indicators relating to gross economic activity and economic impacts based on gross market values provided by the Heritage Alliance of North Dakota were not used in the FEIS analysis. The analysis was based on net income and jobs as these are a better indicator of economic well-being.

Recreation, Travel Management, Visuals

Comment: You are using the NEPA process to deceive the public. Recreation development on the DPNG needs a full-scale EIS. When it is convenient to restrict uses like grazing or oil and gas development, you use plan revision to make the changes, but you circumvent the process to allow new recreation uses.

Recreation, grazing, and oil and gas development are all planning questions addressed in the EIS. NEPA has public disclosure as one of its requirements.

Comment: Summary, p. 32, Travel Mgmt.—By not restricting motorized travel to designated routes; you are helping to fragment the prairie. You seem to advocate unrestricted travel by mentioning the adverse effects of staying on designated motorized travel routes. If you mention three disadvantages to staying on designated routes, you should also include three advantages. Your road analysis focused on effects to human activity. What about relating road use to ecosystem preservation?

The plans differ in how they respond to off-road motorized use.

Both the Thunder Basin and Dakota Prairie plans provide direction that motorized travel occurs only on existing roads and trails.

On the Nebraska National Forest, it is planned that travel management decisions will not be made as part of the LRMP decision, but will be addressed in a later NEPA analysis and further public involvement that tiers to the LRMP direction.

Environmental Justice

Comment: Executive Order 12898 (February 11, 1994) requires federal agencies to make Environmental Justice part of their mission and to address impacts to minorities and low-income populations. The DEIS did not accomplish this.

Environmental Justice issues are addressed in the FEIS in accordance with Executive Order 12898. Minority and low-income populations were identified as part of the social analysis in Chapter 3 of the FEIS. Effects of all alternatives to minority and low-income populations are disclosed in Chapter 3 of the FEIS.

The Executive Order 12898 was signed by President Clinton in 1994 to focus federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The Order directed federal agencies to develop environmental justice strategies to aid federal agencies identify and address disproportionately high and adverse human health or environmental effects of the programs, policies, and activities on minority and low-income populations. The Order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environmental, and to provide minority and low-income communities access to public information on, and an opportunity for public participation in, matters relating to human health or the environment.

Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

To be classified as an environmental justice community, residents must be a minority and/or low income group; excluded from the environmental policy setting and/or decision-making process; subject to a disproportionate impact from one or more environmental hazards; and experience a disparate implementation of environmental regulations, requirements, practices and activities in their communities.

In determining whether there are disproportionately high and adverse environmental or human health effects, including social and economic effects, on an identifiable low-income or minority population, agencies should consider, as appropriate, such effects as: bodily impairment, infirmity, illness or death; air, noise, and water pollution an soil contamination; destruction or disruption of man-made or natural resources; destruction or diminution of aesthetic values; destruction or disruption of community cohesion or a community's economic vitality; destruction or disruption of availability of public and private facilities and services; displacement of persons, businesses, farms, or nonprofit organizations; isolation, exclusion, or separation of minority or low income individuals within a given community or from the broader community; and the denial, reduction in, or significant delay in the receipt of, benefits of USDA programs or activities. In determining if an effect on a minority an/or low income population is disproportionately high and adverse, agencies should consider whether the adverse effect is appreciably more severe or grater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low-income populations.

There are approximately 16 Indian tribes within or near the Northern Great Plains national forests and grasslands. Special efforts have been made to involve Native American tribes within the geographic areas of the planning area. Letters have been exchanged and numerous meetings have been held with tribal councils, tribal committees, tribal historic preservation offices, intertribal groups, and the Great Sioux Nation Treaty Council. Close coordination has also taken place with state and federal agencies, including the EPA, US Fish and Wildlife Service, and State agencies in ND, SD, NE, and WY. County commissioners within all affected counties have been consulted and many public meetings and open houses have been held with affected interests of communities throughout the planning area.

Communities and American Indian tribes within the Northern Great Plains identified the following issues or problem areas that may have potential environmental justice impacts. These issues were analyzed and related impacts were disclosed in the FEIS.

These problem areas are all identified and impacts to minority and low-income populations are disclosed in FEIS, Chapter 3, Community and Lifestyle Relationships. The analysis shows that no minority and/or low income group was excluded from the environmental analysis and/or decision-making process, were not subject to a disproportionate impact from one or more environmental hazards, and will not experience a disparate implementation of environmental regulations, requirements, practices and activities in their communities as a result of the plan revisions on these Northern Great Plains units.

Comment: The Americans with Disabilities Act was implemented to make places more accessible. The new allocations for Research Natural Areas, Special Interest Areas, Wilderness Areas, and roadless areas reduce accessibility by 43%. This plan will limit access and prevent people with physical disabilities from using wheelchair-equipped ATVs to hunt in some areas. The elimination of motorized travel in some grassland areas will prevent the young, elderly, people with health problems, people who are not physically fit, families with children, and the handicapped from using them. Wilderness designations and roadless areas discriminate against handicapped individuals and the elderly. Backcountry recreation non-motorized designation on the TBNG is in conflict with the Americans with Disabilities Act (ADA).

It is unclear where the 43% less accessible percentage was calculated. However the Forest service has tried to respond to this comment by eliminating the seasonal restrictions on motorized travel, and it has significantly reduced the acres where motorized travel will not be allowed on the Dakota Prairie.

It is not the intent of the National Forest to deny any user group or individual access to any part of the Forest, but rather to provide an appropriate mix of access/recreation opportunities to all users. The type of access allowed in certain areas and on certain travelways may be limited in an attempt to protect resources, wildlife, or establish an equitable mix of opportunities for all users. It is correct that Management Area direction for all Wilderness Areas MA 1.1, areas recommended for wilderness MA 1.2, Suitable Wilderness MA 1.2a, Back-country Recreation Non-motorized areas MA 1.31, National Recreation Areas MA 1.31a, Research Natural Areas MA 2.2, and some Special Interest Areas MA 2.1 will restrict motorized uses. However, non-motorized access into these areas is still allowed.

Within Grassland-wide Goal 2.a. of the Plans, an objective is developed to encourage more accessible opportunities on national forests and national grasslands. “Through partnerships, encourage, establish, and sustain a diverse range of recreational facilities and services on NFS lands. Encourage outfitters and guides who support interpretation and educational awareness of grassland ecosystems or who provide services to people with disabilities.” Also, within Grassland-wide Goal 4.a., an

objective also states "Where appropriate, encourage and authorize recreation opportunities for people with disabilities."

Also, within Grassland-Wide Management Direction, Plans, Chapter 1, Section Q, Infrastructure Use and Management, a Standard has been developed stating: "Allow motorized wheelchair use in a non-motorized area so long as that wheelchair meets the legal definition of Title V, Section 507 (c) (2) of the Americans with Disabilities Act."

Effects to people with disabilities are disclosed in FEIS, Chapter 3.

Comment: Allow handicapped hunters to use motorized assistance. Allow people in wheelchairs to use small, specially designed vehicles in wilderness and roadless areas.

It is a grassland-wide standard within plan management direction to "Allow motorized wheelchair use in a non-motorized area so long as that wheelchair meets the legal definition of Title V, Section 507 (c) (2) of the Americans with Disabilities Act." LRMP, Chapter 1, section Q, Infrastructure Use and Management

Takings

Comment: Reducing AUMs for wildlife and recreation is in violation of federal law and is a form of government takings as well as an economic loss. The authority for the Forest Service to condemn or acquire private land via the Declaration of the Taking Act is limited by the scope of the authorization found in the Federal Emergency Relief Act, and the Bankhead Jones Farm Tenant Act. The public purposes stated in these acts define the current public use of the National Grasslands as agricultural. It is therefore illegal for the Forest Service to increase wildlife, recreation, and other non-commodity uses at the expense of livestock grazing on the grasslands.

See response to the first comment under Community and Lifestyle Relationships. The public purposes stated in the Bankhead-Jones Farm Tenant Act and other acts do not define the public use of the national grasslands as agricultural.

Rather, the myriads of laws these public lands are managed under require sustainable levels of all multiple uses including wildlife and recreation.

The legal category most accurately describing a grazing permit is a license in real property. It is defined in 25 Am. Jur. 2d Easements and Licenses (123 as "a personal, revocable, and unassignable privilege, conferred either by writing or parole, to do one or more acts on land without possessing any interest therein." A distinguishing characteristic of a license in land is that it gives no interest in the land—thus fitting within the statutory constraints. Consistent with public land law, a license is "an authority to do a lawful act, which, without it, would be unlawful, and, while it remains unrevoked is a justification for the acts which it authorizes to be done."

Thus, a grazing permit is most accurately described as a license in real property. Consistent with the above discussion, the Forest Service range management regulations state: "Grazing permits and livestock use permits convey no right, title, or interest held by the United States in any lands or resources." (36 C.F.R. 222.3(b)).

As the above discussion of case law and statutes illustrates, a grazing permit does not create a possessory interest in real property. A grazing permit only authorizes the holder to use the property in some manner. Thus, the reduction or elimination of livestock grazing, pursuant to the exercise of the Secretary of Agriculture's statutory discretion, is not a taking under the Fifth Amendment.

The Fifth Amendment provides that private property shall not be taken for public use without just compensation. However, as the United states Supreme Court has held, the issuance of a grazing permit does not create a compensable property right. In United States vs. Fuller (409 U.S. 488.492 (1973)), the Court stated:

> The Government…may not be required to compensate…for elements of value that the Government has created, or that it might have destroyed under the exercise of governmental authority…It would seem a fortiori that it need not compensate for value which it could remove by revocation of a permit for the use of land that it owned outright.

Thus, because a grazing permit confers no property right, there is no compensable injury under the Fifth Amendment for government actions which affect grazing on permitted land.

Comment: Using the $75/AUM, loss in grazing permit value would be $3,022,500--a significant loss of capital assets for the TBNG ranchers and possibly a taking of individual assets. The Supreme Court ruled that the government can't arbitrarily reduce the value of an individual's property (Lucas v. S. Carolina Coastal Commission).

"Grazing permits and livestock us permits convey no right, title, or interest held by the United States in any lands or resources." 36 CFR222.3 (b) Thus reduction in permitted grazing levels is not a taking of private property right. Also, see response above.

Comment: The following two questions weren't addressed in the DEIS as required by law:

- *Will grassland users be entitled to compensation if traditional productive uses of these lands are eliminated to protect riparian habitat, accommodate endangered species, or allow expansion of prairie dogs?*
- *Will grassland permittees be entitled to compensation if a significant reduction in AUMs reduces the value of their grazing permits?*

See response to the first comment under Community and Lifestyle Relationships and response to comment #2, Takings above.

Payments in Lieu of Taxes (PILT)

Comment: The plan doesn't address loss of revenue from reduced payment in lieu of taxes (PILT). How will you replace this lost revenue?

PILT payments are generally based on a formula and for most counties in the Northern Great Plains will be unaffected by increases or decreases in revenue producing outputs. These counties are disclosed in the FEIS, Chapter 3, Community and Lifestyle Relationships.

Comment: Reducing livestock numbers will reduce payments in lieu of taxes (PILT). Presently the federal government pays approximately $.48 per acre ($45,000 on 94,000 acres in Dawes and Sioux Counties). Private landowners pay $3.76/acre in Dawes County and $1.31/acre in Sioux County. This formula needs to be changed to equalize PILT and private property taxes.

Payments generated by the Payment in Lieu of Taxes Act of 1976 (PILT) are based on the number of federal acres within Dawes and Sioux Counties in Nebraska, and not on revenue generated.

In addition to PILT funding, non-PILT payments are made on National Forest lands through the Act of March 4, 1907, commonly called the "25% Fund Act," and through the Bankhead-Jones Farm Tenant Act on National Grasslands. Both these acts return appropriatly 25% of revenues generated by recreation, grazing, mineral exploration, or other sources of revenue. The difference is that National Forest land returns 25% of the gross revenue, while national grasslands return 25%of the net revenue after Conservation Practices funding is subtracted.

Determination for funding formulas for all three laws are established by Congress and thus are outside the scope of the Forest Plan. In 1993, Congress amended the PILT Act to increase the payment formula, but the amendment has not been fully funded. A more complete explanation of revenues to counties can be found in Chapter 3 of the EIS, Community and Lifestyle Relationships.

Grazing

Comment: Eliminate all grazing. Reduce grazing levels. Maintain existing levels or increase grazing.

Various actions relating to grazing levels were analyzed in the FEIS, Chapter 3, Livestock Grazing. The estimated grazing use is dependent on the desired vegetation structural condition which varies by alternative. In accordance with the Multiple Use Sustained Yield Act, grazing has been a natural process in the prairie ecosystem and is an appropriate use on the grasslands and the FEIS considers six alternatives for various grazing levels. The Forest Service is also implementing a long-term schedule to analyze effects on a site-specific allotment level.

Comment: Uphold the mgmt. plan developed in cooperation with the Pioneer Grazing Association.

Land and resource management plans provide programmatic direction for forests and grasslands.

An allotment management plan is the primary document which guides implementation of plan direction for rangeland resources and, as such, must conform to, and be consistent with, the management direction contained in the LRMP (FSM 2212). Because the management plans developed with the Pioneer Grazing Association and others implement existing Land and Resource Management Plans, some parts of the Pioneer and other allotment management plans may have to be changed or updated to implement the revised plans.

Comment: Livestock grazing guideline #10 (Plans, p. 25) is unnecessary and based on poor range science. It could put me out of business/reduce the value of my property by 50%.

On the Thunder Basin National Grassland and the Nebraska National Forest, livestock grazing guideline #10 has been clarified to read, "Prohibit routine winter feeding of domestic livestock on NFS lands." This applies only to NFS lands, as it is not an appropriate activity on these lands. Nothing in this guideline applies to private lands. The Dakota Prairie Grasslands guideline is worded to minimize feeding and storage of hay on the NFS lands.

Comment: The importance of livestock grazing in maintaining grassland health hasn't been adequately discussed.

The environmental consequences of livestock grazing are discussed in the FEIS, Chapter 3, Rangeland Forest Health. Desired vegetation conditions keyed to composition and structure have been developed for each Geographic Area and are dependent upon type of vegetation present, soil and water concerns, and site potential. Utilization levels are estimated to achieve the desired condition. Each alternative would result in a different level of estimated available forage for livestock, depending on capable rangeland, suitable acres, rest acres and desired vegetation conditions. The FEIS further discusses the direct, indirect and cumulative effects by alternative of livestock grazing on grassland health.

Comment: Range analysis should be based on the best available science and should be peer reviewed.

The rationale and science of the livestock grazing effects analysis and management practices are discussed in FEIS, Appendix B, Documentation of Analysis. A Range Peer Review Group was formed to review and provide input to the Documentation of Range Analysis.

Comment: The DEIS rangeland capability analysis inaccurately portrays the amount of capable range.

The criteria used to determine existing capable rangelands is based on Forest Service manual direction. (FSM 1905 and 36CFR219.2) Information required to make the determination includes percent slope; forage production; accessibility; and water availability. The determination of rangeland capability may be reviewed and updated based on site-specific project level analysis. (See FEIS, Appendix B)

Comment: The Forest Service didn't adequately analyze the suitability of livestock grazing--in particular, the following concerns:

- *Whether the Forest Service properly understands the difference between suitability and capability and correctly identified these areas?*
- *Whether the Forest met the NFMA and NEPA requirements in their analysis of grazing in the revised plans?*

The NFMA implementing regulation at 36 CFR 219.20 states that "In forest planning, the suitability and potential capability of National Forest System lands for producing forage for grazing animals and for providing habitat for management of indicator species shall be determined as provided in paragraphs (a) and (b) of this section." Paragraphs (a) and (b) state:

Lands suitable for grazing and browsing shall be identified and their condition and trend shall be determined. The present and potential supply of forage for livestock, wild and free-roaming horses

and burros, and the capability of these lands to produce suitable food and cover for selected wildlife species shall be estimated. The use of forage by grazing and browsing animals will be estimated. Lands in less than satisfactory condition shall be identified and appropriate action planned for their restoration.

Alternative range management prescriptions shall consider grazing systems and the facilities necessary to implement them; land treatment and vegetation manipulation practices; and evaluation of pest problems; possible conflict or beneficial interactions among livestock, wild free-roaming horses and burros and wild animal populations, and methods of regulating these; direction for rehabilitation of ranges in unsatisfactory condition; and comparative cost efficiency of the prescriptions.

Capability and suitability are defined by NFMA implementing regulations at 36 CFR 219.3 in the following manner:

Capability "The potential of an area of land to produce resources, goods and services, and allow resource uses under a assumed set of management practices and at a given level of management intensity. Capability depends upon current conditions and site conditions such as climate, slope, landform, soils, and geology, as well as the application of management practices, such as silviculture or protection from fire, insects, and disease."

Suitability "The appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative use foregone. A unit of land may be suitable for a variety of individual or combined management practices." (36 CFR 219.3)

The specific criteria used to identify suitable and capable rangelands during the forest plan revision process are contained in Appendix B. The suitability analysis identified where grazing was appropriate taking into consideration existing condition, and other uses or values of the area. Lands such as fenced recreation sites, administrative sites, closed allotments, and special use sites were considered unsuitable. The capability analysis identified which lands are physically or biologically capable of supporting grazing or browsing. These capability determinations were based on factors such as cover type, slope, water and roads. Lands determined to be non-capable, based on physical or biological characteristics, were also classed as unsuitable. Capability and suitability were defined and identified in accordance with the regulations.

Suitable acres identified for livestock grazing, their condition, estimates of forage for livestock, estimates of forage for selected wildlife, and the process for addressing unsatisfactory conditions, as required by NFMA is found in 36CFR219.2. These determinations and the rationale behind them are supported in the planning record Appendix B. The unit's forest determined that the land use allocations (capability) would remain constant in all alternatives. No additional lands were proposed for removal from the suitable base of grazing acres. Environmental effects were evaluated and displayed for the alternatives in the FEIS, Chapter 3, Livestock Grazing. An analysis of economic suitability by alternative is contained in the FEIS, Chapter 3 Community and Lifestyle Relationships. This analysis includes both a financial efficiency analysis considers only revenues from grazing fees as benefits, and a cost efficiency analysis which considers the full market value of grazing under permits as benefits. Agency costs in both analyses include permit administration, planning and range improvements. A summary of the economic analysis is contained in FEIS, Chapter 3, Community and Lifestyle Relationships.

Comment: The procedure for estimating livestock forage and stocking rates is based on modeling and theory rather than actual stocking rates and utilization, range condition, and soil stability monitoring.

Several methods were used to determine existing and potential graminoid herbage production on the planning units including use of the Northern Region ecosystem inventory system and the Natural Resource Conservation Service range analysis methodology. In ND, the latter was selected as the best methodology available through consultation with range scientists and the state of ND. It was selected based on comments to the DEIS. Range condition and soil survey data are factors used in the above methodologies. (FEIS, Appendix B). This information is used as a comparison for effects between alternatives and is not be used to set stocking levels on individual allotments. Standard estimates of utilization have been calculated by previous research and then categorized into three basic livestock forage use levels (light, moderate, high). Utilization estimates and the desired vegetative conditions will help determine the carrying capacity of a site. Monitoring information and stocking rate guidelines will be used to help design range management strategies for meeting plant species composition and vegetation structure objectives.

Comment: The proposed changes in stocking rates are a good start but should not be a set number. The numbers should be adjusted on a case-by-case basis to ensure compatibility with other uses on the National Grasslands.

The Forest Service agrees with this comment. This comment is consistent with the direction stated in the DEIS and FEIS. Stocking rate guidelines will be used initially to help achieve desired vegetation structure and plant species composition. The guidelines will provide for light, moderate and heavy grazing intensities creating a mosaic of vegetation structure levels across the landscape. Vegetation structure is a key factor influencing diversity of native plants and animals, watershed function and recreational opportunities. Desired vegetation conditions have been developed for each Geographic Area LRMP Chapter 2. Stocking guidelines will be implemented and monitored and adjusted as needed to attain desired conditions.

Comment: The FS proposal for setting new stocking rates using NRCS guidelines is not appropriate. Proper stocking can only be achieved through the use of historic stocking and good monitoring. Weighing livestock is a big workload that is impractical.

In describing the proper application of their initial stocking rate guidelines, the NRCS also points out the importance of knowing historic stocking and good monitoring to determine proper stocking. The FEIS Appendix I stocking guidelines that will be used by the Forest Service also acknowledge the need for this type of information and provide for the ability to site specifically adjust the stocking rate guidelines with that information. However, the monitoring information needs to be sound and comprehensive and address current conditions and trend for plant species composition, vegetation structure, riparian and wooded draw conditions, wetland conditions and watershed function. If that information is available and it demonstrates that management objectives, standards and guidelines are being met or measurable and timely progress is occurring, then the stocking rate guidelines will need to be adjusted for that area. In the case that such information is unavailable, the stocking rate guidelines will apply and implementation of a sound monitoring programs will be paramount.

Comment: Range conditions have been improving and the FS has no monitoring data that shows a declining trend in range condition. Why then is the FS proposing these reductions in stocking rates?

The Forest Service is not proposing reductions. The Forest Service is estimating that meeting the desired conditions (as outlined in the FEIS and in Appendix B) will require reductions (refer to the grazing suitability and forage and stocking rate responses above).

Comment: The FS use in the DEIS of 1600 lbs. as a figure for the average cow is wrong. A more reasonable estimate would be 1100 lbs. to 1300 lbs.

The allocation of animal unit months (AUMs) is currently based on 1000-pound cows with a calf less than 6 months of age. The Forest Service defines an AUM as "the amount of forage required to sustain a 1000-pound animal and calf for one month". Cow size will be taken into consideration when setting stocking levels. (Plans, Appendix B) The FEIS does acknowledge the fact that cow sizes have increased on some units based on genetic improvements in many breeds. FEIS Chapter 3 Livestock Grazing.

Comment: The formula for figuring AUM should be one cow-calf pair (where the cow weighs approx. 1150 lbs.), not 1 AUM for the cow and 0.32 for the calf. You should also use NRCS stocking rate guidelines.

Several definitions of an AUM are currently being used on public lands on the Northern Great Plains. The Forest Service defines an AUM as "the amount of forage required to sustain 1000-pound animal for one month." The NRCS defines an AUM as "the amount of forage required to sustain a 1000-pound animal of better-than-average milking ability with a calf less than six months' postpartum" (essentially a cow/calf pair). Because different definitions are used in different areas on the Northern Great Plains, one definition was applied for consistency's sake. Existing monitoring information and stocking rate guidelines will be used to design and implement range management strategies for meeting desired vegetation objectives. NRCS stocking rate guidelines are used in development of this strategy. (FEIS Chapter 3 Livestock Grazing)

Comment: Livestock grazing practices and overgrazing continue to reduce the biological diversity on the national grasslands and forests.

36 CFR219.19 states "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area."

Effects of livestock grazing on biological diversity is addressed in FEIS, Chapter 3, Rangeland and Forest Health and in the LMPs, Appendix H, Biological Assessment and Biological Evaluation. The livestock grazing stocking guides (Plan Appendix I) are intended to meet desired vegetation condition objectives as described in Plan, Chapter 2, Geographic Area Direction, to provide for the viability of all plant and animal species and to maintain rare plant communities. (BABE, FEIS Chapter 3 Viability Determinations)

Comment: The FS proposal would rest a mere 5% of the National Grasslands annually which would fall short of restoring land degraded by livestock grazing. We recommend one third of the Grasslands be rested annually as being a more balanced amount of rest.

Desired vegetation objectives, including objectives for acres to be rested and prescribed burned are described in Chapter 2 Geographic area Direction of the Plans. The FEIS Chapter 3 Rangeland and Forest Health and Appendix B discloses the effects of resting various percentages of the grasslands and forests. The Great Plains evolved under a combination of herbivory (grazing), rest, fire, drought, and other disturbances such as hail and grasshopper infestations. Grazing systems, fire, and rest are intended to be implemented in a scale and pattern that will help achieve the desired vegetation objectives set in for the Geographic Areas in the Plans.

Comment: The FS proposal for rest will cause deterioration of plant and animal populations. There is no science supporting rest as a way to improve range condition.

Resting a pasture from grazing may or may not be intended to improve range condition. Resting pastures may result in a higher percentage of forbs in a pasture. This result could be less desirable for livestock but more suited for wildlife due to plant variability in both species and structure. It is not a single intent to improve range condition for livestock consumption.

In the FEIS, Chapter 3, Livestock Grazing and Rangeland Health, there is discussion pertaining to the benefits of rest.

Comment: Consider other management options, such as rest and fire. Too much emphasis is put on livestock as a vegetation management tool and too little emphasis is placed on fire. Too much of the vegetation is taken by the livestock and not enough is left for the wildlife and to protect the soil, riparian areas, and woody draws. Livestock also reduces recreation opportunities and wildlife habitat.

Effects of livestock grazing on soils, riparian areas, woody draws, recreation opportunities and wildlife habitat are discussed in FEIS, Chapter 3.

A variety of management practices (including fire, rest, herbivory) that emulate ecological processes will be used to achieve desired landscape conditions. This direction is described in Goal 1.b and 1.c, Ecological Integrity, and associated objectives in Chapter 1 of the Plan. More specific management direction is found in Chapter 2, of the Plan under Geographic Area Direction. Plant species composition and vegetation structure objectives will be met through design of a range management strategy that uses fire, rest and herbivory as tools. Stocking rate guidelines will define light, moderate and heavy grazing intensities to provide a diversity of high, moderate and low structure grasslands and sagebrush communities. A diverse mosaic of vegetation conditions will help ensure quality habitats for a variety of native plant and animal species ensure healthy watersheds and provide for recreational opportunities.

Comment: Increase livestock grazing, fences, and water developments.

Various actions relating to grazing levels were analyzed in the EIS, Chapter 3. The estimated grazing use is dependent on the estimated suitable rangeland acres vary by alternative. Grazing is an appropriate use of the grasslands and we have considered alternative grazing levels in the EIS, Chapter 3. In response to public comments, Alternative 3 (Preferred) would allow an increase in water developments above current levels on most units. Alternative 3 also provides for an increase in average pasture size above current levels on most units.

Comment: Ranchers are the most knowledgeable people about grazing these lands and should be left alone to do it.

Ranchers and grazing associations shouldn't be in charge of overseeing livestock grazing on public lands.

The Forest Service is charged with administering the National Grasslands and Forests in conformance with all applicable federal laws and regulations. Forest Service regulations at 36 CFR 222.3 authorizes the agency to issue grazing permits and 36 CFR 222.7 authorizes the agency to "recognize, cooperate with and assist" local livestock associations in the administration of grazing on National Forest System lands. A grazing association operates under a grazing agreement, a type of grazing authorization to permit eligible grazing associations organized under state law to graze specified NFS lands for a period of ten years or less. Grazing agreements contain provisions for the associations' to issue grazing permits to their members. 36 CFR 222.2 (c) Forage producing National Forest system lands will be managed for livestock grazing and the allotment management plans will be prepared consistent with the land management plans.

Comment: Native predators and other wildlife shouldn't be killed to protect cattle.

The Forest Service and Animal & Plant Health Inspection Service (APHIS) – Animal Damage Control program along with the States, cooperate under the Animal Damage Control Act of March 2, 1931, as amended, to manage animal damage on National Forest System lands. A Memorandum of Understanding (MOU), September 3,1998, between the Forest Service and APHIS outlines the cooperative approach to animal damage management on National Forest System lands. The MOU outlines cooperation to ensure the protection of National Forest System resources and consistency with Land and Resource Management Plans.

These activities include actions to provide wildlife damage management through direct control, as well as technical assistance to achieve desired management objectives. APHIS carries out animal damage management activities on National Forest System lands mostly to minimize livestock losses from predation by coyotes and other predators. Most animal damage management activities on the National Forest System lands are conducted as a result of coyote predation on domestic sheep. (FEIS Chapter 3, Plant and Animal Damage Control)

We received a variety of comments on the following: The fences for the livestock are keeping recreationists out. No net gain in fences and water developments would unnecessarily remove tools from the manager. All management tools and options should remain available for use within the allotment planning and implementation process. While in general we support no net gain of fences and water developments, fencing of riparian pastures may be necessary for watershed/wildlife habitat improvement. An increasing problem on the Grasslands is the proliferation of water developments. These expand cattle use into areas important to wildlife and continue the fragmentation and loss of natural character of these areas. We would like to see an increase in secondary range by removing unnecessary fences and water developments. The water we have worked so hard at developing on the National Grasslands provides benefits to many species of wildlife. Why are you now proposing to remove them? Livestock Grazing Guideline 12 states "Prioritize for removal any fences or water developments where secondary range or high structure is desired." If proper range management principles are applied throughout the forest, then secondary range should never be utilized.

Water developments and fences are used to determine the extent of an area that could be grazed by livestock. They can also be used to create diverse vegetation conditions. Larger pastures with fewer water developments encourage patchy grazing patterns, which contribute to different vegetative structures.

To respond to these issues, the EIS, Chapter 3, considered both increasing water developments (Alternatives 2 and 3), providing no limits on water developments (Alternative 1), and decreasing water developments (Alternatives 4 and 5). No restrictions on pasture sizes (Alternatives 1 and 2), and at decreasing pasture sizes (Alternatives 3, 4 and 5) were also considered. Alternative 3 provided the best choice to meet desired conditions for vegetation structure, wildlife water, forage production, and recreational access.

Based on public comment the planning units decided to provide flexibility to add fences and water, but only where non-structural management practices will not be successful in making the needed changes

A standardized drought management guide like the one being proposed is inappropriate because precipitation is highly variable and can differ greatly between areas just a few miles apart. Instead the FS should implement adaptive management guidelines for droughts to attain desired conditions and to meet management objectives.

Based on public comment, standardized drought management guidelines (Appendix D-Proposed Plans) have been removed. Guidelines for natural processes, including drought, are contained in Plans, Chapter 1: Grassland-wide and Forest-wide Direction, Livestock Grazing.

Comment: The grazing restrictions/AUM reductions in the proposed plan will put operators/multi-generational ranching operations out of business. Ranches will be sold and subdivided into ranchettes/residential areas, which will have a detrimental effect on wildlife.

The effects to people and wildlife are discussed in FEIS, Chapter 3, Community and Lifestyle Relationships and Rangeland and Forest Health.

Actual reductions, determined at site specific plan implementation level, may force some ranches out of business. As an area becomes more attractive to outside residents some ranches are likely to be broken up and turned into ranchettes by people who make their living from something other than ranching.

Comment: The Internal Revenue Service taxes the entire value of an estate. This includes the value of the grazing permits that are a part of the estate. A grazing permit on federal / state lands is part of the capitalized value of a ranch unit. A new owner will pay and finance operating loans on the equity value of the grazing permits. Each AUM reduction of a grazing permit will reduce the value of that grazing permit.

Although a grazing permit does not give a rancher any permanent rights or title to National Forest System land (36 CFR 222.3 (b)), real property values are associated with a grazing permit by banks, real estate markets and other institutions. The financial sector does recognize that a grazing permit does add to the real estate value of a ranch even though the ranch does not have a permanent legal right to grazing on National Forest System land. A study in Wyoming (Bastian et al, 2000) found a USDA Forest Service permit had an average real estate value of $68.00 per AUM with a range of $40 - $100 per AUM. The grazing permit real estate value will vary across the Northern Great Plains, but

the key point is that various financial markets recognize this value. Further a rancher can obtain a loan based on a percentage of the real estate value of the AUMs in a Forest Service grazing permit. The ability to borrow working capitol may determine whether some ranches are able to stay in business. FEIS, Chapter 3, Community and Lifestyle Relationships.

Comment: The Robel Pole was not designed for use in the shortgrass prairies of North Dakota. A sound, repeatable, scientifically valid measurement system is necessary.

The Robel pole was first used to assess plant biomass on a study site in mixed grass prairie. Since then, this simple tool has been widely used as a way of quantifying the visual obstruction provided by vegetation. This technique has been especially useful in studies of ground-nesting birds. It has been used, with minor modifications, in a variety of grassland habitats, including shortgrass prairie. The Robel pole is a sound, repeatable, scientifically valid measurement system for monitoring visual obstruction in grasslands.

The Robel Pole has been used extensively to assess hiding cover for ground nesting birds. It measures the height / density of residual biomass to obtain a visual obstruction reading in quantifying nesting habitat quality. To this end, there is sound and repeatable scientific evidence of the validity of using the Robel Pole as an important tool in assessing structure objectives. It is a measurement of physical characteristics irrespective of vegetation composition (See Plans, Appendix H).

Comment: None of your maps show land that is inaccessible to livestock, humans, or wildlife. The word inaccessible doesn't appear in any document, appendix, or glossary. Where is the "ungrazed capable rangeland" located? This term is also not included in the glossary.

Maps that show areas not accessible to livestock did not appear in the Draft Environmental Assessment. Maps were produced that indicate, based on a model described in FEIS, Appendix B, inaccessible and ungrazed rangeland. These maps were reviewed by District personnel to make sure all water sources were identified. A process was utilized, based on a set of criteria that determines inaccessible and ungrazed rangeland, to predict preferred and suitable habitats for black-tailed prairie dogs, and to identify rangeland areas that are likely unwatered, ungrazed or lightly grazed or infrequently grazed. The terms "inaccessible" and "ungrazed" rangeland are defined by the set of criteria used in the predictive model. These definitions are found in Appendix B.

Comment: Trends can't be established in two years. Your analysis lacks range trend information.

The monitoring section of the Plan, Chapter 4, indicates that monitoring will occur every 5 to 10 years. This will establish trend information. The analysis in the Plan to determine forage outputs utilized existing productivity information. By utilizing existing production, it took into account past management that determined existing or current range conditions. (FEIS, Chapter 3, Forest and Rangeland Health and FEIS, Appendix B)

Oil, Gas, and Minerals

Comment: Discuss the impacts of scenery management objectives on existing coal mines. Will they limit exploration and production?

The scenic integrity objective for management area 8.4 Mineral Production And Development is "Low", as shown on the Scenic Integrity Objective map at the end of Plan, Chapter 2 Geographic Area Direction for the Hilight Bill geographic area. The theme for the area provides for the surface mining of minerals and the visual impacts that come with it. The scenic integrity objective of low will not place or create constraints on the existing mining operations.

Comment: Discuss the impacts of proposed changes on coal mining and the associated impacts to counties/communities dependent on regional coal mining activities. Include impacts to continued viability of coal mining on adjacent private land. Include impacts on existing mines, expansion, and future development.

Management Area 8.4 Mineral Production And Development was designed to maintain the status quo of the existing condition and provide for future expansion of the mines. Thus, there should be no change in effects to counties or communities.

Existing and future coal mines are not expected to be impacted by the LRMP decision. Expansion proposals and existing potential are not likely to expand into areas on the Thunder Basin that would cause conflicts with roadless areas, SIAs, RNAs or Black-footed ferret reintroduction areas. Coal mines are expected to expand to the north and west away from sensitive areas on the Thunder Basin National Grassland. In addition the coal mine operators have a very good working relationship with the US Fish and Wildlife Service in mitigating impacts to threatened or endangered species. Concerns about additional clean air standards were discovered to be unwarranted. All of the Thunder Basin National Grassland is a Class II area and if one of the unroaded areas became wilderness, the area would remain Class II. Visual quality was also a concern, but the US Forest Service does not use buffers in its management. FEIS Chapter 3, Community and Lifestyle Relations includes a discussion on Wyoming dependence on coal mining revenue sharing to fund state and local governments.

Comment: The DEIS doesn't adequately discuss the contributions from and effects to present and future coal, oil, and gas production on the grasslands.

The effects analysis has been reviewed and in some cases expanded. The mineral status, Reasonably Foreseeable Development Scenarios, and air quality in relation to coal have been updated and can be found in FEIS, Chapter 3.

Comment: Some management plans are proposing new wilderness areas. These new wilderness areas are relatively close to existing facilities and populated areas. The USFS contends that these will be designated as Class II areas (as opposed to federal mandatory Class I areas). However, the Thunder Basin National Grassland Management Plan proposed revision clearly states that these new Class II areas will have regulatory protection for visibility and air quality related values. This situation will place additional burdens on reducing emissions and further retard economic development. Can you explain why the USFS is proposing this new level of protection for Class II areas, even though there is not a requirement to do so (i.e. this is a policy decision)?

Under the Federal Clean Air Act, all new wilderness established after August 7, 1997 are Class II and, as such, do not receive all the special protections provided for Class I wilderness. The Clean Air Act is a tool that the Forest Service can use to provide comments to Air Quality Regulators (the States and EPA). The management goals of all (both Class I and Class II) wildernesses are found in the 1964 Wilderness Act. The Wilderness Act defines wilderness as an area "…which is managed and protected so as to preserve its natural conditions …" Based on this direction, the Forest Service tries to manage and protect all wilderness areas to the same degree.

While the Forest Service has the responsibility to protect all wilderness areas from air pollution impacts, only the states and EPA have the authority to regulate air pollution emissions. States are required to have a new source-permitting program for new air pollution sources with over certain levels of air pollution emissions. Before the state issues a permit, they must determine if the source is applying Best Available Control Technology (BACT), which is determined on a case-by-case basis balancing economics, environmental impacts, and energy costs. In the case of Class II areas, the states can, at their discretion, require the installation of additional air pollution control equipment if the state determines that the proposed new source were going to cause or contribute to adverse environmental impacts. In Wyoming, the air regulatory agencies have stated that they would consider Forest Service comments on air pollution impacts to Class II wilderness areas. However, it is strictly the states authority to determine what, if any weight, the state will give to those comments determining BACT. In the Final EIS, the Thunder Basin National Grassland analyzed changing the 1.2 Recommended Wilderness Area to 2.1 Special Interest Areas. Thus, there are no 1.2 Recommended Wilderness areas on the TBNG in Alternative 3 Final.

Comment: Will special area designations restrict/prohibit the exercise of valid, existing subsurface mineral rights that are separated from surface rights (split estate ownership)? If the answer is "yes," you should either purchase the rights or prohibit the designation.

Special area designations will not restrict or prohibit the exercise of existing rights. Reserved minerals development falls under the Secretary's Rules and Regulations, and outstanding minerals are subject to deed language and to state law. (See Plan, Chapter 1, Standards and Guidelines, D. Mineral and Energy Operations; Chapter 3, Management Area Direction.)

Comment: How will the road restrictions in Management Area 3.65 affect existing leases, private minerals, or in-holdings?

The plan will not change existing legal rights. The terms and stipulations of existing federal oil and gas leases will not be changed. Outstanding mineral rights or reserved mineral rights will be honored. The holders of those rights will be able to exercise their ownership rights.

Comment: Eliminate wilderness and other designations that restrict/prohibit mineral development.

The objectives of Forest Service minerals management are provided in FSM 2802, and discussed in the Oil, Gas, and Minerals section of the FEIS, Chapter 3. Mineral exploration and recovery is a valid use of the National Grasslands, as provided by law, regulation, and policy including the Multiple Use-Sustained Yield Act. Mineral development is only one of the many resource uses. The Forest Service tries to provide a balance between protection of areas where mineral development could have unacceptable impacts to the other resources, and areas where mineral development could be accomplished in an environmentally sound manner.

In response to public comment wilderness is not being recommended on the DPG. MA 1.2 is being replaced with 1.2a which is intended to preserve the wilderness character of these areas while giving ND time to reach a consensus on this issue.

Comment: Honor valid existing mineral rights. The proposed stipulations aren't necessary or scientifically justified; existing standard lease terms are sufficient.

The USDA Forest Service will honor valid existing mineral rights. Lease stipulations are based on the management plan standards and guidelines. They are based upon analysis, scientific information and professional judgment as displayed in the FEIS. (FEIS Appendix H, Biological Assessment)

Comment: Clearly define Conditions for Approval (COAs) for leases with valid existing rights. Don't use COAs to add restrictions beyond those in existing leases.

COAs are defined in the glossary as site-specific constraints or requirements developed at the APD (Application Permit to Drill) processing phase. They differ for each proposed development, based on the site-specific conditions particular to that proposal.

COAs may not apply or create limitations to the rights granted in the lease document. Section 6 of the standard lease terms provides a wide latitude to apply environmental and social conditions on development projects, thus many of the standards and guidelines contained in the management plan revision, but not in the plan at time of lease issuance may be applied to developments. But again, COAs cannot constrain lease rights.

Comment: The proposed restrictions on oil and gas developments could affect state and private minerals; for example, No Surface Occupancy stipulations could adversely impact drilling operations on private land.

The decisions made in the Records of Decision (RODs) for the FEIS to apply stipulations can only be for surface resource protection on federal lands. They cannot control or restrict oil and gas development on state and private minerals. But the ability to develop federal minerals can have an effect on adjacent private resources.

Comment: Severely reduce or eliminate oil, gas and mineral development on the grasslands, particularly in wilderness, roadless, and environmentally sensitive areas.

RNAs and SIAs may be protected from locatable mineral entry by withdrawal. That decision can be made for each RNA and SIA. Management Areas 2.2 (RNAs) and 2.1 (SIAs) direction states that these areas will be withdrawn from mineral entry when necessary to protect the values for which the area was established or created.

Leasing is a discretionary Forest Service decision. Lands may not be leased or leased with stipulations to protect surface resources including a stipulation which prohibits all surface occupancy. Leasing with NSO allows a degree of protection of underground mineral resources while preserving undisturbed surface resources. For specific leasing decisions, see the specific management Area direction in Plan, Chapter 3.

Roadless areas that are allocated to backcountry recreation management have a stipulation of No Surface Occupancy. This stipulation will protect the roadless nature of these areas. Any roadless areas that are allocated to management area prescriptions where surface occupancy is allowed will require an EIS to assess the impact to the roadless character before leasing is allowed.

Comment: Restrict oil, gas, and mineral activities on the grasslands. Place minimal restrictions on oil, gas, and mineral development on the grasslands.

The objectives of Forest Service minerals management are provided in FSM 2802, and discussed in the FEIS, Chapter 3, Minerals and Geology section. The General Mining Law of 1872 provides direction covering hard rock minerals on lands reserved from the public domain for National Forest

purposes. Except as otherwise provided, all valuable mineral deposits, and the lands in which they are found are free and open to exploration, occupation, and purchase under regulations prescribed by law. Withdrawals remove lands from locatable mineral entry.

The FEIS considered alternative management area prescriptions that produced differing effects on mineral activities (see FEIS, Chapter 3). Various restrictions on oil and gas development were considered. Justification for restrictions on oil and gas development is required by regulation. These justifications are disclosed in Plan, Appendix D.

Alternative 3 Final provides a balance between protection of areas where mineral development could have unacceptable impacts, and ensures mineral development will be accomplished in an environmentally sound manner.

While claims may be developed to recover the mineral resource, the Forest Service has the right to examine the claim for validity, and to contest the claim if appropriate. Claims cannot be used for activities other than mining unless they are patented (become private land).

Reducing or eliminating oil, gas and mineral developments in a management area or across a National Grassland is determined by what are the minimum measures needed to accomplish the theme of the management area or protect the National Grassland resources. The Forest Service policy is to make minerals available for development when it can be done in a manner that does not conflict with agency mission or produce unacceptable adverse affects.

Comment: Protect wildlife habitat by limiting oil and gas leasing. Protect bighorn sheep habitat in North Dakota by applying No Surface Occupancy (NSO) stipulations to the maximum number of acres.

NSO in bighorn sheep habitat isn't justified; lesser restrictions will work.

The preferred alternative 3 of the Draft Dakota Prairie Grassland Plan protected approximately 118,720 acres of bighorn sheep habitat. The final plan, FEIS Alternative 3 Final protects over 106,000 acres of occupied sheep habitat decision. Approximately 12,000 acres of unoccupied habitat have been removed from this protected status. Of the 106,000 acres, 35,600 acres will be protected through a CSU stipulation for oil and gas production. The remainder will be protected through NSO stipulations or will be unavailable for leasing. In addition, a timing limit stipulation protects areas from surface disturbance within 1 mile line of sight from bighorn sheep lambing areas from April 1 through June 15, if disturbance would likely cause displacement of bighorn sheep from the lambing area.

Some areas that fall outside of management areas 3.51 and 3.51a may also be protected from new developments through a CSU for bighorn sheep if they are within a mile of bighorn sheep lambing areas found within 3.51 or 3.51a if such activities would adversely impact lamb survival. These areas are not included in the 106,000 acres of protected sheep habitat noted above.

Comment: NSO in bighorn sheep habitat on the Little Missouri National Grassland isn't justified; lesser restrictions will work.

Numerous studies, including some conducted on the Little Missouri National Grassland, suggest that the disturbance associated with oil and gas development degrades habitat quality for bighorn sheep. The use of a No Surface Occupancy stipulation is consistent with bighorn sheep management recommendations form both agency biologists and the scientific literature.

The draft plan applied NSO stipulations to suitable sheep habitat. In a review of these stipulations in developing the FEIS, several issues came to light. The first issue was that we applied NSO to approximately 12,000 acres of unoccupied sheep habitat. Discussions with North Dakota Game and Fish indicate that sheep transplants will not focus on these unoccupied areas, but will focus on supplementing the sheep population south of I-94. These unoccupied sheep areas will be available for oil and gas leasing in the future with no special stipulations for sheep in the Final Plan.

In a second issue, it was identified that the existing mineral ownership pattern and current production facilities may not allow management of undisturbed sheep habitat in some of the bighorn sheep management areas (MA 3.51). The mineral estate is the dominant estate and the Forest Service MA cannot preclude private mineral development; consequently roads can be built to the interior portions of these areas for the purpose of developing the private mineral estate.

In the final plan it is still desired to manage the best sheep habitat possible given the current mineral ownership pattern and existing operations. A new MA was developed (3.51a). This MA covers approximately 35,600 acres. This MA recognizes that roads may be built to private wells within this MA. In the event there is oil and gas production developed on the private minerals, the adjacent federal lands may be leased if the federal development can occur without significant additional impact to the sheep. This change was made to avoid drainage of federal minerals, and allow development that will not significantly affect sheep. If significant additional impacts will occur, then no leasing of federal minerals will occur. This same logic can extend to adjacent spacing units adjacent to existing production facilities.

Comment: NSO stipulations aren't necessary in prairie dog and sage grouse habitat areas. Standard lease terms provide adequate protection.

While standard oil and gas lease provisions provide for considerable protection of natural resources they do not provide for adequately implementing the applicable prairie dog and sage grouse habitat standards and guidelines. 43 CFR 3101.1-2 only provides for moving a proposed location 200 meters and/or delaying drilling for up to 60 days. Also standard lease terms do not provide establishing adequate limits on production activities necessary to implement the applicable standards and guidelines.

The FEIS analyzed five alternatives with various leasing decisions and stipulations. (FEIS, Chapter 3, Minerals and Geology)

No NSO stipulations were attached to prairie dog towns in the DEIS or the FEIS. Direction can be found in Chapter 1 of the FEIS. There are stipulations attached to areas of prairie dog towns occupied by black-footed ferrets and burrowing owls. We do have sage grouse NSO and we need to site the sage grouse direction around sage grouse leks.

Comment: The DEIS didn't adequately address the economic impact of more leasing stipulations. The Controlled Surface Use (CSU) and Timing Limitations (TL) will create de facto NSO on much of the grasslands. More stipulations will greatly impact oil and gas development and significantly reduce revenues.

Each stipulation is different and is applied in a different way. The stipulation is the minimum necessary to protect the intended resources. This is also a good place to add logic for larger NSO circles and minimum impact on production facilities.

Economic impacts are handled in the RFD in both the DEIS and FEIS. The FEIS does contain an analysis of so-called de facto NSO.

Comment: It is too expensive to do directional or horizontal drilling for exploratory holes. The estimates in the plan-1 mile horizontally and 1 mile vertically—should be modified to reflect actual conditions. In some areas, the geologic structure doesn't allow horizontal or directional drilling. Applying NSO stipulations to large tracts in these areas prohibits oil and gas development.

We agree that it is economically impractical to drill exploration wells directionally or horizontally. The analysis has been modified to reflect more accurately these limitations on exploration by considering areas beyond 1/8 mile on the Thunder Basin National Grassland and Nebraska National Forest and ½ mile on the Dakota Prairie Grasslands from the boundary of large NSO areas as inaccessible for purposes of exploration. The effect of the large NSO areas is substantially modified because most of the lands are presently leased, and a large amount of the acreage is held by production. Existing lease rights are not affected by the stipulations in the new plan, and the new stipulations will only be applied after existing leases expire and a new lease is issued. Leases held by production can be held under existing lease terms as long as there is production. These effects are displayed in the EIS, Chapter 3, Oil and Gas.

We agree that the geologic structure affects drilling options and that large tracts with NSO stipulations may make areas inaccessible for oil and gas development. The analysis has been modified to reflect more accurately these limitations by considering areas beyond 1/8 and ½ mile from the boundary of large NSO areas inaccessible for purposes of exploration. The effect of the large NSO areas is substantially modified because most of the lands are presently leased, and a large amount of the area proposed for NSO stipulations is held by production. These effects are displayed in the EIS, Chapter 3, Oil and Gas.

Comment: The DEIS didn't discuss the impact of coalbed methane development on wells, springs, groundwater, and surface water.

The plan revision will not make decisions about the development of coal bed methane (CBM). The leasing decision for the portions of Thunder Basin National Grassland with coal bed methane potential (those areas with seams of coal 20 feet thick and less that 1,500 feet deep) will be deferred until the Powder River Basin EIS is completed. The leasing decision will be made based upon the Powder River Basin Oil and Gas EIS. Also until that time no APDs may be approved except those whose cumulative and significant impacts have been considered in a NEPA document, i.e., the Wyodak EIS, or Drainage EA or subsequent NEPA. Thus, CBM developments are outside the scope of the forest plan revision.

Comment: How will oil and gas development, particularly the presence of wastewater pits, impact migratory birds on the grasslands?

See Grassland-wide standard, Oil and Gas Operations. "Prohibit the use of production pits. New developments and reconstructed developments will not have wastewater pits."

Comment: How will mineral development on the grasslands be effected by the combined impacts from travel management policies in the plans and by the proposed national roadless and roads policies?

See FEIS, Chapter 3, Recreation and Travel Management. Travel management decisions in the plan revisions will increase the cost of developing minerals in some areas of National Forest System lands. Preparation, planning, and processing costs may increase in areas where there is restricted or limited access. There also will be instances where access development for mineral development will require eliminating existing roads in order to create a desirable road system or meet road density requirements, this will also be an increased cost.

Comment: Are the proposed plans compatible with proposed national roadless and roads policies?

The roadless area analysis has been reviewed and in some cases expanded. (FEIS Chapter 3, Roadless) The Management Plans will be amended as needed to be compatible with changes in laws, regulations and national policy. A roads analysis process will be undertaken and a separate decision will be made with further public involvement.

Comment: How will special area designations and nonmotorized management area prescriptions affect recreational rock hounding on the grasslands?

Under Plans, Chapter 1, Grassland-wide and Forest-wide Direction, D. Geology and Minerals, allows rock hounding (hunting and collecting rocks and minerals, not including fossils) on National Forest System lands without permit, (unless specified otherwise in management area direction) providing the specimens are for personal, non-commercial uses. Those management area prescriptions with motorized travel restrictions would require recreational rock hounding to be done by hiking, biking or horseback riding into the rock beds.

Comment: The DEIS doesn't adequately discuss the following alternatives: Not Available for Lease, No Lease, Standard Lease Terms (no additional stipulations).

See FEIS, Chapter 3, Minerals and Geology and Oil and Gas. The FEIS incorporated by reference previous oil and gas leasing analyses that considered the alternatives of Not Available for Lease, No Lease, and leasing with Standard Lease Terms (no additional stipulations).

Reasonable Foreseeable Development (RFD)

Comment: Include the following in the RFD analysis:

- *Coalbed methane development*
- *Evaluate impacts of all oil and gas stipulations (including those related to special area designations).*
- *County-by-county well and production information.*
- *A revised number of wells (97 vs. 80-90).*
- *Updated well and price information.*
- *Coal suitability analysis for the Little Missouri NG.*

The Reasonable Foreseeable Development (RFD) Scenario is a projection of future oil and gas development used to analyze cumulative and significant impacts. A revised version with more current information and data was used for the FEIS. The content of the RFD is based on analysis needs. County by county well and production information is not needed for the decisions. Coal bed methane development is included as it was in the original RFD. And, the most current data was utilized in preparing the forecast of well development. Dakota Prairie grasslands RFD scenario does include coalbed methane development.

Coal Suitability is not part of the RFD, but a separate process defined in 43CFR.

Comment: The explanation of drainage in the RFD and DEIS is confusing/unclear.

The concept of drainage comes from English common law, i.e., the law of capture. This is basically if you can capture the resource (red deer, game, oil, gas, etc…) while it is on your ownership, it is your property. In short, if you can drill a well on your mineral ownership causing oil and gas to migrate from another person's mineral ownership onto your mineral ownership, you own the oil or gas once it crosses the line into your ownership. (FEIS Chapter 3, Oil and Gas)

Comment: The explanation of COAs is confusing/unclear. How do they change with monitoring and inspection and new information?

Conditions of Approval (COA) to the Surface Use Plan of Operation (SUPO) do not change once they are part of an approved Application Permit to Drill (APD). If new information reflects a situation where changes are needed they are negotiated with the lease operator and may be changed via a sundry notice if the parties cannot arrive at a bilateral agreement. The prime example is, Research determined evaporation pits for produced water were causing unlawful taking of waterfowl. Operators were advised of the situation and risk involved with production pits. Many opted to mitigate the risk by netting or elimination of the pit. They then proposed the change via a sundry notice which the USDI Bureau of Land Management and USDA Forest Service approved. They could have continued to utilize the pit and expose themselves to the risk of fines for violating waterfowl laws.

Comment: Use current data in the RFD and EIS.

The Reasonable Foreseeable Development (RFD) Scenario has been revised for the FEIS using the most current data available. (FEIS Chapter 3, Oil and Gas)

Comment: Your discussion of coalbed methane was inadequate.

The Thunder Basin plan revisions will not make decisions about the development of coal bed methane. The decision to lease portions of Thunder Basin National Grassland with coal bed methane potential (those areas with seams of coal 20 feet thick and less that 1,500 feet deep) will be deferred to the completion of the PRB EIS. The leasing decision will be made based upon the Powder River Basin Oil and Gas EIS. Also until that time no APDs may be approved except those whose cumulative and significant impacts have been considered in a NEPA document, i.e., the Wyodak EIS, or Drainage EA or subsequent NEPA. However, the Dakota Prairie grasslands plan RFD scenario documents include CBM development. See FEIS, Chapter 3, Minerals and Geology.

Comment: Mineral exchanges need to be shown on the FEIS maps and discussed in management area direction in the plans.

This Mineral exchanges are the result of land ownership adjustments. They are site-specific projects regarding what the USA owns. While they were discussed at Guideline #2 Minerals and Energy Resources in Management Area 3.51 Bighorn Sheep, they are discussed in concept. Until site-specific projects are proposed, this is adequate analysis for decision and management plan direction.

Comment: Paleontological surveys are expensive for the minerals industry and are not justified by laws and regulations.

In response to comments such as this, the paleontological stipulation on the Dakota Prairie Grasslands was dropped. It was determined that paleontological resources can be protected through a lease notice.

Paleontological surveys are justified under the auspices of NEPA, Antiquities Act and FLPMA. The procedure for paleontological surveys, outlined in Appendix J, should be done in areas with the high potential to produce fossils, prior to any ground disturbing activities to prevent needless destruction or damage to significant paleontological resources. National Environmental Policy Act requires Federal Agencies to assess impacts of any project to any resource. Paleontological resources are natural, nonrenewable, scientifically important resources that have many values such as recreational, educational, interpretive, and scientific. The Forest Service views fossil resources as valuable and non-renewable and requires paleontological surveys prior to ground disturbing activities in areas with the potential to produce significant fossil. The requirement is for all permittees, who may impact paleontological resources. These nonrenewable and scientifically important resources will likely be impacted by construction of pits, derricks, roads, etc. Therefore, conducting paleontological resource inventories (surveys) is a prudent practice to avoid damage and/or loss of significant fossils to the public and scientific community.

Comment: The proposed plan/DEIS emphasized recreation, wildlife, and special area designations over oil, gas, and minerals.

Each of the six alternatives displayed in the FEIS were developed to respond to the seven major revision topics and public comment on the DEIS. Each of the alternatives has some similar features to the others, but each is also distinctly different from the others in how it addresses the revision topics. Each alternative is, in effect, a stand-alone management plan if it is selected. All alternatives considered differing levels of oil and gas development.

While all of the alternatives provide a wide range of multiple uses, goods, and services, some alternatives give more or less emphasis to particular ones. Multiple-use Alternative 2, for example, would emphasize production of commodities such as livestock, minerals, oil and gas, and timber. Multiple-use Alternative 5 would emphasize recreation opportunities and non-commodity services and modify commodity outputs so as to complement recreation objectives.

Alternative 3 Final in the FEIS, the Forest Service preferred multiple-use alternative, is designed to be a blend of commodity uses while adopting additional special area designations and placing added emphasis on native plants and animals as well as recreation opportunities.

Comment: Clarify valid existing rights, including lease rights.

The Plan, Appendix G, Glossary defines "Valid Existing Rights (Minerals)" as **"**Legal interest that attaches to a land or mineral estate and that cannot be divested from the estate until interest expires or is relinquished."

Valid exiting rights, including lease rights are legal rights. They are rights that will withstand a legal review affirming the rights alleged to be owned by the party. Some examples of items that are typically "valid existing rights" are federal oil and gas leases, outstanding mineral rights, reserved mineral rights, outstanding and or reserved easements, and easements from the USA,

Planning

Comment: Some comments stated that the planning process does not conform to the planning regulations. The reasons given included: (1) local and state governments were not involved in the planning process and regional and national issues were not considered, and (2) the multiple use mission required by NFMA was not maintained.

The Northern Great Plains Management Plans Revision team has followed the NFMA regulations in conducting the planning process. The public and local and state governments have been consulted and their concerns evaluated and considered in the development and analysis of the draft and final Revised Plans and FEIS. The Forest Service has tried to balance the concerns from a variety of interests and develop a plan that provides for sustaining forest and grassland ecosystems while providing for desired uses and outputs. Local and state agencies and the public often do not agree with each other so the Forest Service is forced to make the best choice among conflicting commodity and amenity uses with the information available. FEIS, Appendix A describes the process in more detail and list many of the people and agencies contacted. Some participants in the process mistakenly equate involvement with the ability to make the final decision. The Forest Service has the responsibility to make the decision. The fact that some counties were unresponsive to requests for information does not mean the Forest Service has not met its responsibility to provide opportunities for comment and involvement.

The National Forest System is composed of public land that belongs to all citizens of the United States. As such, any citizen, organization or local government has the right to comment on a Plan. Regional and National issues, such as issues of biological diversity, water yield, timber suitability, aquatic and riparian health, are just a few examples that were evaluated in the course of this process. The ID team went through several analysis processes to determine the overall scope and significant issues to be analyzed in depth. *(Note: The planning record contains many documents and letters documenting this process. Summary of Public and Internal Comments, Planning Action No. 1: Identification of Purpose and Need, Planning Action No. 2: Planning Criteria, and Analysis of the Management Situation are formal documents that summarize the overall process used.)*

The Revised Plans provide for multiple use. The preferred Alternative 3 Final balances the need for maintaining viable and sustainable ecosystems and the desire of people to use the forest for recreation, obtain forest products, mine, extract oil and gas, and graze livestock. The other alternatives also provide for multiple use but result in different levels of these uses. Multiple use does not mean that all uses are equally provided on all acres of the public land (reference Section 4 (a) of the Multiple Use Sustained Yield Act of 1960).

Comment: You cited very few recent scientific publications in your documents.

While recognizing that not every reference in the DEIS was cited that could have been, the FEIS updated and improved its citations. Of the 83 dated publications listed in the DEIS, 57% were produced after 1995. Seventy-five percent were produced after 1990. The Biological Assessment/Evaluation, (DEIS-Appendix II, H) lists 209 references of which 20% were produced after 1994 and 53% were produced between 1990 and 1999. References for this section doubled in the FEIS. References for the Habitat Descriptions for Management Indicator Species (DEIS-Appendix II, L) lists 34 references of which 20% were produced after 1994.

Refer to the FEIS, and Appendix H (BABE) for a disclosure for scientific publications used in the FEIS.

Comment: The No Action Alternative doesn't accurately reflect current management practices on the grasslands.

The No-action Alternative (Alternative 1) represents the current Land and Resource Management Plans direction and emphases. In some cases, management outlined in those documents has not been achieved. The FEIS displays the comparison between existing LRMP direction and actual management accomplishments.

Alternative 1 provided a clear reflection of current management practices in all areas except in the area of livestock use projections. However, the draft management plan clearly stated in the DEIS, that projections of livestock use were only valid for comparison among the alternatives, and that this plan would not set stocking rates. These statements are still true. The projected livestock use was developed to provide an estimate of economic impacts that was requested by the public.

To respond to public comment, Alternative 1 was also modified to more closely reflect the current condition. In projections of livestock use, the 20-year average authorized use was inserted to provide a base for comparison of the alternatives. NRCS forage production estimates were used as a basis for the projected livestock use. This was done to respond to the concern that the estimate in the DEIS was too conservative. The results of these changes make the projected livestock use much more comparable to the 20 year average.

Comment: The Purpose and Need for the plan doesn't support the proposed changes or the anticipated effects of implementing the plan.

FEIS, Chapter 1 spells out the purpose and need for change for plan revisions for these Northern Great Plains national grasslands and forests. To respond to this concern, the Purpose and Need in the DEIS was reviewed and revised to more fully describe the need for change.

Over a decade has lapsed since the current Management Plans were approved. Implementation of these Plans has shown us the need for changes in management direction for some resources or programs on these ten grassland units. Several sources have led us to believe we have a need to change our current Management Plans through revision. New issues and changing public values have been identified through public interaction. New information and knowledge has been gained through scientific research and effectiveness monitoring. Management concerns have been derived through implementation experience of the current plans. And, a decade of experience in implementing current Management Plans has provided insight into relationships between prairie vegetation and other resources and better ways of accomplishing desired outcomes.

Based on the information sources identified earlier, we have determined that the combined effect of the needed changes demand immediate attention through Management Plan revision. The discussion In Chapter 1 of the FEIS fully articulates the identified need for change--need for management plan revisions—on these national grasslands and forests.

Comment: Site-specific changes in management area boundaries should accommodate particular unique features, current uses or wildlife habitat.

Management areas are defined as parts of the Forests or Grasslands that are managed for a particular emphasis or theme. To respond to this concern, National Forest and Grassland managers reviewed management area boundaries based on public comments and made adjustments in FEIS, Alternative 3 Final to accommodate particular unique features, current uses, and wildlife habitat.

Comment: You use a NE publication for your drought mgmt. guidelines. You use decision criteria to reduce livestock grazing in dry years, but you don't use the same criteria to increase grazing in wet years. This is unethical use of scientific literature.

The use of drought management guidelines has been dropped from the final Land and Resource Management Plans. Since precipitation does have a direct impact on forage production, timing of and amount of precipitation will be considered when setting stocking rates during Allotment Management Plan revision and in the Annual Operating Instructions specific to each allotment.

Comment: The monitoring section in the plan is too generic and of little value. It doesn't have links to goals and objectives or standards and guidelines.

Plans, Chapter 4, Monitoring has been revised to reflect changes in management direction contained in Plans, Chapters 1-3. The level and intensity of monitoring and analysis will vary with the budget and other management priorities. Table 4.2 Management Plan Monitoring Questions refers to the specific goals and objectives as outlined in Chapter 1, Grassland-wide (and Forest-wide) Direction.

Comment: The Forest Service claims that the grasslands are in danger but fails to provide scientific proof of or statistical support for this position. The Heritage Alliance of North Dakota requested scientific review of the proposed plan.

Some of the components of North Dakota grassland ecosystems that have been identified as at risk include the black-tailed prairie dog and several species associated with them, the western prairie fringed orchid, native plant communities due to invasions of leafy spurge, the tall grass prairie, species (some birds and butterflies) dependent on high structured grasslands, some raptors, plants, fish, amphibians, and reptiles. The Forest Service presented monitoring data on the extent of prairie dog towns, the lack of structural heterogeneity on the grasslands, and the condition of the riparian and woody draws of the grasslands. (Reference the Analysis of the Management Situation for the Northern Great Plains Revision Process, and Chapter 3 of the FEIS).

In the preparation of this document, the Forest Service assembled an interdisciplinary team of scientists. Each member of the team brought knowledge and experience in land management to develop a sound plan that balances the resources and uses of the public lands. The plans are based on this scientific interdisciplinary interaction. The Forest Service better documented scientific references in the final plan, and the reasons for proposing changes in management direction.

Comment: Several large buffalo ranches are currently replacing interior fences to manage grazing timing and frequency (North Am. Bison Journal, September 1999). Amend the buffalo alternative to include this information.

The DEIS disclosed that all action alternatives (2-5) will include "bison friendly" policies, where bison grazing can occur under the current livestock grazing permit process. Alternative 4 would allow for "bison-only" grazing on a minimum of 5% of the lands administered by each of the three units. In this alternative, bison will be treated as a type of livestock, not as free-roaming herds. Several factors will be considered when evaluating the suitability for bison grazing including livestock structures. A site-specific NEPA analyses will be done to determine if an area is desirable and suitable for bison grazing. The best information available on bison grazing will be used in development of a range management strategy for the area. Allotment specific grazing management practices are beyond the scope of the LRMP process and will be addressed at the site-specific allotment planning level.

Comment: Your glossary contains an incorrect definition of the term "range management." Use the following accepted definition (SRM 1998):

The following definition will be used for the term "range management" as defined by the Society for Range Management 1998, "A distinct discipline founded on ecological principles and dealing with the use of rangelands and range resources for a variety of purposes. These purposes include use as watersheds, wildlife habitat, grazing by livestock, recreation, and aesthetics, as well as other associated uses." See Plan, Appendix G, Glossary.

Comment: Consider the following new information:

- *A recent study completed at the request of North Dakota Governor Edward Schafer regarding the condition of Dakota Prairie Grasslands.*
- *Summary of the impacts of various grazing systems on grassland ecosystems by Dr. Lee Manske at the North Dakota state University.*
- *Information on predation as a factor limiting wildlife recruitment (see the Predation Avian Recruitment Task Force website at www.predation.org).*
- *Ongoing, unpublished research on the effects of rest (2 yrs in 7) and sharply reduced stocking rates on grasslands in South Dakota (Rice and Carter).*
- *Research and field trials on allowable forage utilization by Holechek, Gomez, and Galt (1999).*
- *Christensen's research on successful prairie grouse nesting habitat in grassland systems.*
- *University of WY economics model that incorporates various recreation user-day values. WY Game and Fish user-day values for hunting and fishing.*
- *National Research Council methods for monitoring range ecosystem condition (in Rangeland Health).*

These references have been considered and are part of the project file.

Comment: The DEIS doesn't adequately address impacts to air quality.

The Air section in the FEIS has been expanded. See the FEIS, Chapter 3. .

Comment: Proposed buffers may often exceed the boundaries of the grasslands. The revision should clearly state that the proposed buffers wouldn't be applied to private surfaces outside the grassland boundaries.

The proposed buffer zones for wildlife species listed in Plans, Chapter 1: Standards and Guidelines under Biological Resources: F. Fish, Wildlife and Rare Plants apply only to the National Forest System lands and federal mineral ownership.

The plans clearly state in many areas that valid existing rights, including private property rights will be maintained.

Comment: There are major discrepancies in the acres of land involved and the AUMs permitted between the 1995 Monitoring Reports and the NGP DEIS.

Information from the 1995 Monitoring Reports was used in development of the April 1998 Analysis of the Management Situation (AMS) document which focused on the revision topics. Much of this information was incorporated into the DEIS and FEIS.

Comment: MA 1.2, Guideline states that natural insect and disease outbreaks will only be controlled when outside resources are affected. How will you determine this?

Management area 1.2 is recommended for Wilderness. The concept is to allow natural processes to occur within this area without human interference. Some natural insect and disease outbreaks may or may not be harmful to values or resources on lands outside of the recommended wilderness areas.

Evaluating if insect or disease outbreaks will affect resources outside of recommended wilderness management areas will require identifying the type and extent of the outbreak at the time it occurs and evaluating the risks and impacts to adjacent lands and resources. (Plan Chapter 4)

Comment: "Are the lease stipulations working and are they necessary?"

Stipulations related oil and gas exploration and development are necessary in order to meet the Land and Resource Management Plan's purpose and need, goals and objectives, and desired conditions. The rationale for each stipulation is given in Plan, Appendix D, and references a standard or guideline in Plan, Chapters 1-3.

Based on the best scientific information available, the proposed and existing stipulations are thought to be effective.

In response to pubic comment, the paleontological stipulation on the Dakota Prairie national Grasslands was dropped. These resources will be protected with a lease notice rather than a lease stipulation.

We agree that the stipulations need to be monitored and have added this to our monitoring questions in Chapter 4.

Comment: TB plan, Ch 3, p. 15, MA 3.65—the material in this section is arguable and should be deleted.

Management Area 3.65 is Rangelands With Diverse Natural – Appearing Landscapes.

The argument about what National Forest System lands are managed for is the reason for land and resource planning. Resolving that argument is the purpose for these plans. All management area prescriptions are open to argument, as to their content and when they should be applied. The arguments (in the form of comments to the plan) help Forest Service managers understand what mix of resources, uses, and desired conditions the public wants for these lands. It is the USDA Forest Service responsibility to make an informed decision as what mix of management area designations, provides the greatest "public benefit." The laws that apply to the National Forest System lands provide for a mix of amenities and commodities to be produced. There is great discretion in how these lands are managed to produce this balance and mix of amenities and commodities as directed by law.

Comment: Plans, Ch4, Monitoring and Evaluation--each of the monitoring questions needs to be referenced to the appropriate standard or guideline to which it applies.

To respond to public comment, each monitoring item was referenced to the appropriate goals and objectives to which it applies.

Monitoring and Evaluation questions respond to goals and objectives, which are referenced in Chapter 1 of the FEIS. Standards and guidelines in turn were developed to achieve the goals and objectives. It is the condition of the land (goals and objectives) that the focus of our monitoring, not the tools (standards and guidelines) to be applied. (FEIS, Chapter 4.)

Comment: Prominently mention and display the North Country National Scenic Trail in the final planning documents. Add the trail to the list of Sheyenne NG unique attributes (Dakota Prairie Grasslands Plan, Sheyenne GA, page 2-14). Include the trail on key maps.

The North Country National Scenic Trail is in fact a unique attribute for the Sheyenne National Grassland. We have incorporated this as such in the Final LRMP and appreciate being informed of this oversight. Due to increased precipitation and rising water tables in the geographic area of the Sheyenne NG, much of the current route of the trail is underwater. We are in the process of rerouting many miles of the trail across the grassland over the next several years. Because the route is being changed, we are not displaying it on the maps at this time.

Comment: Appendix K – National Goals, Noxious Weed Management – 2080.2, Item 1—how do you plan to prevent the introduction and establishment of noxious weed infestations?

The Revised Plans, Chapter 1 Grassland (and Forest-wide) Direction, states several standards and guidelines we will implement, such as allowing only weed-free products for feed or revegetation projects, using only native plants in revegetation efforts, utilizing integrated management techniques (chemical, biological, and mechanical), requiring weed-free clauses in our revegetation contracts, allowing haying only when noxious weeds are not present, and prohibiting feed storage and regular and routine feeding of livestock.

Comment: Appendix K – National Goals, Recreation – 2302—how do you intend to keep these areas free from trash and litter? What kinds of problems do you anticipate, given the cost of maintaining and policing these areas? Regarding Item 4, explain how you intend to shift landownership patterns?

All direction in the Revised Plan will be implemented according to budgets received from Congress. Maintaining clean and safe recreation facilities and opportunities remains a high priority. We will use all the ownership adjustment tools we have available, i.e., land exchange, land purchase, and land donation to meet landownership adjustment goals as directed in Appendix K - Landownership Adjustment - 5402.

Comment: The DEIS is full of contradictions. In one section, you propose wilderness areas and in another, you say that off-highway driving is expected to increase by 37% in the Rocky Mountains. This is twice the national average.

The revised plans cover an area that includes nearly 2.9 million acres of national grasslands and national forests in four states. Within that area, there are many uses that currently occur. The revised plans attempt to respond to changes in public attitudes regarding the uses that occur on the pubic lands. There are currently no congressionally designated wildernesses existing on national grasslands. Public comments suggested that prairie wilderness designation recommendation is an idea that the Forest Service should consider.

The 1994-95 National Survey of Recreation and Environment (NSRE) projected that off-highway driving would increase in the Rocky Mountain/Great Plains region. It was not limited to National Forest System lands. The revised plans propose to limit travel on the affected national grasslands and forests to designated routes and areas that will be identified through a public process at the local level following the adoption of the plans. The process may take up to five years and will determine which routes and areas will be open for motorized travel. The plans do not account for uses on lands that fall within other jurisdictions that could see increases in off-highway driving, if allowed. The revised plans propose to limit travel on the affected national grasslands and forests to existing roads

and trails initially and later to designated routes (Dakota Prairie National Grasslands and Thunder Basin national Grassland), or initiate transportation planning and go directly to designated routes (Nebraska National Forest). Regardless of which mechanism is used, transportation planning to designate routes and areas will be done through an open public process following the adoption of the plans. The process may take up to five years and will determine which routes and areas will be open for motorized travel. The plans do not account for uses on lands that fall within other jurisdictions.

Comment: DEIS, Ch 2, p. 8—why is there no expected increase in recreation-related jobs and income under Alternatives 1 and 2? The Purpose and Need document implies that recreation use is increasing under current management. Why assume there will be no further increase if current management continues? Continuation of present management under this Alternative 1 would allow an increase in tourism (DEIS Recreation and Tourism, p. 3-11). This contradicts the statement in the DEIS (p. 2-8) which states there would be no increases under Alternative 1.

The Forest Service agrees with this comment, and cannot explain the apparent contradiction. Page 1-13 says, "Current recreation use exceeds levels anticipated in the current management plans." We will change the pg. 2-8 statement, "No increases in jobs and income linked to recreation would be expected." (found in last paragraph)

Comment: DEIS, Ch 2, p. 2, Important Points Common to All Alternatives--the first point is to "Maintain basic soil, air, water, and land resources." Point 4 deals with timber harvest and mineral extraction. You can't maintain land resources if you extract them.

Point 4, in its entirety, says, "Sustain multiple uses, products and services in an environmentally acceptable manner. This includes timber harvest, livestock grazing and locatable and leasable minerals extraction." Through implementation of the Revised Management Plan direction (goals, objectives, standards and guidelines and monitoring), we will ensure that our soil, air, water and land resources are sustained.

Comment: DEIS Appendix B, p. 16--the impact areas for TBNG should also include South Dakota. Many permittees run livestock on the grassland and sell at SD markets. More permittees shop in SD than in Natrona County, WY.

The Thunder Basin economic impact area was based on the location of ranch headquarters.

Comment: The following "key indicators" for livestock grazing (suitable acres, estimated AUMs, estimated forage production, average pasture size, and average number of water developments/sq. mile) don't indicate anything about environmental consequences.

The Forest Service agrees with the comment. Some of these key indicators are used to determine other types of impacts such as economic or recreational impacts. Others are used to determine impacts to grazing.

Each of the "key indicators" for livestock grazing was used to help develop the differences among each of the alternatives. There is some difference in each of the key indicators between alternatives, reflecting a different level of or emphasis on that indicator depending upon which alternative is selected.

The environmental consequences – direct, indirect, and cumulative effects – are displayed and discussed for each of the key indicators in Chapter 3 of the FEIS in the Livestock Grazing section.

Comment: DEIS, Ch 3, p. 8, last paragraph in the Economic Dependency section states "Wood products were not included as only Dawes County had a viable wood products industry." Weston County, WY also has a viable wood products industry.

This is a true statement, the Pine Ridge is the only location within the Northern Great Plains planning units that sells commercial timber and those timber sales make a relatively small contribution to the Dawes/Sioux County economy and to other scattered counties in South Dakota and Wyoming. Timber mills operating predominately in the Black Hills area occasionally purchased timber on the Pine Ridge. The Weston County wood products industry obtains a majority of their timber from sources other than the Northern Great Plains planning units. Wood products were not included for Weston County because only the Pine Ridge GA in the Northern Great Plains planning area sells timber, which makes relatively small contributions to Dawes and Sioux Counties and other counties in South Dakota and Wyoming.

Comment: DEIS, Ch 3, p. 44, Viable Wildlife Populations—this section states the following: "With less vegetation consumed by livestock, more would be available to wildlife." This statement has no basis in fact.

This statement is based on numerous research studies done, especially relative to sharp-tailed grouse and prairie chicken habitat. Appendix H of Revised Plan describes that taller and denser nesting cover provides the best habitat for both sharp-tailed grouse and prairie chicken. References citing numerous studies supporting this statement are listed in Appendix H.

Comment: DEIS, Ch 3, p. 64, Table LG-10—improve the explanation for this table. For example, it isn't clear whether the available forage values were calculated on a pasture-by-pasture basis.

The FEIS Chapter 3 provides a more thorough explanation of the table. Forage values were not calculated on a pasture-by-pasture basis but on the existing condition of range sites as defined by NRCS.

Comment: DEIS, Ch 3, p. 3-142--Table RFH-29 shows that shrubland structure on the TBNG is unknown. If it is unknown, why does Table RFH-46 list exact percentages for each structure class? What is the source of this information?

The difference between Table RFH-29 and RFH-46 is that RFH-29 is the estimated number of acres existing in shrubland structural condition classes. Table RFH-46 is the desired number of acres in shrubland structural condition classes. At the time the Draft EIS was printed, there was not a good estimate of the acres in shrubland structural condition classes available. This does not preclude the development of the desired shrubland structural condition to guide future management. The development of the desired condition takes into consideration many factors, including wildlife habitat needs to maintain desired population levels and a requirement to maintain a broad spectrum of biodiversity and uses. The determination of these levels is derived from scientific literature and research, and experiences from land managers working with the resources directly. (FEIS Chapter 3, Rangeland and Forest Health)

Comment: DEIS, p. 3-174—you state that you don't have information about long-term population trends for greater prairie chickens, sharp-tailed grouse, and sage grouse. You also state that Alternatives 3, 4, and 5 have the best chance of maintaining or increasing habitat suitability. How can you support such a statement?

It is well documented as to what the greater prairie chicken, sharp-tailed grouse, and sage grouse need for nesting and brooding cover. (Revised Plan, Appendix H) This cover is necessary to provide for the overall habitat suitability for this species. While populations will cycle, Alternatives 3,4, and 5 prescribe desired vegetation conditions (high vegetative structure) to provide high quality habitat necessary to sustain prairie grouse populations.

Comment: DEIS, Ch3, p. 184 states that grassland fires move quickly and usually don't change soil permeability and porosity. This isn't true. Fire creates a crust on the soil surface that needs to be broken to allow moisture to soak in.

The statements on page 184 are correct. As the statements point out, this is "usually" the case. There are exceptions when fire does change soil permeability and porosity. However, this is rare with the fine fuels and rates-of-spread in the grassland environment. Soil hydrophobia can result from fire, the extent is dependent primarily on the types of fuels burned, fire intensity and duration.

Comment: It is extremely difficult to read Appendix* I *without flipping through three different areas when trying to determine CSU, NSO, and TL for specific resources. Revise Appendix I to address all of the stipulations.

All stipulations for a resource were listed by that specific resource. Appendix I was updated and changed to Appendix D so the type of limitation and the unit to which the stipulation applies is now listed in brackets following the resource.

Comment: Federal statutes and regulations require federal agencies to consider the economic structure of counties and protect them from adverse impacts. Agencies must also specify mitigation plans to reduce or eliminate adverse impacts to local communities [40 CFR 1502.14(F), 1502.16(H), 1508.20]

In the FEIS Chapter 3, Community and Lifestyle Relationships we have looked at economic impacts to counties. The alternatives presented indicate no alternative will affect more than 1% of the jobs and income of any economic impact area in the Northern Great Plains.

Comment: The proposed plan doesn't describe the existing condition, making it impossible to compare alternatives and evaluate impacts.

Numerous comments were received that the DEIS inadequately discussed the existing conditions.

Alternative 1 provided a clear reflection of current management practices in all areas except in the area of livestock use projections. However, the draft management plan clearly stated in the DEIS, that projections of livestock use were only valid for comparison among the alternatives, and that this plan would not set stocking rates. These statements are still true. The projected livestock use was developed to provide an estimate of economic impacts that was requested by the public.

To respond to public comment, Alternative 1 was also modified to more closely reflect the current condition. In projections of livestock use, the 20-year average authorized use was inserted to provide a base for comparison of the alternatives. NRCS forage production estimates were used as a basis for the projected livestock use. This was done to respond to the concern that the estimate in the DEIS was too conservative. The results of these changes make the projected livestock use much more comparable to the 20 year average.

In the FEIS, we more thoroughly described existing conditions and compare alternatives to existing conditions. (FEIS Chapters 2 and 3)

Comment: The Proposed Plan Revision would hinder existing USDA programs for beginning ranchers.

It is not clear which USDA programs for beginning ranchers would be incompatible with the direction found in the Plans. The revised plans seek to provide for a variety of uses on the national grasslands and forests. Ranching is recognized as an important component of the rural landscape. In some cases, the revised plans call for reduced levels of livestock use in order to provide a broader range of uses and values that are linked to the amount and variety of vegetation left after the grazing season.

Comment: The proposed plan would be contrary to National Energy goals.

The objectives of Forest Service minerals management are provided in FSM 2802, and discussed in the Oil, Gas, and Minerals section of the FEIS, Chapter 3. Mineral exploration and recovery is a valid use of the National Grasslands, as provided by law, regulation, and policy. Alternative 3 Final provides a balance between protection of areas where mineral development could have unacceptable impacts, and ensures mineral development will be accomplished in response to the National Energy goals.

Comment: The Plan violates the Bankhead-Jones, National Industry Recovery, the Federal Emergency Relief Acts, State section line laws, land ownership acts of 1864, 1865, 1866, 1870, 1872, and 1873, the Taylor Grazing Act, the 1984 Wilderness Act and the 14th amendment to the constitution.

The writer of this comment did not address how he or she feels these laws are violated. The comment provides only a list of laws several of which do not apply to National Grasslands. Thus the comment cannot be specifically addressed. The Forest Service's Office of General Counsel has reviewed the history and legal mandates it has for managing the National Grasslands and has made this available in a document known as the National Grassland Management Primer. While some disagreement exists over things such as state section line laws, the Forest Service believes that all aspects of the revised plans are supported by applicable laws.

Comment: The preferred alternative should have been developed using Alternative 1 as a starting point and modifying it based on documented problems, new science, and better management practices.

The Preferred Alternative was developed using a modified version of Alternative 1 that took into account the current situation based upon implementation (or lack thereof) of the current plans over the past 10-15 years. Several factors, including those mentioned, provided the basis for developing the new alternative. Additional factors include: public comments during project level planning; amendments to the current plan; monitoring the effects of implementing the current plan; knowledge gained from basic and applied research on prairie ecosystems; input from other federal agencies, state agencies, partners, and the public; and changes in management philosophy for National Forest System lands. (Refer to FEIS Chapters 1 and 2)

Comment: Your commitment to monitoring and evaluation is lacking. The plans don't meet the three criteria for an effective monitoring and evaluation. The scientific soundness of the indicators is unknown because they aren't specified. The ability of these measures to indicate adequately for the crucial variables that must be monitored is thus entirely unknown and highly doubtful. The frequency with which monitoring and evaluation occurs is surprisingly low. In some cases, the monitoring of a particular indicator will not be complete at the end of the first decade of the Plans. If the purpose of monitoring is to ensure that planning decisions have the desired effect and do have undesirable effects during the course of the planning period, this is clearly a nonsensical proposition. Finally, the plan includes no predetermined degrees of change that will trigger a reanalysis of management activities, the final and equally critical component. These problems are all compounded by a near absence of standards driving the monitoring and evaluation process. The entire process must be framed and driven by a thorough set of strict standards, which ensure that the process operates as it should.

There are major differences between the DEIS and FEIS monitoring plans. This is based on a National and Regional Forest Service effort in response to public and scientific comments. The proposed monitoring program is itself a demonstration of Forest Service commitment to monitoring and evaluation. It presents a new paradigm designed to provide monitoring with much greater impact in maintaining plan currency than the existing program could. It provides for annual evaluations to determine critical needs and current issues and emphasizes flexible response to real-time planning issues.

We agree that monitoring techniques and processes must be based on sound science, though they are not developed to mimic rigorous research processes. Monitoring, by design is not research. Monitoring is intended to determine how well objectives have been met and how closely management standards and guidelines have been applied.

Similarly, the frequency of sampling is designed to vary according to the perceived need for information. It is true that some of the identified monitoring activities require a response at less than an annual frequency, which was established to respond to an identified need.

FEIS, Chapter 4, Introduction discusses the need for effectiveness, implementation and validation monitoring. Chapter 4 has been modified greatly from the DEIS.

Comment: Do a Regulatory Flexibility analysis.

The primary purpose of the Regulatory Flexibility Act of 1980 (RFA) is to ensure that agencies proposing to promulgate federal rules affecting small entities (business, governmental jurisdictions, and not-for-profit organizations) have adequately considered the economic impacts on those small entities. A Land and Resource Management Plan is not a rule. They do not directly regulate small entities. Factors set forth in RFA are not pertinent to the context of land management planning.

An RFA analysis has never been attempted at a National Forest level. Development of guidance for analysis content, methods, and purposes in this new context would be necessary before an analysis could begin. Because hard data at the scale necessary to provide meaningful information about small entities in the planning area is not expected to be readily available, a RFA analysis is unlikely to provide meaningful or reliable information about potential effects of the Plan Revision. Therefore, it is not clear how conducting this analysis and using the resultant information would improve a management Plan decision.

Comment: Consider research and recommendations from non-Forest Service professionals when doing your analyses.

The Forest Service considered a very wide range of published research results. (FEIS Bibliography)

The Forest Service utilized three panels of peer reviewers to review process and analysis methods for several topic areas, including economics, timber, range and viability. FEIS, Appendix A lists the review panels for economics, timber and range.

Comment: Analyze the grassland units separately. Produce a separate plan and EIS for each.

Each grassland unit has a separate analysis enclosed in one Final EIS. This allows the environmental effects chapter to disclose the effects in two ways: effects specific to each administrative unit and effects compared and evaluated among the units within the planning area. Yet, based on this one FEIS, each grassland unit (Dakota Prairies, Nebraska, Thunder Basin) has its own Plan. Where reasonable, the Plans have consistent management direction. However, in response to the public's comments on the draft EIS, each grassland unit developed management direction specific to its location where it was appropriate. For example, management direction that protects bighorn sheep is different between the administrative units to reflect the different management schemes each unit has. In addition, each grassland unit developed management direction for "geographic areas" – areas that are unique and require specific consideration. Hence, the management direction for the Sheyenne National Grassland is different from the Little Missouri National Grassland. In this case, using Geographic Area management direction helps highlight what is needed to manage a tall grass prairie versus a mid- to short-grass prairie.

Doing one EIS instead of three allowed the Forest Service to have a planning process that was: ecosystem based; address cumulative effects over the appropriate planning area; reduced costs; provided for better coordination and collaboration with stakeholders; and more efficient for the public to respond to one planning effort instead of three.

Comment: Rewrite the Geographic Area direction for the Sheyenne National Grassland.

The Sheyenne Geographic Area direction has been rewritten and expanded in the Revised Plan. New information on the desired future condition is present. In addition, standards and guidelines specific to this geographic area have been developed and are included. See Revised Plan, Chapter 2.

Violation of NEPA, NFMA, Etc.

Comment: The plan fails to do the following, as required by NEPA:

- *Address impacts to local custom, culture, economy, and lost revenue for our schools.*
- *Protect and preserve the economic stability of local communities.*
- *Include a cultural analysis of the local area and to protect our national heritage (our traditional use of the land).*

The National Environmental Policy Act of 1969 (NEPA) requires that natural and social sciences be integrated in all planning and decision-making that affect the human environment. The human environment includes the natural and physical environment and the relationship of people to that environment. Forest Service land management planning regulations also instruct that social science knowledge be considered in forest and grassland planning.

Chapter 3 of the FEIS, Community and Lifestyle Relationships, discusses in general terms the existing relationships with the National Grasslands and Forests from the perspectives of a number of affected interests. They include agriculture producers, oil, gas and mineral producers, wood products producers, both consumptive and non-consumptive recreationists, conservation / preservation interests, wildlife advocates, American Indians, adjacent landowners, and governments. The FEIS outlines the anticipated effects of each alternative on each of the interest or user groups.

Also, the FEIS (Chapter 3) outlines the economic environment, level of economic dependency on National Grasslands and Forests, and anticipated effects for the counties within the planning area.

Goals

Comment: There is little evidence that increasing pasture size will improve biodiversity, yet this objective appears throughout the plans.

Increasing pasture size was an objective in the plan. On the Dakota Prairie Grasslands this objective has been removed and replaced with a guideline that provides more flexibility to use structural improvements where nonstructural management techniques are unsuccessful.

There are numerous range studies that indicate pasture size affects grazing distribution. Most range studies and handbooks suggest creating smaller sized pastures to better achieve forage utilization for livestock production. But, on public lands with multiple-use objectives, smaller sized pastures don't necessarily help achieve desired vegetation objectives for livestock and wildlife. Smaller pasture size results in a more uniformly grazed pasture, thus, directly affecting the presence or absence of the variety of plant species and limiting vegetative structure diversity. Larger pasture size results in an uneven grazing distribution, thus, creating a mosaic of vegetative utilization and more diversity in grassland structure.

Comment: Plans, Ch 1, p. 5, Goal 2: Provide Multiple Benefits for People within the Capabilities of Ecosystems--many of the subgoals under Goal 1 belong here; they are similar concerns. It is doubtful if all these objectives can be met simply by prescribing desired vegetation composition and structure classes for the grasslands.

Prescribing desired vegetation composition and structure is one of many ways of providing the diversity that will ensure sustainability. Vegetative objectives, along with all the objectives, standards and guidelines listed in the Revised Plans will help to ensure that we will have sustainable multiple use.

Past management of these public lands has resulted in a fairly homogeneous landscape with little variety in vegetation composition and structure. The revised Plans are calling for a major change in resource management to increase biodiversity on the grasslands by prescribing a variety of different desired vegetation composition and structure classes. Many prairie wildlife species require either high structure like prairie grouse or low structure like prairie dogs. Recreationists on the grasslands desire diversity in the vegetation composition and structure for their desired activities, such as hunting, hiking, camping, bird watching, and general enjoyment. Many of the goals and objectives require a mosaic pattern of vegetative diversity that can be met through these desired vegetation composition and structure classes. In addition, standards and guidelines provide management direction to help achieve the goals and objectives.

Comment: Plans, Ch 1, p. 5, Goal 2.5: Grazing--the goal and objectives are acceptable, but the desired conditions established in the plan will not accomplish this goal.

The goal to assist in satisfying the demand for livestock products through environmentally responsible grazing is a concise statement that describes conditions we expect to be achieved in the future. The objectives are measurable desired condition statements that will help accomplish a goal and that are generally achieved through implementation of specific projects or activities.

The desired conditions, and the standards and guidelines developed for individual geographic areas and management areas, are designed to accomplish the goals. The Revised Plans better outline desired conditions in the Chapter 2, Geographic Area Direction. The EIS better documents and displays livestock grazing effects analyses and management practices and analyzes the effects of various grazing levels. (FEIS, Chapter 3)

Comment: Explain how you plan to achieve your goals for ecological processes and functions and rangeland values. Specify the techniques, methods, and/or practices you will use.

The Forest-wide and Grassland-wide Standards and Guidelines, as well as the direction set forth in the individual geographic areas and management areas, are designed to achieve the stated goals. The Monitoring Section is designed to show how and when we will measure the success of our efforts in achieving the stated goals.

Standards and Guidelines

Comment: NE plan, Ch 1, p. 32, O. Plant Collecting Guideline 4. "Protect American Indian traditional plant collecting areas." Define which plant species and give their locations.

Traditional plant collecting areas are known to exist on the national grasslands and forests for a variety of plant species that hold traditional values for American Indians. Through consultation during the scoping period for project implementation these areas and specific species will be identified if there is a concern by American Indians that the proposed project(s) have the potential to adversely affect the species or the area.

Comment: DEIS, p. D-2, Standard 2—allow modified wheelchairs for outdoor use instead of just indoor wheelchairs. Wheelchairs designed for use in indoor pedestrian areas are useless on unpaved, dirt surfaces.

The Americans with Disabilities Act (ADA) prohibits discrimination against those with disabilities in employment, public service, public accommodations and services operated by private entities. The act specifically allows wheelchair access in Wilderness. The Forest and Grassland Plans extend to all non-motorized areas the same access as ADA allows in Wilderness (see Standards and Guidelines, Q. Infrastructure). The environmental consequences section of this EIS has been expanded to include the effects on the mobility impaired.

Comment: One set of comments dealt with the effectiveness of Forest wide standards and guidelines. One group of commentors said that more restrictive standards and guidelines were needed. One specific suggestion was to change many of the guidelines to standards. Another group felt they were too specific and should be loosened up. Concerns were also expressed that the standards and guidelines were ambiguous and were left too open to interpretation possibly causing some unintended environmental impacts.

Trying to come up with an effective set of Forest wide standards and guidelines has been one of the most time-consuming parts of the revision process. The difficulty has been to develop direction that does not stymie forest management because it is overly controlling to be implemented or is too loose to be effective or meaningful. We feel that the standards and guidelines in the Revised Plans are within this effective range and set the appropriate amount of strategic management direction. Northern Great Plains planning team members, other Forests completing revisions, and the Regional Office worked hard to write these standards and guidelines clearly to avoid ambiguity and unintended environmental impacts so they could be implemented effectively. However, while it is important to write clearly and unambiguously, there needs to be some room for flexibility and interpretation by line officers and project ID team members so that standards and guidelines can be applied in many situations involving a variety of activities over nearly the 2.9 million acres and four states addressed by these plan revisions.

Standards and guidelines have been an area of major concern throughout the revision process. We believe that the standards and guidelines in the Revised Plans provide the proper balance between being too loose to be meaningful and too tight to be overly restrictive. This set of standards and guidelines is a result of many years of work by Forest and Regional ID team members and line officers. Further, the set is a logical result of the comments and suggestions from many interested people from the public and the natural resource expertise of forest managers and ID team members.

Public Involvement

Comment: You didn't give adequate notice of public meetings and didn't provide collaborative opportunities for state and county governments and local citizens.

Public involvement events for this planning effort, up to the release of the DEIS, is found in the beginning of this document. Public events included meetings, open houses, workshops, and information fairs. The list includes twelve newsletters that were sent to a large mailing list and anyone who requested them. Public meeting schedules were listed in those newsletters that preceded scheduled public meetings. News releases announcing upcoming public meetings were issued to local and regional newspapers in the planning area prior to the meetings or other public events.

The planning effort included five collaborative groups that were open to participation by anyone. Each group decided whether to focus on a single issue or to address a broader scope. Collaborative groups were organized for the Grand River, Little Missouri, and Sheyenne National Grasslands in North Dakota, the Buffalo Gap National Grassland (Fall River District) in South Dakota, and the Nebraska National Forest, Bessey District, in Nebraska.

Consultation with state and county governments has been an ongoing process that has consisted of a variety of methods. Their input and ideas have been actively sought and have been seriously considered in drafting the FEIS. While all state governments in the planning area have taken an active role in providing input, some counties have chosen to be less involved in the process.

Plant and Animal Damage Control

Comment: What agency is really in charge of controlling predators, insects and rodents?

The Animal Damage Control Act of March 2, 1931, as amended authorizes the Secretary of Agriculture to provide animal damage management services, to maintain technical expertise for evaluating and recommending animal damage management techniques, and to perform animal damage research. The Secretary has delegated this authority to the Animal and Plant Health Inspection Service (APHIS) and the animal damage control program in APHIS is specifically responsible for animal damage control activities.

The Forest Service and Animal & Plant Health Inspection Service (APHIS) – Animal Damage Control program along with the States, cooperate under the Animal Damage Control Act of March 2, 1931, as amended, to manage animal damage on National Forest System lands. A Memorandum of Understanding (MOU), June 18, 1993, between the Forest Service and APHIS outlines the cooperative approach to animal damage management on National Forest System lands. The MOU outlines cooperation to ensure the protection of National Forest System resources and consistency with Land and Resource Management Plans.

Comment: Use more aggressive control efforts on invasive plants, grasshoppers, prairie dogs, and predators.

The Forest Service is cooperating with the States, other Federal agencies, County Weed and Pest Boards, and adjacent landowners to address the invasive and noxious weed problems on and adjacent to the National Forest System lands. Control efforts utilize an integrated approach to prevention and management of invasive plants and noxious weeds, including biological, chemical, and mechanical.

A Memorandum of Understanding (MOU), June 18, 1993, between the Forest Service and APHIS outlines the cooperative approach to animal damage management on National Forest System lands. The MOU outlines cooperation to ensure the protection of National Forest System resources and consistency with Land and Resource Management Plans. This MOU in no way defines or limits the authority of States to regulate the taking of predators according to State and other applicable Federal laws. An integrated approach to predator management will be utilized including the use of hunting and trapping as control techniques.

In North Dakota, local agreements with Wildlife Services have also been implemented to allow Wildlife Service to do their work and insure the protection of National Forest System resources and consistency with Land and Resource Management Plans.

The black-tailed prairie dog was recently petitioned for listing as a Threatened species under the Endangered Species Act (ESA) by several conservation organizations and the petitions were determined by the U.S. Fish & Wildlife Service (FWS) to be warranted, but precluded by higher listing priorities. The black-tailed prairie dog is currently classified as a Candidate species for possible future protection under ESA. The Plans outline conservation strategies for maximizing the contribution that the Forest Service and the National Grasslands can make to the long-term viability of black-tailed prairie dogs. In addition, the Forest Service is cooperating with the various State Working Groups in the development of a black-tailed prairie dog conservation strategy for each State. This strategy is designed to insure that prairie dogs are not listed, and impacts to private land owners that could result from listing are avoided.

Comment: The pesticides being sprayed on the land are a health risk and are damaging the environment and sensitive plants and animals. Consider non-chemical, non-lethal control measures.

To address this issue see Plan, Chapter 1, Standards and Guidelines. The following Standards and Guidelines address this issue. Guideline: Do not authorize the use of invasive plant control methods that may adversely impact TES plants. Standard: Do not spray grasshoppers within 0.25 mile of known burrowing owl nests. Standard: manage invasive plant species using integrated management techniques, including mechanical, chemical, prescribed fire, and biological control methods. Standards and Guidelines – Haying, revegetation with weed free seed, restrict pesticide use where it will have adverse effects on species at risk.

Comment: More non-chemical and non-lethal methods should be used to control predators that kill livestock.

In North Dakota, the annual work plan between Wildlife Services and the Forest Service promotes the use of nonlethal methods of predator control on national grasslands prior to the use of lethal control methods.

The Forest Service and Animal & Plant Health Inspection Service (APHIS) – Animal Damage Control program along with the States, cooperate under the Animal Damage Control Act of March 2, 1931, as amended, to manage animal damage on National Forest System lands. A Memorandum of Understanding (MOU), June 18, 1993, between the Forest Service and APHIS outlines the cooperative approach to animal damage management on National Forest System lands. The MOU outlines cooperation to ensure the protection of National Forest System resources and consistency with Land and Resource Management Plans.

These activities include actions to provide wildlife damage management through direct control, as well as technical assistance to achieve desired management objectives. APHIS carries out animal damage management activities on National Forest System lands mostly to minimize livestock losses from predation by coyotes and other predators. Most animal damage management activities on the National Forest System lands are conducted as result of coyote predation on domestic sheep.

Prohibit the use of M-44s for predator control in occupied swift fox habitat. Plan, Chapter 1.

Comment: The FS needs to use a more balanced approach to noxious weed management that includes biological, mechanical, prevention and education, as well as chemical control. Noxious weeds are not adequately addressed in the DEIS. The FS should place more emphasis on noxious weed management.

The Forest Plan, under Grassland and Forestwide Direction, Section J. specifies standards and guidelines aimed at controlling existing weed populations and preventing new infestations. One standard specifically directs us to use integrated management techniques, including chemical, biological, and mechanical methods, to control noxious and undesirable plant species.

Comment: Prairie dog populations along property boundaries need to be poisoned to reduce unwanted impacts on adjoining lands.

The black-tailed prairie dog was recently petitioned for listing as a threatened species under the Endangered Species Act (ESA) by several conservation organizations and the petitions were determined by the U.S. Fish & Wildlife Service (FWS) to be warranted, but precluded by higher listing priorities. The black-tailed prairie dog is currently classified as a candidate species for possible future protection under ESA. The Plans outline conservation strategies for the contribution that the Forest Service and the National Grasslands can make to the long-term viability of black-tailed prairie dogs.

Chapter 1, Grassland-wide Direction, addresses the general direction for the management of black-tailed prairie dogs. In addition, Chapter 3, 3.63 Management Area provides management direction for prairie dog management in black-footed ferret reintroduction areas. The Plans limit the use of rodenticide for managing prairie dogs. Instead, the Forest Service is utilizing grazing management systems and stocking levels to enhance prairie dogs expansion where desired and to discourage encroachment to adjacent private lands. In addition, grazing management systems and stocking levels will be utilized to protect the soil resource. In addition, the Forest Service is cooperating with the various State Working Groups in the development of a black-tailed prairie dog conservation strategy for each State. The State Working Groups are developing strategies to address the concerns relative to plague, erosion, and management of prairie dogs on public and private lands. The Forest Service has included a provision that prairie dogs can be poisoned where there is a public health or safety problem, damage to private or public infrastructure, and to respond to unwanted colonization of adjoining private land when it is consistent with the USFWS approved conservation strategy.

Comment: Control prairie dog populations to prevent plague and adverse soil and water impacts and to keep them from encroaching on private land.

The black-tailed prairie dog was recently petitioned for listing as a threatened species under the Endangered Species Act (ESA) by several conservation organizations and the petitions were determined by the U.S. Fish & Wildlife Service (FWS) to be warranted, but precluded by higher listing priorities. The black-tailed prairie dog is currently classified as a candidate species for possible future protection under ESA. The Plans outline conservation strategies for maximizing the contribution that the Forest Service and the National Grasslands can make to the long-term viability of black-tailed prairie dogs.

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The Forest Service has included a provision that prairie dogs can be poisoned where there is a public health or safety problem, damage to private or public infrastructure, and to respond to unwanted colonization of adjoining private land when it is consistent with the USFWS approved conservation strategy

Comment: Grasshoppers cause considerable damage in some years and should be controlled by any means.

Grasshoppers are a part of the ecosystem and used for food by many species of wildlife. Individual requests for treatment would have to be analyzed as to the impacts on the environment. Situations that APHIS considers to be an economic impact would be the only cases to be considered for control on National Grasslands and only in cases were private land is being impacted.

Comment: Grasshopper infestations are caused by livestock overgrazing, and spraying shouldn't occur unless the grazing problems are addressed.

Populations of grasshopper's cycle and population fluctuations are dependent on a number of factors. Overgrazing and other factors can be a contributing factor to grasshopper infestations by increasing the bare ground area for the deposit of grasshopper eggs and improving conditions for grasshopper population expansion. Plan direction is intended to confine heaving grazing to those areas the specifically need it to accomplish specific management objectives, especially vegetation objectives described in Plans, Chapter 2 Geographic Area Direction.

Rangeland and Forest Health

Comment: The existing health of grasslands is good and no additional improvements or changes in management are needed.

Much of this issue is the result of differing definitions of rangeland health. It is likely that the commenter was looking only at the health of the plants or one particular grassland. There are areas where improvement in the plant community is desired on all the grasslands, and there are areas such as on the Sheyenne Grassland where vast improvement in the health of the grassland is needed. However, on some grasslands this statement is true when referring to just plants than when referring to the entire grassland ecosystem as was done in the analysis.

A re-analysis of vegetation composition and structure objectives has been done to respond to public comments. The FEIS will includes a discussion on existing conditions for rangeland composition and structure and provides an outline of desired conditions based on biological assessments and available information.

Comment: Take a more ambitious approach to conservation and ecosystem restoration. Conserving biodiversity and restoring native plants and animals should be the priorities on the grasslands. The desired condition should emphasize native plants and animals and potential natural communities.

Conserving biodiversity and restoring native plants and animals are priorities for the grasslands. The desired condition objectives emphasize native plants and animals and potential natural communities.

Achieving ecosystem health and sustainability through conservation and restoration have priority emphasis that are assured by the following Revised Plan direction: Chapter 1, Grassland wide Goals 1 and associated objectives, standards and guidelines; Management Area 3.64 that emphasizes specific plant and wildlife species and communities; Management Area 3.66 (Dakota Prairie Proposed Plan) which manages areas to restore and maintain native plant and animal species, communities and ecological processes and functions; Management Area 6.1 that emphasizes a diversity of native plants and animals and ecological functions and processes; Management Area 2.1 SIAs; Management Area 2.2 RNAs; Management Area 3.51 Bighorn Sheep Habitat; Management Area 3.58; and Management Area 3.63 Black-footed Ferret Habitat.

Comment: Monitor grassland cover and structure.

Grassland vegetative structure will be monitored. See Plans, Chapter 4.

Comment: Livestock grazing, oil and gas development, and motorized access are damaging rangeland and forest resources. They should be minimized or phased out.

These uses are legitimate and legislatively authorized examples of multiple-use on the National Grasslands and National Forests. In most cases, the uses are also allowed under some type of permit or authorization that contains provisions designed to manage the resources to meet desired conditions.

Many commentors urged increased levels of these uses; others favored decreases. The different alternatives are developed to respond to such needs and desires and to provide varying levels of the different uses, goods, and services. The Standards and Guidelines are specifically designed to prevent damage to rangeland and forest resources and to meet desired resource conditions and monitoring is designed to ensure standards and guidelines are effective.

Alternatives in the FEIS contain a range of mixes of these uses. Alternative 3 Final is selected to provide a balance of these resource uses.

Comment: Precipitation determines the health and productivity of the land, not man or livestock grazing.

Actually a combination of precipitation, human influence, and livestock grazing can all have an impact on the productivity of the land. Precipitation delivered at the right time in plants' growing cycle has a great impact on the health and productivity of the plants for that particular growing season and potentially the following growing season. The same is true of human management and/or livestock grazing. Depending on the timing and degree of use, impacts on the health and productivity of the land can be significant for a particular growing season or several growing seasons in the future.

Comment: Inappropriate parameters are being used to evaluate and describe rangeland and forest health.

The comments on Rangeland and Forest Health reflected the breadth and complexity of the topic. There was considerable debate about the current state of rangeland and forest health and what parameters should be used to define them. For the FEIS, we reanalyzed vegetation composition and structure objectives. We included a discussion on existing vegetative conditions and provided a better outline of desired conditions. We will describe vegetation structure and relate it to wildlife habitat. And we will review our monitoring section and make sure it eventually validates our management assumptions.

Comment: GA direction: in the Spring Creek Area—Management Area 3.65 is being considered as a potential area for sage grouse. Cattle grazing will be limited to reach proper ground cover. This would be a great economic impact on the permittees. (especially not grazing until July). What structure could be handled to have both cattle and grouse?

While sage grouse habitat is one component of the management in Management Area 3.65, it will not be the only factor considered. Each Geographic Area has a desired mix of vegetative structural conditions. (Plan, Chapter 2) Within Spring Creek Geographic Area there will be areas managed for moderate and low structure, as well as areas managed for high structure. This mix will allow livestock grazing to potentially occur throughout the entire year. Stocking rates, season of use, and

length of grazing period will also affect structural conditions. All of this will be taken into consideration when establishing appropriate levels of cattle grazing during site specific allotment planning. Cattle and sage grouse can coexist. Many times, particularly in larger pastures, habitat for sage grouse nesting (high structure) can occur in areas where livestock do not frequent (known as secondary range). Using management techniques such as herding, adjusting fence locations, and not developing livestock water in areas of sage grouse habitat can accomplish desired conditions for grouse and still allow livestock grazing.

Comment: Fully describe the economic effects of prairie dog expansion and black-footed ferret reintroduction.

The Environmental Impact Statement addresses prairie dogs and ferrets in Appendix H: Biological Assessment and Evaluation as well as in Chapter 3: The Affected Environment and Environmental Consequences.

Bison

Comment: Bison are native Great Plains herbivores and should be returned to public grasslands. Reintroduce bison as an alternative to cattle. Establish free-roaming bison herds. No more bison on the grasslands.

Refer to FEIS Chapter 1.

Prairie dogs

Comment: Prairie dogs are keystone species on the grasslands and should be restored to 10 to 25% of their historical range.

The black-tailed prairie dog was recently petitioned for listing as a threatened species under the Endangered Species Act (ESA) by several conservation organizations and the petitions were determined by the U.S. Fish & Wildlife Service (FWS) to be warranted, but precluded by higher listing priorities. The black-tailed prairie dog is currently classified as a candidate species for possible future protection under ESA. The Plans outline conservation strategies for maximizing the contribution that the Forest Service and the National Grasslands can make to the long-term viability of black-tailed prairie dogs.

Chapter 1, Grassland-wide Direction, addresses the general direction for the management of black-tailed prairie dogs. In addition, Chapter 3, 3.63 Management Area provides management direction for prairie dog management in black-footed ferret reintroduction areas. The Plans limit the use of rodenticide for managing prairie dogs. Instead, the Forest Service is utilizing grazing management systems and stocking levels to enhance prairie dogs expansion where desired and to discourage encroachment to adjacent private lands. In addition, grazing management systems and stocking levels will be utilized to protect the soil resource. Prairie dog shooting will be restricted in areas where prairie dog expansion is desired and where shooting is preventing accelerated expansion. Shooting restrictions will be coordinated with the State wildlife agencies.

In addition, the Forest Service is cooperating with the various State Working Groups in the development of a black-tailed prairie dog conservation strategy for each State. The State Working Groups are developing strategies to address the concerns relative to plague, erosion, and encroachment from public lands to private lands.

Comment: Manage the size of prairie dog colonies. Use good range management instead of poisoning.

The black-tailed prairie dog was recently petitioned for listing as a threatened species under the Endangered Species Act (ESA) by several conservation organizations and the petitions were determined by the U.S. Fish & Wildlife Service (FWS) to be warranted, but precluded by higher listing priorities. The black-tailed prairie dog is currently classified as a candidate species for possible future protection under ESA. The Plans outline conservation strategies for maximizing the contribution that the Forest Service and the National Grasslands can make to the long-term viability of black-tailed prairie dogs.

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Comment: Prairie dogs remove all vegetation and cause soil compaction. Increasing their populations would be in conflict with National Soil and Resource Improvement Goal 2553.02 in Appendix K.

Prairie dogs do remove vegetation on prairie dog towns. However, we are unaware of any research that would indicate that prairie dogs would cause soil compaction.

See response to above comment. Goals and objectives in resource management plans can sometimes conflict with one another. Which goal or objective takes precedence in a given situation depends on the application of laws and regulations. In the case of prairie dogs both the National Forest Management Act and Endangered Species Act require we provide for the conservation of this species.

Prairie dogs once covered a much greater area than they currently cover or are proposed to cover by this plan. These ecosystems have evolved with the impacts of prairie dogs. The extent of prairie dogs expected during the life of this plan is not expected to have a significant effect on soil and water resources.

Comment: In 1997, North Dakota declared the prairie dog a noxious pest. They are to be controlled under the jurisdiction of County Weed Boards. Your proposed prairie dog expansion is in direct conflict with state law.

The National Grasslands are required by federal law to provide for viable populations of native species. The black-tailed prairie dog is a native species. The fact that the state of North Dakota has declared this species as a pest does not excuse the Forest Service of its obligation under the National Forest Management Act to provide for the continued viability of this species. The USDI Fish and Wildlife Service released a listing decision regarding the black-tailed prairie dog in February 2000. This decision determined that there was a valid concern over black-tailed prairie dog viability. The proposed expansion of this species is in response to these concerns.

Wildlife

Comment: Proposed wildlife standards and guidelines aren't clear and they are more restrictive than those currently in use.

Wildlife standards and guidelines have been rewritten to provide specific management direction to conserve or restore viable populations of endangered, threatened, proposed, candidate, and sensitive species through recovery and management efforts, including the protection, conservation, and restoration of important terrestrial and aquatic habitats. These wildlife standards and guidelines are necessary based on the detailed biological assessment and evaluation, informal consultation with the FWS, and input from external peer review. In addition, wildlife standards and guidelines have been rewritten to conserve habitat capable of supporting populations of game and fish, as well as providing wildlife viewing opportunities.

Comment: DEIS, Appendix H, p. 83--why didn't you include the trumpeter swan in this appendix? They are listed as Species of Concern in Regions 3 and 6. Several states in your region list them as endangered or extirpated.

A species evaluation was completed for the trumpeter swan in the FEIS. Refer to FEIS Appendix H.

Comment: Oil and gas developments and roads are negatively impacting wildlife and their habitats.

Potential impacts of oil and gas development on species are discussed in FEIS, Chapter 3 and are mitigated through the application of standards, guidelines and stipulations. (FEIS Appendix H, Plan Chapter 4)

Comment: More management indicator species need to be identified and monitored.

The planning regulations (36 CFR 219.19 Fish and Wildlife Resource) outline the direction for identifying and monitoring management indicator species. Planning regulations state that fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area. In addition, the planning regulations require certain vertebrate and / or invertebrate species be identified and selected as management indicator species. These species shall be selected because their population changes are believed to indicate the effects of management activities. The Plans shall establish objectives for the maintenance and improvement of habitat for management indicator species. In the selection of management indicator species, the following categories shall be represented where appropriate: endangered and threatened plant and animal species identified for the planning area; species with special habitat needs that may be influenced significantly by planned management activities; species commonly hunted, fished, or trapped; non-game species of special interest; and additional plant or animal species selected because their population changes are believed to indicate the effects of management activities on other species of selected major biological communities or on water quality. Pronghorn and mule deer were not selected as management indicator species because both of these species habitat requirements are broad and cover several biological communities. The species selected as management indicator species are more restricted to specific biological community or on water quality. Additional MIS were evaluated based on DEIS comments. Additional MIS such as western prairie fringed orchid and pigmy nuthatch were added in the Plans Chapters 2 and 3.

Comment: Special management emphasis for management indicator species is unnecessary, and proposed protection measures will limit other uses.

See response to comment above.

Comment: Protect current populations of bighorn sheep in North Dakota, and increase numbers if possible.

Current bighorn sheep populations will be protected by specific management area designation (MA 3.51, 3.51a, 1.2a, and 1.31 and 2.2), other small MA's also provide protection use of a grassland-wide standard (Plan Chapter 1, section F), and oil and gas stipulations (FEIS, Appendix I). The desire of the Dakota Prairie Grasslands to increase bighorn sheep numbers is documented in the biological evaluation. As noted under the desired condition statement for MA 3.51 and 3.51a it is the desire of the Dakota Prairie Grasslands to increase bighorn sheep numbers. This is further documented in the biological evaluation (FEIS, Appendix H), and in the Dakota Prairie Grasslands goals and objectives (Chapter 1, Goal 1). Bighorn sheep management areas (MA 3.51) are also allocated for two areas in Alternative 3 Final in the Nebraska Plan Revision.

Comment: The solitude requirement for bighorn sheep is overstated. Bighorn sheep and domestic livestock grazing are compatible.

Livestock grazing can either enhance or degrade forage availability for bighorn sheep. The Forest Service agrees with the commenter that bighorn sheep and domestic livestock grazing can be compatible. However, the main concern over domestic livestock is the potential for disease transmission between domestic sheep and goats and bighorn sheep. This concern is based on numerous case studies documented in scientific literature (FEIS Appendix H).

Comment: Antelope and mule deer aren't given the same emphasis as management indicator species.

The planning regulations (36 CFR 219.19 Fish and Wildlife Resource) outline the direction for identifying and monitoring management indicator species. Planning regulations state that fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area. In addition, the planning regulations require certain vertebrate and / or invertebrate species be identified and selected as management indicator species. These species shall be selected because their population changes are believed to indicate the effects of management activities. The Plans shall establish objectives for the maintenance and improvement of habitat for management indicator species. In the selection of management indicator species, the following categories shall be represented where appropriate: endangered and threatened plant and animal species identified for the planning area; species with special habitat needs that may be influenced significantly by planned management activities; species commonly hunted, fished, or trapped; non-game species of special interest; and additional plant or animal species selected because their population changes are believed to indicate the effects of management activities on other species of selected major biological communities or on water quality. Pronghorn and mule deer were not selected as management indicator species because both of these species habitat requirements are broad and cover several biological communities. The species selected as management indicator species are more restricted to specific biological community or on water quality.

The Forest Service agrees that pronghorn and mule deer were not given the same emphasis as management indicator species. The same could be said for hundreds of other species not selected as MIS. As discussed in Appendix B, management which benefits MIS will also benefit associated species. For example, if form diversity increases as a result of sage grouse management, pronghorn habitat quality would also improve.

We recognize that not all of the habitat needs of associated species will be covered by managing solely for MIS. That is why we have specific management aimed at benefiting mule deer. (Chapter 1, Section F) and pronghorn (Appendix C)

Pronghorn and mule deer were not selected as MIS because they did not meet the criteria listed in Appendix B. Specifically, neither pronghorn or mule deer are "a keystone species or habitat specialist" or "sensitive to management activities on NFS lands in the local or regional vicinity", nor can either species' population trends be "tied to habitat conditions resulting from land uses on NFS lands in the same area". This is due to these species' ecology, home range size, seasonal movements, and the intermingled nature of NFS and non-NFS lands."

Vegetation Condition, Composition, and Structure

Comment: The use of structure, or more specifically the Robel pole, as a tool for managing the grasslands is inappropriate. The proper way to manage these systems is by measuring species composition.

Descriptions of desired composition have been strengthened and quantified as a result of input to the DEIS and Draft Plan. Objectives for the mix of composition are clearly articulated and will be monitored using the appropriate protocol for measuring vegetation composition. Structure is partially a function of composition with respect to the ability of specific vegetative species to provide adequate hiding cover for quality nesting habitat for a variety of ground-nesting birds. The Robel Pole is a scientifically based tool to assist the assessment of nesting habitat quality and will be used as a tool for that purpose. (FEIS Chapter 3, Rangeland and Forest Health, FEIS Appendix B)

Many wildlife species, including black-tailed prairie dog, greater prairie chicken, and upland sandpiper, are more sensitive to vegetative structure than they are to vegetative composition. Other species, such as regal fritillary butterflies, are most sensitive to vegetative composition. These facts are why we have identified objectives for both vegetative structure and composition. (FEIS Appendix H)

Comment: The DEIS fails to display the existing condition in relation to species composition and how the existing condition relates to the desired future condition and potential species composition.

The term range condition is defined by the Society for Range Management, 1998 as (a) a generic term relating to present status of a unit of range in terms of specific values or potential. Specific values or potentials must be stated and (b) the present state of vegetation of a range site in relation to the climax (natural potential) plant community for that site. It is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a plant community resemble that of the climax community for the site. It is noted that this term, Range Condition, is being phased out. It is preferable to use the terms "successional status" and "range similarity" index. The Draft Environmental Impact Statement displayed both the existing and potential vegetation cover types in the Rangeland and Forest Health Affected Environment section. However, desired vegetation composition was displayed in the Rangeland and Forest Health Environmental Consequences section. It was difficult for the reader to compare due to the separation in the document. The Final Environmental Impact Statement better displays existing vegetation composition to desired vegetation composition.

Comment: If landscape diversity is a goal of management, is it appropriate to call for 80-90% mid to late seral?

Landscape diversity is desired to provide for a mosaic of habitats for the myriad of grassland species. There are many species such as prairie dogs, mountain plover, and burrowing owls that require low structure early seral conditions. The Revised Plans try to provide for a diversity of seral stages and vegetative structure. The objectives for early, late and mid seral have been revised in the Final Plans and can be found in the Plans, Chapter 2 Geographic Area Direction.

Comment: We feel that the present condition of the range has not been accurately determined. A sound replicable measurement system for range condition that is backed up by scientific data is a necessity.

The Forest Service agrees that the discussion in the DEIS on existing condition of rangelands was inadequate and we expanded the discussion for present rangeland composition and structure in the FEIS. There is a discussion in the Rangeland and Forest Health section in Chapter 3 of the FEIS about the different methods used by agencies to determine rangeland condition and those discussions are further explained under each of the Land Management Units covered by the FEIS, although the discussions vary considerably from one Unit to the next because the available data also vary considerably.

The Forest Service also agrees there is a need to gather additional data on many of the Units and, wherever possible, to gather the information in a consistent manner, regardless of land ownership or the administering agency. Nationally, there is currently an effort underway to evaluate the use of one standard rangeland analysis method for use by the Forest Service, Bureau of Land Management, and Natural Resources Conservation Service (thereby consistent across virtually all land ownerships). There is also an effort, in its final stages, to update the Interagency Technical Guides to assure that all rangeland-monitoring techniques are conducted in identical fashion, regardless of who is using the method and where it is being used. Both efforts have involved university personnel in review and application of the methods.

Comment: Vegetation should be managed to create a mosaic of conditions to support a diversity of native plants and animals.

The Forest Service agrees, and so did a very large number of people who responded to the DEIS and who helped to define issues and concerns originally – Rangeland and Forest Health was determined to be one of the seven major revision topics.

In the proposed Plans, Goal 1 and its subgoals and objectives all discuss the desire to manage for a variety of native plant and animal communities. Throughout the geographic area and management area direction, goals and objectives, standards and guidelines are designed to assure that the mosaic of conditions you describe are achieved and maintained.

Fire

Comment: There are enough acres burned each year by man caused and lightning fires, why does the FS want to add to this acreage using prescribe fire?

Prescribed fire is a tool that can be used to accomplish projects that change environmental conditions and situations in specified locations at a given point in time. Fire is an integral part of the grassland and forested ecosystems. Since prescribed fire, if used properly, produces desirable affects, it will be part of our management tools.

Comment: Your "let it burn" policy and perimeter control fire management strategy puts life, property, and private and state lands at risk. It also encourages the spread of noxious weeds. Allow motorized access to all areas for fire suppression efforts.

See Chapter 1, Section G for the Fire Suppression Strategy. Appropriate Management Response (AMR) will be developed for each management area. Until developed, we will protect life, property, and resource values from wildfire in a cost-efficient manner that maximizes the benefits of shared resources and developing technologies with immediate suppression using strategies based on aggressive initial attack and suppression.

Motorized access for fire suppression (emergency use) will be allowed in all management areas except established Wilderness Areas and those areas recommended for Wilderness.

Comment: The FS proposal for prescribed fire is a good start, but the acreages are too low to emulate natural processes. The amount of acres burned per decade should be increased to mimic natural fire frequency. Adopt a less aggressive approach to wildfire suppression.

Prescribed fire is not the only acreage that will burn. Wildfires will also occur when conditions are suitable for natural or human-caused fires to spread.

Prescribed fire is a tool that can be used to accomplish projects that change environmental conditions and situations in specified locations at a given point in time. Fire is an integral part of the grassland and forested ecosystems. Since prescribed fire produces desirable effects, it will be part of our management tools. The level of burning (acres) will be determined by several factors, including budget, safety, resource benefits, public input, site specific NEPA, and burning conditions.

Appropriate Management Response (AMR) will be developed for each management area. Until developed, we will protect life, property, and resource values from wildfire in a cost-efficient manner that maximizes the benefits of shared resources and developing technologies with immediate suppression using strategies based on aggressive initial attack and suppression. The grasslands are in very intermingled ownership with federal and private lands. Protection of private lands and resources is essential to good neighbor relationships. It should be noted that the grassland also experience frequent lightning caused wildfires which sometimes burn extensive acreages. These natural fires along with the prescribed fire acreages should emulate natural processes in the grassland ecosystem.

Woody Draws

Comment: Why did the FS consider woody draws damaged by livestock as suitable for future livestock grazing?

Woody draws are suitable for grazing. However, the impacts are very dependent on the length of the grazing season in the pasture that includes the woody draw, the time of season grazing is allowed, and the location of water for livestock in relation to the woody draw. If woody draws are grazed during the appropriate season, woody draw regeneration can be successful.

Comment: The proposed reduction in livestock numbers by the FS is not enough to restore woody draws. To improve the condition of woody draws, timing and duration of grazing treatments needs to be managed.

A guideline has been developed to control timing and duration of grazing in pastures with woody draws. See Plans, Chapter 1, Section I, Livestock Grazing.

Recreation, Travel Mgmt, Visuals

Recreation

Comment: The DEIS doesn't disclose the effects of grazing and mineral leasing on Management Area 4.32 Dispersed Recreation, High Use.

This includes the area around Medora on the Little Missouri Grassland, Merritt Reservoir on the Bessey Ranger District and the Railroad Buttes area on the Buffalo Gap National Grassland. In these areas, the effects of grazing and leasing are not separated from the overall effects listed in the FEIS. These effects do not need to be separated. The MA is meant to specify that more care is needed in development activities. This MA has a stipulation to protect the scenery in this area from incompatible oil and gas development. No conflicts with grazing are seen in this area.

Comment: Supposedly, increased tourism can make up for the loss of 777-869 full-time equivalent secondary and 69 full-time equivalent primary agriculture and energy jobs. Yet the DEIS (p. 3-11) states "there is little data available on the dependency of each county on recreation and tourism activities linked to the national grasslands or forests." Please explain why recreation under the new plan would increase faster than it is now. Tourism can't replace the reduction in dollars generated by ranching. A service business (tourism) typically pays a lower wage and is a smaller local economic multiplier than a family ranching operation.

While the FEIS recreation impact analysis has been expanded, the FEIS does not project increases or decreases in tourism by alternative as there isn't supporting evidence that would indicate the management alternatives would significantly alter tourism levels. It does display the effects of projected increases in tourism including a projected 20% annual increase representative of the last 5 years in western North Dakota.

Many comments received during the DEIS comment period questioned how tourism could replace the livestock industry. A study in Wyoming examined this issue (Fletcher et all, 1998). The study compared the relative value of 1000 Animal Unit Months (AUM) of domestic livestock grazing versus 1000 Tourism Visitor Days (TVD). The study found that it takes roughly 1.2 TVD to equal 1 AUM on a personal income basis and roughly 1.07 TVD to equal 1 AUM on an employment basis.

Comment: Don't limit access to the Fairburn agate beds.

Management Area boundaries for the Red Shirt Recommended Wilderness area were changed to allow access to the Fairburn Agate Beds.

Comment: Don't reduce OHV opportunities. Restrict or prohibit motorized vehicles from the backcountry, riparian zones and/or wetlands. Reduce motorized use or recreation as a way to limit environmental damage. Provide single-track motorized trails. Keep motorized and nonmotorized trails open. Close both nonmotorized and motorized trails seasonally or permanently. Keep roads and road systems open. Restrict motorized use to designated areas. Develop more campgrounds, picnic sites, and trails (motorized and nonmotorized) on the grasslands. More recreation facilities/trails aren't necessary and might not be economical given the small amount of recreation use on the grasslands and should not be constructed to preserve the primitive nature of the grasslands. More restrictions for off-road travel are needed. Better enforcement of the restrictions is also needed. Less control and fewer restriction of off-road travel are needed. Don't restrict motorized access for hunters. Create more walk-in hunting areas.

The above comments all have a common thread that can be addressed together. Hundreds of comments are actually paraphrased above, but the intent seems very clear. Interested parties want to enjoy their National Forests and Grassland for the foreseeable future, though they may disagree on whether they want travel activities on public lands to increase or decrease.

The Forest Service is required to provide a broad range of recreation opportunities. On the grasslands, this includes all seasons of the year, both motorized and nonmotorized activities, and a variety of experiences. We complied with this direction by considering resource protection needs, desired management objectives, current uses and trends, public input, and the preferred alternative that uniquely fits these lands. The final land allocations provide an appropriate mix of year-round, seasonal, motorized, and nonmotorized opportunities, based on the overall direction of that alternative and analysis of effects to the resources.

It is not our intent to deny any user group or individual access to the public lands, but rather to provide for the common objective of enjoyment of the grasslands, through a mix of access, product removal, recreation, solitude, and resource protection while maximizing long term net public benefits. The type of access and season of use allowed in certain areas and travelways will be limited or increased, as the case may be, in an attempt to meet the primary emphasis of the selected alternative and specific direction contained in the Revised Plans.

On the Dakota Prairie Grassland fewer acres will be managed for non-motorized opportunities (MA 1.2, 1.2A, 1.31, and 2.2). In the draft over 164,000 acres were managed for non-motorized recreation. In the final plan less than 131,000 acres are managed this way.

The final plan will restrict off-road motorized uses, but existing roads and trails will be open to motorized uses until site specific planning is done through an open public process to close specific roads or trails. Only applies to the Dakota Prairie.

The Plan Revisions explored a wide range of recreation opportunities. The FEIS analyzed this range and the effects of increased recreation on other resources and uses.

See FEIS, Chapter 3, Recreation and Travel Management.

Comment: Prohibit recreational shooting of prairie dogs. Allow recreational shooting of prairie dogs to continue. Allow recreational prairie dog shooting with seasonal restrictions.

The black-tailed prairie dog was recently petitioned for listing as a threatened species under the Endangered Species Act (ESA) by several conservation organizations and the petitions were determined by the U.S. Fish & Wildlife Service (FWS) to be warranted, but precluded by higher listing priorities. The black-tailed prairie dog is currently classified as a candidate species for possible future protection under ESA. The Plans outline conservation strategies for maximizing the contribution that the Forest Service and the National Grasslands can make to the long-term viability of black-tailed prairie dogs.

Plans, Chapter 1, Grassland-wide Direction, addresses the general direction for the management of black-tailed prairie dogs. In addition, Chapter 3, 3.63 Management Area provides management direction for prairie dog management in black-footed ferret reintroduction areas. . In this management area prairie dog shooting will be restricted unless needed to reduce unwanted colonization of adjoining lands and with the concurrence of the USFWS. Prairie dog shooting will be restricted in areas where prairie dog expansion is desired and where shooting is preventing expansion. Seasonal and year-long restrictions will be coordinated with the State Wildlife agencies. Shooting restrictions in the black-footed ferret reintroduction areas will be coordinated with the State wildlife agencies and U.S. Fish & Wildlife Service. In addition, the Forest Service is cooperating with the various State Working Groups in the development of a black-tailed prairie dog conservation strategy for each State. The State Working Groups are developing strategies to address the concerns relative to recreational shooting.

Comment: Prairie dog shooting increases the likelihood that ferrets/owls will accidentally be shot. There is little danger that ferrets and owls will accidentally be killed because ferrets aren't present and owls don't look anything like prairie dogs.

Plans, Chapter 1, Grassland-wide Direction, addresses the general direction for the management of black-tailed prairie dogs. In addition, Chapter 3, 3.63 Management Area provides management direction for prairie dog management in black-footed ferret reintroduction areas. Prairie dog shooting will be restricted in areas where prairie dog expansion is desired and where shooting is preventing expansion. Seasonal and year-long restrictions will be coordinated with the State Wildlife agencies. Shooting restrictions in the black-footed ferret reintroduction areas will be coordinated with the State wildlife agencies and U.S. Fish & Wildlife Service.

See FEIS, Chapter 3, Rangeland and Forest Health, and Appendix H (Biological Evaluation)

Comment: The state game and fish agencies should regulate prairie dog shooting on the grasslands.

Shooting restrictions in the black-footed ferret reintroduction areas or other areas will be coordinated with the State wildlife agencies and U.S. Fish & Wildlife Service. Plans, Chapters 1, 2, and 3.

Comment: Restrictions on prairie dog shooting on public lands could allow landowners to charge more for the activity on private land.

The Forest Service agrees with this statement. Restrictions on prairie dog shoot on public lands could allow landowners to charge for this activity on private, which is an indirect effect from our actions.

Comment: Develop more recreational fishing opportunities.

Plans, Chapter 1., Standards and Guidelines, Fisheries, addresses guideline for the development of new water impoundments for quality recreational fisheries.

Comment: Manage the grasslands to provide fall and early winter cover for upland game bird species.

The Plans address goals and objectives, standards and guidelines to provide quality habitat for upland game birds and waterfowl under Grassland-wide direction, management area direction, and geographic area direction. (Plans Chapter 1, FEIS Appendix H)

Travel Management

Comment: Motorists will be prohibited on 15% of the acreage and 1.2 million acres would be closed to off-road vehicles. Hunting, camping or touring the grasslands will decline, and this will reduce tourism and income for communities.

Page 3-262 of the DEIS combines all Management Areas which retain undeveloped natural characteristics, and concludes that, under Alternative 3, 47% of NFS acres would retain these characteristics, and the remainder, 53%would not. The 47% represents Recommended for Wilderness, Backcountry Non-Motorized, Special Interest Areas, and Research Natural Areas. Our analysis (page 3-266, DEIS) finds that visits from user groups such as hikers, backpackers, canoeists, photographers, and nature seekers will increase in these non-motorized areas. These additional visitors are anticipated to more than compensate for the loss of visitors who demand motorized recreation.

Special Designations

Comment: Protect remaining roadless areas (e.g., recommend to Congress for wilderness designation, put in backcountry nonmotorized prescriptions). They protect biodiversity, preserve aesthetics, and provide biological and ecological reservoirs.

The FEIS contains a range of alternatives considering different management area prescriptions for roadless areas. The effects of the alternatives are described in FEIS, Chapter 3 and Appendix C.

Comment: Wilderness designation would negatively impact a viable recreation economy on the Little Missouri National Grassland by eliminating competitive events, mountain bikers, and dispersed motorized users.

The Forest Service is required to review the condition of roadless areas and determine if the lands are suitable for wilderness. (36CFR219.17)

Wilderness was a significant issue in North Dakota during the comment period of the draft plan. Currently key elected officials have indicated an unwillingness to support wilderness legislation. Given this, the Forest Service has decided against wilderness recommendations in the Final Plan for the Dakota Prairies Grasslands in order to allow additional time for consensus on this issue to develop. Rather than recommending wilderness, the Forest Service has determined that 4 areas of the Little Missouri National Grassland are suitable for wilderness. These areas include the Long X, Twin Buttes, Bullion Butte and Kinley Plateau areas. These areas comprise over 41,000 acres. Management objectives in the final plan are aimed at protecting the wilderness values of these areas.

A wilderness recommendation on the Sheyenne is not being made at this time because it is thought that such a recommendation may constrain restoration efforts. When the area on the Sheyenne is restored, it will be reconsidered for a wilderness recommendation. See FEIS, Appendix C.

Comment: Pursue more Wilderness designations on the grasslands. Don't recommend areas for Wilderness designation. Current levels of development are incompatible with Wilderness designation.

The FEIS analyzed five alternatives, which considered a range of recommended Wilderness acreages. The analysis based upon 36 CFR 219.17, and Forest Service Handbook 1909.12,7 can be found in the FEIS, Appendix C.

Comment: Pursue more Wild and Scenic River designations on the grasslands Don't recommend any Wild and Scenic River designations on the grasslands; specifically don't recommend the Little Missouri River (ND) and the Middle Loup River (NE).

The Forest Service manages only a small part of the Little Missouri River shoreline, and these areas are often small isolated parcels. Areas where the Forest Service manages both sides of the river is rare. Most of the shoreline is private property. The Forest Service has developed and carried a separate management area (MA 4.22) for the management of scenic areas, scenic vistas, and travel corridors for the Little Missouri River corridor. This management area will extend from the middle of the river to ¼ mile on either side of the river. This management area will focus on preserving scenic resources and recreational uses of these areas.

Many commentors noted that current management is suitable for this corridor. In the Forest Service's analysis it was determined that nondesignation would likely not change current or predicted uses. Therefore a recommendation for designation was not made. (FEIS Chapter 3, Wild and Scenic Rivers)

The FEIS analyzed five alternatives, which considered a range of Wild and Scenic River designations for eligible and suitable rivers. The analysis can be found in the FEIS, Chapter 3.

Comment: Establish more Research Natural Areas and Special Interest Areas on the grasslands. Don't establish more Research Natural Areas and Special Interest Areas on the grasslands.

The Code of Federal Regulations 219.25 directs the Forest Service to provide for RNAs during forest planning. The FEIS looked at a range of alternatives for establishing RNA's. See FEIS, Chapters 2 and 3.

Comment: How will the management restrictions in Research Natural Areas and Special Interest Areas affect your ability to control/manage fire, noxious weeds, insects, and disease?

Special Interest Areas describe a broad scope of management concerns, including areas with significant geological, historical, vegetative, and scenic values. Restrictions for SIAs can be found in the MA Direction, 2.1 Management Areas. Research Natural Areas focus on unique plant communities valued for their research opportunities. One of the objectives of the Revised Plan is to develop a management plan for each RNA within five years. This latter plan will determine the restrictions for RNAs. In both cases, the introduction of exotic plants, or the outbreak of insects or diseases would threaten the special qualities of these Areas. The Plans do not restrict fire suppression responses. This guideline (Chapter 1, G. Fire) directs us to develop an Appropriate Management Response (AMR for each management area). Plan, Chapter 1, Section Q. Infrastructure provides for the use of appropriate emergency services (i.e. law enforcement, fire suppression, medical, search and rescue) and administrative use on roads or areas where motorized use is restricted.

Comment: Special area designations will limit or restrict the following: Grazing; Access to and activities on adjacent/intermingled private lands; Access for administrative uses (e.g., range management); Access to other valid existing rights (water, minerals, etc.); Oil and gas exploration and development. Limit livestock grazing, minerals activity, and associated structures in wilderness areas.

Special area designations do not restrict grazing. However, some collateral activities such as use of motorized vehicles and certain types of facility construction may be restricted. The vast majority of these areas have been determined to be suitable for grazing.

Special Area Designations include Research Natural Areas, Recommended for Wilderness, Special Interest Areas, and Wild and Scenic River designations. In all these cases, valid existing rights to water, access, and minerals will be maintained and administrative access honored. (See Plans, Chapter 1, Section M.) In the cases of Research Natural Areas and Special Interest Areas, each individual management area will have some uses restricted, depending upon the emphasis of the area. In the cases of Recommended Wilderness areas, some restrictions will apply until Congress determines whether or not to designate these areas. (See specific Management Area Direction in Plans, Chapter 3, and Management Area Direction.)

Comment: Your criteria for assessing roadless areas are too broad. Your criteria for assessing roadless areas are too narrow.

The criteria for determining areas are found in the 36 Code of Federal Regulations 219.17, and the Forest Service Handbook 1909.12,7. (FEIS, Appendix C)

Comment: Don't designate special areas for prairie dog habitat.

The black-tailed prairie dog is currently classified by the Fish and Wildlife Service as a candidate species for possible future protection under ESA. The Plans outline conservation strategies for maximizing the contribution that the Forest Service and the National Grasslands can make to the long-term viability of black-tailed prairie dogs.

Chapter 1, Grassland-wide Direction, addresses the general direction for the management of black-tailed prairie dogs. In addition, Chapter 3, 3.63 Management Area provides management direction for prairie dog management in black-footed ferret reintroduction areas. The Plans limit the use of rodenticide for managing prairie dogs to certain circumstances. Instead, the Forest Service is utilizing grazing management systems and stocking levels to enhance prairie dogs expansion where desired and to discourage encroachment to adjacent private lands. In addition, grazing management systems and stocking levels will be utilized to protect the soil resource. Prairie dog shooting will be restricted in areas where prairie dog expansion is desired and where shooting is preventing expansion. Shooting restrictions will be coordinated with the State wildlife agencies.

In addition, the Forest Service is cooperating with the various State Working Groups in the development of a black-tailed prairie dog conservation strategy for each State. The State Working Groups are developing strategies to address the concerns relative to plague, erosion, and encroachment from public lands to private lands.

Other Topics

Fossils

Comment: Preserve recreational fossil collecting and rock hounding on the grasslands.

Recreational fossil collecting and rock hounding will continue to be open to the public in accordance with 36 CFR 261.99i and Forest Service policy. Currently, nonvertebrates (invertebrates, fossil plants, and petrified wood) are available for collection by the public without a permit. If any areas are detected to contain scientifically significant nonvertebrate paleontological resource an assessment of the impact of recreational collection may lead to some areas open only to permitted fossil collection by the scientific community. (Plan Chapter 1)

Comment: Don't require paleontological surveys prior to oil and gas development; they are unnecessary.

The oil and gas stipulation designed to protect paleontogical resources was dropped in response to public comment on the Dakota Prairie Grasslands. These resources will be protected through a lease notice. Many of the acres that had the paleontologic stipulation in the draft will be leased under standard lease terms in the final plan.

Forest Service policy and National Environmental Policy Act suggests the procedure for paleontological surveys, outlined in Appendix J, should be done in areas with the high potential to produce fossils, prior to any ground disturbing activities to prevent needless destruction or damage to significant paleontological resources. Paleontological resources are another resource managed by federal land management agencies, including the Forest Service. There are laws/statues, such as the National Environmental Policy Act that requires Federal Agencies to assess impacts of any project to any resource. Paleontological resources are natural, nonrenewable, scientifically important resources that have many values including recreational, educational, interpretive, and scientific, to name a few. Therefore, the Forest Service views fossil resources as valuable and requires paleontological surveys prior to ground disturbing activities in areas with the potential to produce significant fossils, is not just a requirement for minerals industry but also for all permittees, who may impact paleontological resources. Within the Northern Great Plains, most oil and gas development occurs in areas with highly significant fossiliferous geologic units exposed at the surface. These nonrenewable and scientifically important resources will likely be impacted by construction of pits, derricks, roads, etc. Therefore, conducting paleontological resource inventories (surveys) is a prudent practice to avoid damage and/or loss of significant fossils to the public and scientific community.

Heritage Resources

Comment: Emphasize preservation of cultural and historic sites. Provide more interpretation opportunities at these sites.

The preservation and public interpretation of historic sites is addressed in the FEIS, Chapter 3 and in the LRMP, Chapter 1. Federal laws protect heritage resources on federal lands. Compliance with these laws preserve and interpret cultural sites for the benefit of all people.

Comment: How will Management Area 4.32 designation (Dispersed Recreation, High Use) impact heritage and wildlife resources in the Railroad Buttes area on the Buffalo Gap National Grasslands?

Federal laws addressed in the FEIS, Chapter 3 require that the Nebraska National Forest consider the effects of the proposed management area designation on heritage resources. Compliance with the National Historic Preservation Act requires protection of significant sites within the Railroad Buttes area. (Plan Chapter 1, Heritage Resources)

Tribal Relations

Comment: DEIS, Ch 3, p. 37, Table CLR-15 discloses that the American Indian population comprises 7.1% of South Dakota's population. This is an attempt to reinforce the concept that the Lakota are just another racial group (a community of color numerically smaller than the white population). While the percentage is correct at the state level, it is a distortion of what is transpiring in the western part of the state.

FEIS, Ch 3, Tables disclose the American Indian population for each of the states within the planning area, and each of the counties directly economically impacted by plan revision decisions, respectively. The tables show that several counties have high American Indian populations. The tables are not meant to suggest that the Lakota people are just another racial group, smaller than the white population, but are meant to disclose elements of the social environment including race and mean household income levels, two factors important in doing social analysis, including identifying environmental justice factors. The combination of tables found in the FEIS provide a more holistic picture of the population demographics.

Comment: The Forest Service failed to consult with American Indian governments, as required by NEPA and NFMA and failed to comply with Environmental Justice policy ([Executive Order] EO 12898 of 1994). The proposed plans and DEIS fail to address numerous issues of concern to Americans Indians including alternatives that would address American Indian concerns and impacts on customary and traditional uses. Include an Appendix on American Indian history and concerns.

The Forest Service agrees we have a responsibility to fulfill our mission of providing goods and services from national forests for the benefit of all people while simultaneously protecting the rights or privileges secured to Tribes in treaties or other laws. On lands ceded to the United States by treaty or Executive Order, which later were incorporated into the National Forest System, these rights and privileges vary. It is incumbent on the Forest Service to carry out the intent of treaties or other laws in a manner that protects and maintains Tribal rights or privileges while also maintaining a responsibility to all national forest users and complying with existing laws and regulations. The Forest Service goal in relation to Indian tribes is to understand when legal responsibility exists, and then endeavor to carry out the responsibility with regard to the potentially affected Tribe.

The Forest Service recognizes that, as a Federal agency, it shares in the unique relationship and obligation that the United States government has toward Federally-recognized Tribal governments. This obligation is particularly important where the Forest Service manages lands that are subject to treaty rights. The Forest Service Manual (FSM) 1563.03 lists the basic responsibilities of the Forest Service toward Tribal governments. The Manual states that it is Forest Service policy to:

1. Maintain a governmental relationship with Federally-recognized Tribal governments;

2. Implement our programs and activities honoring Indian treaty rights and fulfill legally mandated trust responsibilities to the extent they are determined applicable to National Forest System lands;

3. Administer programs and activities to address and be sensitive to traditional Native religious beliefs and practices; and

4. Provide research, transfer of technology, and technical assistance to Tribal governments.

Forest planning regulation at 36 CFR 219.7 requires notification and coordination with Tribal governments during the development of forest plans. These requirements are essentially equivalent to the requirements for Forest Service coordination with planning efforts by other Federal agencies and State and local governments. The requirements include: mailing notices of the "... preparation of a land and resource management plan, along with a general schedule of anticipated planning actions" to "... all Tribal ... leaders whose tribal lands or treaty rights are expected to be impacted"

(36 CFR 219.7 (b)), "... review the planning and land use policies of ... Indian tribes" (36 CFR 219.7 (c)) with the review results "… displayed in the environmental impact statement for the plan" (40 CFR 1502.16(c), 1506.2). The requirements further state that "… the responsible line officer shall meet with ... representatives of Indian tribal governments at the beginning of the planning process to develop procedures for coordination. As a minimum, such conferences shall also be held after public issues and management concerns have been identified and prior to recommending the preferred alternative" (36 CFR 219.7 (d)).

Executive Order 12898 (February 11, 1994) addresses "environmental justice in minority populations and low-income populations", with particular emphasis on "disproportionately high and adverse human health or environmental effects" on these populations. Section 1-103 of the EO requires "development of agency strategies" to identify and address such effects. The Presidential memorandum accompanying the EO stated that it "... is designed to focus Federal attention on the environmental and human health conditions ... to promote nondiscrimination in Federal programs substantially affecting human health and the environment" (USDA Environmental Justice Departmental Regulation 5600-2 of December 15, 1997, Appendix B, p. B-1). The Presidential memorandum also stated the EO is intended "to provide minority communities and low-income communities access to public information on, and an opportunity for public participation in, matters relating to human health or the environment" (p. B-1).

USDA Departmental Regulation 5600-2 interprets EO 12898, providing the guidance and strategy for all USDA agencies, including the Forest Service. This Regulation defines American Indians as minority population groups (Section 4, Definitions, (c)). It also includes the goal of providing "… to the greatest extent possible, the opportunity for minority and low-income populations to participate in planning, analysis, and decision making that affects their health or environment ... ", to assure that disproportionately high and adverse effects do not occur (Section 5, Goals, (c)). The USDA regulation also directs agencies, to the extent practical, collect and analyze data on "… race, national origin, or income level, to determine whether agency programs and activities have disproportionately high and adverse human health or environmental effects …" (Section 6, Implementation Policy, (f)).

The Forest Service is committed to complying with all laws that may apply to American Indians including: the Archeological Resources Protection Act of 1979 (P.L. 96-96, 93 Stat. 721), the American Indian Religious Freedom Act of 1978 (P.L. 95-341, 92 Stat. 469), the National Historic Preservation Act of 1966 (P.L. 89-665, 80 Stat. 915) as it relates to traditional cultural properties, and the American Indian Graves Protection and Repatriation Act of 1990 (P.L. 101-601, 104 Stat. 3048).

The record for this planning process shows that we were diligent in our efforts to consult with American Indian tribes within the Northern Great Plains. Numerous letters were sent to the Oglala Sioux, Rosebud Sioux, Lower Brule Sioux, Fort Sisseton Sioux, Cheyenne River Sioux, Standing Rock Sioux, Mandan, Hidatsa, and Arikara Tribes, the Great Sioux Nation Treaty Council, the Northern Plains Intertribal Natural Resources Cooperative, and other tribes and tribal organizations from 1997 to 2000. Tribes were on the official mailing list and received copies of all notifications of meetings, revision reporters, and copies of the DEIS. Numerous meetings were held with these same groups as well as the Ute Tribe and the Medicine Wheel Coalition on plan revision issues from 1993 to 2000. Meetings with tribes were held a variety of locations throughout the Northern Great Plains, including Bismarck, ND, Rapid City, SD, Ft. Yates, ND, McLaughlin, SD, Eagle Butte, SD, Lower Brule, SD, Rosebud, SD, and Pine Ridge, SD. The record contains meeting notes from many meetings held with tribes and tribal groups, as well as letters and resolutions we received from tribes and tribal organizations. Tribal input was considered and utilized where such input was within the scope of the decisions to be made in land and resource management plan revision.

Comment: Develop partnerships with all tribes near or adjacent to the grasslands[1] for bison restoration and joint management of the grasslands. Work with the Pine Ridge Indian and Cheyenne River Sioux reservations on black-footed ferret restoration. Standing Rock Sioux and Lower Brule should be involved in prairie restoration.

In response to a desire to develop partnerships with tribes near or adjacent to grasslands for bison restoration and joint management of national grasslands, please refer to previous response.

The Nebraska National Forest, specifically the Buffalo Gap National Grassland, has been working closely with the Cheyenne River Sioux Tribe and the US Fish and Wildlife Service on black-footed ferret restoration on the Cheyenne River Indian Reservation. Ranger Bill Perry has been assisting tribal leaders in training tribal employees on captive management and care of ferrets and also on the black-footed ferret release process. October 2000 will mark the release of the first ferrets on the Cheyenne River Indian Reservation, an important step in the recovery of these animals.

Prairie restoration efforts on the Standing Rock and Lower Brule Sioux Reservations are outside the scope of this planning effort and will not be addressed in this FEIS.

Comment: Help the Standing Rock Sioux reestablish traditional ways and enhance their economic opportunities.

Specific actions that could help Standing Rock Sioux reestablish traditional ways and enhance economic opportunities were identified during the consultation process with the Standing Rock Sioux Tribe, however some of these actions are outside the scope of the LRMP decision.

During consultation, the Standing Rock Sioux Tribe expressed support for Alternative 4 in the DEIS and specifically supported the restoration of the bison and native ecosystem in addition to the protection of cultural resources on the National Grasslands.

The management area for the lands within the Standing Rock Sioux Reservation boundary have been changed to Management Area 3.65, Rangelands with Diverse Naturally-Appearing Landscapes in the FEIS. This management area emphasizes maintaining or restoring a diversity of desired plants and animals and ecological processes and functions. Management actions aimed at achieving the desired condition of this management area could help to the Standing Rock Sioux in reaching goals related to traditional ways and economic opportunity.

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[1] Including the Standing Rock Sioux, the Cheyenne River Sioux, the Rosebud Sioux, and the Oglala Sioux.

Actions outside the scope of the decision of the LRMP include returning the lands within the exterior boundary of the Standing Rock Sioux Reservation to the Standing Rock Sioux Tribe and co-management of these lands until such time when the lands are returned to the Tribe.

Comment: Include Tribal Alternative 6, which eliminates grazing permits, restores native ecosystems, established bison refuges, and allows co-management of the grasslands with American Indian tribes.

Several individuals also requested a "Tribal Alternative," Alternative 6, be added to the EIS. As proposed, this is not really an alternative for management area allocations or management direction for all national grasslands and national forests within the planning area; rather, it contains some philosophies and or policy decisions that are generally outside the scope of planning. The Tribal Alternative was described as follows:

- *Elimination of the present grazing leasing permit system (the end of federal subsidization of private ranching and mining).*

This is outside the scope of this decision because grazing permits and agreements are issued according to regulations and policy. Changes to the permitting system itself would require changes in those regulations and policies, and possibly in the laws on which those regulations are based.

- *Adoption of native species and bison refuge system philosophy and implementation of a refuge system (the elimination of interior fencing and the upgrading of exterior fences, and focus on the reintroduction of imperiled species and species that no longer exist in the area).*

Adoption of native species policy is within the scope of the land management planning decision. We have included within alternatives, information and direction on restoration and reintroduction of imperiled species and species that no longer exist in the area. We have included in the EIS and final plans information and direction on restoration of native vegetation and recovery of listed threatened, endangered, and Forest Service sensitive species. See Rangeland and Forest Health Section FEIS, Plans Chapter 1, Chapter 2, Chapter 3, etc. For our response to bison refuge system philosophy, refer to the response to the Native American Bison Refuge alternative following.

- *Adoption of co-management responsibilities between the USFS and Tribal Colleges (as directed in the presidential executive order for federal agencies to work with tribal colleges and with specific timelines for complete turnover).*

Co-management of the national grasslands with adjacent Indian tribes is outside the scope of the planning effort. Congress provided through legislation such as the National Forest Management Act, Multiple Use Sustained Yield Act, and other acts and their implementing regulations that management authority for the national grasslands shall rest with the Forest Service through the line officer. Co-management of these public lands is not possible, but we can and will continue to build working relationships with tribes, will solicit their advice and input on management of the national grasslands and forests.

The focus and intent of the Presidential Executive Order for working with tribal colleges is different from "co-management. The Presidential Executive Order for working with tribal colleges provides direction for federal agencies to develop five-year plans to work with tribal colleges and develop training and education programs that involve tribal colleges. We will work with tribal colleges on training, recruitment for employment, technical assistance, and cooperative projects covered by specific cooperative agreements, (See Plans, Chapter 1 Goal 4b), but co-management of the national grasslands to tribes or tribal colleges is outside the scope of the Presidential Executive Order and is also outside the scope of this planning effort.

See also Final Plan Chapter 1, Goal 4.b. Objective "Provide opportunities for federally recognized American Indian Tribes to participate in planning and management of national grasslands, especially where tribes have claimed special geographic, historical, or cultural interest."

- *Adoption of these grasslands as tribal college field research facilities and laboratories.*

See the discussion in C above. See also Final Plan Chapter 1, Goal 4.b. Objective states "Create and foster partnerships with other agencies, accredited educational and research institutions, tribal colleges, and other appropriate public and private sector organizations to further the goals of research, education, protection, and interpretation.

Comment: Several tribes requested bison grazing be required adjacent to Indian reservations.

The DEIS disclosed that all action alternatives (2-5) will include "bison friendly" policies, where bison grazing can occur under the current livestock grazing permit process and where existing grazing agreements would be modified to allow bison grazing by individual grazing association members. Requiring bison grazing adjacent to Indian reservations would have required the designation of Bison Management Areas, cancellation or conversion of existing permits and grazing agreements with the required notification period and subsequent appeals / litigation, etc. Instead of having to cancel permits, disrupt lives and economies, work through appeals and litigations that would occur as a result of a decision to devote certain lands exclusively to bison (wither wild or permitted), the Forest Service chose to focus on actions that would favor bison but would do so in a minimally disruptive manner.

Several tribes, intertribal organizations, individual tribal members, and others requested the USFS explore opportunities in the EIS to remove domestic cattle and restore bison grazing (wild, free-roaming herds) to the National Grasslands.

The FEIS, Chapter 2 discloses that an alternative that would emphasize free-roaming bison was analyzed but not considered in detail. Free-roaming bison would require that states manage the animals because bison would be considered wildlife. Discussions have indicated the states are not interested in accepting this responsibility. Without full State acceptance of bison as wildlife, and their acceptance of the responsibilities for management of the animals under State laws, this alternative was not viable and was therefore not considered in detail.

Bison are not listed by the USFWS as a threatened or endangered species. Nor do they have any other special legal status. Therefore, there is no requirement under ESA or other existing laws or regulations for formal bison restoration as wild and free roaming animals. However, the action alternatives provide an emphasis to favor bison to the extent that doing so is feasible.

The USFS generally can specify what kind of livestock are run under a grazing permit when needed to meet resource objectives such as: sheep or goat grazing for leafy spurge control, preventing conflicts between domestic sheep and bighorn sheep, etc. This allows the producer maximum flexibility to determine what kind of livestock is best suited to his / her needs and what kind of livestock provides him / her with the highest economic returns. The decision on kind of permitted livestock is made considering an evaluation of the capability and suitability of the involved lands, the desires of the prospective permittee as expressed in his / her application, and any laws, regulations, policies or land management planning decisions. If a permittee or prospective permittee requested conversion from cattle, sheep or other livestock to bison, we would consider this request. The criteria that we would use in evaluating the feasibility of the conversion would include, but not be limited to, capability and suitability of the involved lands for bison, land management planning decision s in place, potential impacts on other permittee operations, wildlife habitat, private lands, etc. Suitability considerations would include: public safety, animal health (primarily related to disease transmission), and current and future status and needs of structural improvements (costs, who pays,

animal control, and potential effects on intermingled private lands). We would strive to allow for conversion to bison if doing so would be made feasible within the evaluation criteria and was economically feasible to do so.

Additionally, the EIS did not identify the need for bison grazing over cattle grazing in the purpose and need. The USFS feels that cattle grazing can adequately achieve the desired future vegetation conditions. This is supported by Steuter and Hidinger: "We conclude that conserving the soil, water, and biological resources of the mixed-grass prairie will be accomplished with sound grazing management, rather than determined solely by the choice between bison and cattle. Whether managing mixed prairie with bison or with cattle, the stocking rate and grazing management will determine the long-term health of both the prairie and grazing animal." (Steuter and Hidinger, 1999) No purpose and need items surfaced during the planning process related to other reasons to emphasize conversion to bison.

Comment: Several tribes requested access to federal lands for bison grazing.

The Office of General Counsel has reviewed the respective treaties. Based on documents provided, we believe that grazing rights are not retained within the treaty language. We will consider any new or additional information the Tribes may provide with respect to this issue.

However, a tribe or an individual member of a tribe can acquire a grazing permit or become a member of a grazing association, on a National Grassland under the following conditions, which apply to any and all applicants (FSH 2209.13.3).

A term grazing permit may be issued to an applicant under the following circumstances:

The applicant has either purchased livestock that are currently grazing under a term grazing permit or base property to qualify for a grazing permit with term status and the seller has executed a waiver to the United States in favor of the applicant provided the purchaser is otherwise eligible and qualified.

The applicant has inherited permitted livestock or base property.

Ownership of a corporation or company has changed.

In order for an individual to become a member of a grazing association they must meet the specific requirements for that grazing association which generally includes the following:

1. Control of base property to the extent required by the grazing association.
2. Meet the commensurability requirements of the grazing association.
3. Must be a citizen of the United States or any person who has filed declaration of intention to become a citizen of the United States.

Furthermore, "The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status."

To file a complaint of discrimination, write USDA Director, Office of Civil Rights, Room 326-W, Whitten Building, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD).

Comment: Some commentors requested the EIS address an alternative to establish a Native American Bison Refuge (NABR) in South Dakota. An NABR is a "research and training facility, based on tribal traditional knowledge and philosophy, to explore methods of culturally-based resource utilization and husbandry." An NABR would have to be 10,000 to 20,000 acres, large enough to conduct research, training, education, bison management, personnel development, etc. and be large enough to host a pure and applied bison facility to maintain 500 to 1,000 animals.

This is not a fully developed alternative for consideration in land management planning; rather it is a partial alternative, which was considered for the portions of national grasslands in South Dakota. Under this scenario, the USFS would have to designate Bison Management Areas. Establishing Bison Management Areas was considered but not fully studied based on several factors. First, the grasslands in South Dakota are composed of very intermingled ownerships of federal and private lands making establishment of a larger sized bison management area difficult. Secondly, in discussions with the states, there has been no support for reintroduction of bison on the national grasslands. Third, suitability for grazing by bison considering such factors as public safety, herd health, livestock structures needed, etc has not been considered site specifically.

Forest Service policy does not favor one kind of livestock over another unless needed to meet resource objectives such as: sheep or goat grazing for leafy spurge control, preventing conflicts between domestic sheep and bighorn sheep, etc. This allows the producer maximum flexibility to determine what kind of livestock is best suited to his / her needs and what kind of livestock provides him / her with the highest economic returns.

In this EIS, bison grazing was considered in several ways. In all action alternatives (2-5), management direction for "bison-friendly" policies were included, where bison grazing could occur under a permit and where existing grazing agreements would be modified to allow bison grazing. In Alternative 3, bison grazing could be allowed where permittees desire a change to bison as a type of livestock. In Alternative 4, within 15 years, at least 5% of each unit will be allocated to bison-only grazing. The priority for bison-only grazing allotments would be those allotments where a permittee requests a change to bison, vacant allotments, and new allotments received through land acquisition. In all these cases, bison would be treated as a type of permitted livestock and not as free-roaming wildlife herds. Alternative 3 is the preferred alternative.

Free-roaming bison would require that states manage the animals because free-roaming bison are considered wildlife. Discussions have indicated the states are not interested in accepting this responsibility. Free roaming bison as wildlife is outside the scope of this planning effort.

Bison are not listed by the USFWS as a threatened or endangered species; therefore, there is no requirement under the Endangered Species Act for formal bison restoration.

Additionally, the need for bison grazing over cattle grazing was not identified in the Purpose and Need for plan revision identified in Chapter 1 of the EIS. Cattle grazing can adequately achieve the desired future vegetation conditions. This is supported in the scientific literature: "We conclude that conserving the soil, water, and biological resources of the mixed-grass prairie will be accomplished with sound grazing management, rather than determined solely by the choice between bison and cattle. Whether managing mixed prairie with bison or with cattle, the stocking rate and grazing management will determine the long-term health of both the prairie and grazing animal." (Steuter and Hidinger, 1999)

Treaty Rights

Comment: The DEIS failed to recognize treaty rights/rights of American Indians as illustrated by the following:

- *Failure to thoroughly review treaty documents.*
- *Failure to review the treaty territory and the bison treaty stipulation. This stipulation establishes a prior and superior claim for bison reintroduction on the grasslands within the treaty territory.*
- *Failure to consider transfer of land to other entities, specifically to tribal governments.*
- *Failure to consider "Tribal rights res. by treaty' and "tribal waters tights."*
- *Failure to negotiate with the recognized representatives of tribes to reach a mutually agreeable outcome.*
- *Omitting discussion of the 1868 Fort Laramie Treaty claims still in force on the western South Dakota grasslands.*

Comment: The Three Affiliated Tribes would like the Blue Buttes designated as a spiritual site and protected under treaty laws and federal Indian Law. Based on our 1851 treaty with the US government, this area was mandated as a federally protected cultural and spiritual site. Our 1851 treaty was ratified before the US Constitution and as such, is the supreme law of the land. As one nation to another, the Tribes are asking that the treaty rights be upheld. The tribe has retained grazing rights in the Little Missouri NG because of the 1851 treaty.

The Blue Buttes Area will be managed as Management Area 2.4 (American Indian Traditional Use Area). This area will be managed to protect the traditional beliefs of the Three Affiliated Tribes concerning their origins and cultural history. The area will be managed to protect the cultural landscape, including the scenic, cultural, botanical, and wildlife characteristics, and to maintain or restore the natural ecological processes. Standards and guidelines will be implemented to ensure the values of the area are protected (See management area description).

We have reviewed the Treaty of 1851, subsequent Executive Orders, and the Treaty of December 14, 1886 (Ratified by Congress on March 3, 1891). Our analysis of these documents (OGC draft opinion) indicates that under the Treaty of 1851, the Three Affiliated Tribes did retain grazing rights within the boundaries of the Fort Laramie Treaty. However, under the terms of the Treaty of 1886, the Three Affiliated Tribes ceded to the United States all their right, title and interest in and to the land north of the 48 parallel N. latitude and west of a north and south line six miles W. of the most westerly point of the big bend in the Missouri River, south of the 48 north latitude. Based on the information in the terms of the Treaty of 1886, The Three Affiliated Tribes did not retain grazing rights within the boundaries of the Little Missouri National Grasslands.

Land Use/Land Ownership

Comment: Pursue land exchanges because they can consolidate small, isolated public tracts and improve hunting opportunities, prairie dog management, and overall management efficiency.

Plans, Chapter 1, Forest-wide and Grassland-wide Direction, addresses the goals and objectives for land adjustment through land exchange. In addition, standards and guidelines are addressed for both land exchange and public access. Based on experience, the land exchange program has actually shown a slight decrease in federal land due to land exchanges being based on appraised values. See FEIS, Chapter 3, Other Topics, Lands.

Comment: Land exchanges will affect access to and activities on adjacent public lands.

The Forest Service is required to provide reasonable access to state and private lands where none exists.

Exchanges will only improve access to the public lands because rights-of-way on necessary roads and trails on parcels slated fro disposal will be maintained. New access routes can be developed if needed on acquired parcels.

Plans, Chapter 1, Forest-wide and Grassland-wide Direction, addresses the goals and objectives for land adjustment through land exchange. In addition, standards and guidelines are addressed for both land exchange and public access. Based on experience, the land exchange program has dramatically improved access and increased recreational activities on adjacent public lands. See FEIS, Chapter 3, Other Topics, Lands.

Comment: Don't use condemnation to acquire additional lands or to obtain access.

Condemnation is not a recommended procedure in the Plans for making land adjustments nor acquiring access. Plans, Chapter 1, Forest-wide and Grassland-wide Direction, addresses the goals and objectives for land adjustment through land exchange. In addition, standards and guidelines are addressed for both land exchange and public access. See FEIS, Chapter 3, Other Topics, Lands.

Comment: The DEIS didn't adequately discuss the effects and costs of invasive plants, prairie dogs, oil and gas development, and access on adjacent and intermingled non-federal lands.

The FEIS, Chapter 3, discloses the effects of alternatives on adjacent and intermingled non-federal lands in FEIS, Chapter 3, Cumulative effects by revision topic.

Comment: The proposed plan could dictate management on intermingled state and private lands (e.g., roadless areas, Wild and Scenic Rivers, Research Natural Areas, etc,). The DEIS needs to address these effects.

The Revised Plans clarified this issue. The Plans direct management on National Forest System lands only. Effects on adjacent private lands are disclosed in FEIS, Chapter 3.

Comment: TB pg 1-18 (20) Does the statement "Permit haying and mowing only where desired vegetation conditions are being met." pertain to private land or FS lands? If private land, does this fall under the admin boundaries of the TBNG? Is this legal in WY? State the law that gives you this right?

There is no law that allows the Forest Service to control haying or mowing on private lands. This statement is part of a guideline that only applies to National Forest System lands. It does not apply to private, State School Trust lands or other ownerships. The Forest Service does not have the jurisdiction to control the use of privately owned lands or lands administered by a different government agency.

Comment: Thunder Basin Pg 1-1 Goals and Objectives: Doesn't the statement "Mgmt requirements establish broad multiple use mgmt direction and generally apply to all areas of the NG and national forest" include the private lands?

The direction found in the Revised Plans applies to National Forest System land only.

The Forest Service has no jurisdiction over private lands.

Comment: TB pg 1-2 Goal 1: Does the statement: "This goal focuses on achieving ecosystem health and sustainability through conserving and restoring ecosystem structure…Does this goal mean that all lands, public and private within the admin boundaries of the TBNG are to focus on achieving ecosystem health through conserving and restoring ecosystem structure. Taking farmland and putting it back to its natural state? Do you have the power to implement this statement?

The direction found in the Revised Plans applies to National Forest System land only.

The Forest Service has no jurisdiction over private lands.

Comment: Thunder Basin Plan Pg 1-1 Introduction: Does this statement "This chapter contains direction that applies grassland wide, unless more stringent or restrictive direction is found in Ch 2 or 3" include private land?

The direction found in the Revised Plans applies to National Forest System land only.

The Forest Service has no jurisdiction over private lands.

Comment: By acquiring more federal land (through land exchanges), you will reduce the local tax base.

Plans, Chapter 1, Forest-wide and Grassland-wide Direction, addresses the goals and objectives for land adjustment through land exchange. In addition, standards and guidelines are addressed for both land exchange and public access. Based on experience, the land exchange program has actually shown a slight decrease in federal land due to land exchanges being based on appraised values. See EIS, Chapter 3, Other Topics, Lands.

Comment: The plan/DEIS didn't adequately address some special uses on the grasslands. For example:

- *Can you process additional permits in a timely manner?*
- *How will you manage outfitter/guide permits?*
- *How will you handle utility corridors and communication towers?*

The first question doesn't request a change in plan direction or effects analysis. Actual funding for processing Special Use Permits will come from appropriated dollars from Congress or changes in regulations may allow the Forest Service to recover the cost of the applications from the applicant for the special use. The process is not in place at the time this was written. The Forest Service ability to process new permit applications is a function of the funding available.

In addition, there are criteria to evaluate in permitting outfitter guide Special Use Permits, found in the Plans, Grassland and Forestwide Direction, K. Recreation, Outfitters and Guides. Additional standards and guides were added to respond to the public comments.

The Plans do restrict the placement of utility corridors and towers in some management areas. (FEIS Chapter 3) Special Area Designations may restrict the location of these; refer to these Management Areas for information on each Area. Also, the Plans Chapter 1, contain direction for utility corridors Grassland and Forestwide Direction, P. Special Uses. Scenic Integrity Objectives can also restrict utility corridors, depending on the size of the utilities.

Water Resources

Comment: The proposed plan doesn't adequately address aquatic and riparian resources on the grasslands. Riparian/wetland management should be emphasized, and riparian areas and wetlands should be protected. Additionally, cattle should be removed from all damaged riparian/wetland areas, not just those listed as "non-functional."

The Revised Plan, Chapter 1, contains several goals and objectives, standards and guidelines concerning protections of water, watersheds, and riparian / wetland areas. Monitoring of water sources in the future will also be a key to land management practices. This direction makes it clear that grazing impacts to riparian / woody draws are dependent on the length of the grazing season, the time of season grazing is allowed, and the location of water for livestock in relation to the woody draw rather than just the presence or absence of livestock.

Monitoring of these key areas will be a key to determining the success of land management practices.

Comment: Establish management direction to deal with sources of water pollution.

Monitoring would be the key to identifying the problems with water pollution and follow up with the proper corrective management.

Direction pertaining to this comment is already found in sections B, C, D, and I, Chapter 1 of the final plans.

The monitoring chapter has also been expanded to insure the management practices result in the desired water quality outcomes. (Chapter 4)

Comments that Do Not Warrant Further Action

We received many comments (spanning a wide range of topics) that didn't warrant further action for various reasons. In some cases, the comments were outside the scope of Forest Service authority or responsibility. Some comments were narrative or questions that didn't require changes in the documents or analyses. Some didn't provide enough information, so we were unable to determine what the commentor was saying/asking. Examples of these comments are listed below, as is the reason they didn't require further response. The complete list of these comments is available in the Administrative Record, on file at the Nebraska National Forest Supervisor's Office in Chadron, NE.

Community and Lifestyle

Comment: The data analyzing socio-economic effects of communities must come from the most reliable sources, i.e. state records, county tax records, etc rather than computer generated models.

The economic analysis used IMPLAN (an analysis model), which uses information collected by Bureau of Economic Affairs and other federal agencies. This information is county specific.

Comment: Your planning efforts should originate from a local level. Your plan should be based on economic viability, the people directly involved, and the resources to be managed. It should consider goals of local people and sustainable resource production.

Comment does not request a change in plan direction or effects analysis. The alternatives were developed by addressing issues raised by local and national interests. This was done because all citizens have a stake in the public lands.

Grazing

Comment: The proposed plan revision erroneously concludes that range condition ratings relate only to livestock forage value. You didn't present any monitoring data to show whether current mgmt direction was met.

Range condition is defined as the current vegetation species composition compared to the potential natural condition. Current range condition is disclosed in the Affected Environment and Environmental Consequences section of the Rangeland and Forest Health FEIS, Chapter 3. Production based on the current vegetation species composition was used in determining livestock forage values. The Analysis of the Management Situation presents information as to whether current management direction is being met. The LRMP will set the desired conditions, the Allotment Management Plan decision will determine if changes need to be made to individual allotments.

Comment: You propose to reduce AUMs because cows are larger than the standard 1,000 lbs. However you didn't mention the research showing that cattle now convert forage more efficiently. The 1,000+ lb cow today requires less forage than a 1,000-lb cow of 30 yrs ago.

An animal unit month, AUM, is the amount of forage required for one animal unit. There have been numerous studies, some presented in FEIS, Appendix C, that indicate various forage requirements dependent on livestock weights. There is a guideline that states adjustments will be made to account for variations in livestock weights to meet desired vegetative conditions. This will be determined at the allotment management planning level. We are not aware of any research that concludes that livestock today use forage more efficiently.

Oil, Gas, and Minerals

Comment: In the TBNG, a management area has been designated for "Mineral Production and Development." Recovery of mineral resources in this area is important to the region. As part of mineral resource recovery, "waste coal" (material that doesn't meet the commercial quality requirements) can be cost effectively converted locally, producing electricity effectively converted locally, producing electricity development should be a criteria in developing the Proposed Plan and Draft EIS, similar to the development of oil and gas reserves.

This issue is outside the scope of the LRMP decision.

Planning

Comments: The proposed plan is a good idea and long overdue. The FS should go beyond the timid alternatives currently being proposed. Appendix K - National Goals, p. 3, Recreation in Wilderness 2323.11--I support this goal.

These comments don't require further agency action; they don't call for a change in the DEIS effects analysis or the LRMP decision.

Plant and Animal Damage Control

Comment: Spraying for grasshoppers are likely to impact the species that eat them (swift fox, mountain plover, western burrowing owls, sage grouse). If wildlife restoration is a priority, you should re-evaluate this activity and probably reduce or eliminate it.

Refer to Plans, Chapter 1, Biological Resources, and section J. Noxious and invasive species standards and guides 8, 9, 10**.**

Comment: Noxious weeds are invading federal lands at a rate of 4,000 acres per day. How will you handle the increase when current funding prevents you from controlling the existing infestations?

The comment does not reference the public lands for the Northern Great Plains.

The comment doesn't request a change in plan direction or effects analysis. Actual funding will come from appropriated dollars from Congress, from cooperators (livestock grazing permittees and local governments, research, etc.), and grants.

Rangeland and Forest Health

Comment: Don't put prairie dogs on the endangered species list; they are not endangered. The Endangered Species Act restricts prairie-dog-related activities on private property.

This comment is outside the scope of the LRMP decision. The Forest Service does not have the authority to list species. That is the responsibility of the U.S. Fish and Wildlife Service.

Comment: Management guidelines for the benefit of pronghorn and mule deer in the Southern Little Missouri EIS have not been incorporated into the new Forest Plan. This issue needs to be revisited to assure that roading does not further degrade the quality of available habitat for these important species.

Management direction for these species is found in Plan, Chapter 1 under "Fish, Wildlife, and Rare Plants" and Chapter 2, Geographic Area Direction.

Special Designations

Comment: Why are the Wilderness area operation and maintenance schedules exempt from the NEPA process when everyone else must account for their schedules?

This comment is outside the scope of the LRMP decision. Wilderness operation and maintenance schedule decisions don't fall under the authority of NEPA. They are administrative decisions that carry out previous NEPA decisions.

Comment: Are any rivers in the Nebraska National Forest unit being considered for protection under the Wild and Scenic River act? If so, how will this affect the management of those allotments (especially grazing permits) that include a portion of the designated river?

Refer to the FEIS Alternatives in Chapter 2 for consideration of the Middle Loop, the Cheyenne, and Rapid Creek as Wild and Scenic, as well as the effects analysis, in the FEIS, Chapter 3.

Other Topics

Comment: Establish a large buffer zone to protect adjacent landowners from the effects of the proposed plan. Comment: With an increasing Lakota population, how does the DEIS justify marginalizing the Lakota throughout the EIS process? It would appear that the future of the grasslands management will be under the influences of a white minority over a region that, if the if the white depopulation trend continues, will be a Lakota majority after the first two decades of the 21st century.

This comment is outside the scope of the LRMP decision. Management of National Forest System lands is for all citizens of the USA.

Comment: Thunder Basin plan, Ch 1, p. 5, Goal 1.10 Water Quantity—it is impossible to provide instream flows in most of these areas. Existing flows have been appropriated for human use; these uses must not be restricted. Where will this water come from? How will you manage it? Will obtaining these instream flows affect agriculture and wildlife uses?

The Thunder Basin Plan water quality Goal 1.a states, "Improve and protect watershed conditions to provide the water quality and quantity and soil productivity necessary to support ecological functions and intended beneficial water uses." This is different that what was stated in the Draft Plans as quoted in the comment.

Objective 4 under Goal 1.a states " Within 15 years, identify, maintain, and/or improve stream flows for at least 10 percent of stream segments having high resource values within watersheds". Standards and guidelines have been developed to accomplish this objective (Plan Chapter 1, Water). The FEIS, further defines the legal requirements the Forest is expected to meet in providing quality water for water supplies.

Water allocation is the responsibility of States and the Forest Service abides by that allocation. Where the Forest Service is requested to provide a special use permit for NFS water resources, the permitting process must take into consideration the instream flow maintained to provide for other uses and ecosystem protection.

Comment: Special area designations are necessary to preserve opportunities for solitude, to maintain roadless characteristics, and to protect wildlife habitat.

These comments don't require further agency action; they don't call for a change in the DEIS effects analysis or the LRMP decision.

Comment: Only allow scientific fossil collecting on the grasslands.

This comment is outside the scope of land management planning and does not require a change in the DEIS effects analysis or influence and LRMP decision.

Comment: Allow commercial fossil collecting on the grasslands.

This comment is outside the scope of land management planning and does not require a change in the FEIS effects analyses or influence the LRMP decision.

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Appendix B Documentation of Analysis

I. Introduction

This appendix describes the analysis process and techniques used by the Interdisciplinary Team during the management plan revision process. It contains the following:

- The framework of the planning process.
- A discussion of the data sources and assumptions made.
- A discussion of the various analytical tools and methods used.

The planning administrative record is an additional source of information used to develop this appendix and is incorporated by reference.

The planning problem is a complex one. This complexity stems from the need to address a variety of interrelated and often conflicting issues by allocating land and scheduling activities in a cost-effective manner for the entire Forest over a long period of time. This appendix describes some of the analytical tools used to reduce the process to manageable proportions.

The size of the analysis area and the number of issues being addressed made the alternative development process and effects analyses complex. The planning area includes parts of 2 Forest Service regions, 3 administrative units, and 10 Ranger Districts on 2.9 million acres spread over four states (Nebraska, South Dakota, North Dakota, and Wyoming) and 28 counties.

A. Framework of the Planning Process

The general planning process (as described in 36 CFR 219.12) guides forest plan revision. This section describes 10 steps, which lead from the completion of a forest plan to the completion of a revised forest plan.

Land and resource management plans (management plans) currently direct management of the national forests and their units. Issuance of these plans occurred June 10, 1987 for the Custer National Forest; November 20, 1985 for the Medicine Bow National Forest, and December 14, 1984 for the Nebraska National Forest. Other National Forest System units (not listed above) under the administration of the Custer and Medicine Bow-Routt National Forests will be addressed in future planning efforts.

Step 10 of the Initial Planning Process - Monitoring and Evaluation

The last step of the initial Forest Plan process is the first step in revising a forest plan. Monitoring and evaluation reports were completed on all three units and summarized in 1995 for the forest plan revision. Essentially, this evaluation summarized monitoring data and reviewed the trends in forest plan implementation.

Revision of management plans is directed by the National Forest Management Act (NFMA), by regulations 35 CFR 219, and by the Forest Service Directives System (FSH 1909.12).

Step 1. Identification of Purpose and Need

Many sources were used to identify the need for change. Some principal sources of information included the following:

- Experiences in implementing the management plans and working with the public.
- Public involvement in implementing projects.
- Need for management plan amendments as a result of implementing projects.
- Monitoring the effects of implementation.
- Understanding cumulative effects from implementing projects.
- Issues raised in appeals and litigation.
- Knowledge gained from research on prairie ecosystems.
- Discussions with employees.
- Coordination and input from other federal agencies, state agencies, county governments, and partners.
- Public feedback on values for these national forest and grassland units.
- Results of assessments.
- Changes in management philosophy for NFS lands.

From those sources, the Forest Service developed the Purpose and Need for Change and defined the major revision topics. In February 1997, the Forest Service published a Notice of Intent to Prepare an Environmental Impact Statement to revise the management plans in the Federal Register. The federal notice initiated the formal public involvement process. In response to the federal notice and many other public outreach efforts, the Forest Service received public comments to help further define the major revision topics.

Step 2. Planning Criteria

During this step, the remainder of the process is outlined. Here the seven major revision topics were developed along with indicators of each. These provided focus for the rest of the analysis.

Step 3. Inventory Data and Information Collection

Numerous data sources were used and stored and analyzed on many different computers and systems. The vast majority of the data used was spatial and was stored on the corporate IBM UNIX system in Arc/Info.

Several non-spatial databases were stored on a personal computer using Paradox or Microsoft Excel as the data management software. This information is primarily non-spatial, wildlife-related information.

Step 4. Analysis of the Management Situation (AMS)

This step determines the ability of the planning area to supply goods and services in response to society's demands. It provides background information for formulating a broad range of reasonable alternatives. The April 1998 Analysis of the Management Situation (AMS) document focused on the revision topics. Much of the work originally completed for the AMS has been incorporated into this FEIS.

Step 5. Formulation of Alternatives

See Chapter 2 of the FEIS.

Step 6. Estimated Effects of Alternatives

The physical, biological, economic, and social effects of implementing each alternative considered in detail were estimated and compared according to NEPA procedures.

Step 7. Evaluation of Alternatives

Significant physical, biological, economic, and social effects of implementing alternatives were evaluated.

Step 8. Preferred Alternative Recommendation

The Forest Supervisors reviewed the interdisciplinary team's evaluation and recommended and identified Alternative 3 as the preferred alternative in the proposed Revised Management Plans and Draft Environmental Impact Statement (DEIS). The DEIS was published and sent out for public review. Following the public review period, the interdisciplinary team evaluated agency and public comments, and revise steps 5-7 as needed to address DEIS comments. The Forest Supervisors then reviewed the interdisciplinary team's evaluation and recommend a preferred alternative for each administrative unit.

Step 9. Plan Approval and Implementation

The Regional Foresters will review the Revised Management Plans and Final Environmental Impact Statement (FEIS) for a final decision.

B. Inventory Data Collection and Storage

Geographic Information System (GIS)

The primary tool for analysis is ARC/INFO[1] on an IBM RS 6000 computer. The IBM is a UNIX-based system. This includes the following types of information:

- Administrative Boundary
- Livestock Grazing Allotments
- Animal Points (Key animal/plant habitat sites)
- Bailey's Ecoregions
- Bighorn Sheep Habitat
- Broad Scale Aquatics
- Campgrounds
- Coal Resources
- Common Land Unit
- Common Vegetation Unit
- Common Water Unit
- DEM (Digital Elevation Model - 30 meter)
- Eligible Wild and Scenic Rivers
- Fences
- Geographic Areas
- Geology Formations
- Growing Degree Days
- Heritage Sites
- Land Status
- Land Type Association
- Landform
- Linear Hydrology (Rivers and Streams)
- Little Missouri River
- Maximum Recorded Prairie Dogs
- Mineral Ownership
- National Wetlands Inventory
- Non-FS Wilderness
- Northern Great Plains Intact Grasslands
- Oil and Gas Leases
- Oil and Gas Potential
- Polygon Hydrology (Lakes, ponds, etc.)
- Present Prairie Dog Distribution
- Public Land Survey System
- Recreation Opportunity Spectrum
- Research Natural Areas
- Roads
- Roadless Area Inventory
- Scenery Management System
- Scenic Integrity Objectives
- Shadehill Reservoir
- Special Interest Areas
- Plant and Animal Species Locations
- US Counties
- US States
- Water Points (Developments)
- Watersheds 1:250,000

[1] ARC/INFO is a product of Environmental Systems Research Institute (ESRI), Inc.

Note: A number of GIS models described in Appendix B and used elsewhere in the Northern Great Plains assessment use Digital Elevation Models (DEMs) as one of the variables. The use of 30-meter DEMs will underestimate the number of acres of steeper slopes in the plains. Topography in the plains breaks quickly in the form of escarpments which may be missed by the 30-meter DEMs. Finer resolution DEMs were not available at the time of this analysis and would have exceeded the capability of the computers used in the analysis.

Non-GIS Information

The Neotropical Migratory Birds database is stored on a PC using Paradox[2]. Vegetation structure is a second database. It is stored on a PC using Microsoft Excel.

The tool for storing timber information is the Rocky Mountain Resource Information System (RMRIS). This database was stored on the Data General computer system. The database uses the ORACLE[3] operating system. Since that analysis was completed, the Data General has been decommissioned and replaced by an IBM RS 6000 Unix system. Timber data has been archived on the IBM system but is not yet loaded into the new version of ORACLE on the IBM.

II. Models and Analyses

A. Alternative Development

Alternatives were developed using GIS as a primary display and analysis tool. Each alternative centered on a theme that used a single management prescription as a background management factor. Then, depending on the emphasis of a given alternative, various special areas were brought in and given a different management prescription. For example, RNAs could be brought in and given a 2.2 management prescription, a Wild and Scenic River segment could be brought in and given a 4.4 management prescription, or a ferret recovery area could be brought in and assigned a 3.63 management prescription. The rules used for each alternative are as follows.

Alternative 1

Alternative 1 reflects current management as defined in the existing Management Plans. Previous management prescriptions were cross-walked to the new national numbering system for management prescriptions. The initial crosswalk is as follows:

[2] PARADOX is a product of Borland International, Inc.

[3] ORACLE is a product of the Oracle Corporation.

Table B-1. Comparison of Management Prescriptions in Existing and Revised Forest Plans.

Dakota Prairie Grasslands	
Old Prescription	**New Prescription**
A (heavy stocking)	6.1
B (intensive mgmt)	6.1
C	3.51
D	3.6
E	8.4
F	8.22 (dev. rec. site in grassland setting)
G	None
J	3.31
L	2.2
M	3.x (riparian / woody draw)
Nebraska National Forest Units	
Old Prescription	**New Prescription**
1A	None
1C	8.6
1D	8.3
3A	1.3
3C	1.3
4A	3.6x
4E	3.x
4F	3.x
4G	3.x
6B	6.x
6C	6.x
6F	6.x
6G	6.11
6H	?
6I	1.33
6J	6.x
6K	?
8C	1.13
9A	3.63
10A	2.2
10C	3.1
10F	8.5
10G (prairie dog mgmt.)	3.63
10H	2.x(?)
Added prescriptions from original plan map:	
Soldier Creek Wilderness	1.13
Remainder Soldier Cr. Unit	6.x or 4.3 or 8.2
Pine Ridge NRA	1.31
Hwy. 385 corridor	7.2
Rest of ridge	5.12

Thunder Basin National Grassland	
Old Prescription	**New Prescription**
1D	8.3
2A	4.3
2B	4.3
4B	3.53
5	3.58
6	6
4C	3.5(?)
4D	5.1x
9A	3.x
12A	8.4
No crosswalk for woody draws and aspen emphasis areas.	

After the initial crosswalk was accomplished, the results were presented to the ranger districts to finalize Alternative 1 management area allocations to represent the current management plans.

Alternatives 2-5

Alternatives 2-5 were initially developed using information in the alternative development matrix below. Many changes occurred between the initial alternatives developed and those analyzed in the DEIS. Some of the highlights are as follows:

- Management Prescription 6.2 was eliminated because it did not provide enough actual difference between Management Prescriptions 6.1 and 3.65.
- Consultation with the US Fish and Wildlife Service increased the number of ferret reintroduction areas.
- The number of roadless areas increased after internal Forest Service reviews were completed.

Table B-2. Alternative Development Matrix.

Revision Areas	Alternative 1	Alternative 2	DEIS Alternative 3	FEIS Alternative 3	Alternative 4	Alternative 5
Theme	No Action	Commodity Emphasis	Developed collaboratively; modify current management by adopting special area designations and placing added emphasis on native plant and animal communities.	Developed collaboratively; modify current management by adopting special area designations and placing added emphasis on native plant and animal communities.	Restoration / Ecological Processes Emphasis	Recreation Emphasis
Composition (seral stage or range condition)	No change	Mid-seral			Increase early and late seral	A mix of composition and structure to meet scenery management and hunting objectives.
Structure (Grassland and Sagebrush Understory)		Moderate to low cover			Increase High and Low Structure	Early and late seral stages are important; shrubs and forbs are important
Background Management Area (MA) Emphasis	Most acres in 6.1, 6.2	Most acres in MA 6.1			Most acres in MA 3.65, 6.2	Look at special recreation emphasis MA
Prairie Dog Colony Acreage	Same (about 3%)	Decrease or no change	5%		Increase to 10% of suitable	Increase to 20% of suitable
		Reduce loss of livestock forage				(Biodiversity and recreation prairie dog shooting)
Thunder-Basin Black-footed Ferret Reintroduction Habitat	No ferrets in Rosecrans	Core ferret reintroduction area at Rosecrans			Core ferret reintroduction area at Rosecrans, plus dispersal area	Core ferret reintroduction area at Rosecrans
TES Habitat	Same	Meet viable pops at a minimum level			Meet viable pops at a high level	Something like alternative 4

Revision Areas	Alternative 1	Alternative 2	DEIS Alternative 3	FEIS Alternative 3	Alternative 4	Alternative 5
Special Plant and Animal Habitat	Meet	Meet			Restoration of guilds of species of concern; restore elk; restore bighorn sheep	Meet
Secondary Range	Same	Decrease secondary range			Increase secondary range (less fence and water for a more natural grazing regime)	Slight increase for better upland bird habitat; maybe less fence and water
Range of Natural Variability - use of fire	No change	No change			Use up to historic frequency of disturbance for each ecological unit	Small disturbance program for wildlife viewing
Herbivory (use of bison and frequency and intensity of use)	No change	No change			Bison introduced in sacred areas, low development areas, some RNAs, some wilderness, and some blocked ownership	Less acres allocated to bison that Alternative 4
Forest Health, Composition, Structure, Fuels, Insects and Disease	No change	Allowable Sale Quantity (ASQ) developed			No ASQ but some harvesting	No ASQ, but some harvesting for forest health to maintain a park-like appearance
Livestock Grazing	No change	Increase fences and water for better forage utilization. Use Bison friendly policy for commodities.			Bison friendly as a commodity	Same as Alternative 4
Animal Damage Control (Prairie Dogs)	No change	Reduce loss of NFS livestock forage with chemical control			Reduce movement to adjacent lands with biological control	Reduce movement to adjacent lands with chemical and biological control

Revision Areas	Alternative 1	Alternative 2	DEIS Alternative 3	FEIS Alternative 3	Alternative 4	Alternative 5
Plant Control (noxious weeds and exotics species)	No change	Moderate program			Moderate program - Alternative 4a	Moderate program
					High program - Alternative 4b	
					Convert poa and brome	
Developed Recreation	No change	No change			No change	Increase to respond to local demand and resource protection (select top sites from each forest)
Dispersed Recreation (ROS)	No change	Increase SPM/RN by 1% or no change			Increase SPNM where erosion and best habitats are located. Less fences; larger pastures for more natural appearance	Diversity of settings (some P/SPNM, some SPM, RN, R), more trail development, at least 1 more OHV area, high productivity site cover, P/SPNM > 25,000 acres (1 site per district), dollars for fish stocking and reservoir renovation, less fences (as dictated by scenery and hunting objectives)
Wild and Scenic River	None	None			All rivers at their present classification level	All rivers at lower than present classification
Proposed Wilderness	None	None			All potential areas	Recommend high recreation opportunity areas and opportunities for solitude.

Revision Areas	Alternative 1	Alternative 2	DEIS Alternative 3	FEIS Alternative 3	Alternative 4	Alternative 5
Proposed RNAs	None	None			All proposed	None
SIAs	None	Some that don't conflict with commodities			Those that maintain natural processes	Most those that add to recreation

All action alternatives assume standards and guidelines are in place to ensure viable populations, noxious weed control, proper functioning riparian conditions, and control of prairie dogs near adjacent landowners.

Alternative 3a was developed as part of a public working group for the Fall River District of the Buffalo Gap National Grassland.

B. Community and Lifestyle Relationships

Economic Analyses

Peer Review

Peer review was used in the DEIS model by consulting with researchers in Wyoming, South Dakota, North Dakota, and Nebraska. That model was further peer reviewed through comments received during the DEIS comment period. Further peer review with researchers in Wyoming occurred after the public comment period.

Jobs and Income

Job and income effects were developed for livestock, timber, recreation, oil and gas production using a computer software program called MicroIMPLAN[4]. The sections below describe the various methods used to determine and analyze job and income effects.

General Criteria

The MicroIMPLAN economic impact model was used to generate economic multipliers and response coefficients for effects analysis and to create economic dependency and diversity information. For this reason the impact areas used for analysis purposes consist of individual counties or more often, groups of counties.

The primary criteria in defining economic impact areas are included in the Social and Economic Analysis Handbook (FSH 1909.17), Chapter 20[5]. This source states, "Impact areas may vary depending on the policy issue being analyzed." It also states that " The impact area should be defined as (1) a functional economic unit of a size appropriate to the policy issue and (2) an area that includes most of the economic factors that are most directly affected by the policy."

The specific criteria stated in FSH 1909.17 includes the following:

- Issues being addressed.
- Location of the counties forming the economic center.
- Trade patterns.
- Forest/county boundaries (PILT and 25% Fund payments).
- Worker places of residence.
- Use of program products from other counties.

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[4] IMPLAN Professional - Social Accounting and Impact Analysis Software. Minnesota IMPLAN Group, Inc. Feb 97. www.implan.com

[5] See http://www.fs.fed.us/im/directives/html/fsh.html

Impact Areas Selected and Reasons For Selection

Each impact area is centered around the pre-selected Forest Service administrative units in the Northern Great Plains assessment area. The following discussion lists each of the administrative units, the counties included in the impact area, and the reasons for selection.

Oglala National Grassland and Nebraska National Forest - Pine Ridge Unit

State: Nebraska

Counties: Dawes, Sioux

Information Source: Dave Cawrse - Northern Great Plains Assessment Team Leader.

The major part of the Oglala National Grassland is in Sioux County, with the balance in Dawes County. The major part of the Pine Ridge is in Dawes County, while the remainder is in Sioux County. Dawes County, which includes Chadron, Nebraska, is the trade center for the impact area.

Administrative offices for these two units are located in Chadron, and a major part of the indirect and induced spending arising from National Forest System lands occurs in Dawes County. Nonresident tourists incur most of their expenditures in Dawes County, with some in Sioux County. Sioux County does not offer many opportunities for tourist spending. Home ranches for grazing permittees are located in either Sioux or Dawes County. There are no minerals currently being produced from the Oglala National Grassland. The inclusion of Box Butte and Sheridan Counties was considered but dropped because of the insignificant amount of economic activity occurring in those counties arising from the management of the Oglala National Grassland and Pine Ridge Unit of the Nebraska National Forest.

Nebraska National Forest - Bessey Unit and Samuel R. McKelvie National Forest

State: Nebraska

Counties: Blaine, Cherry, Thomas

Information Source: Dave Cawrse - Northern Great Plains Assessment Team Leader.

Grazing and nonresident tourism are the primary products from this area. The above National Forest System lands are located in all of the counties identified above. All of the home ranches of the grazing permittees are also located in these counties. Cattle are trucked from the area. Nonresident tourists, primarily hunters and people using the campground and swimming pool at Bessey, spend their money throughout the small towns in this three-county area. There are no minerals currently being produced from the area.

Fort Pierre National Grassland

State: South Dakota

Counties: Hughes, Jones, Lyman, Stanley

Information Source: Tony Detoy, District Ranger.

Nonresident tourism and grazing are the primary sources of economic activity in the Fort Pierre National Grassland. Nonresident tourism consists primarily of various types of hunting, with some fishing in man-made ponds. Prairie dog shooting is a popular activity. Most of the tourism money is spent in the Pierre area (Hughes County), with some spent in Fort Pierre (Stanley County). Some tourism activity created by the grassland also occurs along I-90 (Jones and Lyman Counties). The primary tourist attraction in the area is the Missouri River and Lake Oahe. Pierre is the major trade center for the area, and much of the indirect and induced spending arising from the management of the grassland occurs here. Pierre is also the major source of labor for economic activities in the area.

Home ranches of grazing permittees are all in Lyman, Jones, and Stanley Counties. There are cattle auction barns in Stanley and Lyman Counties. Most of the cattle are then trucked from the local area.

Buffalo Gap National Grassland

State: South Dakota, Wyoming, Nebraska

Counties: South Dakota - Custer, Fall River, Jackson, Pennington; Wyoming - Niobrara;

Nebraska - Sioux.

Information Sources: Bob Hodorff, Fall River Ranger District; Kathy Simpfenderfer, Wall Ranger District.

The Buffalo Gap National Grassland is located in Fall River, Custer, Pennington, and Jackson Counties, South Dakota. Similar to other grasslands, nonresident tourism and grazing are important forms of economic activity. Grazing is primarily limited to cattle. Nonresident tourism consists of a variety of hunting activities, including upland bird and large game as well as prairie dog shooting. Rock collecting and sight seeing are also popular. Gas and oil production are economically significant activities on the Buffalo Gap National Grassland. The regional center of economic activity is Rapid City, SD (Pennington County). Much of the indirect and induced spending arising from managing the Buffalo Gap National Grassland occurs in the Rapid City area. Nonresident tourist spending is focused in the Rapid City area but occurs in lesser amounts throughout the counties included in the defined impact area. Home ranches of grazing permittees are in Custer, Pennington, and Fall River Counties, South Dakota, Sioux County, Nebraska and Niobrara County, Wyoming. Gas and oil activity also occurs on the grasslands in these counties, with some of the oil going to the refinery in Newcastle, Wyoming (Niobrara County). Much of the oil is trucked from the area.

Grand River National Grassland

State: South Dakota, North Dakota

Counties: South Dakota - Perkins; North Dakota - Adams.

Information Source: Forest Morin, District Ranger.

Grazing and nonresident tourism are the primary economic activities arising from management decisions made on the Grand River National Grassland. Grazing is primarily cattle with some sheep. Nonresident tourism consists of large game and upland bird hunting and prairie dog shooting. The grassland is located in Corson, Ziebach, and Perkins County, South Dakota, with economic activity extending into Adams County, North Dakota. There are no minerals coming from the Grassland at the present time. All of the home ranches of the grazing permittees are located in Perkins County. However, much of their personal and business spending occurs in Adams County, North Dakota. There are also sale barns and feed lots in Lemmon and Bison (Perkins County). Nonresident tourism spending is focused in the Lemmon, South Dakota area. Administrative offices of the Grassland are also located in Lemmon. A small amount of area is located in Corson and Ziebach Counties, but there is no measurable economic impact in those counties other than a small amount of 25% funds.

Cedar River National Grassland

State: North Dakota, South Dakota

Counties: North Dakota - Sioux: South Dakota - Perkins.

Information Source: Forest Morin, District Ranger.

The Cedar River National Grassland is located in Sioux and Grant Counties, North Dakota. The economic effects extend into Lemmon area of South Dakota. The primary economic activities are very similar to the Grand River National Grassland already discussed. These activities consist of nonresident tourism consisting of various forms of hunting and livestock grazing. There is no minerals activity. The area was included in the gas and oil leasing EIS only because it was in North Dakota. Although a small part of the grassland is in Grant County, it has not been included in the economic impact area because of the insignificant amount of economic activity arising from the grassland other than a small amount of 25% funds. Nonresident tourism spending is focused in the Lemmon area (Perkins County), South Dakota. Lemmon serves as a trade center for daily needs, but big-item shopping is done in Bismarck or Dickinson.

Little Missouri National Grassland

State: North Dakota, Montana

Counties: North Dakota - Billings, Bowman, Dunn, Golden Valley, McKenzie, Slope, Stark, Williams; Montana - Fallon, Richland, Wibaux, Dawson.

Information Source: Spike Thompson, District Ranger - McKenzie District; Norm Bishop, Medora District.

Gas and oil leasing, grazing, tourism--the Little Missouri has it all, as well as being the largest of the grasslands. The southern and northern EISs for gas and oil leasing were used as the starting point for determining the impact area. This was discussed with Richard Marshall, Region 1 Minerals Economist. The next step was to determine if any of the other resources created a

need to expand the area already determined for gas and oil effects. With the presence of the Little Missouri River as well as several other smaller streams, the Little Missouri National Grassland offers a wider range of recreational activities than most other grasslands. Its proximity to Roosevelt National Park also enhances its role as a provider of outdoor recreation. However, the economic effects of recreational activities fall well within the geographic area delineated for gas and oil effects. The predominance of tourism spending occurs in Williston, Dickinson, Watford City, Sidney, and along the US 94 corridor. Most of the home ranches of grazing permittees are in McKenzie County, North Dakota with some in Dawson County, Montana. In summary, there was no apparent reason to expand the analysis boundary past the area determined for gas and oil leasing.

Sheyenne National Grassland

State: North Dakota

Counties: Ransom, Richland

Information Source: Bryan Stotts, District Ranger.

The Sheyenne National Grassland is located in Ransom and Richland Counties of South Dakota. Outdoor recreation and grazing are the primary uses. Outdoor recreation generates a certain degree of nonresident tourism for the local economy and consists of activities such as big game, waterfowl, and turkey hunting; ORV use; and sightseeing. Most of the users are from the Fargo area, and most are day users, though there is some overnight camping on the grassland. Nonresident tourists generated little motel and restaurant business in the vicinity, and the economic effect of tourism does not go much beyond Ransom or Richland Counties. For this reason, there was little economic reason to include Cass County in the analysis. The same holds true for grazing. All the home ranches of grazing permit holders are in Richland or Ransom Counties. Sargent County was excluded because there was no apparent economic reason to include it. There is no mineral activity on the Sheyenne National Grassland.

Thunder Basin National Grassland

State: Wyoming

Counties: Campbell, Converse, Crook, Natrona, Niobrara, Weston.

Information Source: Joe Reddick.

The Thunder Basin National Grassland is located in Campbell, Converse, and Weston County, Wyoming. However, the economic effects of mining activity extend to Cook, Natrona, and Niobrara Counties. The major economic centers are Douglas (Converse), Gillette (Campbell) and Casper (Natrona). Much of the work force lives and spends money in these cities. Many businesses in these cities are supported by the mining (coal and oil) industry. Mining headquarters are largely in Gillette. There are oil refineries in Casper and Newcastle. Cattle and sheep grazing exist throughout the grassland, and home ranches are within the minerals impact boundaries. Recreation / nonresident tourism spending follows the same pattern. The exclusion of Natrona County was considered, but further study showed it to be an integral part of the mining economy. Its exclusion would cause the analysis to omit a significant amount of the effects of changes in the mining industry.

Methodology for Determining Economic Response Coefficients for Cattle

Introduction

The economic response coefficients included in this report were calculated to help managers estimate the effects of changes in national grassland management. For example, increases or decreases in the level of livestock grazing could have economic effects on nearby communities. These effects can be measured in terms of employment and income earned by the local population. The following analysis provides coefficients, when multiplied by changes in grazing outputs (AUMs) can produce a reasonable estimate of the change in jobs and income for the selected economic regions.

Methodology

Response coefficients are calculated for each of the economic regions included in cattle and sheep economic work sheets available in the administrative record. The economic impact areas are described above consist of counties or groups of counties which were determined to be in some way economically effected by management of the national grasslands in the Northern Great Plains assessment area.

Livestock Grazing

Livestock grazing was based on cattle production. Sheep grazing is a small part of total grazing in any of the EIAs and for the purposes of this analysis assumed to provide the same level of jobs and income as cattle grazing. The steps in determining jobs and income were as follows:

1. Determine direct jobs and income per AUM.
2. Develop IMPLAN Social Accounting Matrix (SAM)-type multipliers for each EIA.
3. Multiply SAM multipliers by direct jobs and income per AUM determined in step 1 to get total jobs and income from NFS lands. (AUMs x Direct Job or income response coefficient x SAM multiplier).
4. Determine intermingled lands multiplier
5. Multiply total jobs and income from NFS lands by intermingled lands multiplier to get total jobs from NFS pastures.

Step one was determined by David T. Taylor, University of Wyoming Agricultural and Applied Economics professor. The following table shows an example of the first phase in step one. Here ranch level sales, labor costs, average herd size, etc information is obtained and converted to an AUM basis. In this example, Montana was selected for western North Dakota as Montana average herd size more closely matched the herd size normally found on the Little Missouri.

Table B-3. Determining per AUM Job and Income Factors Example.

Little Missouri National Grasslands Livestock Grazing

1997 Census of Agriculture, Montana, Table 51

Beef Cattle Ranching and Farming (NAICS 112111)

	Per Ranch	Per Cow[1]	Per AUM[2]
Total Sales	$72,705	$534.60	$33.41
Hired Labor Expense	$4,433	$32.60	$2.04
Net Cash Returns	$12,834	$94.37	$5.90
Number of Beef Cows	136	1.00	0.06
Cattle and Calves Inventory	207	1.52	0.10
Government Payments	$3,880	$28.53	$1.78
Other Farm Income	$1,639	$12.05	$0.75
Taxes	$3,996	$29.38	$1.84
Depreciation	$5,715	$42.02	$2.63

[1] Based on 136 Beef Cows

[2] Based on 16 AUMs per Cow - Source: Workman, J.P. 1986. Range Economics. Macmillan Publishing, Inc. New York, NY.

Labor Assumptions

1 Full Time Proprietor	1.00	0.007353	0.000460
Hired Labor[3]	0.17	0.001250	0.000078
Total	**1.17**	**0.008603**	**0.000538**

[3] Based on $4,433 of hired labor / $26,401 Ave Earning Per Job for Hired Agr Labor (REIS)

The labor assumptions table gives jobs per AUM (.000538 jobs / AUM). The employee compensation of income is $2.04 / AUM based on the hired labor expense row of Table 1. To get labor earnings employee compensation must be added to proprietor income. Proprietor income is derived from Table 1 as follows:

> Proprietor Income ($5.80) = Net Cash Receipts ($5.90) - Depreciation ($2.63) + Govt Payments ($1.78) + Other Farm Income ($0.75).

Labor Earnings is then $2.04 + $5.80 = $7.84 / AUM which give direct jobs and income multipliers per AUM of .000538 jobs and $7.84 in income.

The above method tended to overestimate jobs and income because the statewide estimates of average herd size per ranch did not agree with local average herd sizes found on the national grasslands and forests, but much of the data used to create the job and income estimates was available only on a statewide basis. Herd size was available by county so regression equations were developed using statewide herd size, jobs, and income REIS data for Montana, Nebraska, North Dakota, South Dakota, and Wyoming. The equations developed are as follows:

> Jobs = .91133739 + .00197568 * beef cows per ranch
>
> Income = -3838.6846 + 183.441098 * beef cows per ranch

Once the regression equations were developed average Economic Impact Area (EIA) herd size estimates were used to estimate jobs and income per ranch, per beef cow, and per AUM. The per AUM job and income factors were then used as multipliers to determine direct jobs and income per EIA and for each alternative.

The second step includes using the MicroIMPLAN economic impact model to determine the local employment and income SAM multipliers ((Direct+Indirect+Induced) / Direct). These can be created automatically in IMPLAN once EIA counties are aggregated into a single model. The multipliers are those obtained for sector 4 (Range Fed Cattle – See "County Profiles and Estimated Impacts.doc" in the Administrative Record). A separate model is created for each EIA, and each EIA will have its own set of SAM income multipliers and SAM employment multipliers.

The third step is to multiply AUMs by direct job or income response coefficients by SAM multipliers for total jobs and income from grazing on National Forest System (NFS) lands. This is done for each of the EIAs for each alternative including the existing condition (see Table 3-7 in FEIS Chapter 3). At this point in the SAM, multipliers could have been adjusted once more by calculating direct income and job accounts in IMPLAN for sector 4, inserting them in the IMPLAN matrix in place of the default values and rerunning the multiplier reports. An initial test with Thunder Basin (See FEIS_direct_rng_tb_tt_modified.xls in the administrative record) indicated the adjusted job multiplier would be 6% less. For this level of adjustment, the SAM multipliers were not readjusted.

The fourth step is to identify the percentage of private lands controlled by commonly fenced pastures (Intermingled Lands). Many Forest Service grazing pastures are mixed ownership pastures--private and state lands fenced in with NFS lands. Private and state landowners have the right to manage grazing as they see fit if they are willing to fence their lands separate from NFS lands. If the private and state lands are not fenced separately from NFS lands, the landowners waive their right to manage grazing as they see fit and must abide by the Land and Resource Management Plan direction. Chapter 3 Community and Lifestyle Relations displays the intermingled lands multipliers.

The fifth step is multiplying total NFS grazing jobs and income by the intermingled lands multipliers and then adding total NFS grazing jobs and income with intermingled lands total jobs and income for total NF pasture jobs and income (see Table 3-9 in FEIS Chapter 3). When grazing jobs and income are reported through the rest of the FEIS (including the NFS dependency tables), it is the NF pasture jobs and income that are used.

Methodology for Determining Economic Response Coefficients for Minerals Production

Introduction

The economic response coefficients used in this analysis were calculated to help managers and planners estimate the effects of changes in national grassland management. For example, increases or decreases in the level of minerals production could have economic effects on communities near national grasslands. These effects can be measured in terms of employment and income earned by the local communities. The following analyses provide a reasonable estimate of the change in jobs and income for the selected economic regions as related to changes in mineral outputs

Methodology

Response coefficients were calculated for each of the gas-, oil-, or coal-producing economic regions included in the "Impact Areas" index in this analysis. The economic impact regions were established as part of the Northern Great Plains assessment and consist of counties or groups of counties which were determined to be in some way economically effected by national grasslands management in the Northern Great Plains assessment area. The reasoning for determining each of the specific impact areas is explained above.

Minerals Mining Activity Categories

The development of response coefficients was limited to two major mineral groups: gas and oil and coal. Other minerals in grassland areas were too minor to merit analysis. Gas and oil are analyzed as a single unit of joint production and the results expressed in "million barrels of oil". The reason for this is that the impact model used for analysis includes natural gas and crude petroleum in a single production function. This means that the current employment and income generated from both activities for each impact area is included in the same account in the impact model and the resulting impacts are also combined. Coal production is measured in "million short tons.

Areas Analyzed

Only 4 national grasslands produced, or will produce in the near future, enough gas, oil, or coal to warrant analysis. Only Thunder Basin National Grassland was analyzed for coal production. Thunder Basin, Buffalo Gap, Oglala, and Little Missouri National Grasslands produce gas and oil.

Determining Impacts

The MicroIMPLAN economic impact model was used to determine the employment and income attributable to the production of gas, oil, and coal in the designated impact areas. The details of MicroIMPLAN will not be explained in this report. It is enough to know that the model predicts changes in employment and income based on predicted changes in final demand. In this case, the change in final demand is represented by the total industry output included in the MicroIMPLAN accounts for the impact areas.

The report shown in this analysis was built from MicroIMPLAN reports. The MicroIMPLAN reports were imported into a spreadsheet (Microsoft Excel) and modified to present the desired information.

Coal

Total coal jobs and income were developed by adding up the direct coal jobs and income obtained from the Oil and Gas IMPLAN model for Campbell, Converse, and Crook counties and multiplying by the coal SAM multiplier for jobs and income.

Oil and Gas

Oil and gas production for the impact area was taken from tables maintained by the Washington Office of the USDA Forest Service. Data was available for each grassland by county and for each total county (Forest Service and non-Forest Service production).

The general approach to calculating response coefficients was to determine direct and total income and employment attributable to the oil and gas industry and then divide it by physical production. This would give a response coefficient that would disclose the income and employment attributable to each million barrels of oil production for the impact area in and around the selected impact area. The assumption is that gas production varies directly and somewhat in proportion to oil production. The joint production function problem is described above. 1997 data was used because this is the most recent year available in impact models.

The total employment and income attributable to gas and oil production was taken from the MicroIMPLAN database. However, this only provides direct employment and income. An impact analysis was necessary to calculate the indirect effects. A scenario was created using the total industry output for the natural gas and crude petroleum sector (Implan sector 38) to represent the total change in final demand attributable to oil and gas production.

Conclusions

The use of these tables is fairly simple. For example, let's say a management alternative the Thunder Basin National Grassland will increase coal production by 30 million short tons per year. The summary table the Thunder Basin shows 18.78 direct and 42.55 total jobs for each million short tons of coal produced in the impact area. This means that approximately 1,280 new jobs would be created in the impact area.

If the decision-maker wants to know in what economic sectors the new jobs will occur, they need to go to the individual detailed table (e.g., Coal Production for the Thunder Basin National Grassland). There they will see the most jobs will be created in the coal mining sector, but a substantial amount will also be created in maintenance and repair, railroads and related services, wholesale trade, eating and drinking establishments, and many other retail and service sectors. Impacts on employee compensation income and total income would be determined the same way.

Recreation Economic Response Coefficients – General Tourism

Economic response coefficients were developed for general tourism in the Northern Great Plains economic impact areas. Coefficients were developed for each national grassland economic impact area plus the McKelvie Unit of the Nebraska NF (9 economic impact units). The response coefficients were developed for both non-resident and resident tourists. Non-resident tourists are those that reside outside the economic impact area being analyzed. Resident tourists are everyone else. The coefficients are in terms of total jobs and labor income, and each coefficient represents the change for each 1,000 tourist days. Using the Little Missouri National Grassland as an example: on the average, each thousand non-resident tourists spend enough per day in the economic impact area to generate 2.8 direct jobs and 3.4 total jobs (includes subsequent rounds of spending), $46,122 in total labor income. Keep in mind this is “total” jobs and many of them could be part-time. This should not be confused with “full time equivalents” which is another way of expressing job effects.

The distribution of the impacts throughout the economic sectors can be seen on the individual impact reports. Using the Little Missouri National Grassland again: for each thousand non-resident tourists, 8 jobs are created in the hotels sector, .5 jobs in food stores, and .5 jobs in miscellaneous retail. Because of rounding to zero, the jobs report does not disclose the effects of indirect and induced spending. To get this, the unit of impact would have to be increased to at least 10,000 tourist spending days. However, the labor income report can be used to identify

the sectors benefiting from indirect and induced spending. This can be useful to demonstrate what a wide range of sectors / businesses benefit from tourist spending.

The coefficients were developed using the IMPLAN Pro economic impact model with the 1997 county level data sets (this is the latest available from Minnesota Implan Group). Impact models were developed for each of the 9 economic impact areas (EIA). A general tourist spending profile was then subjected to the impact component of the model to generate the reports discussed above and the summary spreadsheets. The spending profile used was for nationwide spending for "mechanized travel," and developed by Don English of the Forest Service Southeast Station in Athens, Georgia. It can be seen on the accompanying spreadsheet (See job_income_rec.xls in the administrative record). It is expressed in 1990 dollars and was converted to 1997 dollars by the IMPLAN model.

Estimated recreation jobs and income did not change by alternative, as it could not be said that one alternative or another would affect overall demand. In estimating jobs and income, it was assumed that 50% of tourists were local EIA residents and the rest were non-resident. Recreation Visitor Days (RVD) estimates were obtained from FEIS Chapter 3, Recreation and Travel Management.

Economic Diversity and Dependency

Introduction

An effort was made to describe economic conditions in Northern Great Plains communities that were associated with the management of the national grasslands and forests of that area. The purpose of this appendix is to generally describe how several of the descriptive variables were determined and measured.

It was felt that economic diversity and dependency needed to be described to the extent practical. This was based on public interest and also developments in other assessments such as the Interior Columbia Basin Ecosystem Management Project. Several units of measure were selected to describe the above variables. Their selection was based as much on data availability as it was on their ability to describe economic conditions.

One of the first decisions was the selection of the geographical unit to be used for measurement and reporting. The first geographic level was that of economic impact areas[6]. These were clusters of counties that bore a significant portion of the effects of management activities from the national grasslands and forests. A comprehensive description of economic conditions at the community level was not done because of a lack of consistent data over the region as a whole. Therefore, descriptions focused at the county or county group level. After economic diversity and dependency were determined at the economic impact area level, there was much demand by local citizens and officials to have the same data available for each individual county. This was also done. In summary, descriptive models have been built at the county, economic impact area, state, and five-state region levels.

[6] See Appendix B (this appendix) "B. Community and Lifestyle Relationships;Economic Analyses; Impact Areas Selected and Reasons For Selection".

Economic Diversity

Several measures were used to demonstrate the diversity of the economies of the economic units of choice. The variables chosen were (1) the number of economic sectors (2) a listing and description of all economic sectors in the economy and (3) the Shannon-Weaver diversity index.

The source of this information is the MicroIMPLAN economic impact system. The single best description of the IMPLAN system is documented in *IMPLAN PRO - A Users Guide* etc. written by the Minnesota IMPLAN Group Inc. More information can be found at their web site http://www.implan.com.

Shannon-Weaver Economic Diversity Indices

The most technical method used to describe economic diversity is the Shannon-Weaver economic indices. Economic diversity indices using the Shannon-Weaver entropy function have been previously computed for all U.S. counties, labor market areas, Bureau of Economic Affairs (BEA) functional economic areas, BEA component economic areas and states using IMPLAN employment data for the years 1977, 1982, 1985, and 1990-1996. These indices have been computed for three levels of industry aggregation: 1-, 2-, and 4-digit Standard Industrial Classification (SIC) groups. For purposes of the NGP assessment only 1996 at the 4-digit level, and the direction of change (1983 through 1996 and 1990 through 1996) were displayed for each county in the NGP economic impact area[7].

Economic diversity is defined as "the presence in an area of a great number of different types of industries" or "the extent to which the economic activity of a region is distributed among a number of categories", then it is useful to have a summary statistic to describe the diversity of an area and compare it to other areas or compare the same area. The entropy method measures diversity of a region against a uniform distribution of employment where the norm is equi-proportional employment in all industries.

1996 is the most recent year for which the Shannon-Weaver indices have been computed.

Economic Dependency

The geographic scale for computing and displaying economic dependency is the same as that used for economic diversity. The question examined in this analysis is “How dependent is an EIA on a particular industry and the indirect and induced jobs and income it creates?” Economic dependency was determined using a two-step process.

In the first step, dependency was estimated for grazing and minerals in total. That is, regardless of Forest Service activities, how dependent is a county or EIA on the grazing industry or the mineral industry in terms of jobs and income? Total livestock grazing dependency was accomplished by estimating direct county and EIA-wide grazing related jobs and income and then multiplying by IMPLAN derived SAM multipliers for a total (direct, indirect, and induced) job and income effect. Total mineral dependency was determined by obtaining IMPLAN mineral sector jobs and income (sectors 37, 38, and 39) and multiplying those values by the appropriate IMPLAN SAM job or income weighted average multiplier. Total jobs and income were then divided into the total grazing or mineral related jobs and income to get percent dependency. This is not a true economic dependency measure, as adjustments were not made to obtain only basic or export (export out of the EIA) related jobs and income. IMPLAN

[7] See www.fs.fed.us/institute/economic_center/spatialdata3.html

supplied this data for both the county and EIA level and both levels of dependency are found in Table 3-2 (FEIS Chapter 3). For example, the table shows that Billings County is 42.4% dependent on the livestock industry for direct, indirect, and induced jobs related to beef cattle. At the same time, the Little Missouri National Grassland EIA is 14.1% dependent on the livestock industry for direct, indirect, and induced jobs related to beef cattle.

In the second step of the dependency analysis, national forest and grassland production of grazing, minerals, and recreation were examined (see Table 3-3 in FEIS Chapter 3). Recreation was added to this level of analysis because a general estimate of RVDs was available all of the grassland and forest units, while similar information was not available at the county or EIA level. The purpose of this table was to examine the dependency of the EIAs on National Forest activities. In this analysis, only jobs and income related to activities occurring on National Forest System lands (in the case of grazing, National Forest pastures) is compared to total EIA jobs and income. The data was not easily disaggregated back down to the county level so as to provide a fair disaggregation and was left at the EIA level. The values in this table are significantly smaller than in the previous industry dependency table (see Table 3-2, FEIS Chapter 3). For example while the Little Missouri National Grassland Economic Impact Area (EIA) is 14.1% dependent on direct, indirect, and induced jobs related to livestock production (see Table 3-2, FEIS Chapter 3), the Little Missouri National Grassland EIA is 1.6% dependent on direct, indirect, and induced jobs related to livestock production on National Forest pastures (see Table 3-3, FEIS Chapter 3).

Indirect Effects On Intermingled Lands

As part of the DEIS comment analysis, it was discovered that significant livestock grazing effects that were indirect in nature were not considered in the DEIS analysis. The primary component of the livestock grazing indirect effects analysis is the intermingled land analysis. This analysis examines the effect of Forest Service control over private and state lands that are fenced in common pastures with National Forest System lands (national forests and grasslands).

Every national grassland or national forest has an administrative boundary that describes the outer limit of the grassland or forest unit in question. Within this boundary, as little as 1/3 of the acres are actually national grassland or national forest acres. The remaining acres are private or state lands. Generally the Forest Service has control only over the national grassland or national forest acres, not the entire area within the administrative boundary. One exception is a Forest Service pasture containing state and or private lands mixed in with National Forest System acres. Within an administrative boundary, there are many pastures with no national grassland or national forest acres in them; these pastures are not considered Forest Service pastures. In the Forest Service pastures with intermingled lands, the state and private land owners have elected not to fence out their lands from federal lands and must abide by the stocking decisions of Forest Service managers. The state and private landowners can fence out their pastures at any time.

The FEIS predominantly discusses effects based only on National Forest System lands, except where there are indirect effects as defined in the National Environmental Policy Act (NEPA) such as the intermingled land livestock grazing effect.

The analysis process was one in which the total acres of Forest Service pastures were compared to the actual acres of National Forest System lands within those pastures to develop a indirect effects multiplier. The equation for the multiplier is:

> *(Non-Forest Service Pasture Acres + Forest Service Pasture National Forest System Acres) / Forest Service Pasture National Forest System Acres*

The smallest this multiplier can be is 1. Within the Northern Great Plains units, no multiplier was greater than 2.3 (on the Thunder Basin).

Using the Thunder Basin as an example, the use of the multiplier will be explained. The multiplier basically says that for every 1 acre of National Forest System land, the Forest Service controls stocking on an additional 1.3 acres of state or private land.

Say the Land and Resource Management Plan decision determines stocking is to be reduced 10%on National Forest System lands resulting a direct, indirect, and induced economic loss of 100 jobs and 1 million in income. The total indirect effect considering federal, state, and private land within Forest Service pastures would be 230 jobs (100 jobs x 2.3) and $2.3 million in income (1 million in income x 2.3).

The indirect effects from the intermingled lands are discretionary in nature because Non-Forest Service landowners have elected to not fence out their land, but it is still an effect to be considered.

Summary

It is important that the methodologies be consistently applied to give comparable results over the planning units. Other regional and more detailed local studies have been conducted. While these studies are usually high quality, they are not comparable to each other due to different methods used and different variables measured. For this reason, national level data, such as that coming from the IMPLAN system, the Regional Economic Information System, and the U.S. Census, was used. Results of the local and regional studies were compared with the IMPLAN results, and where there were differences, the differences could usually be reconciled.

Social Analysis

The study method used was guided discussion groups, also known as focused group interviews or focus groups. Richard Krueger, author of *Focus Groups: A Practical Guide for Applied Research*, explains that focus groups can produce insights into the attitudes, perceptions, and opinions of participants? (1994:19). They are what Krueger describes as a “socially oriented research procedure” (29). The results are qualitative data in which the participants choose how they respond and how they react to the responses of others in the group. Focus groups are made up of people who are similar to each other. Generally, the participants in the groups for this study were homogeneous in their use, interest, orientation, or goals for these public lands.

Each discussion group was led by a trained moderator. Discussion results were entered on a laptop computer by a recorder provided by the Forest Service. The discussions were also audio- tape recorded for later interpretation and report writing.

Subjects of the Study

The subjects were user / interest groups as identified by contact lists, referrals, and self-reports. The intent of the homogeneity among group participants was to promote more free-flowing discussion among group participants and to help analyze different perspectives between groups.

The user / interest groups identified for this study included:

- Industries and related support suppliers.
- Agricultural production (permittee and nonpermittee ranchers, suppliers, wholesalers).
- Oil, gas, minerals industries and suppliers.
- Wood products industry (applies to Nebraska's Pine Ridge region only).
- Consumptive recreationists (hunters, anglers, rock collectors, and suppliers).
- Nonconsumptive recreationists (trail users, sightseers, campers, and suppliers).
- Conservation, preservation, environmental orientations.
- Wildlife production (promotes wildlife conservation and habitat enhancement).
- Government (local, state, federal).
- American Indian government.
- Adjacent landowners.

Participant Criteria

Most participants for the group discussions met the following criteria:

- Lived within 100 miles of public lands in question (local residency was preferred).
- Had some knowledge and / or experience with national forest / grassland management.
- Described themselves as members of a use / interest group category.
- Were willing to participate voluntarily in a 2-hour discussion.

Participant Recruitment

The recorder used a preliminary participant list provided by the District Ranger / manager to recruit participants. This list included people currently on the Forest Service mailing list and names of people not on the list but known to have an association with the user / interest segment. For instance, industrial suppliers and wholesalers, people with an indirect interest, or people who might experience secondary effects. Once a preliminary participant list was developed, the recorder telephoned the potential participants. The target group size was 6 to 12 people.

In most cases, two discussion groups were completed for each user / interest segment. The group discussions were held near the public lands. Public or neutral locations, such as libraries or restaurants, were preferred discussion sites.

Role of Moderator

The moderator encouraged and guided the flow of conversation through a series of sequenced questions. Some situations called for more intervention to keep people on the topic. Other situations allowed the moderator to take a more passive role while the conversation took a natural course to the next question.

The moderator collaborated with the recorder in the report writing. The recorder had the primary responsibility for preparing the report, but the moderator reviewed and corrected the report as necessary.

Role of Recorder

The recorder took comprehensive notes, operated the tape recorder, handled the environmental conditions and logistics, and responded to unexpected interruptions. The recorder prepared the discussion results and incorporated changes offered from participant and moderator reviews. The recorder also recruited and notified participants.

Interview Content and Questions

After introductions, the moderator explained how the information from the discussion would be used. The participants were encouraged to be open and candid in their responses to the study questions. The moderator then posed the first of a series of suggested interview questions. The moderator had flexibility to reword the questions to fit their style and the situation as long as the study objectives were achieved.

Interview Question 1

What is most important to you on the _____ national grassland / forest? How would you like to see it managed? How would you describe your goals for management?

Interview Question 2

Based on how you defined your goals for management, what do you see as opportunities or situations to achieve your goals? In other words, what Forest Service management would further your ability to achieve your goals?

Interview Question 3

Along the same line, what do you see as the obstacles or limitations to achieving those goals?

Interview Question 4

What do you see as some of the interests people have in the _____ national grassland / forest? How do you view your goals in light of these other interests and views?

Interview Question 5

Where the uses and interests of different people conflict, what opportunities do you see for reconciling those conflicting interests?

Optional Questions, if time allowed

Interview Question 6

What has been your experience with the way the Forest Service makes decisions? How open have you found the Forest Service in bringing people into making decisions?

Interview Question 7

What does the term "multiple-use" mean to you?

Interview Question 8

What does the term "ecosystem management" mean to you?

Group Interview Results

In the fall of 1997, the Forest Service conducted interviews with 19 groups of people who identified with a use or interest in the national forests and grasslands in the Northern Great Plains. These group discussions were led by trained moderators who asked a set of standard questions provided by the Forest Service. The questions were designed to explore principal management goals for the public lands. The use or interest groups interviewed for the study are listed below along with some of the key management goals for each segment.

Agriculture Segment

The primary management goals for the public lands identified by this segment are vigorous grass production, available water, and suitable access. There is strong support to manage these federal lands as they believe the Bankhead-Jones Farm Tenant Act intended--to supplement grazing and stabilize local economic conditions. Some people believe that the intent was for local grazing associations and members to have more influence on management decisions than other types of users.

Oil, Gas, Minerals Segment

Access to leased lands and timely responses to applications were among top management goals for this segment. Participants felt the Forest Service could streamline processes and reduce costly delays by better planning and coordination and by anticipating needed information and completing inventories when conditions allow.

Wood Products Segment

This group believes a desired condition for the timber stands is needed, and timber management is an appropriate tool for achieving desired conditions for the forested lands. In their view, timber management could reduce the risk of insects and fire and improve overall forest health. The group believes there are sufficient timber resources to sustain a modest allowable sales quantity on the Nebraska National Forest. The quantity should be a common-sense program based on good inventory data and potential growth and yield.

Consumptive Recreation Segment (hunters, anglers, rock collectors, etc.)

These people have a strong appreciation for public lands where they can pursue their activities. Access is important; however, access doesn't mean driving anywhere but, instead, being able to get to the public lands. The condition of the vegetation, whether trees or grass, is important to providing quality wildlife habitat and recreation experiences.

Nonconsumptive Recreation Segment (trail users, campers, sightseers, etc.)

For this segment, access to the public lands and the experiences they offer is a fundamental management goal. Access could be improved by installing easier-opening gates or cattle guards (instead of gates) and reducing fences overall. Improved visitor information and trail signs would enhance their recreation experience. This group believes that if recreation is encouraged on the public lands, it should be planned for and managed.

Conservation/Preservation/Environmental Segment

The health of the grasslands was considered the primary management goal. People spoke of the need for viable wildlife populations, properly functioning grassland ecosystems, and a healthy mosaic of native vegetation that includes habitat provisions for threatened, endangered, and sensitive plant and animal species. This group believes that a long-term vision for managing the national grasslands should be developed, especially with the involvement of all interested parties.

Wildlife Advocacy/Production Segment

This segment looks to the national grasslands to fill habitat niches that private lands are not providing. They appreciate that the public lands are open to everyone, and citizens have a say in how they are managed. Vegetation condition is considered a critical habitat component. Native grasses are desired, as is grass left to mature instead of being grazed uniformly. Livestock grazing and fire are regarded as tools to achieve vegetation diversity

Government Segment

This group values the natural resources and management opportunities found on the national forest and grassland units. The units represent large tracts of grassland that provide diverse vegetation, recreation sources, wildlife habitat, and economic contributions to communities.

American Indian Community Segment

American Indian communities want to be self-sufficient, and they see the national forests and grasslands as resources that could potentially further their self-sufficiency and improve their economic conditions. They also look to these public lands for spiritual and cultural reasons and uses.

Adjacent Landowners Segment

This segment wants the Forest Service to be a good neighbor by building relationships with their neighbors. As good neighbors, the Forest Service should be accountable and trustworthy. They should respect the opinions of local residents and not try to dominate their neighbors. They should also respect the rights of private property owners and help reduce public trespass on the private lands.

Planning Coordination and Outreach

The Forest Service continually coordinates with scores of state and local governments, associations, tribes, partners, groups, and other entities. This ongoing process is an effort to better identify common goals and visions for the National Forest System lands and adjacent lands on the Northern Great Plains. As part of this effort, the Forest Service tries to keep abreast of the many plans, like county land-use plans, developed by other counties or other entities. Such entities include: county and tribal governments, state wildlife agencies, recreation and tourism agencies, regional economic development groups, state and local transportation departments, and research colleges and universities, to name just a few.

In the fall and winter of 1996-97, Forest Service district rangers and legislative coordinators contacted county, state, and regional agencies in the vicinity of Forest Service units on the Northern Great Plains. The outreach had two goals:

- To assess whether existing local economic development, growth, or other trends or plans could be facilitated by national forest and national grassland management.
- To assess the current and future impact of national forest and national grassland management on local infrastructure, such as police, fire, water, sewer, schools, and roads.

Most agencies expressed a desire to be kept informed of Forest Service planning and management activities. Some presented land-use plans that would require close coordination with Forest Service management. A few expressed a desire that the Forest Service be involved in local land-use plans. Many cases of existing coordination and cooperation in joint ventures were cited. A few opportunities were brought forward for future coordination and cooperation, such as South Dakota's desire to facilitate the permit process on public lands for the motion picture industry. Such a process could facilitate movie productions such as Dances With Wolves, which brought millions of dollars into South Dakota[8].

C. Fire and Fuels Management

Prescribed fire acres were developed utilizing PCHA (Personal Computer Historical Analysis) which is a data storage and retrieval system to determine current acres being burned from the past 20-year period. Historical fire regimes were utilized based on research from *The Role of Fire in Managing for Biological Diversity on native Rangeland of the Northern Great Plains* (Carolyn Hull Sieg) and *Historical Ecology and Ecosystem Variation in Mid-continent Grasslands* (Judy P. von

[8] See Administration Record "Planning Coordination and Outreach with State and Local Entities".

Ahlefeldt). Based on this information, units determined the percent of their unit which should be burned on a yearly basis.

D. Fish, Wildlife and Rare Plants

Potential Black-tailed Prairie Dog Habitat

A habitat model to predict potential habitat for black-tailed prairie dogs was developed and applied using GIS computer technology. The development and use of this model was in response to public comments that frequently addressed the subject of potential prairie dog habitat on NFS lands. Ideally, potential prairie dog habitat would have been determined and defined as the maximum extent of prairie dog colonies known to have occurred historically on those areas that are now part of a national grassland or forest. Of course, historical information on prairie dog colony distributions during the 1800s and early 1900s are not available so a modeling effort appeared to be the next best strategy to quantify and map potential habitat for the species.

Like most modeling efforts, models should be expected to undergo continued modifications and refinements, and this model is no exception. As a means to partially validate and refine model drafts, the maximum distribution of colonies known to occur on each unit over the last 20 to 25 years was compared with habitat predictions of the various model drafts. Refinements in modeling rules (habitat criteria) were made until approximately 85% or more of the maximum recorded colony distribution occurred in habitat predicted to be suitable.

The model criteria (variables) for black-tailed prairie dogs varied between some NFS units depending on the type of soils or vegetation information available. The overall general modeling criteria were as follows:

- Suitable soils.
- Suitable vegetation.
- Suitable slope.
- Suitable hydrology.

Most soils on the NFS lands in the planning area are suitable for prairie dog burrowing. Even some of the sandy soils in the valleys of the Nebraska Sandhills support burrowing activities. Also soils with shallow bedrock are known to support prairie dog colonies. Some soils may be preferred by prairie dogs but few preclude prairie dog burrowing.

Soil type data were not available for the Little Missouri National Grassland, Cedar River National Grassland and Grand River National Grassland. For these units, soil inferences by existing vegetation were used.

Forest and wetland vegetation types were considered unsuitable for prairie dogs. Grassland vegetation types including those with minor shrub components were considered preferred habitat. Since black-tailed prairie dogs also occur in shrublands and modify shrublands by removing shrubs in and around their colonies, shrublands were considered suitable but marginal habitat.

Slopes with suitable soils and vegetation that were less than 10% slope were considered preferred habitat. Slopes ranging from 10 to 30%were classified as suitable but marginal habitat. Areas with average slopes exceeding 30%were identified as unsuitable.

All water and wetlands were classified as unsuitable for prairie dog colonization. Areas with shallow water tables were also classified as unsuitable.

Wet areas were identified in two ways: 1) using US Geological Survey (USGS) data modified by the USDA Forest Service and 2) using National Wetlands Inventory (NWI, www.nwi.fws.gov) data. The first was accomplished by placing a 100-foot buffer (50 feet either side of a stream center) on all USGS perennial and intermittent streams to model the riparian/woody zone. A USGS polygon water layer was also obtained to represent water bodies. Second, the National Wetlands Inventory (NWI), developed by the US Fish and Wildlife Service, was used to identify wet areas with both linear and polygon components in the same manner as the USGS hydrology layer. A data dictionary published by the USFWS entitled "NWI Maps Made Easy, USFWS 2/1993" was used to interpret the codes in the NWI coverages. The water and wetlands part of the analysis used both the USGS and the NWI wetlands systems in the prairie dog potential analysis to ensure maximum identification of wet areas. The Thunder Basin was the exception as the National Wetlands Inventory was not available for it.

The presence of large herbivore (livestock or bison) grazing and/or past soil disturbances was originally considered as criteria for predicting potential prairie dog habitat. Large herbivore grazing was spatially analyzed and mapped using a GIS model for predicting the location and extent of primary, secondary, and ungrazed range. However, other than for steep slopes, almost all rangelands classified as primary, so the presence of large herbivore grazing was dropped as a meaningful criteria. Past soil disturbances in the form of water developments, pipelines, range ripping and furrowing, and past cultivation are also good predictors of suitable prairie dog habitat, but information for this criteria did not exist or was not readily available.

An attempt was made to develop a model for predicting potential prairie dog habitat on the NFS lands in the Nebraska Sandhills, but this effort was unsuccessful.

The Sheyenne National Grassland falls outside of the black-tailed prairie dog habitat range and was not analyzed.

The Pine Ridge is a forest landscape and was not analyzed for black-tailed prairie dog habitat.

In classifying prairie dog habitat suitability, a site was classified as preferred habitat only if all four variables (vegetation, soil, slope, and water) were rated as preferred. If one variable was rated suitable but marginal, the entire site was rated marginal. If one variable was rated unsuitable, the entire site was rated unsuitable.

Analysis differences between different Forest Service administrative units were due to the kinds of soils and vegetation data available and, in the case of the Thunder Basin, the lack of a National Wetlands Inventory.

Dakota Prairie Grasslands

Soil data were not available for the Dakota Prairie units, but the analysis was augmented with a broad-based vegetation classification scheme (see Vegetation Composition for Dakota Prairie Grassland described elsewhere in Appendix B).

The vegetation classifications used for the Grand River, Cedar River, Medora, and McKenzie Analysis Unit are described in the following table. Codes with '**' are preferred vegetation types, codes with '*' are marginal vegetation types, and codes without an asterisk are unsuitable vegetation types.

Table B-4. Code - Existing Vegetation Composition Name.

2010 - Agriculture-Dry	4206 - Ponderosa Pine
2020 - Agriculture-Wet	4214 - Rocky Mountain Juniper
*3111 - Non-native Grass	4300 - Mixed Broadleaf / Conifer Forest
**3130 - Very Low Cover Grasslands	5000 - Water
**3140 - Low Cover Grasslands	6120 - Broadleaf Dominated Riparian
**3150 - Low / Moderate Cover Grasslands	6130 - Mixed Broadleaf / Conifer Riparian
**3160 - Moderate / High Cover Grasslands	6140 - Mixed Forest / Nonforest Riparian
*3210 - Mixed Mesic Shrubs	**6210 - Graminoid / Forb Dominated Riparian
*3309 - Silver Sage	*6310 - Shrub Dominated Riparian
3313 - Creeping Juniper	*6400 - Mixed Shrub / Herbaceous Riparian
*3318 – Shadscale	7301 - Exposed Rock
*3352 - Wyoming Big Sagebrush Steppe	7600 - Badlands
*3510 - Mesic Shrub-Grassland Complex	760 - Shrub Badlands
*3520 - Xeric Shrub-Grassland Complex	**7602 - Grass Badlands
3530 - Tree-Grass Complex	9800 - Clouds
4140 - Mixed Species Broadleaf Forest	9900 - Cloud Shadow
4205 - Limber Pine	

Nebraska National Forest Units

The Nebraska National Forest units had soil survey data and grassland vegetation data, as well as some shrubland and tree data.

Shrub and trees can make a site marginal or unsuitable depending on the species and percent cover. If the shrub species is either sagebrush (ARCA13 and ARTEM types) or rabbitbrush (CHNA2 types) and cover percent is greater than 10% the vegetation is marginal. Otherwise it is preferred. If the shrub species is greasewood (SAVE) the vegetation is not preferred. If greasewood cover is greater than 0 and less than or equal to 10% the vegetation is marginal. If greasewood cover is greater than 10% the vegetation is unsuitable. All other shrubs are preferred vegetation.

Sites are not preferred vegetation if trees were present. If the tree species cover is greater than 0 and less than or equal to 10%, the vegetation is marginal. If tree species cover is greater than 10%, the vegetation is unsuitable.

Soil data was based on range sites[9]. A given soil site can consist of between 1 to 3 different range sites. Each soil site was classed as preferred, marginal, or unsuitable[10].

Thunder Basin National Grassland

The Thunder Basin analysis used vegetation classified from the USDA Forest Service Pueblo IRI (Integrated Resource Inventory) Center, which classified vegetation into the following types. Each type was classified for prairie dog suitability.

Table B-5. Vegetation Habitat Types.

ARTR	Marginal
ARTR-SW	Marginal
NO ACCESS	Unsuitable
NO DATA	Unsuitable
NO RNG SITE	Unsuitable
PIPO JUNIP	Unsuitable
PITS	Unsuitable
PODE	Unsuitable
RIPARIAN	Unsuitable
SAVE-LO	Unsuitable
SAVE-UP	Unsuitable
STCO	Preferred
STCO-PDOG	Preferred
STCO-SW	Preferred
UNKNOWN	Unsuitable
WATER	Unsuitable

Soils were classified using the NRCS sri_muid by looking at the underlying range sites within each sri_muid to determine prairie dog soil suitability[11].

The references consulted in the development of this model are listed at the end of this appendix.

Selection of Management Indicator Species

Regulations in 36 CFR 219.19 and 219.20 (National Forest System Land and Resource Management Planning, September 30, 1982) call for the selection, evaluation, and monitoring of management indicator species (MIS) and their habitat. MIS can be "plant or animal species selected because their population changes are believed to indicate the effects of management activities on other species of selected major biological communities or on water quality." The intent of the regulations is that population trends of the selected species occurring on or in the vicinity of NFS lands would be closely tied to habitat conditions resulting from authorized lands uses on those same NFS lands and that a suite of species would react to the authorized lands uses in a manner similar to the response of the MIS. The regulations do not imply that the population dynamics of management indicator species, as influenced by land uses, directly

[9] See South Dakota and Nebraska USDA - NRCS Technical Guides for a description of range sites.

[10] See Administrative Record "Black-Tailed Prairie Dog Habitat Suitability AML, Nebraska."

[11] See Administrative Record "Black-Tailed Prairie Dog Habitat Suitability AML, Thunder Basin."

represent the population dynamics of other species. Also, the regulations do not require that MIS be selected for all management activities or all biological communities on NFS lands.

Considerable scientific discussion has occurred as a result of the application of the MIS concept by the Forest Service during the development and implementation of the first generation of national grassland and forest Land and Resource Management Plans. Several critical reviews of the MIS concept and its application have been published (Landres et al. 1988, Niemi et al. 1997, U.S. General Accounting Office 1991). Many of the criticisms of the MIS concept and how it has been applied appear to be valid. In response to these critiques and other concerns about the MIS concept and its application, the following criteria were used to help select the best and most credible MIS for the major biological communities and issues:

- Species is indigenous.
- Species is a year-long resident of the vicinity (non-migratory), or population trends of the species in the local or regional vicinity are closely tied to habitat conditions resulting from land uses on NFS lands in the same area.
- Species is considered a keystone species or habitat specialist.
- Species is sensitive to management activities on NFS lands in the local or regional vicinity. Population trends of the species are assumed to be related to changes in habitat composition, structure, ecological processes, and / or human activities.
- Species is appropriate for the scale that best represents the key issues or management concerns.
- Biologically and economically feasible to monitor populations and habitat of the species at similar spatial scales. Populations are of sufficient size or density to be reasonably detected and monitored. Accepted survey protocols exist. Analysis and interpretation of inventory data should produce meaningful and reliable trend information. Species that require high investment for low returns or suspect results should be avoided.
- Species where the scientific literature supports the assumed limiting factors and habitat associations.

Using these selection criteria, suitable MIS could not be identified for some biological communities. Additional evaluation and research may be needed to identify suitable MIS candidates for these communities. It is possible that, based on the selection criteria, credible MIS may not exist for some biological communities.

E. Oil, Gas, Minerals Management

Coal Suitability

Coal suitability for the Thunder Basin National Grassland was accomplished, separate from the Revision effort, jointly by the BLM Casper District Office and FS Douglas Ranger District. The results of this process were used in the analysis.

A coal suitability was done for the remainder of the planning area only on areas where the coal development potential is moderate or high (minerals / geology / paleontology meeting notes, November, 1995). The only area, other than the Thunder Basin National Grassland, that met the criteria is the Little Missouri National Grassland. To determine lands unsuitable for coal mining, ARCView was used to overlay the 20 criterion from 43 CFR 3461.5 on areas of coal

development potential. Where criteria data was not available in GIS (for example federal lands under permit by the Forest Service and being used for scientific study), the information was obtained from Forest Service files in Billings, Montana. There were no areas determined unsuitable for coal mining on the Little Missouri National Grassland.

Oil and Gas Leasing

Stipulation Comparison

The oil and gas leasing alternatives were developed from the stipulation comparison chart shown in Table B-6 . For the current analysis, Alternative 1 (No Action) represents existing leasing decisions (columns 1-4 in the following table). The fifth column represents the stipulations used in Alternatives 2-5 in the DEIS and proposed Revised Management Plans. Alternatives 2, DEIS 3, FEIS 3, 4, and 5 use a consistent set of stipulations (column 6 in the following table). The alternatives vary by acres allocated to management areas and, in most cases, do not vary standards and guidelines except for those associated with management areas. For all alternatives, the lease stipulations used in the FEIS were updated from those used in the DEIS in accordance with new information and as a logical outgrowth of public comment on the DEIS.

To understand the analysis in the FEIS, it is important to know that Alternative DEIS 3 uses the same stipulations as Alternatives 2, FEIS 3, 4 and 5. The difference in alternatives is in the acres allocated to management areas. In the following table, the stipulations used in the DEIS are maintained in column 5 for comparison with the stipulations used in the FEIS, Alternatives 2, DEIS 3, FEIS 3, 4 and 5.

The following abbreviations were used in Table B-6.

TBNG	Thunder Basin National Grassland
NLMNG	Northern Little Missouri National Grassland
SLMNG	Southern Little Missouri National Grassland
NNF	Nebraska National Forest
NAA	Not administratively available for leasing
NCA	Administratively available but not currently authorized for leasing
CSU	Controlled Surface Use
LN	Lease Notice
NSO	No Surface Occupancy
TL	Timing Limitation
G	goshawk
P	prairie falcon
S	Swainson's hawk
F	ferruginous hawk
EIS	Environmental Impact Statement
SIO	Scenic Integrity Objective
LM	Little Missouri
TRNP	Theodore Roosevelt National Park
NFS	National Forest Service
MA	Management area
DPG	Dakota Prairie Grasslands
CRNG	Cedar River National Grassland

Table B-6. Stipulation Comparison Chart

Resource, Use, Issue	TBNG	NLMNG	SLMNG	NNF	DEIS Standards and Guidelines	FEIS Standards and Guidelines
Surface - Physical					CSU for riparian areas, woody draws, wetlands, and floodplains over 200 meters from edge.	CSU for water, wetlands, woody draws, riparian areas, and floodplains; all units.
Floodplains	CSU	LN	LN	NSO w/i 1/8 mi		
Riparian	CSU		CSU			
Wetland	CSU	LN	LN	NSO w/i 1/8 mi		
River Bottom		NSO				
Playa	CSU					
High soil and water hazard	CSU			NSO>15%		
Moderate soil and water hazard				CSU		
Soil productivity permanent impairment to soil productivity	CSU					
Slopes 34-60%	CSU					
Slopes>60%	NSO					
Slopes >40% and mass failure		NSO	NSO			
Slopes > 40%					CSU	NSO; all units
Soils susceptible to mass failure					CSU slopes 25 to 40%	CSU slopes 25 to 40% w/soils susceptible to mass failure; TBNG, NNF only
Water Quality Monitoring	LN					
Wooded Draw		NSO	NSO			

Resource, Use, Issue	TBNG	NLMNG	SLMNG	NNF	DEIS Standards and Guidelines	FEIS Standards and Guidelines
Wildlife						
T and E species / habitat	LN	LN	LN	LN		
Bald eagle and peregrine falcon nests	NSO, TL - 2 / 1-7 / 31w / i 1 mi, CSU w / i ½-mi				TL w / i 1 mi 2 / 1-7 / 31 CSU w / in 1 / 2 mi	NSO w / i 1mi line of sight; DPG. NSO w / i 1mi line of sight bald eagle only, not peregrine falcon on TBNG and NNF.
Bald eagle winter roost	TL-11 / 1-4 / 1 w / i 1 mi				TL w / i 1 mi 11 / 15-2 / 29	NSO w / i 1mi; all units
goshawk, osprey, Swainson's hawk, prairie falcon	TL -3 / 1-7 / 31 w / i ¼-mi CSU w / i 300 ft	NSO w / i ¼-mi (P) TL-3 / 15-7 / 20 (P)	TL-3 / 1-8 / 1 w / i 1 mi NSO w / i 1 / 2 mi (P)	TL-3 / 1-8 / 1 w / i 1 / 2 mi	CSU w / i ½-mi (G,P,S)	TL w / i ½-mi 3 / 1-7 / 31(S) NSO ¼-mi (S); TBNG, NNF. NSO w / i ¼ mi (P) NLMNG, SLMGNG
ferruginous hawk	TL -3 / 1-7 / 31 w / i ¼-mi CSU w / i 300 ft	NSO w / i ¼-mi (P, F) TL-3 / 15-7 / 20	TL-3 / 1-8 / 1 w / i 1 mi NSO w / i 1 / 2 mi	TL-3 / 1-8 / 1 w / i 1 / - mi NSO w / i 1 / 4 mi	TL w / i 1 mi from 3 / 1-7 / 31 CSU w / i ½-mi	TL w / i ½-mi 3 / 1-7 / 31; NSO w / i ¼ mi; TBNG, NNF. NSO w / i ½ mi; NLMNG, SLMNG.
merlin				TL-3 / 1-8 / 1 w / i 1 / 2 mi	TL w / i 1 / 2 mi from 3 / 15-7 / 15;	TL w / i ½-mi 4 / 1-8 / 15 NSO w / i ¼ mi; TBNG, NNF. NSO w / i ½ mi; NLMNG, SLMNG.
golden eagle	TL -2 / 1-7 / 31 w / i ¼-mi CSU w / i 300 ft	NSO w / i ¼-mi TL-3 / 15-7 / 15 w / i ½-mi	NSO w / i ½-mi	TL-3 / 1-8 / 1 w / i 1 / 2 mi NSO w / i ¼-mi	CSU w / i in ½-mi	TL w / i in ½-mi 2 / 1 to 7 / 31 NSO w / i ¼ mi; TBNG, NNF NSO w / i ½ mi; NLMNG, SLMNG.

Resource, Use, Issue	TBNG	NLMNG	SLMNG	NNF	DEIS Standards and Guidelines	FEIS Standards and Guidelines
Wildlife, cont.						
burrowing owl					TL w/i ¼-mi from 5/1-7/31	NSO w/i ¼ mi; all units.
sharp-tailed grouse	CSU w/i ¼-mi	NSO w/i 200 ft TL-3/1-4/15 w/i ¼-mi	NSO w/i 1/4 mi TL-3/1-6/15 w/i 1 mi	NSO w/i ¼-mi TL-3/1-6/15 w/i 1 mi	CSU w/i ¼-mi TL w/i 1 mi from 3/1-6/15	TL w/i 1 mi from 3/1-6/15 NSO w/i ¼ mi; all units.
sage grouse	CSU w/i ¼-mi		NSO w/i ¼-mi; TL- w/i 2 mi 3/1-6/15	NSO w/i ¼-mi, TL-3/1-6/15 w/i 1 mi	TL w/i 2 mi from 3/1-6/15; CSU w/i ¼-mi	TL w/i 2 mi from 3/1-6/15 NSO w/i ¼ mi; all units.
Rookery	TL-3/1-7/31 w/i ¼-mi					
Mountain plover					TL w/i plover use area or rookery or w/i ¼-mi of nest from 3/1-7/31	TL w/i ¼-mi 3/15-7/31 CSU brooding habitat NSO nesting areas; TBNG, NNF
Black-footed ferret occupied habitat outside MA 3.63						TL w/i 1/8 mi 3/1-8/31 CSU; all units
Big game crucial range		CSU or NSO in canyonlands				
Deer winter range	TL-12/1-4/30 CSU, NSO					
bighorn sheep		NSO-Mgmt Area C	NSO habitat		Lambing areas TL w/i 1 mi 4/1-6/15 CSU w/i 1 mi sight distance	Lambing areas TL w/i 1 mi 4/1-6/15 CSU w/i 1 mi sight distance; NLMNG, SLMNG only
mule deer			CSU			

Resource, Use, Issue	TBNG	NLMNG	SLMNG	NNF	DEIS Standards and Guidelines	FEIS Standards and Guidelines
Wildlife, cont.						
Antelope winter range		NSO w/i 900 ft TL-1/1-3/31				TL w/i mapped areas 1/1-3/31 only on NLMNG and SLMNG
prairie dogs		NSO w/i 100 ft	NSO w/i 100 ft	CSU w/i 1/4 mi		
swift fox					TL - w/i 1/4 mi of swift fox dens from 3/1-7/30	TL - w/i 1/4 mi of swift fox dens from 3/1-7/31; all units
Sensitive and Watch Plants			CSU known populations		CSU known populations - bring forward from SLMNG EIS	Carried forward in Botanical SIAs
Visual Resources						
Retention visual quality				NSO	CSU - High SIO area surface occupancy subject to operational constraints	CSU - High SIO area surface occupancy subject to operational constraints; all units
Scenery – Theodore Roosevelt NP						CSU - High SIO w/i 1 mi of TRNP; NLMNG, SLMNG
Retention foreground		NSO w/i seen area of LM River TL-5/15-9/15 next to TRNP	NSO w/i foregrd retention of LM River			
Partial retention foreground				CSU	CSU - Moderate SIO area surface occupancy subject to operational constraints	CSU - Moderate SIO area surface occupancy subject to operational constraints; all units
Middle and background			CSU w/i mid and background of LM and NFS access routes			

Resource, Use, Issue	TBNG	NLMNG	SLMNG	NNF	DEIS Standards and Guidelines	FEIS Standards and Guidelines
Visual Resources, cont.						
Cultural Resources	LN	LN	LN, NSO Traditional use	LN	NSO areas in NLMNG and SLMNG greater than 400 meters in width	NSO w/i National Register eligible sites; NLMNG, SLMNG
Other	NSO Buffalo Divide	CSU Elkhorn; NSO Blue Butte; NSO Graves		NSO Fiddle Cr	Bring forward stips from SLMNG where larger than 400 meters in width, Blue Buttes is not administratively available for leasing TBNG area is covered by MA 2.1, NNF- NSO on Fiddle Creek, bring forward.	Blue Buttes is not administratively available for leasing; Elkhorn is in MA 2.1 TBNG area is covered by MA 2.1, NNF- NSO on Fiddle Creek, bring forward.
Special Value Areas	NSO and CSU Biological diversity and rec. values		NSO Ponderosa Pine		Will only show in Alternative 1 for both units. They are handled by MAs in other alternatives	Will only show in Alternative 1 for both units. They are handled by MAs in other alternatives
Paleontology Area	LN	LN	LN, CSU	LN, CSU Potential, NSO All known	CSU on geologic formations classed 3,4 and 5 for fossils	CSU on geologic formations classed 3,4 and 5 for fossils TBNG, NNF only On DPG a LN is used.
Uses, Special Designations						
Recommended for Wilderness						NSO, MA 1.2; TBNG, NNF
Suitable for Wilderness						NAA, MA 1.2A; NLMNG, SLMNG
Backcountry Recreation Nonmotorized						NSO, MA 1.31; all units

Resource, Use, Issue	TBNG	NLMNG	SLMNG	NNF	DEIS Standards and Guidelines	FEIS Standards and Guidelines
Uses, Special Designations, cont.						
Wild and Scenic Classification			TL-5/15-9/15 Little Missouri		NSO, MA 1.5 Wild	NSO, MA 1.5 Wild; NLMNG, SLMNG
Research Natural Areas		NSO	NSO		NSO, MA 2.2	NSO, MA 2.2; all units
Special Interest Areas			NSO candidate areas, CSU Nominated areas		CSU -DPG - Slope Type Formation, Cannonball/Slope Contact, Bullion Creek Formation Type TBNG - Paleontological, Cheyenne River Zoological NNF - Edgemont Shark Locality, Marietta South, One-Mile Hill, and Wallace Ranch Localities;	CSU -DPG - Slope Type Formation, Cannonball/Slope Contact, Bullion Creek Formation Type Section TBNG - Paleontological, Cheyenne River Zoological NNF - Edgemont Shark Locality, Marietta South, One-Mile Hill, and Wallace Ranch Localities
Special Interest Areas - Botanical						NSO – DPG - Aspen Stand, The Bog, Grand River Sand Dunes, Black Butte, Black Cottonwood, Riparian Pools, and Roundtop Butte
Special Interest Areas - Geologic						NSO – DPG –White Buttes, Burning Coal Vein/ Columnar Juniper, and Ice Caves. NSO-TBNG-Lance Geologic site
Special Interest Areas - Historic						NSO – DPG – Battle of the Badlands, Custer Trail/Davis Creek, and Square Buttes. NSO-TBNG-Cow Creek Rangelands

Resource, Use, Issue	TBNG	NLMNG	SLMNG	NNF	DEIS Standards and Guidelines	FEIS Standards and Guidelines
Uses, Special Designations, cont.						
Special Interest Areas					NSO - TBNG- Cellars and Buffalo Divide Archeological sites NNF-Toadstool Park, Hudson Meng Bison Bonebed, and Warbonnet/Yellowhand	NSO - TBNG- Cellars and Buffalo Divide Archeological sites NSO-NNF-Toadstool Park, Hudson Meng Bison Bonebed, and Warbonnet/Yellowhand
Roadless Areas Inventoried Roadless Areas (IRAs)		NSO Low Development Areas	NSO			
Developed Sites						
Designated dispersed recreation sites						TL w/i ¼ mi 5/1-12/1 Burning Coal Vein, Buffalo Gap, Sather Lake CCC, Campgrounds and Summit, White tail Picnic Areas, and 6 Maa Daa Hey Trail overnight camps, Wannagan, Magpie, Roosevelt, Elkhorn, Beicegel, Bennett; NLMNG, SLMNG
Designated dispersed rec use site (fisheries)	CSU w/i 400 mtr for noise				Bring forward from TBNG	CSU w/i 400 mtr for noise for TBNG: Weston Reservoir, Upton Cent. No. 2, Kellog Dam, Upton Bass Pond, Turner Reservoir, East Iron Creek Reservoir TBNG
Dispersed			TL-5/15-9/15 Foreground LM River			NSO, w/I ¼ mi of Little Missouri River MA 4.22; NLMNG, SLMNG

Resource, Use, Issue	TBNG	NLMNG	SLMNG	NNF	DEIS Standards and Guidelines	FEIS Standards and Guidelines
Developed Sites, cont.						
Campgrounds		NSO, TL-5/15-9/15 w/i ¼-mile CSU w/i ¼-mi	NSO, TL-5/1-12/1 w/i ¼-mi		NSO	NSO
Mgmt. Prescriptions						
Mgmt Area C (wildlife)		NSO	NSO		Bring forward for CRNG, Knispel T130,R85 SW Sec 21 and North Community T129, R89 NWSENE Sec 15	Bring forward for CRNG, Knispel T130,R85 SW Sec 21 and North Community T129, R89 NWSENE Sec 15
MA 1.2 Recommended for wilderness					NSO	NSO, MA 1.2; TBNG, NNF
MA 1.2A Suitable for Wilderness					NSO	NAA, MA 1.2A; NLMNG, SLMNG
MA 1.31 Back country nonmotorized					NSO	NSO
MA 2.4 American Indian traditional use areas					Not administratively available for leasing	Not administratively available for leasing
MA 3.51 Bighorn Sheep					NSO w/i MA 3.51	NSO w/i MA 3.51;
MA 3.51A Bighorn Sheep						Not currently authorized; CSU under specified conditions
MA 3.63 Black-footed ferret reintroduction					CSU	CSU w/i reintroduction habitat; DPG TBNG, NNF. NSO w/i reintroduction habitat/roadless; DPG only.

Resource, Use, Issue	TBNG	NLMNG	SLMNG	NNF	DEIS Standards and Guidelines	FEIS Standards and Guidelines
Mgmt. Prescriptions, cont.						
MA 3.68 Big game range					TL w/i winter range 12/15-3/15 TL w/i elk calving areas 5/1-6/31 CSU over whole area	TL w/i winter range 12/15-3/15 TL w/i elk calving areas 5/1-6/31; TBNG only
MA 4.22 Little Missouri River Corridor						NSO, w/I ¼ mi of Little Missouri River MA 4.22; NLMNG, SLMNG
Amidon Admin. Site LMNG			NSO		Not mapped on unit maps so will not bring forward	Not mapped on unit maps so will not bring forward
Cedar River NG			CSU entire area		Bring forward CSU	SLT only entire area
Areas Not Administratively Available		4 areas _ Blue Buttes; Long X Divide; Twin Buttes; Dutchman's Barn			Bring forward areas as not administratively available	Bring forward Blue Buttes; Long X Divide; Twin Buttes and add Bullion Buttes and Kinley Plateau, not administratively available; NLMNG, SLMNG

Analysis Process

The oil and gas leasing analysis was only done on those Northern Great Plains administrative units analyzed in previous oil and gas leasing decisions or presently under analysis:

- The Little Missouri National Grassland and Cedar River National Grasslands.
- The southern portion of the Fall River District of the Buffalo Gap National Grassland.
- The Oglala National Grassland.
- The Thunder Basin National Grassland.

The basic process of the analysis was to put all factors that resulted in a stipulation in a single Arc/Info file. This resulted in very large files, but placed all the information in a single location to facilitate future use of the information when deciding on an application to drill.

The information inside each file was tracked in two ways. First information about each factor was stored separately in as many as three different fields. One field defined the constraint (NSO, CSU, SLT, NCA, NAA etc.) another defined the reason (burrowing owl, High Scenic Integrity Objective, etc.) and a third defined whether or not a timing limitation was in affect. Timing limitations were separate from other stipulations as they can occupy the same space as a NSO, CSU, SLT, NCA, or NAA stipulation.

Second, the information was tracked by stipulation and timing limitation for mapping purposes. By tracking information in these two ways, one can produce a map of each unit showing the dominant stipulation and whether or not a timing limitation exists. At the same time, one can look at the individual stipulations. It also provides future information on what other stipulations might apply if on-site analysis determines the reason for the dominating stipulation does not, in fact, exist.

A key point of the oil and gas analysis is that it is a subsurface ownership analysis and the patterns depicted on a map will not resemble a normal surface ownership pattern. Only those tracts with federal subsurface ownership were included in the analysis. In many cases, there is National Forest System surface ownership and private ownership of the subsurface minerals. In these cases, there isn't a leasing decision to be made as there is no federal ownership of the minerals. In the case of private surface ownership and federal mineral ownership, a leasing decision will be made.

Alternative 1 for each unit was developed from each of the existing oil and gas decisions. If updated information was appropriate to use, such as current wildlife points, these locations were included in Alternative 1. New wildlife species points not addressed in the original analyses were not included. Several sites in the original analyses that have leasing stipulations were found not to have federal minerals under them upon further analysis, and therefore these sites do not appear in Alternative 1.

Alternatives 2-5 were developed from Table B-6 displayed above. This chart was reduced to a list of 44 resources, uses, or issues (variables). If a variable exists on a given unit, an oil and gas leasing stipulation was developed for it. The following table displays the variables analyzed in each unit.

Table B-7. Stipulation Analysis Chart.

Resource, Use, or Issue (variables)	Cedar River NG	Medora District Little Missouri NG	McKenzie District Little Missouri NG	Thunder Basin NG	Fall River District Buffalo Gap NG	Oglala NG
Riparian, Woody Draws, Wetlands, and Floodplains[12]		X	X	X		
Slopes > 40%	X	X	X	X	X	X
Soils susceptible to mass failure	X	X	X	X	X	X
Bald Eagle Nest				X		
Bald Eagle Winter Roost				X		
goshawk			X			
Swainson's hawk			X	X	X	X
prairie falcon		X	X	X		X
ferruginous hawk		X	X	X	X	X
merlin			X	X		
golden eagle		X	X	X	X	X
burrowing owl		X	X	X	X	X
sharp-tailed grouse		X	X	X		X
sage grouse		X		X	X	
mountain plover				X		
Pronghorn antelope		X	X			
swift fox					X	
Sensitive and Watch Plants	X					
Scenic Integrity Objectives	X	X	X	X	X	X
Cultural Resources / Heritage Sites		X	X		X	
Not Administratively Available		X	X			
Paleontology Area	X	X	X	X	X	X
Wild River Classification		X				
Special Interest Areas		X		X	X	X
Developed Recreation Sites (Campgrounds)		X	X			

[12] Although all units have wet or woody draw areas, only those areas greater than 400 feet wide were included. This is because standard lease terms allow Forest Service managers to move any operator selected drilling location 200 feet without needing a special leasing stipulation.

Resource, Use, or Issue (variables)	Cedar River NG	Medora District Little Missouri NG	McKenzie District Little Missouri NG	Thunder Basin NG	Fall River District Buffalo Gap NG	Oglala NG
Designated dispersed recreation Site				X		
Mgmt Area C (wildlife)	No Federal Minerals					
MA 1.2 Recommended for wilderness		X	X		X	X
MA 1.2A Suitable for wilderness		X	X			
MA 1.31 Back country nonmotorized			X	X		X
MA 2.2 Research Natural Areas		X	X	X		
MA 2.4 American Indian traditional use areas			X			
MA 3.51 Bighorn Sheep		X	X			
MA 3.51A Bighorn Sheep		X	X			
MA 3.63 Black-footed ferret reintroduction			X	X		
MA 3.63 Black-footed ferret reintroduction roadless			X			
MA 3.68 Big game range				X		
MA 4.22 River and Travel Corridor		X	X			
Not Currently Authorized for Leasing-Coal bed methane				X		
Amidon Admin. Site LMNG	No Federal Minerals					
Cedar River NGL CSU	CSU entire area - X					
Standard Lease Terms	X	X	X	X	X	X
Federal mineral status	X	X	X	X	X	X
Federal lease status	X	X	X	X	X	X

F. Plant and Animal Damage Control

As their part of the Northern Great Plains Interagency Steering Committee agreement, the National Park Service developed a presence or absence report of noxious weeds. This report was completed in April 1998 and can be viewed on an Internet sit located at http://www.calmit.unl.edu/ngp. The following information sources were used:

- State of Montana, Department Of Agriculture, Helena, Montana. Data only reported at statewide level.
- *Nebraska Department of Agriculture, Bureau of Plant Industry, County Infestation Report*, 1995.
- *North Dakota Department of Agriculture, County Weed Board Annual Report*, 1995.
- *Annual Report, South Dakota Weed and Pest Program*, 1995.
- Wyoming Weed and Pest Program Coordinator, 1995.

G. Range Management and Livestock Grazing

The following describes the components used in the range analysis. It includes

- Process used to determine existing capable rangelands.
- Process used to determine suitable rangelands.
- Process used to determine vegetation structure.
- Process used to determine vegetation composition.
- Process used to determine desired upland herbaceous vegetation conditions.
- Process used to determine herbage productivity.
- Process used to determine forage outputs.

Decisions made in the revised management plans will not determine the number of livestock (animal unit months or stocking levels) allowed to graze on the national grassland and forest units. Instead, the revised management plan will describe desired conditions for vegetation that fit within the context of rangeland health and multiple uses. The revised management plans focus on the conditions desired on the landscape to ensure sustainable rangeland health. The desired conditions are defined by the species of grass (composition) and height and density of the grass (structure). Estimates were then made for analysis purposes of likely grazing levels given the assumption of season-long grazing and varying (by alternative) season-long rest (absence of livestock grazing) levels.

Primary, Secondary, and Inaccessible/Ungrazed Rangelands

Biotic and abiotic factors interact with animal behavior at various spatial and temporal scales to determine livestock grazing patterns across landscapes (Bailey et al. 1996, Cook 1966, Senft et al. 1987). Forage quality and quantity are the primary biotic factors, while slope and distance from water are the primary abiotic factors. The animal behavior factor is the ability of livestock to recall the location of preferred foraging and shelter sites.

This model uses only abiotic factors to predict and map broad grazing distribution patterns. These patterns are classified and mapped as primary, secondary, and inaccessible / ungrazed range. Primary ranges are usually grazed first and heavier by livestock. Secondary ranges are those usually grazed last and to a lesser degree (Society for Range Management 1989). Models using the abiotic factors of slope and distance to water are usually more reliable that those that include biotic variables because the abiotic factors are the overriding determinants of large-scale grazing patterns. They also act as constraints within which the mechanisms involving the biotic factors operate (Bailey et al. 1996, McInnis et al. 1990). Because of this, inclusions resulting from biotic and animal behavior factors can be expected to occur within the broad map units derived from this model.

Information on livestock grazing distribution is key in helping to assess livestock forage availability and to predict effects of grazing on wildlife. Results of this GIS model will not be used for determining actual livestock grazing capacities. It is recognized that actual use data would be best for mapping livestock grazing distribution patterns across each planning area, but this information is not uniformly available across all areas. It's also recognized that type of livestock will also influence grazing distribution; the abiotic factors in this model are based on cattle. Computer model results may be modified in areas grazed by sheep or other livestock. The GIS analysis also includes information on the distribution of existing range developments (fences and water) and current grazing management strategies.

Livestock Distribution Criteria

Following are the criteria to classify primary, secondary and inaccessible / ungrazed rangeland.

Primary Range

Criteria (All must be met)

1. Grazed by livestock.
2. Classified as "capable rangelands" (USDA Forest Service 1996).
3. Natural or developed water sources within 1 mile (Holechek et al. 1989, Mackie 1970).
4. Less than 10% slope (Holechek et al. 1989, Mackie 1970).
5. No barriers to livestock (including fences).

Secondary Range

Criteria (Numbers 1 and 2 have to be met plus one or more of the remaining criteria)

1. Grazed by livestock.
2. Classified as "capable rangelands" (USDA Forest Service 1996).
3. 1 to 1.75 miles from water (Holechek et al. 1989, Mackie 1970).
4. 11% to 40% slope (Holechek et al. 1989, Mackie 1970, USDA Forest Service 1996).
5. No barriers to livestock (including fences).

Inaccessible/Ungrazed Rangeland

Criteria (Number 1 must be met plus one or more of the remaining criteria)

1. Classified as rangeland including grasslands, shrublands, savannah, and wet meadows but excluding other wetlands, aquatic areas, barren lands, and ungrazable woodlands / forests.
2. Greater than 1.75 miles from water (Holechek et al. 1989, Mackie 1970).
3. Greater than 40% slope (Holechek et al. 1989, Mackie 1970, USDA Forest Service 1996).
4. Barriers (including fences) exclude livestock.
5. Administratively excluded or withdrawn from livestock grazing.

References are listed at the end of Appendix B.

Spatial data used for modeling included fences, water developments, natural water, slope, and range capability using the criteria described above. A draft map depicting the modeling results was sent to District staff for review. This review identified many water sources that were missed by the water developments layer. Many intermittent streams that are used early in the year by livestock where also not included on the layer. These additions were made on a polygon-by-polygon basis for the Nebraska units and Thunder Basin National Grassland. The Little Missouri National Grassland indicated there were no unwatered places on the national grassland due to an extensive watering system and the use of intermittent streams early in the season. Secondary range on the Little Missouri was due to slopes above 10%[13].

Capable Lands for Livestock Grazing

A capability analysis identifies areas on the national grasslands and forests with the physical characteristics capable of supporting livestock grazing. Generally, this includes areas that are accessible to livestock and producing adequate forage. The results are displayed in Table B-19 through Table B-21.

Criteria to Determine Existing Capable Rangelands

Areas considered physically capable of supporting livestock grazing must contain the following features as addressed in the Forest Service Manual:

- Occur in areas with slopes less than 40 percent;
- Soils producing more than 200 pounds of forage per acre;
- Be accessible to livestock;
- Have water or the potential to have water. (Areas where there is no water can be made capable by providing water and therefore are considered to be capable)

[13] See also "Primary / Secondary Range AMLs" in the Administrative Record.

Information Used to Determine Existing Capable Lands

The following information was gathered or developed to determine capable rangelands and maps developed which displayed the information:

- Ownership from CFFs (Cartographic Feature Files).
- Slope by 10 percent breaks from DEMs (USGS 30-meter Digital Elevation Model).
- Soils with a potential for producing more than 200 pound of forage per acre.
- Location of areas that don't produce forage: rock, roads, water bodies, bare ground, etc.
- Areas inaccessible to livestock (determined by District personnel).

Process

Use GIS to identify areas that meet the following criteria:

- Begin with lands that are National Forest System lands.
- Subtract areas with slopes greater than 40%.
- Subtract areas with the potential of producing less than 200 lbs forage / acre.
- Subtract areas that are dominated by a large percentage of rock, bare ground, roads, and water bodies.
- Subtract areas that are currently inaccessible (such as railroad rights-of-way) to livestock.

Slope was determined from 30-meter USGS digital elevation model (DEM) grids. Each grid was run through a process in Arctools to define slope, percent slope and finally slope in 10% increments.

The wetness of a site was determined in two ways. First linear features (streams) from Forest-maintained USGS-based hydrology layers were buffered three feet either side of the centerline to model average stream width. Second the polygon features, lakes, ponds, etc. were identified as standing water bodies from the forest hydrology layers. These two features defined wet areas and standing water. The forest hydrology information, in conjunction with the water site classification of the potential productivity step below, provided a more thorough classification of water than either cover coverage, independently.

Similar to streams, roads and train tracks were buffered and classified as noncapable rangeland. Roads were buffered 8 feet either side of the centerline to allow for the road bed. Train tracks were buffered 100 feet either side of the centerline to model an average corridor where livestock are fenced out.

The GIS methods used to identify the above five criteria differed between units due to the type of soil productivity information available. Different soil surveys use slightly different soil classifications. The Dakota Prairie Grasslands and the Spring Creek area of the Thunder Basin National Grassland did not have a GIS-compatible soil survey. The processes used by the different units are as follows:

Dakota Prairie Analysis Units

- Grand River and Cedar River National Grasslands.
- McKenzie District of the Little Missouri National Grassland.
- Medora District of the Little Missouri National Grassland.
- Sheyenne National Grassland.

Cedar River, Grand River, Little Missouri, and Sheyenne National Grasslands

Ecological classification of potential site productivity was used to classify range capability. Sites on the Dakota Prairie Grassland were classified using the process described in "Determination of Herbage Productivity - Dakota Prairie Grassland" in this chapter as follows:

200 lbs production / acre	Crested Wheatgrass
201-400 lbs production / acre	Badlands
401-600 lbs production / acre	Coniferous trees / forest
601-800 lbs production / acre	Water
801-1000 lbs production / acre	Deciduous Forest / Woodland
1001-1200 lbs production / acre	Cropland
1201+ lbs production / acre	

Of the site-types listed above, those with 200 lbs production / acre, Coniferous trees / forest, and water were considered not capable.

Nebraska Analysis Units

- Bessey unit of the Nebraska National Forest.
- Fall River District of the Buffalo Gap National Grassland.
- Fort Pierre National Grassland.
- McKelvie National Forest.
- Pine Ridge unit of the Nebraska National Forest and the Oglala National Grassland.
- Wall District of the Buffalo Gap National Grassland.

The Nebraska units had an extensive GIS land resource information system available provided by the Integrated Resource Inventory Center (IRI) in Pueblo, CO. A key piece of information provided was the NRCS (Natural Resource Conservation Service) SRI_MUIDs which link to a rather extensive soils data base. One component of the database is potential soil productivity. Using the data base tools of Info soil types were selected for a potential productivity below 200 lbs of production.[14],[15]

[14] See /fsfiles/office/plan/data/ngp/land_cover_type/sri_muid.txt

Medicine Bow-Routt Analysis Unit

- Thunder Basin National Grassland.

Thunder Basin Analysis Unit Low productivity SRI_MUIDs

The Thunder Basin Range Capability Analysis was different from the one done for the Nebraska units because the soil survey was incomplete and somewhat inaccurate, the Spring Creek soil survey had not been completed, and because of active coal leases and strip mining on the Thunder Basin[16].

The first analysis of range capability used a soil productivity table[17] similar to the one used for the Nebraska units above and found all sri_muids with a zero NRCS production value and classified them as noncapable rangeland. District review of the resulting map indicated the first analysis overestimated the acres of noncapable rangelands because some of the sri_muids with zero NRCS values were actually productive lands that were inaccurately characterized by the soil survey. The problem sri_muids with zero value were identified for District review on a map. George Wiggins of the Douglas Ranger District indicated the four sri_muids listed below were in fact capable rangelands:

- sri_muid 45045 is 75% capable * avg production of 1097 lb / acre = 822.75 lb / acre
- sri_muid 605233 is 20% capable * avg production of 1097 lb / acre = 219.4 lb / acre
- sri_muid 605234 is 65% capable * avg production of 1097 lb / acre = 713.05 lb / acre
- sri_muid 709119 is 80% capable * avg production of 1097 lb / acre = 877.6 lb / acre

The above sri_muids were removed from the list of noncapable sri_muids.

The percent capable determination was based on Douglas District professional interpretation of soil map unit description, comparable field data, and general field experience by Forest Service rangeland management professionals familiar with the area.

The average production value of 1097 lb / acre was determined by Virginia Emly, GIS coordinator Nebraska NF. This production value was based on an acre-weighted average from sri_muid polygons having NRCS production values on the Thunder Basin.

Noncapable rangelands due to soils for the Spring Creek portion of the Thunder Basin were determined on a prorated basis[18] from noncapable rangelands on the rest of the Thunder Basin. The prorated process estimated the acres of noncapable rangeland due to soils but did not identify the location of those noncapable rangelands.

Rangelands on which an existing coal mining lease existed were classified as noncapable rangelands. This was because these lands could be taken out of production for a coal strip mine depending on the needs of the coal mining company. The US Forest Service can permit grazing those lands on an annual basis. Due to the temporary forage availability on coal leased lands, these lands were not considered capable rangelands.

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[15] See Administrative Record "Range Capability AML - Bessey, Fall River, Fort Pierre, McKelvie, Pine Ridge, Wall"

[16] See Administrative Record "Range Capability AML - Thunder Basin"

[17] See Paper - "Thunder Basin Range Production Table"

[18] See paper - "Thunder Basin Incapable Soils Worksheet"

Suitable Lands for Livestock Grazing

Suitability is defined as the appropriateness of applying certain resource management practices to a particular land area based on economic and environmental consequences and considerations for other uses that may be affected. A unit of land may be suitable for a variety of individual or combined management practices.

Each management area has a specific set of standards and guidelines used in determining suitable lands. Alternatives vary in the allocation of management areas to achieve the goals and objectives for that alternative.

Information Used to Determine Suitable Lands

- Rangeland capability (see Capable section).
- Management Area Prescription allocation for each alternative.
- Areas closed to grazing or not in an allotment.
- Areas that are determined by the District to be environmentally sensitive with no forage value assigned.
- Fenced recreation areas and / or sites.
- Administrative sites.
- Special areas (wildlife, plant species, etc.).

Process

Use GIS to identify areas that meet the following criteria:

- Start with capable rangelands generated from the Capable section.
- Develop alternatives with different range management prescriptions as defined in the management areas to meet goals and objectives of the alternatives.
- Analyze alternative uses foregone. Perform the following:
    a. Subtract areas with management area prescriptions that have standards and guidelines that do not allow livestock grazing.
    b. Subtract fenced recreation sites, developed recreation sites, administrative sites, and special use sites.
    c. Subtract areas that are closed to grazing.

A District interdisciplinary team identifies site-specific areas within each management area based on the goals and objectives for each alternative and areas where conflicts occur between livestock and other resources. The team then determines if these areas are unsuitable, and if so, they are subtracted from suitable rangelands.

Results of Inventory and Analysis

The determination of both rangeland capability and suitability may be reviewed and updated if it becomes an issue at the site-specific project level. For instance, rangelands identified as capable and suitable for domestic livestock grazing in the land and resource management plan may include areas that are not appropriate for domestic livestock grazing when analyzed at the site-specific level (i.e., wetlands or some dispersed recreation sites). In determining alternative uses forgone, the only criteria utilized applied to the management area prescriptions that contain standards and guideline that do not allow grazing. These management areas prescriptions also included administrative sites. The results of the analysis are displayed in Table B-20 through Table B-22. Due to the small difference between capable and suitable rangeland, the cost of administration does not differ between alternatives due to suitability.

In some situations, domestic livestock need not be prohibited from areas identified in the plan as unsuitable. For example, a forested or riparian area with sufficient forage to support domestic livestock may not be identified as suitable, but the presence of domestic livestock drifting in from an adjacent suitable area may not conflict with other uses. In this situation, it would not be necessary to physically prevent access to the forested or riparian area by domestic livestock, but there would be no allocation of forage.

Grassland Vegetation Structure

Grassland structure, as used in this document, refers to the vertical structure of vegetation types dominated by grasses, sedges and forbs and where shrubs are absent or a minor component. The vertical structure of grassland vegetation, in combination with other vegetation characteristics, influences the diversity of plants and animals that occurs across grassland landscapes. The visual obstruction method (Robel et al. 1970) has been selected for monitoring and analyzing vertical vegetation structure. Visual obstruction readings (VOR) are commonly used to measure vertical structure[19] and represent the height that vegetation totally (100%) screens a calibrated pole when viewed from a standard height (39 inches) and distance (156 inches).

The pole used by the Forest Service in the planning area is modified from that described by Robel et al. (1970) and is painted with alternating 1-inch gray and white bands. Robel et al. used a pole graduated in half decimeters. The narrower 1-inch graduations on the modified pole provide a finer level of resolution to detect changes in grassland structure.

VORs are taken from 4 directions around stations systematically located every 10 paces along a linear paced transect. In steep (>15% slope) topography, readings are taken at each station from 2 directions on the contour. The number of the last band partially or totally visible is recorded as the VOR, and mean VOR is calculated for each station and transect. The number of stations per transect and the number of transects per unit area is predetermined based on variability observed during initial sampling and a desired level of precision (1/2 inch) and confidence (80%). Transect locations were random and commonly stratified by sites with similar levels of

[19] Robel et al. 1970, Sousa 1987, Duebbert and Lokemoen 1977, Grosz and Kirby 1986, Manske et al. 1988, Mattise et al. 1981, Sedivec et al. 1995, Benkobi et al. 2000, Benkobi 1999, U.S. Fish and Wildlife Service 1999

potential productivity. Sampling was random across an entire unit or within a contiguous block.

Uplands were prioritized for monitoring. It should not be assumed that this distinction implies that structure along drainages and overflow sites is any less important. In fact, on the more arid grasslands located in the western part of the planning area, these sites can be major contributors to grassland structure because they are more conducive to the establishment and growth of mid- and tall-grass species. Also, vegetation along drainages also serves as a filter strip--an important ecological function related to enhancing soil stability and water quality.

Most VOR transects were measured in the fall after killing frost and livestock grazing and prior to the influence of winter winds and snowpack. The primary reason for monitoring the vegetation left after livestock grazing in the fall is that spring nesting cover (before spring green-up) is critical to some grassland wildlife species, especially during droughts. Winter cover is also important to some resident wildlife species on the open plains.

Knowing the full range of cover levels that can occur in an area is key to understanding and managing grassland structural diversity. Like any vegetation measurement, the range of values that can be expected for a particular measurement needs to be known if management direction and effectiveness are to be fully and accurately established and assessed. Since livestock grazing can directly reduce vegetation structure by removing forage, managing vegetation structure on grasslands is largely a program of managing livestock grazing intensity. The frequency and intensity of grazing can also influence plant species composition and vigor, thereby indirectly increasing or decreasing the amount of structure a site can produce. For example, a site dominated by mid-grass species can produce more vertical structure than a comparable site where multiple years of heavy livestock grazing have reduced mid-grass composition and increased the amount of short-grass species.

Theoretically, the lowest VOR that can be expected for any grassland site is limited only to the extent that livestock can physically remove above-ground vegetation. This typically results in mean transect VORs less than 1 or 2 inches. The maximum VOR (long-term biological potential) for a particular site occurs where forage from the last 1 or 2 growing seasons has not been removed by livestock and where the current successional stage of a site maximizes mid and tall grass species composition and vigor (Sousa 1987). The ability to measure and monitor the long-term biological potential to provide vegetation structure is frequently limited by having sites or reference areas with those characteristics. Areas on NFS lands or other jurisdictions where specific management techniques can be applied to help determine the long-term biological site potential for structure are scarce to non-existent. The need for sufficiently sized reference areas for monitoring and experimentation will be addressed as part of this planning effort. Some of the currently ungrazed sites have been rested from livestock grazing too long and do not reflect maximum structure.

An average VOR by itself is not a perfect or complete descriptor of grassland structure because the variability of the cover, or patchiness, may be important to many wildlife species that depend on grassland cover for various life functions. Size and shape of cover patches and their distribution across the landscape can also influence the use of grasslands by wildlife. The amount of litter can also be important but seldom contributes to VORs. Although other structure measurements would have been useful, this analysis was limited to VORs.

Monitoring results were available for most of the NFS units in the planning area. However, structure levels on the Cedar River and Thunder Basin National Grasslands were not monitored. Because of its proximity and similar management to the Grand River National Grassland, we are assuming that grassland structure conditions on the Cedar River unit are similar to those found on the Grand River National Grassland. The Thunder Basin National Grassland was not monitored because this unit is more representative of short-grass prairie and shrublands and typically does not produce a wide range of grassland cover levels. Monitoring grassland structure on the Nebraska National Forest's Pine Ridge Ranger District was not a management priority, so monitoring on that unit was minimal, and the results are not summarized. Analysis results are presented as frequency distributions using 1-inch class increments.

This monitoring program was limited solely to public lands, and none of the analysis results apply to other land jurisdictions in or near the National Forest System lands. Although it would be desirable from an ecosystem management standpoint to put the results of this monitoring into the context of structure levels at a broader scale, it is highly unlikely that monitoring of other land jurisdictions will occur.

Information on precipitation is also presented because precipitation and the resulting growing conditions, along with livestock grazing, have a significant effect on potential and existing vegetation structure.

Plant Species Composition

Several analysis methods were utilized to determine a mix of vegetation composition on the Dakota Prairie Grassland units, Nebraska National Forest and associated grassland units and the Thunder Basin National Grassland. The Nebraska National Forest utilized the Natural Resource Conservation Service analysis methodology and an ecological site description process developed by the Rocky Mountain Experiment Station. The Thunder Basin National Grassland utilized an ecological site description process developed by the Rocky Mountain Experiment Station. These processes measure existing species composition on a range site or ecological site and compare it with the expected climax plant community for the same range or ecological site. Since each state office of the NRCS establishes criteria for range sites, these vary from state to state. In North Dakota, range sites established by the state NRCS office included more than one vegetation type and were not specific for habitat type classification. In the 1980s, it was determined by Region 1 of the Forest Service to utilize habitat types in determining vegetation community types which were smaller in scale than that of the NRCS range sites.

The following descriptions and tables should be used to compare existing mix of vegetation composition with the potential mix of vegetation composition at climax condition. The potential vegetation composition is not to be used for what the desired mix of vegetation composition should be since field managers should try to achieve a mix of vegetational ecological conditions. This information is used as a guideline in determining a desired mix of dominant vegetation as displayed in the desired upland herbaceous vegetation condition to achieve resource goals and objectives for each alternative in the Management Plans. This was also used in the effects analysis of the Environmental Impact Statement.

Dakota Prairie Grassland Units

Vegetation composition for the Dakota Prairie Grasslands units was derived using several data sources, including the following:

- Two GIS themes.
- Existing vegetation and land cover classes and potential vegetation environments.
- Field plots.
- Habitat type and ecological classifications completed for the Little Missouri and Sheyenne National Grasslands.

The ecological classifications describe both potential vegetation (climax or reference plant associations) and seral or alternative vegetation states associated with each habitat type. Development of the classifications followed protocols outlined in Forest Service Handbook direction (2090.11)[20] and recommendations of the Range Inventory and Standardization Committee Report (RISC 1988) for developing and using classifications for rangeland assessments.

Field sampling methods followed plot layout and sampling protocols outlined in the Northern Region Ecosystem Inventory and Analysis Guide (USDA Forest Service 1992). Information collected at the plot included production by life-form, species composition, dominance type, habitat type, ground cover values, vegetation and cover class, and physical characteristics of the site. This data provides ancillary information attached to each existing vegetation and land cover class and potential vegetation map unit. The ancillary information can be used to summarize composition, production, and other characteristics of the cover class and potential vegetation map unit.

Existing Vegetation

Existing vegetation and land cover classes were derived from LANDSAT Thematic Mapper (TM) imagery through a contract with the Wildlife Spatial Analysis Lab, University of Montana (Redmond et al 1997). Three and a half LANDSAT images, ground truth plots, and expert knowledge about vegetation cover types and patterns were used to generate the existing vegetation and land cover theme.

The following table is a summary of LANDSAT images and ground truth plots used to generate the existing vegetation and land cover GIS theme.

[20] www.fs.fed.us/im/directives/html/fsh.html

Table B-8. Summary of Information Used to Generate Vegetation and Land Cover.

Dakota Prairie Grassland Unit	LANDSAT Scene	LANDSAT Scene Date	Number of Ground Truth Plots	Yrs. represented by ground truth plots
Sheyenne NG	Path30/Row27 (1/2 scene)	August 10, 1992	377	1992-1996
Grand/Cedar River NG	Path33/Row28	June 12, 1992	686	1994-1996
Little Missouri River NG	Path33/Row28	June 12, 1992	686	1987-1996
	Path34/Row28	August 9, 1993	875	1987-1996
	Path34/Row27	July 11, 1994	1351	1987-1996

The vegetation and land cover classes represent a broader classification of existing vegetation than typically used for allotment management planning and are based on spectral differences between classes rather than direct measures of species composition and dominance. They are most similar to cover type maps or vegetation type maps. Dominance types are typically finer scale vegetation descriptions used for project and allotment level planning that are nested within the vegetation and land cover classes.

Six grassland vegetation cover classes were used to describe vegetation composition for grassland-dominated vegetation:

1. 3111, non-native grass (crested wheatgrass).
2. 3130, very low cover and production grass.
3. 3140, low cover and production grass.
4. 3150, low/moderate cover and production grass.
5. 3160, moderate/high cover and production grass.
6. 3170, high cover and production grass.

The five cover and production classes were derived from measures of Modified Normalized Vegetation Index (MNDVI), which is correlated to biomass. To associate the six cover classes to dominance types, assumptions about production and foliar and ground cover properties relationships between dominance types and the cover classes were used. These correlations are based on knowledge about spectral relationships to foliar cover (represented by dominance types), bare soil, and biomass. These assumptions will be validated at a later date against the data by comparing the frequency of plots representing the dominance types and their occurrence within each grass cover class.

The following table displays the assumed relationships between grass cover classes and dominance types and associated vegetation and bare soil attributes.

Table B-9. Attributes for Cover Classes and Dominance Types.

Grass Cover Class	Assumed Cover Class Attributes	Dominance Type Correlations	Assumed Dominance Type Attributes
3111	Moderate to high production and cover	crested wheatgrass	Production > 1000 lb / ac; bare ground < 10%
3130	Very low production and low foliar cover and high bare soil.	Short grass species are dominant and co-dominant. 1. blue grama-threadleaf sedge 2. clubmoss-blue grama 3. blue grama-clubmoss	Production < 500 lb / ac; bare ground > 10%.
3140	Low foliar cover and low production, moderate to high bare soil.	Short grass species are dominant and mid grass species are co-dominant. 1. blue grama-western wheatgrass 2. threadleaf sedge-needle and thread 3. blue grama-needle and thread	Production < 500 lb / ac. bare ground < 10%
3150	Low to moderate foliar cover, low bare soil, low / moderate production.	Mid grass species dominant and short grass species are co-dominant. 1. western wheatgrass-blue grama 2. needle and thread-blue grama 3. green needle grass-needle leaf sedge 4. needle and thread-threadleaf sedge	Production 500-1000 lb / ac; bare ground < 10%
3160	Moderate to high foliar cover and production, low to no bare soil.	Mid grass species dominant and co-dominant except warm season species where a short grass species is co-dominant 1. western wheatgrass-green needlegrass 2. green needlegrass-western wheatgrass 3. western wheatgrass-needle and thread 4. plains reedgrass-threadleaf sedge 5. little bluestem-threadleaf sedge 6. sand bluestem-sideoats grama	Production > 1000 lb / ac; bare ground < 10%
3170*****	High cover and production low to no bare soil	Tall grass species dominant and co-dominant. 1. big bluestem-little bluestem	Production > 1500 lb / ac; no bare soil

***** Applies to Sheyenne NG only.

Potential Vegetation Composition

This is a derived GIS layer used to predict the spatial distribution of biophysical environments associated with habitat types across the three grassland units. It is not a vegetation map in the traditional sense. It represents biophysical settings associated with a habitat type based on moisture / temperature gradients across the landscape, which are a function of soil properties, climate, and vegetation. The potential vegetation environment layer is used with the existing vegetation layer to identify the capability of the land to support the desired vegetation and

make comparisons between existing vegetation and desired vegetation for planning and monitoring purposes. The map is based on 23 soil, climate, terrain and spectral variables that were associated to geo-referenced field data representing habitat types of the three grassland units (Jensen et al 1998). The habitat types used for development of this layer have been described by USDA-FS (1992), Hirsch (1985), Girard (1985), Hanson et al (1984), Hanson and Hoffman (1985), Nelson et al (1985) and USDA-FS (1996). The number of plots used to generate the predicted potential vegetation environment GIS layer are as follows:

Grassland Unit	**No. of Field Plots**
Sheyenne NG	316
Grand / Cedar River NG	324
Little Missouri NG	1285

Nebraska National Forest and Thunder Basin National Grassland

Existing Vegetation Composition

On the Nebraska National Forest units, Natural Resource Conservation Service range analysis methods and ecological site classification methodology (Uresk 1990) has been conducted since 1987 to determine current range condition and composition by vegetation type. Plot data has been collected using these methodologies on the national forest and national grassland units. The plot data is associated with range and ecological sites are stored in a tabular database. On the Thunder Basin National Grassland, an ecological site classification methodology developed by Benkobi and Uresk (1996) was used to determine current conditions on ecological sites.

Potential Vegetation Composition

Potential vegetation composition was derived by utilizing the NRCS technical guide. This guide describes the expected range site vegetation dominance type given the biological site potential and normal moisture year.

Desired Upland Herbaceous Vegetation

The purpose of this document is to give a thorough explanation of how we arrived at our desired future condition for vegetation composition and our rationale for selection of seral stages.

A Forest Service team of wildlife biologists and range conservationists decided to use seral stages as a descriptor for desired and existing vegetation composition. The team included the following individuals: Dan Uresk, Dave Wheeler, Bob Mountain, Clarke McClung, Mike McNeill, Jim Wickel, Dan Svingen, Greg Schenbeck, Tim Byer, Virginia Emly, and Joe Alexander. The group agreed to use the Natural Resource Conservation Service's Handbook for describing seral stages on all of the units except the Bessey and McKelvie Units and the Thunder Basin National Grassland which has peer reviewed and published work on ecological sites .

An interdisciplinary team also established vegetation structure objectives for grassland, sagebrush, and ponderosa pine vegetation types. The amount and diversity of quality habitats for game species, management indicator species, threatened, endangered, and sensitive plant and animal species were the primary factors considered in developing the vegetation structure objectives.

After deciding to use the above listed methodologies, the team worked with a GIS specialist to obtain the breakdown of range sites for each of the national forests and grasslands on the Nebraska National Forest. This data showed the number of acres classified into each specific range site for every unit.

Upon examining this data, it became evident that there were only three to five major range sites for each unit. The rest of the acreages fell into range sites which were a minor component of the landscape (less than 5%). It was assumed at this point that for management purposes at the geographic area scale only the major range sites would be described and therefore would be where we focused our monitoring efforts in the future.

Once the major range sites had been identified for each unit, the Natural Resource Conservation Service range site descriptions were used to extrapolate what we could expect to see in terms of species composition across the landscape. The range site descriptions along with professional knowledge of the transitional states within these range sites were used to break out the seral stages for each unit. Descriptions were then written in a narrative format for each geographic area (GA).

After descriptions had been written for each geographic area, we looked at the structure objectives for each GA. We then related the structure objectives with the seral stage write-ups to determine what would be needed at the GA scale to achieve our structure objectives. Using professional judgment, structure objectives and the knowledge of the management in the areas surrounding these grassland units, we selected the numbers listed in the GA write-ups for desired future condition.

Following the above listed analysis, the write-ups for each GA were sent to the respective Ranger Districts for an interdisciplinary review. The Districts then modified the write-ups using the professional knowledge and expertise of their staffs. Once the desired future condition was determined for each unit, they were forwarded on to the writer/editor for final edits and insertion into the Forest Plan.

Existing condition for the Nebraska National Forest units were determined by using existing data. The data already delineated by range sites was then sent back to the District staff. The staff members then took the definitions of Late, Late Intermediate, Early Intermediate and Early seral stages for each of the GA and applied them to the data sets.

Information used in the development of the matrices came from data already gathered for potential vegetation productivity, structure and composition to provide guidelines or sideboards in determining a mix of upland herbaceous vegetation conditions. In general in the Draft EIS, Matrix A was used with Alternative 1, which would continue the present mix and level of multiple-use activities. Matrix A was also used with Alternative 2 which places emphasis on commodity outputs. Matrices B and C were used with Alternatives 3 and 5, which would place greater emphasis on wildlife habitats, recreation opportunities, and noncommodity services. Matrix D was used with Alternative 4, which would emphasize natural processes and restoration of impaired native ecosystems. The objectives of the matrices were to meet multiple-use objectives and habitat requirements as outlined in Appendix H of the Land and Resource Management Plan. In the Final EIS, other matrices were developed through further analysis and public involvement.

It is not possible to display the percentage of vegetative mix for each vegetation community type as it relates to plant succession. Plant succession is defined as the progressive replacement of plant communities on an ecological site that leads to the climax plant community. The transition pathway of succession is not necessarily linear and may follow alternative pathways rather than follow a single pathway. The field manager must monitor existing vegetation composition and structure conditions to establish the seral stage in relation to the path of succession.

Dakota Prairies National Grassland

The following tables, developed for the DEIS display the desired mix of dominant vegetation types (expressed as a seral stage) and structure based on a management area average potential:

Table B-10. Desired Mix of Vegetation Types for Grand River/Cedar River National Grasslands.

		Structure		
Matrix	**Composition**	**High**	**Moderate**	**Low**
a.	80% late to mid seral stage	10% - 30%	55% - 75%	10% - 20%
b.	85% late to mid seral stage	20% - 30%	50% - 70%	10% - 20%
c.	90% late to mid seral stage	30% - 40%	40% - 60%	10% - 20%
d.	90% late to mid seral stage	35% - 45%	35% - 55%	10% - 20%

For the Grand River / Cedar River National Grasslands, Matrix B is the preferred matrix for this geographic area in the FEIS for desired structure.

Desired seral stages (plant species composition) and vegetation structure across the geographic area are as follows:

Desired Seral Stages - Objective		
Early	Mid	Late
10 to 15%	65 to 75%	15 to 20%

The potential mix of seral conditions within this geographic area (GA) is very diverse due to the influences of precipitation, soil types, and disturbances such as grazing and fire. Descriptions of species dominance / co-dominance associated with early, mid and late seral conditions follow below. Seral stages are aggregated into sites having similar soil texture and / or topographic features; together they provide an overview of the entire GA. Although dune and badland soils / topography are present within this GA, they are not of significant size and would not be discussed further. The following descriptions incorporate information from NRCS Range Site descriptions and Rangeland Cover Types of the United States, Society for Range Management (1994).

Early seral: This seral condition would most commonly occur in and around prairie dog towns, and in isolated areas of high livestock use such as around water developments or concentration areas near fences or natural barriers. This seral condition is important in providing habitat for

prairie dogs and low structure obligate species. These sites often contain large areas where club moss is a dominant floristic feature.

- Sandy soil sites – Dominated by blue grama, sedge, and annual forbs. Mid and tall grass species such as prairie sandreed, needle-and-thread grass, western wheatgrass, and little bluestem are conspicuously absent. Many areas of bare soil can be present.
- Silty soil sites – Dominated by blue grama, annual forbs, fringed sage, and broom snakeweed. Mid and tall grass species such as western wheatgrass, needle-and-thread grass and green needlegrass are conspicuously absent. Many areas of bare soil can be present.
- Clay soil sites – Dominated by blue grama, annual forbs and annual grasses. Mid and tall grass species such as green needlegrass, needle-and-thread grass, western wheatgrass, and little bluestem are conspicuously absent. Many areas of bare soil can be present.
- Shallow soil sites – Dominated by blue grama, annual forbs, and annual grasses. Mid and tall grass species such as little bluestem and western wheatgrass are conspicuously absent. Many areas of bare soil can be present.
- Overflow sites – Dominated by blue grama, annual forbs, and Kentucky bluegrass. Tall and mid grass species such as big bluestem, needle-and-thread grass, and prairie sandreed are conspicuously absent. Water tables are usually lowered and some bare soil can be present.

Mid seral*:* This seral expression can provide opportunities for achieving high structure as it moves toward late seral conditions and mid / tall grass species begin to increase. The species mix found in mid seral conditions is highly variable.

- Sandy soil sites – Blue grama, upland sedges, and Kentucky bluegrass primarily dominate in earlier mid seral conditions although sand dropseed and sideoats grama may be present in limited quantities. Blue grama continues to dominate as movement begins toward the latter stages of mid seral condition where prairie sandreed, needle-and-thread grass, and western wheatgrass begins to replace it as a dominant in the later mid seral condition. High structure can be achieved as this habitat type moves toward late seral conditions.
- Silty soil sites – Blue grama and sedge are primarily dominant in earlier mid seral conditions. These species continue to be present in large amounts as movement begins toward a higher seral condition where little bluestem and prairie junegrass become more prominent in mid seral conditions. Western wheatgrass, needle-and-thread grass, and green needlegrass begin to replace these species as this habitat type moves toward late seral conditions. High structure can be achieved as this habitat type moves toward late seral conditions.
- Clay soil sites – Blue grama and upland sedges primarily dominate in earlier mid seral conditions although buffalo grass, inland saltgrass, and needle grasses can be present in limited quantities. Blue grama continues to be present in large amounts as movement begins toward a higher seral condition where western wheatgrass and green needlegrass begin to appear in the composition. These two species begin to become co-dominant as these sites move toward late seral conditions. High structure can be achieved as this habitat type moves toward late seral conditions.

Mid seral, cont.

- Shallow soil sites – Blue grama dominates early mid seral conditions, with limited occurrences of green needlegrass and needle-and-thread grass. Blue grama continues to be present in large amounts as movement begins toward a higher seral condition with associated increases of green needlegrass and needle-and-thread grass in mid seral conditions. Western wheatgrass, needle-and-thread grass, green needlegrass, and sideoats grama begin to replace blue grama as this habitat type moves toward late seral conditions. High structure can be achieved as this habitat type moves toward late seral conditions.
- Overflow sites – Blue grama and Kentucky bluegrass tend to be more dominant in earlier mid seral conditions. As this type moves to the latter mid seral condition, switchgrass, sideoats grama, prairie sandreed and green needlegrass increase and becomes more prominent. Big bluestem and western wheatgrass begin to replace these species as this habitat type moves toward late seral conditions. High structure can be achieved as this habitat type moves toward late seral conditions.

Late seral: This seral expression provides the best opportunity for achieving high structure objectives on all habitat types.

- Sandy soil sites – Dominated by prairie sandreed, needle-and-thread grass, and little bluestem. Associated species include lesser amounts of sand bluestem, sideoats grama, western wheatgrass, and sand dropseed. In some areas big bluestem can be an important component and blue grama may be present in limited (less than 10% by composition) quantities.
- Silty soil sites – Dominated by western wheatgrass, needle-and-thread grass, and green needle grass. Associated species include lesser amounts of little bluestem, sedge and prairie junegrass. This seral condition also may contain limited (less than 10% by composition) occurrence of blue grama.
- Clay soil sites – Dominated by western wheatgrass, needle-and-thread grass, and green needlegrass. Contains lesser amounts of buffalo grass, needleleaf sedge, and inland saltgrass. On thinner clay sites this seral condition may also contain limited (10-15% by composition) occurrence of blue grama.
- Shallow soil sites – Dominated by little bluestem. Associated species include lesser amounts of western wheatgrass, sideoats grama, needle-and-thread grass, and green needlegrass. On very shallow soils, blue grama and needle-and-thread grass dominate. This seral condition may also contain limited (less than 10% by composition) occurrence of blue grama.
- Overflow sites – Dominated by big bluestem and western wheatgrass. Associated species include lesser amounts of prairie sandreed, green needlegrass, sideoats grama, and switchgrass.

Desired Structure Objectives		
Low	Moderate	High
10 to 20%	50 to 70%	20 to 30%

High vegetation structure can be achieved on moderate and highly productive grasslands dominated by mid and / or tall grasses (late or moderate-late seral stages). Grasslands on

moderate to highly productive soils but in a low seral condition and dominated by short-stature plant species generally do not have the capability to provide high vegetation structure. Management changes would be necessary to move some existing seral conditions toward a higher seral condition to meet structure objectives.

Prairie dog colonies provide low structure, as do grassland areas grazed by livestock at high intensities. Low vegetation structure can result from a dominance of low stature plant species in an early seral condition or from heavy utilization of mid and tall grasses typical of high mid to high seral conditions.

Table B-11. Desired Mix of Vegetation Types for Little Missouri National Grassland.

		Structure		
Matrix	**Composition**	**High**	**Moderate**	**Low**
a.	80% late to mid seral stage	10% - 20%	60% - 80%	10% - 20%
b.	85% late to mid seral stage	20% - 35%	45% - 70%	10% - 20%
d.	90% late to mid seral stage	40% - 60%	25% - 45%	10% - 20%
g.	80% late to mid seral stage	20% - 30%	50% - 70%	10% - 20%

For the Little Missouri National Grassland, matrix g is the preferred matrix for the Badlands and Rolling Prairie Geographic areas in the FEIS .

For the Badlands Geographic area, the desired seral stages (plant species composition) and vegetation structure across the geographic area are as follows:

Desired Seral Stages - Objective		
Early	Mid	Late
10-15%	65-75%	15-20%

The potential mix of seral conditions within this Geographic Area (GA) is very diverse, due to the influence of precipitation, soil types, and disturbances such as grazing and fire. Descriptions of species dominance / co- dominance associated with early, mid, and late seral conditions follow below. Seral stages are aggregated into sites having similar soil texture and / or topographic features. Together they provide an overview of the entire GA. These descriptions incorporate information from the NRCS Range Site descriptions and *Rangeland Cover Types of the United States* (Society for Range Management 1994).

Early seral: This seral condition would most commonly occur in and around prairie dog towns, and in areas of intensive livestock use such as around water developments or concentration areas near fences or natural barriers. This seral condition is important in providing habitat for prairie dogs and low structure obligate species.

- Steep south and west aspect slopes (all soil types) – Primarily short grasses such as blue grama and buffalo grass along with upland sedges, fringed sage, annual forbs and shrubs. Mid and tall grass species such as western wheatgrass, needle-and-thread grass, and prairie sandreed are conspicuously absent.

Early seral, cont.

- Moderate slopes (less than 35% on all soil types) – Primarily short grasses such as blue grama and buffalo grass along with upland sedges, fringed sage, annual forbs and shrubs. Mid and tall grass species such as western wheatgrass, needle-and-thread grass, and green needlegrass, are conspicuously absent. Occurrences of bare soil can increase significantly from late or mid seral conditions.
- Saline lowland sites (fine textured soils) – Primarily large increases of inland saltgrass, with varying amounts of foxtail barley, mat muhly, silverweed cinquefoil, and other annual forbs. Mid and tall grass species such as Nuttall alkaligrass, western wheatgrass, and slender wheatgrass are conspicuously absent.

Mid seral: This seral expression can provide opportunity for achieving high structure as it moves toward late seral conditions and mid/tall grass species begin to increase. The species mix found in mid seral conditions is highly variable.

- Steep south and west aspect slopes (all soil types) – Species composition is highly variable with blue grama, Sandberg bluegrass, and upland sedges dominating in the early mid seral condition. In the early mid seral condition, blue grama dominates on these sites. As the seral condition improves, blue grama would decrease and western wheatgrass along with needle-and-thread begins to dominate this seral condition.
- Moderate slopes (less than 35% on all soil types) – Species composition is highly variable with blue grama, buffalo grass, Sandberg bluegrass, and upland sedges dominating the early mid seral conditions on clay soils and blue grama, sand dropseed, and upland sedges dominating the early mid seral condition on sandy soils. As the seral condition improves, those species decrease and western wheatgrass and needle-and-thread grass begin to dominate this seral condition.
- Saline lowland sites (fine textured soils) – Inland saltgrass increases as seral condition moves downward to the point where it is very dominant in early seral conditions. Inland saltgrass begins to decrease while Nuttall alkaligrass, alkali cordgrass, western wheatgrass and slender wheatgrass begin to increase and gradually dominate these sites as movement is made toward a higher seral condition.

Late seral: This seral expression provides the best opportunity for achieving high structure objectives especially on the moderate slopes.

- Steep south and west aspect slopes (all soil types) – Primarily western wheatgrass, needle-and-thread grass, little bluestem, and blue grama. Important associated species include plains muhly, red threeawn, sideoats grama, and upland sedges. For this seral condition, western wheatgrass and needle-and-thread grass are the dominant/co-dominant species on these sites.
- Moderate slopes (less than 35% on all soil types) – Primarily western wheatgrass, needle-and-thread grass, prairie sandreed, and sand bluestem. Important associated species include Sandberg bluegrass, sand dropseed, needleleaf sedge, and buffalograss on clay sites and Canada wild rye, prairie junegrass, and upland sedges on sandy sites. For this seral condition, western wheatgrass and needle-and-thread grass are the dominant/co-dominant species on these sites.

- Saline lowland sites (fine textured soil types) – Primarily Nuttall alkaligrass, slender wheatgrass, alkali cordgrass, western wheatgrass, and very limited amounts of inland saltgrass. Important associated species include plains bluegrass, alkali sacaton, and mat muhly.

Desired Structure Objectives

Low	Moderate	High
10-20%	50-70%	20-30%

High vegetation structure can be achieved on moderate and highly productive grasslands dominated by mid and/or tall grasses (latter stages of mid seral and late seral stages). Grasslands on moderate to highly productive soils but in a low seral condition and dominated by short-stature plant species generally do not have the capability to provide high vegetation structure. Management actions may be necessary to improve some existing seral conditions to meet structure objectives.

Prairie dog colonies provide low structure, as do grassland areas intensively grazed by livestock. Low vegetation structure can result from a dominance of low stature plant species in an early seral condition or from heavy utilization of mid and tall grasses typical of high mid to high seral conditions.

For the Rolling Prairie Geographic area in the Little Missouri National Grasslands, the desired seral stages (plant species composition) and vegetation structure across the Geographic area are as follows:

Desired Seral Stages Objectives

Early	Mid	Late
10-15%	65-75%	15-20%

The potential mix of seral conditions within this geographic area is very diverse due to the influences of precipitation, soil types, and disturbances such as grazing and fire. Descriptions of species dominance/co-dominance associated with early, mid and late seral conditions follow below. Seral stages are aggregated into sites having similar soil texture and/or topographic features; together they provide an overview of the entire GA. These descriptions incorporate information from the NRCS Range Site descriptions and Rangeland Cover Types of the United States, Society for Range Management (1994).

Early seral: This seral condition would most commonly occur in and around prairie dog towns, and in areas of intensive livestock use such as around water developments or concentration areas near fences or natural barriers. This seral condition is important in providing habitat for prairie dogs and low structure obligate species. These sites often contain large areas where club moss is a dominant floristic feature.

- Sandy soil sites (deeper soil development) - Dominated by blue grama, threadleaf sedge, sun sedge, and gray sagewort. Mid and tall grass species such as western wheatgrass, needle-and-thread grass, sand bluestem, and little bluestem are conspicuously absent. Many areas of bare soil can be present.

Early seral, cont.

- Clay soil sites (deeper soil development) - Dominated by blue grama, threadleaf sedge, fringed sage, and broom snakeweed. Mid and tall grass species such as western wheatgrass, needle-and-thread grass, and prairie junegrass are conspicuously absent. Many areas of bare soil can be present.
- Shallow soil sites (primarily loam and sandy loam soil textures) – Dominated by blue grama, threadleaf sedge, fringed sage, cactus and red threeawn. Mid and tall grass species such as western wheatgrass, needle-and-thread grass, plains muhly, and sideoats grama are conspicuously absent. Many areas of bare soil can be present.
- Overflow sites (primarily clay and clay loam soil textures) – Dominated by blue grama, sedges, annual forbs, and Kentucky bluegrass. Tall and mid grass species such as big bluestem, needle-and-thread grass, and green needlegrass are conspicuously absent. Many areas of bare soil can be present.

Mid seral: This seral expression can provide opportunity for achieving high structure as it moves toward late seral conditions and mid / tall grass species begin to increase. The species mix found in mid seral conditions is highly variable.

- Sandy soil sites (deeper soil development) – Blue grama, upland sedges, and Kentucky bluegrass primarily dominate in earlier mid seral conditions. These species continue to be present in large amounts as movement begins toward a higher seral condition where big bluestem, green needlegrass, and western wheatgrass begin to replace those species. High structure can be achieved as this habitat type moves toward late seral conditions.
- Clay soil sites (deeper soil development) – Blue grama, threadleaf sedge, sun sedge and hairy grama primarily dominate in earlier mid seral conditions. These species continue to be present in large amounts as movement begins toward a higher seral condition where Sandberg bluegrass and upland sedges become a co-dominant in mid seral conditions. Western wheatgrass, needle-and-thread grass, green needlegrass begin to dominate as this habitat type moves toward late seral conditions. High structure can be achieved as this habitat type moves toward late seral conditions.
- Shallow soil sites (primarily loam and sandy loam soil textures) – Blue grama and threadleaf sedge primarily dominate in earlier mid seral conditions. These species continue to be present in large amounts as movement begins toward a higher seral condition where Sandberg bluegrass becomes a co-dominant in mid seral conditions. Western wheatgrass, needle-and-thread grass, plains muhly, and sideoats grama begin to replace these species as this habitat type moves toward late seral conditions. High structure can be achieved as this habitat type moves toward late seral conditions.
- Overflow sites (primarily clay and clay loam soil textures) – Blue grama and fescue sedge tend to be more dominant in earlier mid seral conditions. As this type moves to the latter mid seral condition, western wheatgrass increases and becomes a co-dominant. Big bluestem, needle-and-thread grass, and green needlegrass begin to replace these species as this habitat type moves toward late seral conditions. High structure can be achieved as this habitat type moves toward late seral conditions.

Late seral: This seral expression provides the best opportunity for achieving high structure on all habitat types.

- Sandy soil sites (deeper soil development) – Primarily prairie sandreed, needle-and-thread grass, sand bluestem, and little bluestem. Associated species include lesser amounts of prairie junegrass, western wheatgrass, and sand dropseed.
- Clay soil sites (deeper soil development) – Primarily western wheatgrass, needle-and-thread grass, green needle grass, and prairie junegrass. Associated species include lesser amounts of inland saltgrass, Sandberg bluegrass, and buffalo grass.
- Shallow soil sites (primarily loam and sandy loam soil textures) – Primarily western wheatgrass, needle-and-thread grass, and plains muhly. Associated species include lesser amounts of prairie junegrass, little bluestem, upland sedges, and sideoats grama.
- Overflow sites (primarily clay and clay loam soil textures) – Primarily big bluestem, needle-and-thread grass, and green needlegrass. Associated species include lesser amounts of western wheatgrass, porcupine grass, bearded wheatgrass, and thickspike wheatgrass. Forbs comprise approximately 10% of this habitat type in late seral condition. Typical species include Rydberg's sunflower, tall goldenrod, and tall white aster.

Desired Structure Objectives

Low	Moderate	High
10-20%	50-70%	20-30%

High vegetation structure can be achieved on moderate and highly productive grasslands dominated by mid and / or tall grasses (latter mid seral or late seral stages). Grasslands on moderate to highly productive soils but in a low seral condition and dominated by short-stature plant species generally do not have the capability to provide high vegetation structure. Management actions may be necessary to improve some existing seral conditions to meet structure objectives.

Prairie dog colonies provide low structure, as do grassland areas intensively grazed by livestock. Low vegetation structure can result from a dominance of low stature plant species in an early seral condition or from heavy utilization of mid and tall grasses typical of high mid to high seral conditions.

The height and density of grasses, forbs and sedges in the understory of sagebrush stands are important factors influencing structure for several wildlife species. The relationship of structure to quality nesting habitat for sage grouse is described in Appendix H.

Table B-12. Desired Mix of Vegetation Types for Sheyenne National Grassland.

Matrix	Composition	Structure High	Structure Moderate	Structure Low
a.	80% late to mid seral stage	10% - 20%	60% - 80%	10% - 20%
b.	85% late to mid seral stage	10% - 30%	55% - 75%	10% - 20%
c.	90% late to mid seral stage	20% - 30%	50% - 70%	10% - 20%
d.	90% late to mid seral stage	50% - 70%	20% - 40%	0% - 20%
g.	80% late to mid seral stage	30% - 40%	50% - 65%	5% - 10%

For the Sheyenne National Grassland, Matrix G is the preferred matrix for this Geographic area in the FEIS

For the Sheyenne Geographic area, the desired seral stages (plant species composition) and vegetation structure across the GA are as follows:

Desired Seral Stages Objectives		
Early	Mid	Late
5-10%	50-65%	30-40%

The potential mix of seral conditions within this GA is very diverse. Although topographic relief is minimal, the extremes in available moisture in the predominately sandy soils of this GA provide distinct vegetation changes within short distances. Although management such as prescribed fire and livestock grazing can have a significant influence on vegetation composition, hydrologic and topographic features such as sand dunes and depressions are the primary influence on floristic composition within the GA.

Blowout areas may be present in the sandy and sand soil sites during any of the seral conditions described below, but are generally more extensive in early seral stages.

Descriptions of species dominance/co-dominance associated with early, mid and late seral conditions are as follows below. Seral stages are aggregated into sites having similar soil texture and/or topographic features; together they provide an overview of the entire GA. These descriptions incorporate information from NRCS Range Site descriptions and Rangeland Cover Types of the United States, Society for Range Management, 1994. It is important to note that the species composition and characterization of wetlands represents ecological condition as opposed to classic seral condition descriptions.

Early seral: Early seral conditions are a natural component of these highly erodible sandhills. Sparsely vegetated dunes in healthy condition provide important habitat for species dependent on early seral conditions. This seral condition would most commonly occur in and around areas of intensive livestock use such as around water developments or concentration areas near fences or natural barriers. This seral condition is important in providing habitat for Richardson's ground squirrel and other low structure obligate species.

- Sandy and sand soil sites in undulating prairie topography – In early seral conditions, blue grama, and annual forbs dominate. Mid and tall grass species are conspicuously absent. Blowout areas are common and would increase in size without changes in management to move them toward a higher seral condition.
- Sandy and sand soil sites in choppy sandhills topography – In early seral conditions Kentucky bluegrass, blue grama, sun sedge, and annual forbs such as western ragweed dominate. Mid and tall grass species are conspicuously absent. Western snowberry can be dominate in early seral conditions. Blowout areas are common and would increase in size without management actions to move them toward a higher seral condition.
- Midsites in all topographies – In early seral condition Kentucky bluegrass, sun sedge and blue grama dominate the composition. Forbs such as ragweed, goldenrod, and hoary vervain are prevalent. Blowout areas may occur and would increase in size without management actions to move them toward a higher seral condition.
- Wet meadows (sub irrigated but can be seasonably flooded) – In the early seral condition, Kentucky bluegrass, foxtail barley and Baltic rush dominate. The water table drops in early seral condition creating areas of bare soil dominated by annual forbs.
- Wetlands (water tables at the soil surface with portions continually flooded) – In early seral conditions, Kentucky bluegrass, fowl bluegrass, foxtail barley, and Baltic rush dominate. Water tables drop earlier in the season and there are large areas of bare soil dominated by annual forbs for most of the year.

Mid seral: This seral expression can provide opportunity for achieving high structure as it moves toward late seral conditions and mid / tall grass species begin to increase. The species mix found in mid seral conditions is highly variable.

- Sandy and sand soil sites in undulating prairie topography – In the early stages of this seral condition blue grama, Kentucky bluegrass, western yarrow, western ragweed and goldenrod can be present with very limited occurrences of sand dropseed, sun sedge, and prairie junegrass. As this type moves toward late seral conditions, sand dropseed and blue grama can increase while prairie sandreed, needle-and-thread grass, and little bluestem begin to reappear. In the latter stages of mid seral condition, sand dropseed and hairy grama begin to decrease while prairie sandreed, needle-and-thread grass, little bluestem, and porcupine grass increase. Kentucky bluegrass and blue grama may still be present in moderate amounts in the latter stages of mid seral conditions.
- Sandy and sand soil sites in choppy sandhills topography – In the earlier stages of mid seral condition, Kentucky bluegrass, sun sedge, and hairy grama can dominate. Curlycup gumweed may also dominate in the early stages of mid seral condition. As this type moves toward late seral conditions sideoats grama and needle-and-thread grass begin to reappear through the latter stages of mid seral condition, when prairie sandreed and sand bluestem also begin to reappear and become more visually prominent. Kentucky bluegrass and blue grama can still be present in moderate amounts.

Mid seral, cont.

- Midsites in all topographies – In the earlier stages of mid seral condition Kentucky bluegrass, sun sedge, and blue grama mostly dominate the composition. As this type moves toward late seral conditions these species decrease and tall grass species such as big bluestem, indiangrass and switchgrass begin to reappear. In the latter stages of mid seral conditions, those species become a more conspicuous part of the composition and sun sedge and blue grama begin to disappear although they still can be a dominant portion of the composition.
- Wet meadows (sub irrigated but can be seasonally flooded) – In the earlier stages of mid seral conditions, fowl bluegrass, fescue sedge, common spike sedge, Baltic rush, and Kentucky bluegrass dominate. As this type moves toward late seral conditions northern reedgrass and switchgrass begin to reappear. In the latter stages of mid seral conditions, those species begin to dominate and Kentucky bluegrass, fowl bluegrass, and Baltic rush begin to become less evident and northern reedgrass, switchgrass, and woolly sedge begin to dominate.
- Wetlands (water tables at the soil surface with intermingled open water) – In the earlier stages of mid seral conditions, fowl bluegrass, common spike sedge, Baltic rush, and Kentucky grass dominate. As this type moves toward late seral conditions prairie cordgrass and slough sedge begin to become more evident. In latter stages of mid seral conditions, those species begin to dominate and Kentucky bluegrass, fowl bluegrass, and Baltic rush begin to become less evident.

Late seral: This seral expression provides the best opportunity for achieving high structure objectives on all habitat types.

- Sandy and sand soil sites in undulating prairie topography – This type is dominated by prairie sandreed, needle-and-thread grass, and prairie Junegrass. Associated species include little bluestem, porcupine grass, sand lovegrass, and blue grama. On less coarse sandy sites, forbs can be an important component (up to 15% by composition) including purple prairie clover, penstemon, and dotted gayfeather. On coarser sand sites, shrubs can also be an important component (up to 10% by composition) including western snowberry, leadplant, and prairie rose.
- Sandy and sand soil sites in choppy sandhills topography – This type is dominated by sand bluestem, prairie sandreed, and needle-and-thread grass. Associated species include sideoats grama, Canada wild rye, and little bluestem. This type also supports a diverse forb life form in late seral conditions including penstemon, stiff sunflower, and prairie spiderwort. Shrubs and tree may be visually conspicuous across the landscape including western snowberry, sumac, leadplant, chokecherry, scattered bur oak, and small clumps of aspen in favored sites.
- Midsites in all topographies – This type is dominated by big bluestem, switchgrass, northern reedgrass, indiangrass, and to a lesser extent, little bluestem. Scattered forbs can include penstemon, large gayfeather, and white prairie clover. This site in late seral conditions provides excellent opportunity for quality prairie chicken nesting habitat.
- Wet meadows (sub irrigated but can be seasonally flooded) –This type is dominated by switchgrass, northern reedgrass, and wooly sedge. This site in late seral conditions can also contain a diverse number of forbs including the western prairie fringed orchid, a federally listed species. Willows can be a component of this type.

- Wetlands (water tables at the soil surface with portions continually flooded) – Extreme yearly and seasonal fluctuations in water depth are characteristic of wetlands. These water fluctuations result in plant composition shifts that may be beyond the influence of specific management activities. Typically, this type can be dominated by prairie cordgrass and several sedge species. Associated species include cattails and bulrushes along the edge of open flooded depressions. Baltic rush can be found in limited quantities, associated primarily with the edge of open water.

Desired Structure Objectives

Low	Moderate	High
5-10%	50-65%	30-40%

High vegetation structure can be achieved on those portions of the GA that are dominated by mid and / or tall grasses (late or the latter stages of mid seral condition). Grasslands on moderate to highly productive soils but in a low seral or ecological condition and dominated by short-stature plant species generally do not have the capability to provide high vegetation structure. Management actions may be necessary to move some existing seral conditions toward a higher seral condition to meet structure objectives. In many cases, this change may be fairly rapid and easy to achieve (mid seral conditions), while for other cases, it may take years or decades to accomplish (low and early mid seral conditions).

Grassland areas intensively grazed by livestock over extended time periods, provide low structure. Low vegetation structure can result from a dominance of low stature plant species in an early seral or low ecological condition or from heavy utilization of mid and tall grasses typical of high mid to high seral conditions. These sites are especially important for Richardson's ground squirrel and other low structure obligate species.

Eliminate non-native trees outside developed and identified high-use dispersed recreation areas within 20 years.

Thunder Basin National Grasslands

Table B-13. Desired Mix of Vegetation Types for Thunder Basin National Grassland, Mixed-grass Prairie.

		Structure		
Matrix	**Composition**	**High**	**Moderate**	**Low**
a.	80% late to mid seral stage	10% - 20%	50% - 70%	20% - 30%
b.	85% late to mid seral stage	15% - 25%	55% - 75%	15% - 25%
c.	90% late to mid seral stage	30% - 40%	40% - 60%	10% - 20%
d.	90% late to mid seral stage	40% - 60%	30% - 50%	5% - 15%
g.	70% late thru early intermediate seral stage	30% - 40%	40% - 50%	15% - 25%
h.	55% late thru early intermediate seral stage	30% - 40%	25% - 35%	30% - 40%

Matrix	Composition	Structure High	Moderate	Low
i.	70% late thru early intermediate seral stage	25% - 35%	45% - 55%	15% - 25%
j.	70% late thru early intermediate seral stage	35% - 45%	35% - 45%	15% - 25%
k.	70% late thru early intermediate seral stage	30% - 40%	45% - 55%	10% - 20%

In the DEIS, late to mid seral stage is a combination of these dominant vegetation types 1) green needlegrass, western wheatgrass, 2) western wheatgrass, blue grama, 3) western wheatgrass, buffalo grass, blue grama.

In the FEIS, the seral stages on the Thunder Basin National Grasslands were expanded from early, mid and late seral stages to early, early intermediate, late intermediate, and late seral stage.

On the Thunder Basin National Grassland, the preferred matrix in the FEIS for each Geographic Area is as follows:

- Broken Hills GA matrix g
- Cellars Rosecrans GA matrix h
- Fairview Clareton GA matrix i
- Hilight Bill GA matrix i
- Spring Creek GA matrix j
- Upton Osage GA matrix k

Desired seral stages (plant species composition) and vegetation structure (Plan Appendix I) across the Broken Hills geographic area of the Thunder Basin National Grassland are as follows:

Desired Seral Stages - Objective

Late	Late Intermediate	Early Intermediate	Early
15 to 25%	30 to 40%	25 to 35%	10 to 30%

Across the landscape, grass and sagebrush are intermingled. In some areas, grasses are the dominant species; in other areas, sagebrush is the dominant species. The vegetation composition varies depending on seral stage.

In grass-dominated communities in mid to late seral stages, the dominant native grass species are western wheatgrass, needle and thread grass, green needlegrass, and little bluestem. In grass-dominated sites in early to mid seral stages, grasses such as blue grama often dominate. Threeawn and blue grama are commonly the dominant grasses on prairie dog colonies in early seral stage.

In sagebrush-dominated communities, there is more sagebrush in the mid to late seral stages than in early to mid seral stages. As the community moves from early to late seral stage, the percentage of grasses declines. In the understory, the dominant native plant species are western wheatgrass and green needlegrass.

Desired Vegetation Structure (Objective)

High	Moderate	Low
30 to 40%	40 to 50%	15 to 25%

High vegetation structure can be achieved on moderate and highly productive grasslands dominated by mid grasses (late or late intermediate seral stages). Grasslands on moderate to highly productive soils but in an early seral condition and dominated by short-stature plant species generally do not have the capability to provide high vegetation structure. Management changes may be necessary to move some existing seral conditions toward a higher seral condition to meet structure objectives.

Prairie dog colonies provide low structure, as do grassland areas grazed by livestock at high intensities. Low vegetation structure can result from a dominance of low stature plant species or from heavy utilization of mid grasses.

The height and density of grasses, forbs and sedges in the understory of sagebrush stands are important factors influencing structure for several wildlife species. The relationship of structure to quality nesting habitat for sage grouse is described in Appendix H. Appendix H describes quality nesting as sagebrush understories with residual herbaceous cover averaging at least 7 inches in height. This objective is primarily provided when sagebrush habitat types are in a late seral condition.

Desired seral stages (plant species composition) and vegetation structure (Plan Appendix I) across the Cellars Rosecrans geographic area of the Thunder Basin National Grassland are as follows:

Desired Seral Stages - Objective

Late	Late Intermediate	Early Intermediate	Early
10 to 20%	20 to 30%	25 to 35%	25 to 35%

Across the landscape, grass and sagebrush are intermingled. In some areas, grasses are the dominant species; in other areas, sagebrush is the dominant species. The vegetation composition varies depending on seral stage.

In grass-dominated communities in mid to late seral stages, the dominant native grass species are western wheatgrass, needle and thread grass, green needlegrass, and little bluestem. In grass-dominated sites in early to mid seral stages, grasses such as blue grama often dominate. Threeawn and blue grama are commonly the dominant grasses on prairie dog colonies in early seral stage.

In sagebrush-dominated communities, there is more sagebrush in the mid to late seral stages than in early to mid seral stages. As the community moves from early to late seral stage, the percentage of grasses declines. In the understory, the dominant native plant species are western wheatgrass and green needlegrass.

Desired Vegetation Structure - Objective

High	Moderate	Low
30 to 40%	25 to 35%	30 to 40%

High vegetation structure can be achieved on moderate and highly productive grasslands dominated by mid grasses (late or late intermediate seral stages). Grasslands on moderate to highly productive soils but in an early seral condition and dominated by short-stature plant species generally do not have the capability to provide high vegetation structure. Management changes may be necessary to move some existing seral conditions toward a higher seral condition to meet structure objectives.

Prairie dog colonies provide low structure, as do grassland areas grazed by livestock at high intensities. Low vegetation structure can result from a dominance of low stature plant species or from heavy utilization of mid grasses.

The height and density of grasses, forbs and sedges in the understory of sagebrush stands are important factors influencing structure for several wildlife species. The relationship of structure to quality nesting habitat for sage grouse is described in Appendix H. Appendix H describes quality nesting as sagebrush understories with residual herbaceous cover averaging at least 7 inches in height. This objective is primarily provided when sagebrush habitat types are in a late seral condition.

Desired seral stages (plant species composition) and vegetation structure (Plan Appendix I) across the Fairview Clareton geographic area of the Thunder Basin National Grassland are as follows:

Desired Seral Stages - Objective

Late	Late Intermediate	Early Intermediate	Early
10 to 20%	30 to 40%	30 to 40%	10 to 20%

Across the landscape, grass and sagebrush are intermingled. In some areas, grasses are the dominant species; in other areas, sagebrush is the dominant species. The vegetation composition varies depending on seral stage.

In grass-dominated communities in mid to late seral stages, the dominant native grass species are western wheatgrass, needle and thread grass, green needlegrass, and little bluestem. In grass-dominated sites in early to mid seral stages, grasses such as blue grama often dominate. Threeawn and blue grama are commonly the dominant grasses on prairie dog colonies in early seral stage.

In sagebrush-dominated communities, there is more sagebrush in the mid to late seral stages than in early to mid seral stages. As the community moves from early to late seral stage, the percentage of grasses declines. In the understory, the dominant native plant species are western wheatgrass and green needlegrass.

Desired Vegetation Structure - Objective

High	Moderate	Low
25 to 35%	45 to 55%	15 to 25%

High vegetation structure can be achieved on moderate and highly productive grasslands dominated by mid grasses (late or late intermediate seral stages). Grasslands on moderate to highly productive soils but in an early seral condition and dominated by short-stature plant species generally do not have the capability to provide high vegetation structure. Management changes may be necessary to move some existing seral conditions toward a higher seral condition to meet structure objectives.

Prairie dog colonies provide low structure, as do grassland areas grazed by livestock at high intensities. Low vegetation structure can result from a dominance of low stature plant species or from heavy utilization of mid grasses.

The height and density of grasses, forbs and sedges in the understory of sagebrush stands are important factors influencing structure for several wildlife species. The relationship of structure to quality nesting habitat for sage grouse is described in Appendix H. Appendix H describes quality nesting as sagebrush understories with residual herbaceous cover averaging at least 7 inches in height. This objective is primarily provided when sagebrush habitat types are in a late seral condition.

Desired seral stages (plant species composition) and vegetation structure (Plan Appendix I) across the Hilight Bill geographic area of the Thunder Basin National Grassland are as follows:

Desired Seral Stages - Objective

Late	Late Intermediate	Early Intermediate	Early
10 to 20%	30 to 40%	30 to 40%	10 to 20%

Across the landscape, grass and sagebrush are intermingled. In some areas, grasses are the dominant species; in other areas, sagebrush is the dominant species. The vegetation composition varies depending on seral stage.

In grass-dominated communities in mid to late seral stages, the dominant native grass species are western wheatgrass, needle and thread grass, green needlegrass, and little bluestem. In grass-dominated sites in early to mid seral stages, grasses such as blue grama often dominate. Threeawn and blue grama are commonly the dominant grasses on prairie dog colonies in early seral stage.

In sagebrush-dominated communities, there is more sagebrush in the mid to late seral stages than in early to mid seral stages. As the community moves from early to late seral stage, the percentage of grasses declines. In the understory, the dominant native plant species are western wheatgrass and green needlegrass.

Desired Vegetation Structure (Objective)

High	Moderate	Low
25 to 35%	45 to 55%	15 to 25%

High vegetation structure can be achieved on moderate and highly productive grasslands dominated by mid grasses (late or late intermediate seral stages). Grasslands on moderate to highly productive soils but in an early seral condition and dominated by short-stature plant species generally do not have the capability to provide high vegetation structure. Management changes may be necessary to move some existing seral conditions toward a higher seral condition to meet structure objectives.

Prairie dog colonies provide low structure, as do grassland areas grazed by livestock at high intensities. Low vegetation structure can result from a dominance of low stature plant species or from heavy utilization of mid grasses.

The height and density of grasses, forbs and sedges in the understory of sagebrush stands are important factors influencing structure for several wildlife species. The relationship of structure to quality nesting habitat for sage grouse is described in Appendix H. Appendix H describes quality nesting as sagebrush understories with residual herbaceous cover averaging at least 7 inches in height. This objective is primarily provided when sagebrush habitat types are in a late seral condition.

Desired seral stages (plant species composition) and vegetation structure (Plan Appendix I) across the Spring Creek geographic area of the Thunder Basin National Grassland are as follows:

Desired Seral Stages - Objective

Late	Late Intermediate	Early Intermediate	Early
10 to 20%	30 to 40%	30 to 40%	10 to 20%

Across the landscape, grass and sagebrush are intermingled. In some areas, grasses are the dominant species; in other areas, sagebrush is the dominant species. The vegetation composition varies depending on seral stage.

In grass-dominated communities in mid to late seral stages, the dominant native grass species are western wheatgrass, needle and thread grass, green needlegrass, and little bluestem. In grass-dominated sites in early to mid seral stages, grasses such as blue grama often dominate. Threeawn and blue grama are commonly the dominant grasses on prairie dog colonies in early seral stage.

In sagebrush-dominated communities, there is more sagebrush in the mid to late seral stages than in early to mid seral stages. As the community moves from early to late seral stage, the percentage of grasses declines. In the understory, the dominant native plant species are western wheatgrass and green needlegrass.

Desired Vegetation Structure (Objective)

High	Moderate	Low
35 to 45%	35 to 45%	15 to 25%

High vegetation structure can be achieved on moderate and highly productive grasslands dominated by mid grasses (late or late intermediate seral stages). Grasslands on moderate to highly productive soils but in an early seral condition and dominated by short-stature plant species generally do not have the capability to provide high vegetation structure. Management changes may be necessary to move some existing seral conditions toward a higher seral condition to meet structure objectives.

Prairie dog colonies provide low structure, as do grassland areas grazed by livestock at high intensities. Low vegetation structure can result from a dominance of low stature plant species or from heavy utilization of mid grasses.

The height and density of grasses, forbs and sedges in the understory of sagebrush stands are important factors influencing structure for several wildlife species. The relationship of structure to quality nesting habitat for sage grouse is described in Appendix H. Appendix H describes quality nesting as sagebrush understories with residual herbaceous cover averaging at least 7 inches in height. This objective is primarily provided when sagebrush habitat types are in a late seral condition.

Desired seral stages (plant species composition) and vegetation structure (Plan Appendix I) across the Upton Osage geographic area of the Thunder Basin National Grassland are as follows:

Desired Seral Stages - Objective

Late	Late Intermediate	Early Intermediate	Early
15 to 25%	30 to 40%	25 to 35%	10 to 20%

Across the landscape, grass and sagebrush are intermingled. In some areas, grasses are the dominant species; in other areas, sagebrush is the dominant species. The vegetation composition varies depending on seral stage.

In grass-dominated communities in mid to late seral stages, the dominant native grass species are western wheatgrass, needle and thread grass, green needlegrass, and little bluestem. In grass-dominated sites in early to mid seral stages, grasses such as blue grama often dominate. Threeawn and blue grama are commonly the dominant grasses on prairie dog colonies in early seral stage.

In sagebrush-dominated communities, there is more sagebrush in the mid to late seral stages than in early to mid seral stages. As the community moves from early to late seral stage, the percentage of grasses declines. In the understory, the dominant native plant species are western wheatgrass and green needlegrass.

Desired Vegetation Structure (Objective)

High	Moderate	Low
30 to 40%	45 to 55%	10 to 20%

High vegetation structure can be achieved on moderate and highly productive grasslands dominated by mid grasses (late or late intermediate seral stages). Grasslands on moderate to highly productive soils but in an early seral condition and dominated by short-stature plant species generally do not have the capability to provide high vegetation structure. Management changes may be necessary to move some existing seral conditions toward a higher seral condition to meet structure objectives.

Prairie dog colonies provide low structure, as do grassland areas grazed by livestock at high intensities. Low vegetation structure can result from a dominance of low stature plant species or from heavy utilization of mid grasses.

The height and density of grasses, forbs and sedges in the understory of sagebrush stands are important factors influencing structure for several wildlife species. The relationship of structure to quality nesting habitat for sage grouse is described in Appendix H. Appendix H describes quality nesting as sagebrush understories with residual herbaceous cover averaging at least 7 inches in height. This objective is primarily provided when sagebrush habitat types are in a late seral condition.

Nebraska National Forest And Grassland Units

The major range sites for each of the Nebraska units is as follows:

Unit	Range sites	Acres/Range Site
Bessey	Sands/Choppy Sands	85,700
	Dry Valley	100
McKelvie	Sands/Choppy Sands	107,970
	Dry Valley	6,370
Fall River	Clayey	56,630
	Silty	14,600
	Thin Upland	15,460
Wall	Clayey	15,380
	Silty	24,240
	Dense Clay	9,210
	Shallow Clay	6,860
	Thin Claypan	14,970
Fort Pierre	Clayey	58,590
	Silty	5,430
	Shallow Clay	4,940
	Thin Claypan	3,870
Oglala	Clayey	35,230
	Limy Upland	13,680
	Silty	2,900
	Shallow Clay	20,030
Pine Ridge	Silty	8,970
	Savanna	31,720

Table B-14. Desired Mix of Vegetation Types for Nebraska National Forest Units Ft. Pierre, Buffalo Gap and Oglala National Grasslands, Pine Ridge Unit.*

		Structure		
Matrix	**Composition**	**High**	**Moderate**	**Low**
a.	80% late to mid seral stage	10% - 20%	50% - 70%	20% - 30%
b.	85% late to mid seral stage	20% - 30%	50% - 70%	10% - 20%
c.	90% late to mid seral stage	30% - 40%	40% - 60%	10% - 20%
d.	90% late to mid seral stage	40% - 60%	30% - 50%	0% - 20%
g.	65% late thru early intermediate seral stage	25% - 45%	45% - 65%	1% - 20%
h.	75% late thru early intermediate seral stage	15% - 35%	40% - 60%	15% - 35%

Matrix	Composition	Structure High	Moderate	Low
i.	70% late thru early intermediate seral stage	10% - 30%	50% - 70%	10% - 30%
j.	60% late thru early intermediate seral stage	35% - 45%	35% - 45%	15% - 25%
k.	60% late thru early intermediate seral stage	30% - 40%	35% - 45%	20% - 30%
l.	50% late thru early intermediate seral stage	25% - 35%	35% - 45%	25% - 35%
m.	60% late thru early intermediate seral stage	30% - 50%	30% - 50%	10% - 30%
n.	60% late thru early intermediate seral stage	10% - 20%	65% - 85%	5% - 15%

***** The Pine Ridge Unit and Oglala National Grassland were evaluated the same, as they are one administrative unit.

In the DEIS, late to mid seral stage is a combination of these dominant vegetation types 1) western wheatgrass, green needlegrass, 2) western wheatgrass, green needlegrass, little bluestem, big bluestem, 3) needle-and-thread, buffalo grass, blue grama, 4) western wheatgrass, needle-and-thread, sedge, 5) needle-and-thread, sedge.

In the FEIS, the seral stages for the units on the Nebraska National Forest were expanded from early, mid and late seral stages to early, early intermediate, late intermediate, and late seral stage.

On the Nebraska National Forest and Grassland Units, the preferred matrix in the FEIS for each Geographic Area is as follows:

- Fall River Northeast GA matrix g
- Fall River Southeast GA matrix h
- Fall River West GA matrix i
- Wall North GA matrix j
- Wall Southeast GA matrix k
- Wall Southwest GA matrix l
- Fort Pierre GA matrix m
- Oglala GA matrix i
- Pine Ridge GA matrix m

The following section describes the specific vegetative compositional and structural objectives for the Fall River Northeast Geographic Area:

Composition

The desired plant species composition objective across the geographic area is as follows:

Late Seral	Late Intermediate Seral	Early Intermediate Seral	Early Seral
20 to 40%	40 to 60%	5 to 15%	5 to 10%

The description of the dominant native plant species in the late seral stage is as follows: The more productive soils (clayey, silty, and thin upland soils) should be comprised mainly of midgrasses and to a lesser extent tall grasses. On clayey, silty, and thin upland range sites western wheatgrass, green needlegrass, porcupine grass, sideoats grama, and little bluestem are the primary mid grasses and big bluestem should make up the majority of the tall grass. Tallgrasses such as big bluestem, switchgrass, and prairie sandreed should be expressed in the overflow or run-in sites.

The description of the dominant native plant species in the late intermediate seral stage is as follows: The more productive soils (clayey, silty, and thin upland soils) should be comprised mainly of midgrasses and to a lesser extent shortgrasses. The dominant grass species in the late intermediate seral stage should be western wheatgrass with the codominance made up of needle and thread, porcupine grass, blue grama, and sedges. The mix of grasses making up the codominance in the late intermediate seral stages will fluctuate according to precipitation and / or grazing intensities. Overflow sites will be made up of midgrasses, mainly western wheatgrass and green needlegrass.

The description of the dominant native plant species in the early intermediate seral stage is as follows: The more productive soils (clayey, silty, and thin upland soils) should be comprised mainly of shortgrasses and to a lesser extent midgrasses. The dominant grass species in the early intermediate seral stage should be blue grama, buffalo grass, western wheatgrass, needle and threadgrass, and sedges. The mix of grasses making up the codominance in the early intermediate seral stages will fluctuate according to precipitation and / or grazing intensities. Overflow sites will be made up of midgrasses and shortgrasses; mainly western wheatgrass, needle and thread, and blue grama.

The description of the dominant native plant species in the early seral stage is as follows: The more productive soils (clayey, silty, and thin upland soils) should be comprised mainly of shortgrasses with little if any presence of midgrasses. The early seral stage will be dominated by sedges, and short grasses such as blue grama and buffalograss on all range sites. Overflow sites will be dominated by shortgrasses and to a lesser extent midgrasses. The early seral stage should be emphasized on the less productive claypan soil types, in and around prairie dog towns, and in isolated areas of high livestock use.

Structure

Manage the geographic area to meet the vegetation structure objectives identified below:

High	Moderate	Low
25 to 45%	45 to 65%	1 to 20%

High vegetation structure can be achieved on moderate and highly productive soils dominated by mid and / or tall grasses (late or late intermediate seral stage composition). Grasslands on moderate to highly productive soils but dominated by short statured species generally do not have the capability to provide high vegetation structure unless management is changed to increase the composition of mid to tall grass species over a period of years or decades.

Moderate structure can be achieved on moderate to highly productive soils dominated by mid and / or tall grasses depending on grazing use levels. Grasslands within this geographic area receiving light to moderate levels of livestock use should be in the late or late intermediate seral stage to achieve moderate structure. Grasslands dominated by shortgrass species in the early intermediate or early seral stage will not achieve moderate structure under even light grazing levels.

Low productivity soils, prairie dog colonies, and grassland areas grazed by livestock at high intensities provide low structure. Low vegetation structure can result from a dominance of low stature plant species or from heavy utilization of mid and tall grasses.

See Plan Appendix I for more information on grassland structure.

The following section describes the specific vegetative compositional and structural objectives for the Fall River Southeast Geographic Area:

Composition

The desired plant species composition objective across the geographic area is as follows:

Late Seral	Late Intermediate Seral	Early Intermediate Seral	Early Seral
20 to 30%	40 to 60%	15 to 25%	1 to 10%

The description of the dominant native plant species in the late seral stage is as follows: The more productive soils (clayey, silty, and thin upland soils) should be comprised mainly of midgrasses and to a lesser extent tall grasses. On clayey, silty, and thin upland range sites western wheatgrass, green needlegrass, porcupinegrass, sideoats grama, and little bluestem are the primary mid grasses and big bluestem should make up the majority of the tall grass. Tallgrasses such as big bluestem, switchgrass, and prairie sandreed should be expressed in the overflow or run-in sites.

The description of the dominant native plant species in the late intermediate seral stage is as follows: The more productive soils (clayey, silty, and thin upland soils) should be comprised mainly of midgrasses and to a lesser extent shortgrasses. The dominant grass species in the late intermediate seral stage should be western wheatgrass with the codominance made up of needle and thread, porcupine grass, blue grama, and sedges. The mix of grasses making up the codominance in the late intermediate seral stages will fluctuate according to precipitation and / or grazing intensities. Overflow sites will be made up of midgrasses, mainly western wheatgrass and green needlegrass.

The description of the dominant native plant species in the early intermediate seral stage is as follows: The more productive soils (clayey, silty, and thin upland soils) should be comprised mainly of shortgrasses and to a lesser extent midgrasses. The dominant grass species in the early intermediate seral stage should be blue grama, buffalo grass, western wheatgrass, needle and threadgrass, and sedges. The mix of grasses making up the codominance in the early intermediate seral stages will fluctuate according to precipitation and / or grazing intensities. Overflow sites will be made up of midgrasses and shortgrasses; mainly western wheatgrass,

needle and thread, and blue grama.

The description of the dominant native plant species in the early seral stage is as follows: The more productive soils (clayey, silty, and thin upland soils) should be comprised mainly of shortgrasses with little if any presence of midgrasses. The early seral stage will be dominated by sedges, and short grasses such as blue grama and buffalograss on all range sites. Overflow sites will be dominated by shortgrasses and to a lesser extent midgrasses. The early seral stage should be emphasized on the less productive claypan soil types, in and around prairie dog towns, and in isolated areas of high livestock use.

Structure

Manage the geographic area to meet the vegetation structure objectives identified below:

High	Moderate	Low
15 to 35%	40 to 60%	15 to 35%

High vegetation structure can be achieved on moderate and highly productive soils dominated by mid and / or tall grasses (late or late intermediate seral stage composition). Grasslands on moderate to highly productive soils but dominated by short statured species generally do not have the capability to provide high vegetation structure unless management is changed to increase the composition of mid to tall grass species over a period of years or decades.

Moderate structure can be achieved on moderate to highly productive soils dominated by mid and / or tall grasses depending on grazing use levels. Grasslands within this geographic area receiving light to moderate levels of livestock use should be in the late or late intermediate seral stage to achieve moderate structure. Grasslands dominated by shortgrass species in the early intermediate or early seral stage will not achieve moderate structure under even light grazing levels.

Low productivity soils, prairie dog colonies, and grassland areas grazed by livestock at high intensities provide low structure. Low vegetation structure can result from a dominance of low stature plant species or from heavy utilization of mid and tall grasses.

See Plan Appendix I for more information on grassland structure.

The following section describes the specific vegetative compositional and structural objectives for the Fall River West Geographic Area:

Composition

The desired plant species composition objective across the geographic area is as follows:

Late Seral	Late Intermediate Seral	Early Intermediate Seral	Early Seral
10 to 30%	50 to 70%	10 to 20%	1 to 10%

Grasses: The description of the dominant native plant species in the late seral stage is as follows: The more productive soils (clayey, silty, and thin upland soils) should be comprised mainly of midgrasses and to a lesser extent tall grasses. On clayey, silty, and thin upland range sites western wheatgrass, green needlegrass, porcupine grass, sideoats grama, and little bluestem are the primary mid grasses and big bluestem should make up the majority of the tall grass. Tallgrasses such as big bluestem, switchgrass, and prairie sandreed should be expressed in the overflow or run-in sites.

The description of the dominant native plant species in the late intermediate seral stage is as follows: The more productive soils (clayey, silty, and thin upland soils) should be comprised mainly of midgrasses and to a lesser extent shortgrasses. The dominant grass species in the late intermediate seral stage should be western wheatgrass with the codominance made up of needle and thread, porcupine grass, blue grama, and sedges. The mix of grasses making up the codominance in the late intermediate seral stages will fluctuate according to precipitation and / or grazing intensities. Overflow sites will be made up of midgrasses, mainly western wheatgrass and green needlegrass.

The description of the dominant native plant species in the early intermediate seral stage is as follows: The more productive soils (clayey, silty, and thin upland soils) should be comprised mainly of shortgrasses and to a lesser extent midgrasses. The dominant grass species in the early intermediate seral stage should be blue grama, buffalo grass, western wheatgrass, needle and threadgrass, and sedges. The mix of grasses making up the codominance in the early intermediate seral stages will fluctuate according to precipitation and / or grazing intensities. Overflow sites will be made up of midgrasses and shortgrasses; mainly western wheatgrass, needle and thread, and blue grama.

The description of the dominant native plant species in the early seral stage is as follows: The more productive soils (clayey, silty, and thin upland soils) should be comprised mainly of shortgrasses with little if any presence of midgrasses. The early seral stage will be dominated by sedges, and short grasses such as blue grama and buffalograss on all range sites. Overflow sites will be dominated by shortgrasses and to a lesser extent midgrasses. The early seral stage should be emphasized on the less productive claypan soil types, in and around prairie dog towns, and in isolated areas of high livestock use.

Sagebrush Stands: The dominant native plant species in the understory of big sagebrush stands in the late seral stage is as follows: The late seral stage is dominated by midgrasses such as western wheatgrass, green needlegrass, and needle and thread with shortgrasses especially blue grama and buffalograss being a minor part of the understory component.

The dominant native plant species in the understory of big sagebrush stands in the late intermediate seral stage is as follows: Western wheatgrass is the dominant grass species in the understory with blue grama and buffalograss being the two codominant species.

The dominant native plant species in the understory of big sagebrush stands in the early intermediate seral stage is as follows: The early intermediate seral stage has an understory dominance of blue grama and buffalo grass while western wheatgrass is a lesser component of the understory.

The dominant native plant species in the understory of big sagebrush stands in the early seral stage is as follows: The early seral stage is dominated by shortgrasses such as buffalograss and blue grama. There is also a considerable amount of annual forbs, broom snakeweed, and plains cactus making up the understory of the sagebrush communities in the early seral stage.

Structure

Manage the geographic area to meet the vegetation structure objectives identified below:

High	Moderate	Low
10 to 30%	50 to 70%	10 to 30%

High vegetation structure can be achieved on moderate and highly productive soils dominated by mid and / or tall grasses (late or late intermediate seral stage composition). Grasslands on moderate to highly productive soils but dominated by short statured species generally do not have the capability to provide high vegetation structure unless management is changed to increase the composition of mid to tall grass species over a period of years or decades.

Moderate structure can be achieved on moderate to highly productive soils dominated by mid and / or tall grasses depending on grazing use levels. Grasslands within this geographic area receiving light to moderate levels of livestock use should be in the late or late intermediate seral stage to achieve moderate structure. Grasslands dominated by shortgrass species in the early intermediate or early seral stage will not achieve moderate structure under even light grazing levels.

Low productivity soils, prairie dog colonies, and grassland areas grazed by livestock at high intensities provide low structure. Low vegetation structure can result from a dominance of low stature plant species or from heavy utilization of mid and tall grasses.

The following section describes the specific vegetative compositional and structural objectives for the Wall North Geographic Area:

Composition

The desired plant species composition objective across the geographic area is as follows:

Late Seral	Late Intermediate Seral	Early Intermediate Seral	Early Seral
20 to 40%	30 to 50%	10 to 30%	1 to 20%

The description of the dominant native plant species in the late seral stage is as follows: The more productive soils (clayey and silty range sites) should be comprised mainly of midgrasses and to a lesser extent tall grasses, the moderate productive soils (dense clay and shallow clay range sites) should be comprised of midgrasses, while the less productive thin claypan and claypan range sites should be comprised of midgrasses and shortgrasses. On clayey and silty range sites western wheatgrass, green needlegrass, needle and thread, sideoats grama, and little bluestem are the primary mid grasses and big bluestem should make up the majority of the tall grass. The dense clay range sites are comprised of mainly western wheatgrass and green needlegrass to a lesser extent. On shallow clay range sites, found primarily on the slopes, western wheatgrass, and green needlegrass occur in amounts approximately equal to big bluestem, little bluestem, and sideoats grama. Western wheatgrass, blue grama, and buffalograss should dominate the less productive thin claypan and claypan range site. The mix of grasses making up the codominance on all range sites in the late seral stage will fluctuate according to precipitation and / or grazing intensities. Tallgrasses such as big bluestem, switchgrass, and prairie sandreed should be expressed in the overflow or run-in sites.

The description of the dominant native plant species in the late intermediate seral stage is as follows: The more productive soils (clayey and silty range sites) should be comprised mainly of midgrasses and to a lesser extent shortgrasses and tall grasses, the moderate productive soils (dense clay and shallow clay range sites) should be comprised of midgrasses and short grasses, while the less productive thin claypan and claypan range sites should be comprised of shortgrasses and to a lesser extent midgrasses. The dominant grass species on clayey and silty range sites in the late intermediate seral stage should be western wheatgrass with the codominance made up of needle and thread, blue grama, and sedges. The dense clay range sites are comprised of mainly western wheatgrass. On shallow clay range sites little bluestem,

western wheatgrass, and sideoats grama are the dominant species while blue grama and sedges become more abundant. Blue grama, buffalograss and to a lesser extent western wheatgrass will dominate the less productive thin claypan and claypan range sites. The mix of grasses making up the codominance on all range sites in the late intermediate seral stage will fluctuate according to precipitation and / or grazing intensities. Overflow sites will be made up of midgrasses, mainly western wheatgrass and green needlegrass.

The description of the dominant native plant species in the early intermediate seral stage is as follows: The more productive soils (clayey and silty range sites) should be comprised mainly of shortgrasses and to a lesser extent midgrasses, the moderate productive soils (dense clay and shallow clay range sites) should be comprised of midgrasses and short grasses, while the less productive thin claypan and claypan range sites should be comprised of shortgrasses. The dominant grass species on clayey and silty range sites in the early intermediate seral stage should be blue grama, buffalograss, western wheatgrass, needle and thread, and sedges. The dense clay range sites are comprised of mainly western wheatgrass and an increasing amount of forbs. On shallow clay range sites blue grama and threadleaf sedge dominate the site while little bluestem is the remaining midgrass component. The less productive thin claypan and claypan range sites will be dominated by annual grasses and cactus. The mix of grasses making up the codominance in the early intermediate seral stages will fluctuate according to precipitation and / or grazing intensities. Overflow sites will be made up of midgrasses and shortgrasses; mainly western wheatgrass, needle and thread, and blue grama.

The description of the dominant native plant species in the early seral stage is as follows: The more productive soils (clayey and silty range sites) should be comprised mainly of shortgrasses with little if any presence of midgrasses, the moderate productive soils (dense clay and shallow clay range sites) should be comprised of short grasses with little presence of midgrasses, while the less productive thin claypan and claypan range sites should be comprised of shortgrasses. The early seral stage will be dominated by sedges, and short grasses such as blue grama, buffalograss and annual grasses on all range sites. The mix of grasses making up the codominance in the early seral stages will fluctuate according to precipitation and / or grazing intensities. Overflow sites will be dominated by shortgrasses and to a lesser extent midgrasses.

Structure

Manage the geographic area to meet the vegetation structure objectives identified below:

High	Moderate	Low
35 to 45%	35 to 45%	15 to 25%

High vegetation structure can be achieved on moderate and highly productive soils dominated by mid and / or tall grasses (late or late intermediate seral stage composition). Grasslands on moderate to highly productive soils but dominated by short statured species generally do not have the capability to provide high vegetation structure unless management is changed to increase the composition of mid to tall grass species over a period of years or decades.

Moderate structure can be achieved on moderate to highly productive soils dominated by mid and / or tall grasses depending on grazing use levels. Grasslands within this geographic area receiving light to moderate levels of livestock use should be in the late or late intermediate seral stage to achieve moderate structure. Grasslands dominated by shortgrass species in the early intermediate or early seral stage will probably not achieve moderate structure under even light grazing levels.

Low productivity soils, prairie dog colonies, and grassland areas grazed by livestock at high intensities provide low structure. Low vegetation structure can result from a dominance of low stature plant species or from heavy utilization of mid and tall grasses.

The following section describes the specific vegetative compositional and structural objectives for the Wall Southeast Geographic Area:

Composition

The desired plant species composition objective across the geographic area is as follows:

Late Seral	Late Intermediate Seral	Early Intermediate Seral	Early Seral
20 to 40%	30 to 50%	10 to 30%	1 to 20%

The description of the dominant native plant species in the late seral stage is as follows: The more productive soils (clayey and silty range sites) should be comprised mainly of midgrasses and to a lesser extent tall grasses, the moderate productive soils (dense clay and shallow clay range sites) should be comprised of midgrasses, while the less productive thin claypan and claypan range sites should be comprised of midgrasses and shortgrasses. On clayey and silty range sites western wheatgrass, green needlegrass, needle and thread, sideoats grama, and little bluestem are the primary mid grasses and big bluestem should make up the majority of the tall grass. The dense clay range sites are comprised of mainly western wheatgrass and green needlegrass to a lesser extent. On shallow clay range sites, found primarily on the slopes, western wheatgrass, and green needlegrass occur in amounts approximately equal to big bluestem, little bluestem, and sideoats grama. Western wheatgrass, blue grama, and buffalograss should dominate the less productive thin claypan and claypan range site. The mix of grasses making up the codominance on all range sites in the late seral stage will fluctuate according to precipitation and / or grazing intensities. Tallgrasses such as big bluestem, switchgrass, and prairie sandreed should be expressed in the overflow or run-in sites.

The description of the dominant native plant species in the late intermediate seral stage is as follows: The more productive soils (clayey and silty range sites) should be comprised mainly of midgrasses and to a lesser extent shortgrasses and tall grasses, the moderate productive soils (dense clay and shallow clay range sites) should be comprised of midgrasses and short grasses, while the less productive thin claypan and claypan range sites should be comprised of shortgrasses and to a lesser extent midgrasses. The dominant grass species on clayey and silty range sites in the late intermediate seral stage should be western wheatgrass with the codominance made up of needle and thread, blue grama, and sedges. The dense clay range sites are comprised of mainly western wheatgrass. On shallow clay range sites little bluestem, western wheatgrass, and sideoats grama are the dominant species while blue grama and sedges become more abundant. Blue grama, buffalograss and to a lesser extent western wheatgrass will dominate the less productive thin claypan and claypan range sites. The mix of grasses making up the codominance on all range sites in the late intermediate seral stage will fluctuate according to precipitation and / or grazing intensities. Overflow sites will be made up of midgrasses, mainly western wheatgrass and green needlegrass.

The description of the dominant native plant species in the early intermediate seral stage is as follows: The more productive soils (clayey and silty range sites) should be comprised mainly of shortgrasses and to a lesser extent midgrasses, the moderate productive soils (dense clay and shallow clay range sites) should be comprised of midgrasses and short grasses, while the less productive thin claypan and claypan range sites should be comprised of shortgrasses. The dominant grass species on clayey and silty range sites in the early intermediate seral stage

should be blue grama, buffalograss, western wheatgrass, needle and thread, and sedges. The dense clay range sites are comprised of mainly western wheatgrass and an increasing amount of forbs. On shallow clay range sites blue grama and threadleaf sedge dominate the site while little bluestem is the remaining midgrass component. The less productive thin claypan and claypan range sites will be dominated by annual grasses and cactus. The mix of grasses making up the codominance in the early intermediate seral stages will fluctuate according to precipitation and / or grazing intensities. Overflow sites will be made up of midgrasses and shortgrasses; mainly western wheatgrass, needle and thread, and blue grama.

The description of the dominant native plant species in the early seral stage is as follows: The more productive soils (clayey and silty range sites) should be comprised mainly of shortgrasses with little if any presence of midgrasses, the moderate productive soils (dense clay and shallow clay range sites) should be comprised of short grasses with little presence of midgrasses, while the less productive thin claypan and claypan range sites should be comprised of shortgrasses. The early seral stage will be dominated by sedges, and short grasses such as blue grama, buffalograss and annual grasses on all range sites. The mix of grasses making up the codominance in the early seral stages will fluctuate according to precipitation and / or grazing intensities. Overflow sites will be dominated by shortgrasses and to a lesser extent midgrasses.

Structure

Manage the geographic area to meet the vegetation structure objectives identified below:

High	Moderate	Low
30 to 40%	35 to 45%	20 to 30%

High vegetation structure can be achieved on moderate and highly productive soils dominated by mid and / or tall grasses (late or late intermediate seral stage composition). Grasslands on moderate to highly productive soils but dominated by short statured species generally do not have the capability to provide high vegetation structure unless management is changed to increase the composition of mid to tall grass species over a period of years or decades.

Moderate structure can be achieved on moderate to highly productive soils dominated by mid and / or tall grasses depending on grazing use levels. Grasslands within this geographic area receiving light to moderate levels of livestock use should be in the late or late intermediate seral stage to achieve moderate structure. Grasslands dominated by shortgrass species in the early intermediate or early seral stage will not achieve moderate structure under even light grazing levels.

Low productivity soils, prairie dog colonies, and grassland areas grazed by livestock at high intensities provide low structure. Low vegetation structure can result from a dominance of low stature plant species or from heavy utilization of mid and tall grasses.

The following section describes the specific vegetative compositional and structural objectives for the Wall Southwest Geographic Area:

Composition

The desired plant species composition objective across the geographic area is as follows:

Late Seral	Late Intermediate Seral	Early Intermediate Seral	Early Seral
20 to 40%	20 to 40%	10 to 30%	10 to 30%

The description of the dominant native plant species in the late seral stage is as follows: The more productive soils (clayey and silty range sites) should be comprised mainly of midgrasses and to a lesser extent tall grasses, the moderate productive soils (dense clay and shallow clay range sites) should be comprised of midgrasses, while the less productive thin claypan and claypan range sites should be comprised of midgrasses and shortgrasses. On clayey and silty range sites western wheatgrass, green needlegrass, needle and thread, sideoats grama, and little bluestem are the primary mid grasses and big bluestem should make up the majority of the tall grass. The dense clay range sites are comprised of mainly western wheatgrass and green needlegrass to a lesser extent. On shallow clay range sites, found primarily on the slopes, western wheatgrass, and green needlegrass occur in amounts approximately equal to big bluestem, little bluestem, and sideoats grama. Western wheatgrass, blue grama, and buffalograss should dominate the less productive thin claypan and claypan range site. The mix of grasses making up the codominance on all range sites in the late seral stage will fluctuate according to precipitation and / or grazing intensities. Tallgrasses such as big bluestem, switchgrass, and prairie sandreed should be expressed in the overflow or run-in sites.

The description of the dominant native plant species in the late intermediate seral stage is as follows: The more productive soils (clayey and silty range sites) should be comprised mainly of midgrasses and to a lesser extent shortgrasses and tall grasses, the moderate productive soils (dense clay and shallow clay range sites) should be comprised of midgrasses and short grasses, while the less productive thin claypan and claypan range sites should be comprised of shortgrasses and to a lesser extent midgrasses. The dominant grass species on clayey and silty range sites in the late intermediate seral stage should be western wheatgrass with the codominance made up of needle and thread, blue grama, and sedges. The dense clay range sites are comprised of mainly western wheatgrass. On shallow clay range sites little bluestem, western wheatgrass, and sideoats grama are the dominant species while blue grama and sedges become more abundant. Blue grama, buffalograss and to a lesser extent western wheatgrass will dominate the less productive thin claypan and claypan range sites. The mix of grasses making up the codominance on all range sites in the late intermediate seral stage will fluctuate according to precipitation and / or grazing intensities. Overflow sites will be made up of midgrasses, mainly western wheatgrass and green needlegrass.

The description of the dominant native plant species in the early intermediate seral stage is as follows: The more productive soils (clayey and silty range sites) should be comprised mainly of shortgrasses and to a lesser extent midgrasses, the moderate productive soils (dense clay and shallow clay range sites) should be comprised of midgrasses and short grasses, while the less productive thin claypan and claypan range sites should be comprised of shortgrasses. The dominant grass species on clayey and silty range sites in the early intermediate seral stage should be blue grama, buffalograss, western wheatgrass, needle and thread, and sedges. The dense clay range sites are comprised of mainly western wheatgrass and an increasing amount of forbs. On shallow clay range sites blue grama and threadleaf sedge dominate the site while little bluestem is the remaining midgrass component. The less productive thin claypan and claypan range sites will be dominated by annual grasses and cactus. The mix of grasses making up the codominance in the early intermediate seral stages will fluctuate according to precipitation and / or grazing intensities. Overflow sites will be made up of midgrasses and shortgrasses; mainly western wheatgrass, needle and thread, and blue grama.

The description of the dominant native plant species in the early seral stage is as follows: The more productive soils (clayey and silty range sites) should be comprised mainly of shortgrasses

with little if any presence of midgrasses, the moderate productive soils (dense clay and shallow clay range sites) should be comprised of short grasses with little presence of midgrasses, while the less productive thin claypan and claypan range sites should be comprised of shortgrasses. The early seral stage will be dominated by sedges, and short grasses such as blue grama, buffalograss and annual grasses on all range sites. The mix of grasses making up the codominance in the early seral stages will fluctuate according to precipitation and / or grazing intensities. Overflow sites will be dominated by shortgrasses and to a lesser extent midgrasses.

Structure

Manage the geographic area to meet the vegetation structure objectives identified below:

High	Moderate	Low
25 to 35%	35 to 45%	25 to 35%

High vegetation structure can be achieved on moderate and highly productive soils dominated by mid and / or tall grasses (late or late intermediate seral stage composition). Grasslands on moderate to highly productive soils but dominated by short statured species generally do not have the capability to provide high vegetation structure unless management is changed to increase the composition of mid to tall grass species over a period of years or decades.

Moderate structure can be achieved on moderate to highly productive soils dominated by mid and / or tall grasses depending on grazing use levels. Grasslands within this geographic area receiving light to moderate levels of livestock use should be in the late or late intermediate seral stage to achieve moderate structure. Grasslands dominated by shortgrass species in the early intermediate or early seral stage will not achieve moderate structure under even light grazing levels.

Low productivity soils, prairie dog colonies, and grassland areas grazed by livestock at high intensities provide low structure. Low vegetation structure can result from a dominance of low stature plant species or from heavy utilization of mid and tall grasses.

The following section describes the specific vegetative compositional and structural objectives for the Fort Pierre Geographic Area:

Composition

The desired plant species composition objective across the geographic area is as follows:

Late Seral	Late Intermediate Seral	Early Intermediate Seral	Early Seral
20 to 40%	30 to 50%	10 to 30%	1 to 20%

The description of the dominant native plant species in the late seral stage is as follows: The more productive soils (clayey, silty, and thin upland soils) should be comprised mainly of midgrasses and to a lesser extent tall grasses. On clayey, silty, and thin upland soils western wheatgrass, green needlegrass, porcupinegrass, sideoats grama, and little bluestem are the primary mid grasses and big bluestem should make up the majority of the tall grass. Western wheatgrass, blue grama, and buffalograss should dominate the less productive claypan soil types. Tallgrasses such as big bluestem, switchgrass, and prairie sandreed should be expressed in the overflow or run-in sites.

The description of the dominant native plant species in the late intermediate seral stage is as follows: The more productive soils (clayey, silty, and thin upland soils) should be comprised mainly of midgrasses and to a lesser extent shortgrasses, while the less productive claypan soils should be comprised of shortgrasses and to a lesser extent midgrasses. The dominant grass species in the late intermediate seral should be western wheatgrass with the codominance made up of needle and threadgrass, porcupinegrass, blue grama, and sedges. The mix of grasses making up the codominance in both the late intermediate seral stages will fluctuate according to precipitation and / or grazing intensities. Overflow sites will be made up of midgrasses, mainly western wheatgrass and green needlegrass.

The description of the dominant native plant species in the early intermediate seral stage is as follows: The more productive soils (clayey, silty, and thin upland soils) should be comprised mainly of shortgrasses and to a lesser extent midgrasses, while the less productive claypan soils should be comprised of shortgrasses. The dominant grass species in the early intermediate seral stage should be blue grama, buffalo grass, western wheatgrass, needle and threadgrass, and sedges The mix of grasses making up the codominance in the early intermediate seral stages will fluctuate according to precipitation and / or grazing intensities. Overflow sites will be made up of midgrasses and shortgrasses; mainly western wheatgrass, needle and threadgrass, and blue grama.

The description of the dominant native plant species in the early seral stage is as follows: The more productive soils (clayey, silty, and thin upland soils) should be comprised mainly of shortgrasses with little if any presence of midgrasses, while the less productive claypan soils should be comprised of shortgrasses. The early seral stage will be dominated by sedges, clubmoss, and short grasses such as blue grama and buffalograss on all soil types. Overflow sites will be dominated by shortgrasses and to a lesser extent midgrasses. The early seral stage should be emphasized on the less productive claypan soil types, in and around prairie dog towns, and in isolated areas of high livestock use.

Structure

Manage the geographic area to meet the vegetation structure objectives identified below:

High	Moderate	Low
30 to 50%	30 to 50%	10 to 30%

High vegetation structure can be achieved on moderate and highly productive soils dominated by mid and / or tall grasses (late or late intermediate seral stage composition). Grasslands on moderate to highly productive soils but dominated by short statured species generally do not have the capability to provide high vegetation structure unless management is changed to increase the composition of mid to tall grass species over a period of years or decades.

Moderate structure can be achieved on moderate to highly productive soils dominated by mid and / or tall grasses depending on grazing use levels. Grasslands within this geographic area receiving light to moderate levels of livestock use should be in the late or late intermediate seral stage to achieve moderate structure. Grasslands dominated by shortgrass species in the early intermediate or early seral stage will not achieve moderate structure under even light grazing levels.

Low productivity soils, prairie dog colonies, and grassland areas grazed by livestock at high intensities provide low structure. Low vegetation structure can result from a dominance of low stature plant species or from heavy utilization of mid and tall grasses.

The following section describes the specific vegetative compositional and structural objectives for the Oglala Geographic Area:

Composition

The desired plant species composition objectives across the geographic area is as follows:

Late Seral	Late Intermediate Seral	Early Intermediate Seral	Early Seral
10 to 30%	50 to 70%	10 to 20%	1 to 10%

The description of the dominant native plant species in the late seral stage is as follows: The more productive soils (clayey, shallow clay, limy upland, and silty range sites) should be comprised mainly of midgrasses and to a lesser extent tall grasses, while the less productive claypan soils should be comprised of midgrasses and shortgrasses. On clayey and silty range sites western wheatgrass, green needlegrass, sideoats grama, and little bluestem are the primary mid grasses and big bluestem should make up the majority of the tall grass. On shallow clay range sites, found primarily on the slopes of the river breaks, western wheatgrass, ricegrass, and green needlegrass occur in amounts approximately equal to big bluestem, little bluestem, and sideoats grama. Leadplant should also be a common part of the grassland community on the above mentioned range sites in the late seral stage. Western wheatgrass, blue grama, and buffalograss should dominate the less productive claypan range site. Tallgrasses such as big bluestem, switchgrass, and prairie sandreed should be expressed in the overflow or run-in sites.

The description of the dominant native plant species in the late intermediate seral stage is as follows: The more productive soils (clayey, shallow clay, limy upland, and silty range sites) should be comprised mainly of midgrasses and to a lesser extent shortgrasses, while the less productive claypan soils should be comprised of shortgrasses and to a lesser extent midgrasses. The dominant grass species on clayey and silty range sites in the late intermediate seral stage should be western wheatgrass with the codominance made up of needle and thread, blue grama, and sedges. On shallow clay range sites little bluestem, western wheatgrass, and sideoats grama are the dominant species while blue grama and sedges become more abundant. The mix of grasses making up the codominance on all range sites in the late intermediate seral stage will fluctuate according to precipitation and/or grazing intensities. Overflow sites will be made up of midgrasses, mainly western wheatgrass and green needlegrass.

The description of the dominant native plant species in the early intermediate seral stage is as follows: The more productive soils (clayey, shallow clay, limy upland, and silty range sites) should be comprised mainly of shortgrasses and to a lesser extent midgrasses, while the less productive claypan soils should be comprised of shortgrasses. The dominant grass species on clayey and silty range sites in the early intermediate seral stage should be blue grama, buffalograss, western wheatgrass, needle and thread, and sedges. On shallow clay range sites blue grama and threadleaf sedge dominate the site while little bluestem is the remaining midgrass component. The mix of grasses making up the codominance in the early intermediate seral stages will fluctuate according to precipitation and/or grazing intensities. Overflow sites will be made up of midgrasses and shortgrasses; mainly western wheatgrass, needle and thread, and blue grama.

The description of the dominant native plant species in the early seral stage is as follows: The more productive soils (clayey, shallow clay, limy upland and silty range sites) should be comprised mainly of shortgrasses with little if any presence of midgrasses, while the less productive claypan soils should be comprised of shortgrasses. The early seral stage will be dominated by sedges, and short grasses such as blue grama and buffalograss on all range sites.

Overflow sites will be dominated by shortgrasses and to a lesser extent midgrasses. The early seral stage should be emphasized on the less productive claypan range sites, in and around prairie dog towns, and in isolated areas of high livestock use or other persistent disturbances.

Structure

Manage the geographic area to meet the vegetation structure objectives identified below:

High	Moderate	Low
10 to 30%	50 to 70%	10 to 30%

High vegetation structure can be achieved on moderate and highly productive soils dominated by mid and / or tall grasses (late or late intermediate seral stage composition). Grasslands on moderate to highly productive soils but dominated by short stature species generally do not have the capability to provide high vegetation structure unless management is changed to increase the composition of mid to tall grass species over a period of years or decades.

Moderate structure can be achieved on moderate to highly productive soils dominated by mid and / or tall grasses depending on grazing use levels. Grasslands within this geographic area receiving light to moderate levels of livestock use should be in the late or late intermediate seral stage to achieve moderate structure. Grasslands dominated by shortgrass species in the early intermediate or early seral stage will not achieve moderate structure under even light grazing levels.

Low productivity soils, prairie dog colonies, and grassland areas grazed by livestock at high intensities for an extended season of use provide low structure. Low vegetation structure can result from a dominance of low stature plant species or from heavy utilization of mid and tall grasses.

The following section describes the specific vegetative compositional and structural objectives for the Pine Ridge Geographic Area:

Composition

The desired plant species composition objectives across the geographic area is as follows:

Late Seral	Late Intermediate Seral	Early Intermediate Seral	Early Seral
15 to 25%	40 to 70%	5 to 15%	1 to 20%

The description of the dominant native plant species in the late seral stage is as follows: The more productive soils (silty and savannah range sites) should be comprised mainly of midgrasses and to a lesser extent tall grasses. On silty range sites western wheatgrass, green needlegrass, sideoats grama, and little bluestem are the primary mid grasses and big bluestem should make up the majority of the tall grass. Savannah range sites should be made up of little bluestem, sideoats grama, green needlegrass, and slender wheatgrass for midgrass species and big bluestem, prairie sandreed, and sand bluestem will make up the tallgrass species.

The description of the dominant native plant species in the late intermediate seral stage is as follows: The more productive soils (silty and savannah range sites) should be comprised mainly of midgrasses and to a lesser extent shortgrasses and tallgrasses. The dominant grass species in the late intermediate seral stage on silty range sites should be western wheatgrass with the codominance made up of needle and threadgrass, blue grama, and sedges. The dominant grass species in the late intermediate seral stage on savannah range sites should be little bluestem, prairie sandreed, slender wheatgrass, sideoats grama, and blue grama. The mix

of grasses making up the codominance in the late intermediate seral stages will fluctuate according to precipitation and / or grazing intensities.

The description of the dominant native plant species in the early intermediate seral stage is as follows: The more productive soils (silty and savannah range sites) should be comprised mainly of shortgrasses and to a lesser extent midgrasses. The dominant grass species in the early intermediate seral stage on silty range sites should be blue grama, buffalo grass, western wheatgrass, needle and threadgrass, and sedges. The dominant grass species in the early intermediate seral stage on savannah range sites should be little bluestem, prairie junegrass, prairie sandreed, blue grama, hairy grama, and plains muhly. The mix of grasses making up the codominance in the early intermediate seral stages will fluctuate according to precipitation and / or grazing intensities.

The description of the dominant native plant species in the early seral stage is as follows: The savannah range sites in an early seral stage will be dominated by broadleaf weeds such as annual ragweed, green sagewort, and lupine, sedges, and annual grasses like downy brome. Other species common to the early seral stage on savannah range sites are short stature grass species such as red threeawn, hairy grama, and blue grama. The silty range sites should be comprised mainly of shortgrasses with little if any presence of midgrasses. Sedges will dominate the early seral stage on silty range sites and short grasses such as blue grama and buffalograss. The early seral stage should be emphasized on the less productive saline upland range sites and in isolated areas of high livestock use or other persistent disturbances.

Structure

Manage the geographic area to meet the vegetation structure objectives identified below:

High	Moderate	Low
10 to 20%	65 to 85%	5 to 15%

High vegetation structure can be achieved on moderate and highly productive soils dominated by mid and / or tall grasses (late or late intermediate seral stage composition). Grasslands on moderate to highly productive soils but dominated by short stature species generally do not have the capability to provide high vegetation structure unless management is changed to increase the composition of mid to tall grass species over a period of years or decades.

Moderate structure can be achieved on moderate to highly productive soils dominated by mid and / or tall grasses depending on grazing use levels. Grasslands within this geographic area receiving light to moderate levels of livestock use should be in the late or late intermediate seral stage to achieve moderate structure. Grasslands dominated by shortgrass species in the early intermediate or early seral stage will not achieve moderate structure under even light grazing levels.

Low productivity soils, and grassland areas grazed by livestock at high intensities for an extended season on use provide low structure. Low vegetation structure can result from a dominance of low stature plant species or from heavy utilization of mid and tall grasses.

Forest Vegetation

Manage for a 40-60% forest cover (silvicultural structural stages 2-5; see glossary) across the geographic area.

Manage timber stands to do the following:

- Improve forest health.
- Prevent potentially damaging forest pest populations.
- Reduce fuel loading and risk of catastrophic wildfire.
- Enhance wildlife and TES habitats.
- Provide national forest timber to support local economies.
- Recover or enhance rangeland vegetation from Ponderosa pine encroachment.
- Improve riparian habitat.
- Enhance recreation experiences or visuals.

Manage forest cover to achieve a 60-80 sq. ft. basal area on 10% of the forest cover. Manage to achieve silvicultural structural stages 4 and 5, with emphasis on structural stages 4a (mature open) and 5 (old growth/late successional).

Manage forest cover to create stands with four structural stages in the forest cover as follows:

- 15-25% in structural stage 2.
- 15-25% in structural stage 3.
- 40% in structural stage 4.
- 20% in structural stage 5.

Achieve forest structural diversity by maintaining or enhancing hardwood trees, shrub inclusions and other beneficial plant communities and openings.

Table B-15. Desired Mix of Vegetation Types for Nebraska National Forest, Bessey Unit, Samuel R. McKelvie National Forest.

		Structure		
Matrix	**Composition**	**High**	**Moderate**	**Low**
a.	80% late to mid seral stage	20% - 30%	70% - 80%	0
c.	85% late to mid seral stage	40% - 60%	40% - 60%	0
d.	90% late to mid seral stage	70% - 80%	20% - 30%	0
g.	61% late thru early intermediate seral stage	40% - 60%	40% - 60%	0%-5%

In the DEIS, late to mid seral stage is a combination of these dominant vegetation types 1) sand bluestem, prairie sandreed, 2) little bluestem, switchgrass, sedge, and 3) blue grama, sedge

In the FEIS, the seral stages for the units on the Bessey and Samuel R. McKelvie Units were expanded from early, mid and late seral stages to early, early intermediate, late intermediate, and late seral stage.

On the Bessey and McKelvie Units, the preferred matrix in the FEIS for each Geographic Area is matrix g.

The following section describes the specific vegetative compositional and structural objectives for the Bessey Geographic Area:

Composition

The desired plant species composition objective across the geographic area is as follows:

Late Seral	Late Intermediate Seral	Early Intermediate Seral	Early Seral
30-50%	30-50%	1-20%	1-20%

The description of the dominant native plant species in the late seral stage is as follows: The sands and choppy sands ecological type will be dominated by sand bluestem while little bluestem will be the codominant species. Prairie sandreed, hairy grama, switchgrass, sedges and sand lovegrass are also important grasses in the late seral stage on this ecological type. On the more productive dry valley ecological type blue grama will be the dominant species while sedges will be the codominant species. Prairie sandreed, sand bluestem, switchgrass, sand lovegrass, and little bluestem are also important grasses on dry valley sites in the late seral stage.

The description of the dominant native plant species in the late intermediate seral stage is as follows: The sands and choppy sands ecological type will be dominated by little bluestem while sand lovegrass will be the codominant species. Sand bluestem, sedges, prairie sandreed, hairy grama, and switchgrass, are also important grasses in the late intermediate seral stage of the sands and choppy sands ecological type. On the more productive dry valley ecological type little bluestem will be the dominant species while sedges will be the codominant species. Switchgrass, blue grama, sand bluestem, hairy grama, and needle and thread are also important grasses on dry valley sites in the late intermediate seral stage.

The description of the dominant native plant species in the early intermediate seral stage is as follows: The sands and choppy sands ecological type will be dominated by hairy grama while little bluestem will be the codominant species. Sand bluestem, sedges, prairie sandreed, switchgrass, and sand lovegrass, are also important species in the early intermediate seral stage of the sands and choppy sands ecological type. On the more productive dry valley ecological type sedges will be the dominant species while blue grama will be the codominant species. Little bluestem, switchgrass, prairie sandreed, sand bluestem, and hairy grama are also important grasses on dry valley sites in the early intermediate seral stage.

The description of the dominant native plant species in the early seral stage is as follows: The sands and choppy sands ecological type will be dominated by sand bluestem while switchgrass will be the codominant species. Sand lovegrass, sedges, little bluestem, prairie sandreed, and blue grama are also important species in the early seral stage of this ecological type. On the more productive dry valley ecological type switchgrass will be the dominant species while sand bluestem will be the codominant species. Little bluestem, prairie sandreed, needle and thread, blue grama, and sedges are also important species on dry valley sites in the early seral stage

Structure

Manage the geographic area to meet the vegetation structure objectives identified below:

High	Moderate	Low
40 to 60%	40 to 60%	0 to 5%

High vegetation structure can be achieved on moderate and highly productive soils dominated by mid and / or tall grasses (early or early intermediate seral stage composition). Grasslands on moderate to highly productive soils but dominated by shortgrass species generally do not have the capability to provide high vegetation structure unless management is changed to increase the composition of mid to tall grass species over a period of years or decades.

Moderate structure can be achieved on moderate to highly productive soils dominated by mid and / or tall grasses depending on grazing use levels. Grasslands within this geographic area receiving light to moderate levels of livestock use will need to be in the early or early intermediate seral stage to achieve moderate structure. Grasslands dominated by shortgrass species in the late intermediate or late seral stage will not achieve moderate structure regardless of grazing levels.

Low productivity soils, prairie dog colonies, and grassland areas grazed by livestock at high intensities provide low structure. Low vegetation structure can result from a dominance of low stature plant species or from heavy utilization of mid and tall grasses.

The following section describes the specific vegetative compositional and structural objectives for the McKelvie Geographic Area:

Composition

The desired plant species composition objective across the geographic area is as follows:

Late Seral	Late Intermediate Seral	Early Intermediate Seral	Early Seral
30 to 50%	30 to 50%	1 to 20%	1 to 20%

The description of the dominant native plant species in the late seral stage is as follows: On the more productive dry valley ecological type blue grama will be the dominant species while sedges will be the codominant species. Prairie sandreed, sand bluestem, switchgrass, sand lovegrass, and little bluestem are also important grasses on dry valley sites in the late seral stage. The sands and choppy sands ecological type will be dominated by sand bluestem while little bluestem will be the codominant species. Prairie sandreed, hairy grama, switchgrass, sedges and sand lovegrass are also important grasses in the late seral stage on this ecological type.

The description of the dominant native plant species in the late intermediate seral stage is as follows: On the more productive dry valley ecological type little bluestem will be the dominant species while sedges will be the codominant species. Switchgrass, blue grama, sand bluestem, hairy grama, and needle and thread are also important grasses on dry valley sites in the late intermediate seral stage. The sands and choppy sands ecological type will be dominated by little bluestem while sand lovegrass will be the codominant species. Sand bluestem, sedges, prairie sandreed, hairy grama, and switchgrass, are also important grasses in the late intermediate seral stage of the sands and choppy sands ecological type.

The description of the dominant native plant species in the early intermediate seral stage is as follows: On the more productive dry valley ecological type sedges will be the dominant species while blue grama will be the codominant species. Little bluestem, switchgrass, prairie sandreed, sand bluestem, and hairy grama are also important grasses on dry valley sites in the early intermediate seral stage. The sands and choppy sands ecological type will be dominated by hairy grama while little bluestem will be the codominant species. Sand bluestem, sedges, prairie sandreed, switchgrass, and sand lovegrass, are also important species in the early intermediate seral stage of the sands and choppy sands ecological type.

The description of the dominant native plant species in the early seral stage is as follows: On the more productive dry valley ecological type switchgrass will be the dominant species while sand bluestem will be the codominant species. Little bluestem, prairie sandreed, needle and thread, blue grama, and sedges are also important species on dry valley sites in the early seral stage. The sands and choppy sands ecological type will be dominated by sand bluestem while switchgrass will be the codominant species. Sand lovegrass, sedges, little bluestem, prairie sandreed, and blue grama are also important species in the early seral stage of this ecological type.

Structure

Manage the geographic area to meet the vegetation structure objectives identified below:

High	Moderate	Low
40 to 60%	40 to 60%	0 to 5%

High vegetation structure can be achieved on moderate and highly productive soils dominated by mid and / or tall grasses (early or early intermediate seral stage composition). Grasslands on moderate to highly productive soils but dominated by shortgrass species generally do not have the capability to provide high vegetation structure unless management is changed to increase the composition of mid to tall grass species over a period of years or decades.

Moderate structure can be achieved on moderate to highly productive soils dominated by mid and / or tall grasses depending on grazing use levels. Grasslands within this geographic area receiving light to moderate levels of livestock use will need to be in the early or early intermediate seral stage to achieve moderate structure. Grasslands dominated by shortgrass species in the late intermediate or late seral stage will not achieve moderate structure regardless of grazing levels.

Low productivity soils, prairie dog colonies, and grassland areas grazed by livestock at high intensities provide low structure. Low vegetation structure can result from a dominance of low stature plant species or from heavy utilization of mid and tall grasses.

For all units an emphasis (Matrix a through d) was then assigned to each management area by alternative dependent on what the desired condition should be to achieve resource goals and objectives based on structural stage classes. Not all units have all four matrices, a through d. The reason was that in the original development of the matrices there were overlaps of only 5%. It was decided to combine those matrices that overlapped. Further analysis and public input derived several other matrices for different geographic areas. For monitoring purposes, structural stages would be monitored based on the local site potentials to determine if the desired conditions are being met.

Herbage Productivity

Several methods were used in determining existing and potential graminoid herbage production on the Northern Great Plains planning units.

Dakota Prairie Grasslands

Existing Production

Herbage production for the Dakota Prairie Grasslands were derived from two sources: the Natural Resources Conservation Service (NRCS) and North Dakota State University (NDSU). Average production for rolling prairie and badlands types on the Little Missouri were provided by NRCS personnel (Froemke 2000) based on their recommended stocking for those types. The NRCS web site (http://plants.usda.gov) was consulted with regard to production on the Grand River National Grassland (GRNG). Twenty-three plots of clipped data were available for Perkins County, which contains most of the GRNG. The data was available for five separate range sites. Production values for each range site were averaged before arriving at an average production value with which to characterize the GRNG. Because of the proximity of the Cedar River National Grassland (CRNG), the average production value used for the GRNG was also used for the CRNG.

The NRCS did not feel that production data for the Sheyenne National Grassland (SNG) was as reliable as that found for the western side of the state, and NDSU was consulted in the attempt to find research specific to the SNG. Several graduate theses dealing with vegetation resources on the SNG were provided and reviewed. Two of those efforts contained production data that was specific to the SNG. One study (Nelson 1986) was conducted during one year (1982) while the other (Hopkins, 1996) gathered production data from the period of 1991 – 1994. The average production values from these two studies were within .3% of each other and the data covering multiple years was selected to characterize production on the SNG.

Potential Production

Vegetation production within the Northern Great Plains is highly variable due to annual and seasonal fluctuations in precipitation, affecting available moisture for vegetation growth. Production data was compared to that of other studies (Bjugstad 1965, Uresk and Bjugstad 1996) and Natural Resource Conservation Service (NRCS) production data. Dakota Prairie Grassland data was found to fall within the production range of these other studies. The following table displays the range in production data for selected North Dakota counties associated with the grassland units from NRCS soil survey data tables.

The Natural Resource Conservation Service technical guide was used to determine potential productivity for range site based on biological site potential and normal moisture year. The following table displays the range in production data for selected North Dakota counties associated with the grassland units from NRCS soil survey data tables.

Table B-16. Range of Production for Select North Dakota Counties.

County	Grassland Unit	Production Range lbs/acre	Mean lbs/acre
Ranson	Sheyenne NG	1000 - 6600	3167
Golden Valley	Little Missouri NG, Medora Dist	700 - 6600	2223
Billings	Little Missouri NG, Medora Dist.	500 - 2600	1506
McKenzie	Little Missouri NG, McKenzie Dist.	500 - 6600	1685
Corson	Grand River NG	1362-2185	1834
Perkins	Grand River NG	1401-2257	1893

The following table summarizes the average existing production to the average potential production based on the mean value from the Natural Resource Conservation Service.

Table B-17. Existing vs. Potential Productivity.

Planning Unit	Existing Average pounds/acre	NRCS Potential Average pounds/acre	Existing Percent of Potential
Grand River National Grasslands	1427	1,893	75%
Cedar River National Grasslands	1427	1,834	78%
Little Missouri National Grassland	908	1,685	57%
Sheyenne National Grassland	2127	3,167	67%

Nebraska National Forest Units and Thunder Basin National Grassland

Existing Production

On the majority of the Nebraska National Forest units, the Natural Resource Conservation Service (NRCS) range analysis methodology was used to determine current range condition from which existing herbage productivity was derived from the average NRCS productivity values. Plot data was collected from 1987 to present using this methodology on the Buffalo Gap, Ft. Pierre and Oglala National Grasslands and on the Pine Ridge portion of the Nebraska National Forest. The range site plot data was put into a geographical information system for analysis. On the Thunder Basin National Grassland, the Bessey Division of the Nebraska National Forest, and the Samuel R. McKelvie National forest, an ecological inventory was used to determine current range condition (seral stage). However, existing productivity was derived using a similar methodology as to the other Nebraska National Forest units.

Potential Production

The Natural Resource Conservation Service technical guide was used to determine potential productivity for range site based on biological site potential and normal moisture year.

The following table shows the average existing productivity as compared to the average potential productivity.

Table B-18. Existing vs. Potential Productivity.

Planning Unit	Existing Average pounds/acre	Potential Average pounds/acre	Existing Percent of Potential
Thunder Basin National Grassland	564	1,007	56%
Bessey unit, Nebraska National Forest	1,480	2,540	58%
Samuel R. McKelvie National Forest	1,430	2,610	55%
Buffalo Gap National Grassland / Fall River	960	1,480	65%
Buffalo Gap National Grassland / Wall	920	1,410	65%
Fort Pierre National Grassland	1,450	2,050	70%
Pine Ridge unit, Nebraska National Forest	920	1,460	63%
Oglala National Grassland	1,080	1,550	70%

Process to Determine Forage Outputs

Decisions made in the revised management plans will not determine the number of livestock (animal unit months) allowed to graze on the national grassland and forest units. Instead, the revised management plan will describe desired conditions for vegetation that fit within the context of rangeland health and multiple uses. The desired conditions are defined by the species of grass (composition) and height and density of the grass (structure). Forage outputs were determined only to compare the effects and desired condition for each of the alternatives. The analysis process that was utilized to determine estimated available forage and corresponding animal unit months (AUMs) are based on a fixed set of planning assumptions only to show differences among the management alternatives.

Rangeland managers must ensure that the resources under their care are used in a sustainable manner. Standard estimates of utilization or the quantity of biomass removed by grazing have been calculated by previous research. These estimates have been categorized into three basic livestock forage use levels: light, moderate, and high. This information is crucial to ensuring that grazing does not result in damage to plants or the soil. Utilization estimates help determine the carrying capacity of a site in terms of use over space and time (Orr 1998).

There is a relationship between structure and the allocation of forage to livestock based on continuous season-long grazing. A guide to determine the appropriate allocation of forage use was developed that incorporated the desired structure levels. This forage use, however, does not consider forage losses from trampling, waste, and other herbivory uses. The following table displays the appropriate allocation of forage for livestock under a continuous season-long grazing system and to maintain the desired structure levels:

Table B-19. Forage Allocation Under Continuous, Season-long Grazing.

	High Structure Class	Moderate Structure Class	Low Structure Class
Livestock Forage Use	8 - 10% (light use)	25 - 35% (mod. use)	35 - 40% (heavy use)
Total Utilization level	30 - 35%	35 - 55%	55 - 65%

(Orr 1998; Nebraska Cooperative Extension 1986; Holecheck, Pieper, Herbel 1989)

Calculations to Determine Total Available Forage

Calculations were made on suitable rangeland using existing herbage production by range site or habitat type on the Thunder Basin National Grassland and on the Nebraska National Forest and associated units and at the vegetative zone level on the Dakota Prairie National Grasslands.

On the Dakota Prairie National Grasslands, total available forage was calculated using the following process:

Step 1

Management Area Acres from Plan	X	Structure Class Percent from Desired Upland Herbaceous Matrix Determination	=	Acres by Structure Class

Step 2

Acres by Structure Class	X	Herbage Production of Site	=	Total Herbage Production by Structure Class

Step 3

Total Herbage Production by Structure Class	X	Allocated Use by Structure Class from Forage Use Guidelines	=	Forage Available by Structure Class

Step 4

Available Forage Production by Structure Class for all Structure Classes Added Together	=	Total Available Forage

Total available forage was calculated using a GIS analysis on the Thunder Basin National Grassland and Nebraska National Forest and associated units. Spatial and tabular data used for modeling included range capability, existing herbage production, management area allocations, structure classes, utilization levels per structure class and percentage rested acres. [21] A simplistic explanation of the analysis steps is as follows:

[21] See Administrative Record "Availabe Forage AMLs and matrix.aws for Thunder Basin , Bessey Unit, Samuel R. McKelvie, Pine Ridge Unit / Oglala NG, Fall River RD, Wall RD and Ft. Pierre RD "

Explanation of analysis steps, cont.

- Determined the allowable forage factor to use for each desired mix of vegetation type matrix (See Table B-13/B-1 4) by alternative. This calculation is based on the midpoint percentage of each structure lass, the range of forage allocated per structure class (see Table B-19) and the percentage of rested acres.
- Assigned the matrix class to each management area by alternative.
- Assigned the allowable forage factor to each matrix class.
- Subtracted all nonsuitable rangeland areas.
- Determined total amount of forage allocated to livestock. (Allowable forage factor x existing herbage production on suitable acres = allocated forage).

Calculation of Forage Use

To calculate the number of AUMs of grazing, the total available forage should be divided by the forage requirements of the animal unit. Forage requirement is the forage needed to sustain an animal (e.g., cow, horse) or pairs of animals (e.g., cow and calf) for one month, based on the size, type, and class of the animal.

These calculations are based on a continuous season-long grazing system and assume an animal unit forage intake requirement of 780 lbs per month (intake requirements for a 1,000-lb. cow with calf up to 6 months of age). Factors, such as management systems, timing of use, and livestock size were not taken into consideration in order to provide a consistent comparison of effects for each alternative. The information used is an expression of the information currently known at a landscape level but does not reflect the site-specific conditions of all areas. This information was developed as an aggregation of existing data from the planning area. Site-specific variation in available forage and AUMs may occur as a result of adaptive resource management, vegetation condition differences, or acres of prairie dog colonies desired.

The following tables show estimated forage outputs on capable and suitable lands based on alternative resource emphasis. Although Alternative 1 is described as representing current management direction, it should be noted that the estimated allowable AUMs may not match what is currently permitted or authorized. This is due to the fact that current management has implemented a variety of grazing systems, timing of use, and special conditions. As already stated, the values shown are based on a continuous season-long grazing system, the least intensive management of any that might be used. Also, the current actual use could be 20% less than the authorized use level because actual use can vary considerable on a yearly basis. The column entitled “Existing Condition” reflects average use for the 20-year period on the Dakota Prairie National Grasslands and a 5-year period on the Nebraska National Forest and Thunder Basin National Grassland ending in 1999.

Table B-20. Summary Table for the Dakota Prairie Grasslands

Planning Unit	Capable Acres	Existing Condition	Alt. 1	Alt. 2	DEIS Alt. 3	FEIS Alt. 3	Alt. 4	Alt. 5
Grand River National Grassland	152,600							
Suitable Acres		152,600	152,600	152,390	153,380	152,360	152,390	152,350
Estimated Total Available Forage (M pounds)		46,370	48,996 to 53,351	48,929 to 53,278	42,331 to 51,737	43,375 to 47,506	32,520 to 36,098	38,154 to 42,068
midpoint		46,370	51,174	51,103	47,034	45,440	34,359	40,111
Estimated AUMs		57,501	62,815 to 68,399	62,729 to 68,305	54,270 to 66,330	54,270 to 66,330	41,819 to 46,280	48,916 to 53,933
midpoint		57,501	65,607	65,517	60,300	58,257	44,050	51,424
(Acres / AUM)		2.7	2.4 – 2.2	2.4 – 2.2	2.8 – 2.3	2.8 – 2.5	3.6 – 3.3	3.1 – 2.8
midpoint		2.7	2.3	2.3	2.5	2.6	3.5	3.0
Cedar River National Grassland	6,650							
Suitable Acres		6,650	6,650	6,650	6,580	6,650	6,650	6,650
Estimated Total Available Forage (M pounds)		1,930	2,894 to 3,179	2,894 to 3,179	1,615 to 1,973	2,524 to 2,795	1,840 to 2,069	2,178 to 2,434
midpoint		1,930	3,037	3,037	1,794	2,659	1,955	2,306
Estimated AUMs		3,401	3,111 to 4,076	3,111 to 4,076	2,070 to 2,530	3,326 to 3,583	2,360 to 2,652	2,792 to 3,121
midpoint		3,401	3,893	3,893	2,300	3,410	2,506	2,956
(Acres / AUM)		2.0	1.8 – 1.6	1.8 – 1.6	3.2 - 2.6	2.1 – 1.9	2.8 – 2.5	2.4 – 2.1
midpoint		2.0	1.7	1.7	2.9	2.0	2.7	2.3
Little Missouri National Grassland McKenzie and Medora units	884,730							
Suitable Acres		884,620	884,620	884,460	823,910	884,460	884,530	884,530
Estimated Total Available Forage (M pounds)		246,405	244,987 to 269,084	244,942 to 269,035	201,113 to 245,817	213,622 to 236,510	154,954 to 174,123	184,324 to 206,009
midpoint		246,405	257,035	256,989	223,456	225,066	164,539	195,167
Estimated AUMs		315,900	314,085 to 344,979	314,029 to 344,917	257,850 to 315,150	273,874 to 303,218	198,659 to 223,235	236,312 to 264,114
midpoint		315,900	329,532	329,473	286,500	288,546	210,947	250,213
(Acres / AUM)		2.8	2.8 – 2.6	2.8 – 2.6	3.2 - 2.6	3.2 – 2.9	4.5 – 4.0	3.7 – 3.4
midpoint		2.8	2.7	2.7	2.9	3.2	4.2	3.5
Sheyenne National Grassland	69,500							
Suitable Acres		69,200	69,200	69,500	67,925	69,500	67,840	69,500
Estimated Total Available Forage (M pounds)		44,970	44,892 to 49,308	45,087 to 49,522	19,094 to 23,338	35,460 to 39,322	20,490 to 26,550	33,594 to 37,252
midpoint		44,970	47,100	47,304	21,216	37,391	23,520	35,423

Planning Unit	Capable Acres	Existing Condition	Alt. 1	Alt. 2	DEIS Alt. 3	FEIS Alt. 3	Alt. 4	Alt. 5
Sheyenne National Grassland, cont.								
Estimated AUMs		57,650	57,554 to 63,216	57,804 to 63,490	24,480 to 29,920	45,416 to 49,866	26,269 to 34,039	45,069 to 47,759
midpoint		57,650	60,385	60,647	27,200	47,937	30,154	45,414
(Acres / AUM)		1.2	1.2 – 1.1	1.2 – 1.1	2.8 - 2.3	1.5 – 1.4	2.6 – 2.0	1.6 – 1.5
midpoint		1.2	1.2	1.2	2.5	1.5	2.3	1.5

Table B-21. Summary Table for the Thunder Basin National Grassland

Planning Unit	Capable Acres	Existing Condition	Alt. 1	Alt. 2	DEIS Alt. 3	FEIS Alt. 3	Alt. 4	Alt. 5
Thunder Basin National Grassland	532,100							
Suitable Acres		532,100	532,100	532,100	532,100	532,060	531,060	532,100
Estimated Total Available Forage (M pounds)		87,900	80,005 to 118,943	79,543 to 118,482	84,731 to 103,561	70,146 to 106,112	61,201 to 96,888	73,360 to 110,463
midpoint		87,900	99,474	99,012	94,146	90,038	79,044	91,911
Estimated AUMs		112,700	102,570 to 152,492	101,978 to 151,900	108,630 to 132,770	89,932 to 136,042	78,462 to 124,216	94,052 to 141,620
midpoint		112,700	127,530	126,939	120,700	115,434	101,340	117,836
(Acres / AUM)		4.7	5.2- 3.5	5.2 – 3.4	4.9 – 4.0	5.9 – 3.9	6.6 – 4.3	5.6 – 3.8
midpoint		4.7	4.4	4.3	4.5	4.9	5.5	4.7

Table B-22. Summary Table for the Nebraska National Forest Units.

Planning Unit	Capable Acres	Existing Condition	Alt. 1	Alt. 2	DEIS Alt. 3 *Alt 3a*	FEIS Alt. 3	Alt. 4	Alt. 5
Bessey unit, Nebraska National Forest	89,580							
Suitable Acres		88,500	88,500	88,480	88,770	89,010	88,490	88,480
Estimated Total Available Forage (M pounds)		27,245	16,830 to 28,012	19,683 to 30,883	24,710 to 30,202	17,072 to 27,885	11,883 to 20,936	13,010 to 23,191
midpoint		27,245	22,421	25,283	27,456	22.382	16,409	18,100
Estimated AUMs		34,930	21,577 to 35,913	25,235 to 39,593	31,680 to 38,720	21,887 to 35,749	15,234 to 26,841	16,679 to 29,732
midpoint		34,930	28,745	32,414	35,200	28,696	21,037	23,206
Stocking Level (Acres / AUM)		2.5	4.1 – 2.5	3.5 – 2.2	2.8- 2.3	4.0 – 2.5	5.8 – 3.3	5.3 – 3.0
midpoint		2.5	3.3	2.8	2.5	3.2	4.5	4.1
Samuel R. McKelvie National Forest	114,190							
Suitable Acres		112,270	112,270	112,240	111,680	112,470	112,070	111,670

Planning Unit	Capable Acres	Existing Condition	Alt. 1	Alt. 2	DEIS Alt. 3 *Alt 3a*	FEIS Alt. 3	Alt. 4	Alt. 5
Estimated Total Available Forage (M pounds)		33,560	23,290 to 38,880	27,041 to 42,623	28,782 to 35,178	23,615 to 38,571	16,514 to 29,096	18,014 to 32,112
midpoint		33,560	31,085	34,831	31,980	31,093	22,084	25,063
Estimated AUMs		43,020	29,859 to 49,846	34,668 to 54,644	36,900 to 45,100	30,276 to 49,450	21,172 to 37,302	23,095 to 41,170
midpoint		43,020	39,853	44,656	41,000	39,862	29,237	32,132
(Acres / AUM)		2.6	3.8 – 2.3	3.2 – 2.0	3.0 - 2.5	3.7 – 2.8	5.3 – 3.0	4.8 – 2.7
midpoint		2.6	3.0	2.6	2.8	3.2	4.1	3.7
Buffalo Gap National Grassland/Fall River	306,430							
Suitable Acres		306,430	306,430	306,400	313,420	306,400	306,400	306,400
Estimated Total Available Forage (M pounds)		76,050	51,369 to 78,146	56,194 to 83,195	69,849 to 85,371 *68,726 to 83,998*	51,552 to 77,505 51,863 to 76,816	42,302 to 67,075	46,999 to 71,826
midpoint		76,050	64,757	70,128	77,610 *76,362*	64,528 *64,358*	54,699	59,412
Estimated Allowable AUMs		97,500	65,858 to 100,187	72,044 to 106,661	89,550 to 109,450 *88,110 to 107,690*	66,093 to 99,366 66,490 to 98,482	54,234 to 85,992	60,256 to 92,084
midpoint		97,500	83,021	89,909	99,500 *97,900*	82,729 *82,510*	70,127	76,170
(Acres / AUM)		3.1	4.6 – 3.0	4.3 – 2.9	3.5 - 2.9 *3.6 - 2.9*	4.6 – 3.0 4.6 – 3.1	5.6 – 3.6	5.0 – 3.3
midpoint		3.1	3.8	3.6	3.2	3.8	4.6	4.1
Buffalo Gap National Grassland/Wall	238,650							
Suitable Acres		237,450	237,450	238,650	239,235	238,650	238,650	238,650
Estimated Total Available Forage (M pounds)		62,230	40,083 to 61,148	42,289 to 64,496	50,474 to 61,690	40,127 to 60,699	33,074 to 54,551	35,871 to 56,713
midpoint		62,230	50,615	53,392	56,082	50,413	43,812	32,106
Estimated Allowable AUMs		79,780	51,388 to 78,395	54,217 to 82,687	64,710 to 79,090	51,447 to 73,303	42,404 to 69,936	45,990 to 72,708
midpoint		79,780	64,891	68,450	71,900	64,632	56,169	59,349
(Acres / AUM)		2.9	4.6 – 3.0	4.4 – 2.9	3.7 - 3.0	4.1 – 3.2	5.6 – 3.4	5.0 – 3.3
midpoint		2.9	3.8	3.6	3.3	3.6	4.5	4.1
Ft. Pierre National Grassland	113,360							
Suitable Acres		112,550	112,550	112,550	113,390	112,550	112,550	112,550
Estimated Total Available Forage (M pounds)		52,460	30,448 to 46,567	37,616 to 55,528	32,152 to 39,296	27,957 to 43,289	25,077 to 39,407	25,077 to 39,407
midpoint		52,460	38,507	46,571	35,724	38,511	32,242	32,242

Planning Unit	Capable Acres	Existing Condition	Alt. 1	Alt. 2	DEIS Alt. 3 *Alt 3a*	FEIS Alt. 3	Alt. 4	Alt. 5
Estimated AUMs		67,255	39,036 to 59,701	48,225 to 71,190	41,220 to 50,380	35,842 to 55,499	32,150 to 50,522	32,150 to 50,522
midpoint		67,255	49,368	59,708	45,800	49,375	41,337	41,337
(Acres / AUM)		1.7	2.9 – 1.9	2.3 – 1.6	2.8 - 2.3	3.1 – 2.0	3.5 – 2.2	3.5 – 2.2
midpoint		1.7	2.4	1.9	2.5	2.5	2.8	2.8
Pine Ridge unit, Nebraska National Forest	31,560							
Suitable Acres		31,200	31,200	31,490	48,545	31,490	31,520	30,350
Estimated Total Available Forage (M pounds)		10,690	5,411 to 8,304	5,699 to 8,620	8,775 to 10,725	5,554 to 8,331	4,993 to 7,624	4,723 to 7,277
midpoint		10,690	6,857	7,159	9,750	6,942	6,308	5,999
Estimated AUMs		13,700	6,937 to 10,646	7,307 to 11, 050	11,250 to 13,750	7,120 to 10,680	6,402 to 9,774	6,055 to 9,329
midpoint		13,700	8,792	9,178	12,500	8,901	8,087	7,691
(Acres / AUM)		2.3	4.5 – 2.9	4.3 – 3.5	4.3 - 3.5	4.4 – 2.9	4.9 – 3.2	5.0 – 3.2
midpoint		2.3	3.7	3.9	3.9	3.6	4.0	4.1
Oglala National Grassland	79,390							
Suitable Acres		79,370	79,370	79,370	88,200	79,340	79,370	79,370
Estimated Total Available Forage (M pounds)		21,600	16,425 to 25,071	18,146 to 26,791	19,586 to 23,938	16,852 to 25,062	13,019 to 20,800	14,489 to 22,269
midpoint		21,600	20,748	22,469	21,762	20,957	16,909	18,378
Estimated AUMs		27,700	21,059 t0 32,142	23,265 to 34,348	25,110 to 30,690	21,606 to 32,132	16,691 to 26,665	18,575 to 28,500
midpoint		27,700	26,601	28,806	27,900	26,869	21,679	23,563
(Acres / AUM)		2.9	3.8 – 2.5	3.4 – 2.3	3.5 - 2.9	3.7 – 2.5	3.7 – 2.9	4.3 – 2.8
		2.9	3.1	2.8	3.2	3.1	3.3	3.5

References consulted or cited for this analysis are listed at the end of the appendix.

Benchmark Analysis

The maximum livestock production capability is based on the assumptions in the section above "Calculation of Forage Use", all capable rangeland being suitable and all rangelands being in good condition. An assumption of all rangeland being in excellent condition was considered, but rangeland managers indicated an excellent range condition cannot be sustained with continual grazing use.

Alternative 2, depicted in the Summary Tables for the Dakota Prairie Grassland, the Thunder Basin National Grasslands, and the Nebraska National Forest Units, represents the maximum livestock forage benchmark. As a comparison, the following table depicts the midpoint of NRCS recommended initial livestock forage stock guidelines.

Table B-23. NRCS Initial Stocking Levels

Maximum Livestock Production Using or Approximating Standard NRCS Initial Stock Guidelines Forage Allocation = 50% for plant vigor, 25% for Wildlife and Trampling, 25% For Livestock 780 pounds of forage per AUM		
Unit	**Annual M Pounds of Forage Allocated to Livestock**	**Annual AUMs**
Grand River National Grassland	54,440	69,795
Cedar River National Grassland	3,321	4,258
Little Missouri National Grassland, McKenzie District	140,694	180,380
Little Missouri National Grassland, Medora District	140,436	180,046
Sheyenne National Grassland	51,516	66,046
Thunder Basin National Grassland	75,026	96,187
Nebraska National Forest, Bessey Unit	32,745	41,981
Samuel R. McKelvie National Forest	40,137	51,458
Buffalo Gap National Grassland, Fall River District	73,543	94,286
Buffalo Gap National Grassland, Wall District	54,614	70,017
Fort Pierre National Grassland	40,799	52,307
Nebraska National Forest, Pine Ridge Unit	7,176	9,200
Oglala National Grassland	21,430	27,374

This table depicts what initial stocking levels would be using NRCS guidelines. These values compare with the midpoint of the range of values presented in Table B-20 through Table B-22 above. There are significant differences between the Summary tables and the NRCS table. The reason for this is NRCS allocates a 25% use value for livestock whereas the predictive model varies use levels to meet vegetative desired conditions.

H. Recreation Management and Use

Demand Assessment

Information for the demand assessment through the Selected Activity Trends subsection was taken from the Northern Great Plains Plan Revision Recreation Assessment, dated September 3, 1997 (3-4, 9-12). Please refer to this document (on file in Chadron, Nebraska) for more detailed demand information. Many of the management area designations in the next plans will meet recreational demand. Such designations as Special Interest Areas, backcountry nonmotorized recreation, dispersed recreation areas, developed sites, and scenic corridors can fill the varying recreation demands of people.

Perceptions of benefits are based upon personal and societal values, and evidence exists that public values may be shifting. Newspaper coverage of national forests and grasslands has indicated more interest in ecological, aesthetic, and moral/spiritual values relative to economic values. One study revealed that recreation benefits and values were discussed more frequently than any other categories of benefits and values in an analysis of more than 30,000 on-line media news stories between 1992 and 1996. There is also evidence that, while the recreation-customer metaphor does encourage managers to identify recreationists' preferences and to

provide activities and facilities to meet those preferences, some shortcomings remain. For instance, some members of the public see themselves not as "customers," but as "owners" of the public lands, because tax dollars collected from all citizens support public lands.

More importantly, the customer metaphor may imply that recreation settings are viewed similarly to mass-produced consumer products. It ignores the fact that many people form strong personal attachments to specific places that hold unique values to them. Values associated with the experience of being in an environment rather than the value of products or services taken from an environment are known as "experiential values" and contain elements of three broad categories:

- **Emotional Values** - place-based experiences that elicit strong feelings such as a traditional family camping spot or hunting area.
- **Symbolic Values** - places that carry meanings beyond their immediate physical presence such as locations of important events such as General George Custer's travel route across the Little Missouri National Grassland or the Warbonnet Memorial on the Oglala National Grassland.
- **Spiritual Values** - people's experiences that link them to deeper meanings and connections with a greater reality can be, but may not be, associated with a specific place.

The "typical" public lands recreator may be a white male, 25-40 years old, living in a city of 50,000 or less, who has children in a multiple-career home, and is likely to load the family into a sport utility vehicle and travel less than a hundred miles to a wildland setting to recreate for an average 3-4 hours.

The results of several survey instruments that have attempted to capture the essence of outdoor recreation participants are now available. Some surveys such as the National Survey on Recreation and the Environment (NSRE) and the US Fish and Wildlife Service (USFWS) sponsored National Survey of Fishing, Hunting and Wildlife Associated Recreation (FHWAR) have been conducted on a somewhat regular basis for up to 40 years. They offer some of the most comprehensive information about national outdoor recreation participation and trends.

For more site-specific recreation information, the Custer National Forest, in 1992, contracted with a private firm to conduct a random telephone survey to determine perceptions and desires relative to forest and grassland management. The Nebraska National Forest during the summer and fall of 1994 contracted with the Southeastern Forest Experiment Station to conduct on-site surveys of recreationists at sites on each of the Forest's administrative units. In 1995-96, Thunder Basin National Grassland and the Custer National Forest grasslands conducted brief customer satisfaction surveys. In addition, the recreation use figures for each management unit within the planning area are available for 1992-96, and most of the units also collected written recreation information request data for several months in 1995-96. Wyoming updated the State Comprehensive Outdoor Recreation Plan in 1995 in part by conducting county-by-county random telephone surveys and by surveying county recreation directors or county elected officials.

Trends and Projections

Public lands management and planning depends upon accurate information from a variety of sources. "Snap-shot" information isn't as useful as trend information that charts changes over

time and is comparable in methodology, context, and content. To look at trends in recreation, the 1996 survey of Fishing, Hunting, and Wildlife-Associated Recreation sponsored by the USFWS, and the 1994-95 National Survey of Recreation and Environment (NSRE) offer the two best sources of national trend information. As the names imply, one is more narrowly focused on wildlife-related recreation, while the other includes a wider array of primarily outdoor recreation activities.

Rather than attempt to recreate or repeat the findings in these and other references, the following are highlights that apply to the issues, activities, and resources most closely associated with the Northern Great Plains units.

General Trends

Though opinions are divided, most seem to agree that available leisure time is shrinking. The number one reason for not participating in leisure activities is reported as "lack of time." In order to compensate, people are becoming more discriminating about leisure time choices and are seeking ways to easily and precisely locate information leading them to the benefits and leisure time activities they seek. Adventure travel businesses including outfitters and guiding businesses rely increasingly upon electronic marketing and business transactions. Many national forests and grasslands have developed Internet homepages that are available on the national website, but many have not.

The two most significant broad-scale changes that will likely influence how people recreate over the next 50 years relate to anticipated increases both in the population and real income. U.S. Census projections are for population increases ranging from 30 percent in the North to 60 percent in the Pacific region coupled with an 88 percent increase in average real income.

Demographic changes are expected to play an important role in outdoor recreation trends in the coming years. The number of people over 16 has grown by 65 percent since 1960, the percentage of Caucasians, who currently make up over 80 percent of outdoor recreationists, is falling, and the country is becoming more urban. Since recreation participation differs among demographic groups, there will likely be shifts that reflect the country's changing make-up. With increasing age, activities generally switch from active to passive activities. Racial distinctions are also reflected in outdoor recreation preferences, and people with rural backgrounds tend to prefer dispersed recreation activities.

Most activities for which survey information has been collected are projected to continue long-term moderate growth, while more rapid growth is expected for new, risky, technology-driven activities such as mountain biking and jet skiing. Interestingly, the current fastest growing activities include bird watching, hiking, backpacking, primitive area camping, and off-highway driving.

Fishing participation is expected to increase nationally by 36 percent over the next 55 years, with the Rocky Mountain / Great Plains Region seeing as much as a 55 percent increase. Fishing currently accounts for twice as many "primary purpose trips" as nonconsumptive wildlife activities and nearly three times as many as all forms of hunting combined. Nationally, hunting is projected to continue to decline over time. However, the 12 Rocky Mountain / Great Plains states from Nevada east to Kansas are projected to see a 20 percent increase in hunting participation.

Participation in nonconsumptive wildlife activities is expected to increase 64% over the next 55 years, while days spent participating are projected to double. The most prominent factor contributing to this increase appears to be the increasing age of the population.

The following tables illustrate the changes in wildlife-related recreation participation in Northern Great Plain states from 1980-1990 (1980-1990 FHWAR Trends, Rpt 91-2).

Table B-24. Recreation Related to Fish and Wildlife by State (1980-1985)

State	Hunting 1980-1990	Fishing 1980-1990	Non-consumptive, non-residential wildlife 1980-1990
North Dakota	+10%	+5%	+53%
Nebraska	-13%	+30%	+127%
South Dakota	-10%	+17%	+71%
Wyoming	-16%	+1%	+29%

However, the same information for the 1985-1990 period gives a somewhat different impression in some cases.

Table B-25. Recreation Related to Fish and Wildlife by State (1985-1990)

State	Hunting 1985-1990	Fishing 1985-1990	Non-consumptive, non-residential wildlife 1985-1990
North Dakota	-6%	-8%	-12%
Nebraska	-1%	+10%	+20%
South Dakota	-1%	+9%	-26%
Wyoming	-16%	-6%	-27%

Two noticeable changes in the 1985-1990 time-frame were the resurgence of hunting in Nebraska and South Dakota accompanied by a precipitous decline in non-residential (over a 15-minute drive from home), non-consumptive wildlife activities. Hunting is gradually, but steadily, declining as a part of the outdoor recreation menu overall, and several reasons have been suggested.

Hunting is a space-intensive activity requiring large area settings compared to most other activities, and changing attitudes of private landowners has resulted in fewer private lands open to hunting. Many comments received during initial scoping for the plan revision alluded to the increase in fee hunting that reduces the private land available. Another possibility is that, with the continued shift to an urban life-style, fewer young people are exposed to hunting during the time when they are making recreation life-style choices. Finally, hunting participation is higher among Caucasians and American Indians than other groups (Asians, Hispanics, and African-Americans), and Caucasians are becoming a smaller percentage of the population.

The following table indicates the changes in both the numbers of hunters using public lands in the Northern Great Plains states and the percentage of time spent hunting on public lands. Since the 1991 FHWAR failed to distinguish between federal and state public lands as the 1985 version did, all public lands were used for this comparison. It may be important to note that while the figures indicate a general decline both in the number and percent of hunters using public lands (except Wyoming), they may not accurately reflect the use on a specific Northern Great Plains unit. Anecdotal evidence indicates that, for some units, hunting pressure has intensified significantly during this time period. In addition, as private lands become less available to public hunting and as more private landowners convert to fee hunting only, increased use of public lands for hunting can be expected in the future.

Table B-26. Hunters' Use of Public Lands

State	1985 Hunters Using Public Lands	% of Total Hunters Using Public Lands	1991 Hunters Using Public Lands	% of Total Hunters Using Public Lands
North Dakota	56,900	55%	46,900	48%
Nebraska	61,500	32%	44,300	48%
South Dakota	99,900	60%	73,000	50%
Wyoming	121,000	68%	99,700	74%

Only Wyoming saw an increase in the percentage of hunting days on public lands, while all experienced declines in the numbers of hunters using public lands.

Selected Activity Trends

The 1994-95 NSRE noted a 155 percent increase in birdwatching since the 1982-83 survey, the largest increase of any activity, representing 32 million additional participants. Figures indicate that nationally approximately 123,500 dedicated birders spend an average of $2000 a year, half on travel. "Avitourism" is beginning to be appreciated as a source of found money in some areas that have, or have promoted, birding attractions. In Grand Island, Nebraska, crane watching draws 80,000 birders who spend $15 million annually.

Following birdwatching were hiking, backpacking, primitive area camping, and off-highway driving as measured by the percentage growth rate.

Backpacking participation is expected to increase by about 23 percent over the next 50 years while hiking, which currently accounts for nearly 50 million participants and over 800 million days annually, is expected to also grow by between 30 and 80 percent.

Horseback riding accounts for about the same number of participants as backpacking, 15 million, but falls behind only hiking and off-highway driving in the number of primary purpose trips and days spent participating. It is expected to increase primarily based upon projected growth in real income. However, at least in Nebraska, it has received a legislative boost. The 1997 state legislature passed a law designed to limit liability and offer some measure of protection for those engaged in horse-related businesses.

Off-highway driving is expected to grow by 37 percent in the Rocky Mountain / Great Plains region, over twice the national average.

Primitive camping, which in most cases seems to decrease as income increases and draws its following from rural white males, is projected to decline by about 6 percent nationally, while growing by about 20 percent in the Rocky Mountain / Great Plains region.

Days spent biking are expected to increase by 50 percent in the region over the next 50 years compared to developed camping, which will likely double. A recent study by the University of Wisconsin Center for Community Economic Development of 280 mountain bikers revealed that 94 percent felt that "natural surroundings were very or extremely important." The overwhelming majority agreed upon the importance of quiet settings, limiting motorized vehicles, a variety in trail types, and single-track trails. Over 90 percent had household incomes over $30,000 and 31 percent had advanced degrees.

Trends on Specific Units

Note: The numbers in parenthesis at the end of each paragraph refer to page numbers in the Montoring and Evaluation Reports.

Dakota Prairie Grasslands

The *Fiscal Year 1995 Monitoring and Evaluation Report* for the grassland units of the Custer National Forest stated developed recreation use has decreased on the Little Missouri National Grassland due to budget constraints. Several loops in the Buffalo Gap Campground have been closed because of lack of sufficient funding to complete needed repairs. The grassland has seen an increase in horseback and mountain bike use (12).

The Sheyenne National Grassland has experienced a steady rise in use of the North Country Trail, resulting in increased conflicts between horseback riders and hikers (5).

The report contained no recreation trend information for the Grand River and Cedar River National Grasslands.

Medicine Bow-Routt National Forest (TBNG)

The *Thunder Basin National Grassland Fiscal Year 1995 Monitoring Evaluation Report and Ten-year Review* does not indicate there is any recreation demand exceeding available supply, although plans have been developed for at least one small, minimal-service campground. The grassland is experiencing localized damage from off highway vehicles (4, 6)

Nebraska National Forest Units

According to the *Fiscal Year 1995 Monitoring and Evaluation Report*, developed recreation use has exceeded the anticipated management plan accomplishment. Dispersed recreation use as well as off highway vehicle use is less than anticipated accomplishment, although dispersed recreation use has been increasing (11).

Table B-27. Recreation and Management Plan Accomplishment Percentages

Activity Monitored	% Anticipated Management Plan Accomplishment 1992-95
Developed Recreation Use RVDs	155
Dispersed Recreation Use RVDs	86
Off-Highway Vehicle use RVDs	12

There are appears to be a need for additional developed facilities, particularly on the Wall District of the Buffalo Gap National Grassland, which offers no developed recreation facilities, and the Bessey Ranger District, where demand exceeds available facilities (13).

Public Comments

The Public Scoping Comments Summary provides further information on recreation and travel management demand. Some commentors have requested more recreation facilities such as campground, picnic sites, trails, interpretive stations, whereas others discouraged additional facilities (5). Results of the full CUSTOMER survey on the Nebraska National Forest indicate that visitors found the recreation sites and their recreation experience met or exceeded their expectations (v).

Public scoping comments related to hunting included concern over wildlife habitat requirements; access for hunters; concern that number of hunters is reducing the hunting experience; and request for walk-in hunting areas (6). In addition, results from "Customer Report Card" surveys conducted in the autumns of 1994-6 show that hunters across all units rated feeling uncrowded as one of the most important attributes of their outdoor experience. In all cases the number of hunters completely satisfied with having an uncrowded recreation experience was lower than the number who considered it important. This was especially true on the Grand River Ranger District, Sheyenne National Grassland, Pine Ridge Ranger District, and Fall River Ranger District.

Comments received during the scoping period regarding travel management had two themes. Many people stated that the negative effects of uncontrolled off-road travel out weight the rights of people to pursue those activities. Many of the same people promoted more control and enforcement of restrictions. The other theme emphasized that national forests and grasslands are among the few, if not only places for OHV enthusiasts to ride. Some commentors, supporting this theme, suggested segregating OHV activities to specific trails and areas to reduce conflicts with other recreation users (5).

Developed Recreation

To determine the people at one time (PAOT) capacity for developed recreation sites the following assumptions were made:

- Campgrounds and picnic grounds - each individual site has a capacity of 5 PAOTs.
- Boat / canoe launch - 10 PAOTS each at the put in and take out site.
- Hardened dispersed recreation sites - 25 PAOTs.

In Alternatives DEIS 3 and 5, with objectives to construct new recreation facilities, it was assumed that each new campground would have 15 campsites and new picnic grounds would have 10 picnic sites. All alternatives for the Nebraska National Forest assumed the Prehistoric Prairies Discovery Center would be built and would have a 350 PAOT capacity.

Trails

For the Dakota Prairie and Nebraska units any trails now under construction were assumed to be completed for all alternatives.

Dispersed Recreation

The following processes were used to determine the changes in dispersed recreation opportunities. The change in opportunity for quality deer habitat was taken directly from the percent riparian / woody draw regeneration occurring by alternative. Alternative 1 is the base level. Each plus sign equals a 50% increase over base. Therefore, if the increase was close to double of the base percentage, two "+" signs were applied. To determine change in upland bird habitat the percentage of the unit in a high vegetative structure was used. Again Alternative 1 served as the base and the amount of change was based on how much different the structure varied by alternative from the base. Two "+" signs indicate a close to double percentage increase from the base. This information is displayed in the Comparison Tables in FEIS Chapter 2.

Recreation Opportunity Spectrum

The Recreation Opportunity Spectrum (ROS) inventory was conducted according to the direction in the 1996 ROS book (IV-4 -IV-14). The mapped ROS classifications were then entered into GIS. Appropriate ROS classes were selected for each management area based on the intent of the management area prescription. Table B-29 displays the ROS classes assigned to each management area. The ROS classification acronyms are defined as follows:

- SPNM - semi-primitive nonmotorized.
- SPM - semi-primitive motorized.
- RNNM - roaded natural nonmotorized.
- RN - roaded natural.
- RM - roaded modified.
- R – rural.
- U – urban.

Table B-28. Management Areas - Recreation Opportunity Spectrum (ROS)*

Management Area	ROS Classification
1.1 Wilderness: Soldier Creek	SPNM
1.2 Recommended for Wilderness	SPNM
1.2 A Suitable for Wilderness	SPNM
1.31 Backcountry Recreation Nonmotorized	SPNM
1.31A Pine Ridge National Recreation Area	SPNM
1.5 National River System: Wild Rivers Designated and Eligible	RNNM
2.1 Special Interest Areas: Red Shirt Black Cottonwood Rest	 SPNM RNNM Same as existing ROS
2. 2 Research Natural Areas	SPNM for areas over 2,500 acres RNNM for the rest
2.4 American Indian Traditional Use Areas	SPM and RN

Management Area	ROS Classification
3.4 National River System: Scenic Rivers Designated and Eligible	SPM, RN and R
3.51 Bighorn Sheep	SPM, RN, RM and R
3.51A Bighorn Sheep with Nearby Non-federal Mineral Ownership	SPM, RN, RM and R
3.63 Black-footed Ferret Reintroduction Habitat	SPM and RN
3.64 Special Plant and Wildlife Habitat	SPM, RN, and R
3.65 Rangelands with Diverse Natural –Appearing Landscapes	SPM, RN, RM, and R
3.66 Ecosystem Restoration (Tallgrass Prairie)	SPM, RN, and R
3.68 Big Game Range	SPNM (seasonal), SPM, and RN
4.22 Scenic Areas, Vistas or Travel Corridors:	SPM and RN
4.32 Dispersed Recreation: High Use	RN
4.33 Dispersed Recreation	SPM, RN, and RM
4.4 National River System: Recreation Rivers Designated and Eligible	RN and R
5.12 General Forest and Rangelands: Range Vegetation Emphasis	SPM and RN
5.13 Forest Products	SPM and RN
5.31A Experimental Forests (Denbigh)	RN
5.31B Experimental Forests (Souris Purchase Unit)	RN
6.1 Rangeland Resource Production	SPM, RN, RM, and R
6.2 Rangeland with Broad Resource Emphasis	SPM, RN, RM, and R
7.1 Residential/Forest Intermix	RN and R
8.3 Designated Utility Corridors: Existing and Potential	SPM, RN, RM, and R
8.4 Mineral Production and Development	U
8.5 Nursery	R
8.6 Administrative Sites	R, U

*Any Management Area with more than one ROS classification listed used the existing ROS classifications for the adopted classifications.

Scenic Integrity Levels

All the planning units have been inventoried under the new Scenery Management System, following the process outlined in *Landscape Aesthetics A Handbook for Scenery Management*. The mapped landscape values were then entered into GIS. Appropriate scenic integrity levels (SIL) were selected for each management area based on the intent of the management area prescription. The table below displays the SIL classes assigned to each management area.

Table B-29. Management Areas - Scenic Integrity Level.

Management Area	Scenic Integrity Level
1.1 Wilderness: Soldier Creek	Very High
1.2 Recommended for Wilderness	High
1.2 A Suitable for Wilderness	High
1.31 Backcountry Recreation Nonmotorized	High
1.31A Pine Ridge National Recreation Area	High

Management Area	Scenic Integrity Level
1.5 National River System: Wild Rivers Designated and Eligible	High
2.1 Special Interest Areas	High
2. 2 Research Natural Areas	High
2.4 American Indian Traditional Use Areas	High
3.4 National River System: Scenic Rivers Designated and Eligible	Moderate
3.51 Bighorn Sheep	Moderate in FG and MG, Low in BG of scenic classes 1-2; Low in all areas scenic classes 3-7
3.51A Bighorn Sheep with Nearby Non-federal Mineral Ownership	Moderate in FG and MG, Low in BG of scenic classes 1-2; Low in all areas scenic classes 3-7
3.63 Black-footed Ferret Reintroduction Habitat	Low
3.64 Special Plant and Wildlife Habitat	Moderate
3.65 Rangelands with Diverse Natural -Appearing Landscapes	Moderate in FG and MG, Low in BG of scenic classes 1-2; Low in all areas scenic classes 3-7
3.66 Ecosystem Restoration (Tallgrass Prairie)	Moderate in FG and MG, Low in BG of scenic classes 1-2; Low in all areas scenic classes 3-7
3.68 Big Game Range	Moderate in FG and MG, Low in BG of scenic classes 1-2; Low in all areas scenic classes 3-7
4.22 Scenic Areas, Vistas or Travel Corridors:	Moderate
4.32 Dispersed Recreation: High Use	Moderate
4.33 Dispersed Recreation	Moderate in FG and MG, Low in BG of scenic classes 1-2; Low in all areas scenic classes 3-7
4.4 National River System: Recreation Rivers Designated and Eligible	Moderate
5.12 General Forest and Rangelands: Range Vegetation Emphasis	Moderate in FG and MG, Low in BG of scenic classes 1-2; Low in all areas scenic classes 3-7
5.13 Forest Products	Moderate in FG and MG, Low in BG of scenic classes 1-2; Low in all areas scenic classes 3-7
5.31A Experimental Forests (Denbigh)	Moderate
5.31B Experimental Forests (Souris Purchase Unit)	Moderate
6.1 Rangeland Resource Production	Low
6.2 Rangeland with Broad Resource Emphasis	Low
7.1 Residential/Forest Intermix	Moderate
8.3 Designated Utility Corridors: Existing and Potential	Low
8.4 Mineral Production and Development	Low
8.5 Nursery	Low
8.6 Administrative Sites	Low

FG - foreground; MG - middleground; and BG - background.

Travel Management

To determine travel effects by alternative, the management area designation with the corresponding standards and guidelines was used, as well as district travel management plans to determine acres with restrictions. The calculation used for designated route areas is: Designated route areas = total unit acres - (nonmotorized areas - seasonal restriction areas).

The existing miles of road per square mile on each unit was calculated by dividing the acres of the unit by 640 acres to get square miles on the unit. The number of miles of road on each unit was then divided by the number of sq. miles on the unit to determine number of miles of existing road per square mile (mi/sq mi).

K. Special Area Designations

Research Natural Areas

See Appendix E.

Roadless Areas

See Appendix C.

Special Interest Areas

See Appendix F.

Wild and Scenic Rivers

See Appendix G.

J. Timber Management

Tentatively Suited Timber Lands

Tentatively suited timber lands are displayed in Chapter 3 of the DEIS in table TR-1 and the narrative which follows the table.

Tentatively suited timber lands on the Pine Ridge Unit of the Nebraska National Forest were determined in part by soil timber productivity as classified by the NRCS[22],[23].

[22] Soil Survey of Dawes County, Nebraska; USDA Soil Conservation Service, February 1977 pp 79-81 and Consultation with USDA NRCS.

[23] See Administrative Record "Tentatively Suited Timberland AML.

Lands Appropriate for Timber Production

The Little Missouri National Grassland and the Sheyenne National Grassland contain 940 acres and 5,110 acres of tentatively suited timber lands, respectively, that were not considered appropriate for timber production. These lands were considered inappropriate because minimum management requirements, as stated in Forest Service Handbook 2409.13-23, cannot be met[24].

The approximately 26,000 acres of forested type on the Samuel R. McKelvie National Forest and Bessey unit were not considered tentatively suitable based on irreversibility due to soils, questions on restocking within five years, and the inadequate response information available.

Timber discussions from this point on will be limited to the Pine Ridge Unit of the Nebraska National Forest because it is the only planning unit has lands that can be allocated as suited timber lands.

Timber Suitability Analysis

The first step in determining timber suitability was to identify forest lands available for timber harvest. District input and GIS was utilized to determine and identify National Forest System lands that were forested and nonforested.

The Pine Ridge Ranger District evaluated tentatively suitable forestland by utilizing polygons based on soils capable of producing timber as determined by the Natural Resources Conservation Service (NRCS). Based on this, the evaluation shows more lands capable of producing timber than are actually forested. This is due to fire events that have occurred on this unit and the loss of forest cover. It is expected that these areas will become forested and capable of producing timber and, therefore, should be considered in the evaluation.

The next step was to determine unsuitable timberland based on the following criteria:

- Areas not within a Management Area 5.13.
- Areas that cannot be reforested within 5 years of final harvest (on south or west slopes or slopes greater than 40%).
- Areas that are not forested due to fire and other reasons (reforestation costs are significantly higher than the future value of the timber).

The Pine Ridge Ranger District was the only unit that contained the management area prescription 5.13. Therefore, it was the only unit that could contain suitable timber and further analysis on the other units is not necessary. Also, the Pine Ridge Ranger District only used the management area prescription 5.13 in Alternative 2. Based on the GIS layers for the above listed criteria, following is a table indicating suitable timber for the Pine Ridge Ranger District:

[24] See Forest Service Handbook 2409.13-23 - www.fs.fed.us/im/directives/html/fsh.html.

Table B-30. Suitable Timber, Pine Ridge Ranger District.

Criteria	Acres
Tentatively Suitable Timberland	39,800
Areas not within MA 5.13 (NRA and timber sites on Grassland)	2,720
Areas that can not be reforested (south and west slopes, greater than 40 percent slopes)	15,740
Areas not forested but listed as tentatively suitable (fire and other)	11,200
Suitable Timberland	10,140

The following tables describe desired conditions for timber stands both over the long term (100 years) and short term (10 - 15 years). Alternative 1 is not shown because it would continue the current management direction.

Table B-31. Short- and Long-term Desired Conditions for Alternative 2.

10 - 15 year Desired Conditions	100 year Desired Conditions
Dense Timber Stands: Management Area 5.13 One third of suitable timber stands would have 2 stories with 60 - 80 sq/ft basal area of the sawtimber overstory and a seed/sap understory.	**Dense Timber Stands:** Management Area 5.13 All of the suitable timber lands would be uneven-aged stands containing 3 size classes consisting of the following: 10% of the basal area in seed/sap 20% of the basal area in post/pole 70% of the basal area in sawtimber 65% of the total acres in Management Areas 6.1 and 7.1 are unmanaged
Open Savanna Timber Stands: Management Area 6.1 Management Area 7.1 Ten percent of the unsuitable timber land acres would have 20 - 40 sq/ft basal area in sawtimber with no understory.	**Open Savanna Timber Stands:** Management Area 5.13 (100% of the unsuitable acres) Management Area 6.1 (35% of the acres) Management Area 7.1 (35% of the acres) Open, park-like ponderosa pine stands with scattered mature sawtimber. Low fuel loadings and no understory with 100% of the timber being a sawtimber size class.

Table B-32. Short- and Long-term Desired Conditions for Alternative 3.

10 - 15 year Desired Conditions	100 year Desired Conditions
Dense Timber Stands: Management Area 5.12 Management Area 7.1 Ten percent of the unregulated timber land would have 2 stories with 60 - 80 sq/ft basal area in sawtimber and a seed/sap understory.	**Dense Timber Stands:** Management Area 5.12 (75% of the acres) Management Area 7.1 (65% of the acres) Timber lands would be un-even aged stands containing 3 size classes consisting of the following: 10% of the basal area in seed/sap 20% of the basal area in post/pole 70% of the basal area in sawtimber
Open Savanna Timber Stands: Management Area 5.12 Management Area 3.51 Management Area 7.1 Ten percent of the unregulated timber land acres would have 20 - 40 sq/ft basal area in sawtimber with no understory.	**Open Savanna Timber Stands:** Management Area 5.12 (25% of the acres) Management Area 3.51 (100% of the acres) Management Area 7.1 (35% of the acres) Open, park-like ponderosa pine stands with scattered mature sawtimber. Low fuel loadings and no understory with 100% of the timber being a sawtimber size class.

Table B-33. Short- and Long-term Desired Conditions for Alternative 4.

10 - 15 year Desired Conditions	100 year Desired Conditions
Dense Timber Stands: Management Area 6.1 Management Area 7.1 Ten percent of the unregulated timber land would have 2 stories with 60 - 80 sq/ft basal area in sawtimber with a seed/sap understory.	**Dense Timber Stands:** Management Area 6.1 (65% of the acres) Management Area 7.1 (65% of the acres) Timber lands would be un-even aged stands containing 3 size classes consisting of the following: 10% of the basal area in seed/sap 20% of the basal area in post/pole 70% of the basal area in sawtimber
Open Savanna Timber Stands: Management Area 5.12 Management Area 3.51 Management Area 6.1 Management Area 7.1 Ten percent of the unregulated timber land acres would have 20 - 40 sq/ft basal area in sawtimber with no understory	**Open Savanna Timber Stands:** Management Area 5.12 (100% of the acres) Management Area 3.51 (100% of the acres) Management Area 6.1 (35% of the acres) Management Area 7.1 (35% of the acres) Open, park-like ponderosa pine stands with scattered mature sawtimber. Low fuel loadings and no understory with 100% of the timber being a sawtimber size class.

Table B-34. Short- and Long-term Desired Conditions for Alternative 5.

10 - 15 year Desired Conditions	100 year Desired Conditions
Dense Timber Stands: Management Area 6.1 Management Area 7.1 Ten percent of the unregulated timber land would have 2 stories, with 60-80 sq/ft basal area in sawtimber with a seed/sap understory.	**Dense Timber Stands:** Management Area 6.1 (65% of the acres) Management Area 7.1 (65% of the acres) Timber lands would be un-even aged stands containing 3 size classes consisting of the following: 10% of the basal area in seed/sap 20% of the basal area in post/pole 70% of the basal area in sawtimber
Open Savanna Timber Stands: Management Area 3.51 Management Area 6.1 Management Area 7.1 Ten percent of the unregulated timber land acres would have 20-40 sq/ft basal area in sawtimber with no understory.	**Open Savanna Timber Stands:** Management Area 3.51 (100% of the acres) Management Area 6.1 (35% of the acres) Management Area 7.1 (35% of the acres) Open, park-like ponderosa pine stands with scattered mature sawtimber. Low fuel loadings and no understory with 100% of the timber being a sawtimber-size class.

Timber Benchmark Analysis

Maximum timber production was estimated from the tentatively suited timber lands using all Forested acres assuming they could be hand planted if needed to meet the five year regeneration requirement.

A selection harvest system was used with a yield determined by an expert panel[25]. The estimated yield was 2.5 MBF/acre with a reentry and similar yield every 30 years on 29,600 acres (39,800 tentatively suited acres - 11,200 non-forested acres). This gives a maximum annual sustained production (long term sustained yield) of 2.383 MMBF (28,600/30*2.5) in the foreseeable future (next 120 years). Once current nonstocked acres were hand planted and grew into merchantable timber annual timber production (long tern sustained yield) would be 3.316 MMBF (39,800/30*2.5).

Maximum present net value of Pine Ridge timber would be $0.00. Timber on the Pine Ridge currently costs $160/MBF to prepare and sell, while timber prices are $116/MBF, making these sales below cost.

Timber Demand

Ponderosa pine is the primary sawtimber species in the Pine Ridge area. In Nebraska, it is found in the Pine Ridge, eastward along the Niobrara and Snake Rivers and in other scattered pockets in western Nebraska. With control of fire, ponderosa pine which used to exist in presettlement days only in sites protected from fire, has spread across the landscape and this expansion is continuing today. Nebraska's forests have increased from 718,000 acres in 1983 to 948,000 acres in 1994. This reversed a 30% decline from 1955 to 1983. Ponderosa pine in Nebraska increased from 157,000 acres to 174,000 acres from 1983 to 1994. Likewise Nebraska

[25] See timber_effects_mtg_100298.aw

ponderosa pine sawtimber volume increased 23% from 1983 to 1994 although only 14% of the harvest volume was in the higher grade trees with a DBH greater than 19".[26]

The Pine Ridge District, as is the remainder of the Nebraska National Forest, is currently unregulated and has no Allowable Sale Quantity. The timber sales which have occurred on the Pine Ridge District since 1990 are as follows[27:]

Sale Name	Year Sold	Sale Vol.	Product Sold
Homestead	1990	1,161 MBF	Sawtimber
Rocky Buttes	1994	1,018 MBF	Sawtimber

The timber sales listed above were both completed by Pope and Talbot out of Spearfish, South Dakota. All milling was done in Spearfish, SD.

The recently completed Final Environmental Impact Statement for the Black Hills National Forest (BHNF) states (III-447) "A modern efficient wood products industry exists today with a capacity to process more than 200 MMBF annually." The total sale program quantity projected from the BHNF for the next decade is less than or equal to 85 MMBF if the forest receives full funding for the program. The BHNF used industry data on mill capacities, since mill capacity was well above any supply they could produce. Excess milling capacity is evidenced by firms buying BHNF sales from as far away as 300 miles into Montana.[28]

The timber benchmark analysis indicates the long-term sustained yield from Pine Ridge District is less than 4 MMBF annually, which is well within the excess milling capacity of the Black Hills area. Estimated timber production under all alternatives is well within the milling capacity of the Black Hills.

[26] Schmidt, Thomas L and Wardle, Tom D. 1998. The Forest Resources of Nebraska. USDA Forest Service North Central Research Station.

[27] Nebraska National Forest Management Attainment Reports 1985-1995.

[28] USDA Forest Service. 1996. Black Hill National Forest, 1996 Revised Land and Resource Management Plan, Final Environmental Impact Statement. pIII-447.

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Appendix C Roadless Area Evaluation

A Roadless Area Evaluation to Study the Feasibility of Wilderness Recommendations to Congress

Purpose

This appendix describes 44 roadless areas associated with the Northern Great Plains Plans Revision. It further describes the analysis process used to evaluate individual roadless areas and offers findings from that process. Included in this report are: descriptions of each roadless area's affected environment, Wilderness capability and Availability Analyses, Evidence of Need for Wilderness and the consequences of management area acreage allocations for each of the five Forest Plan alternatives. At its most fundamental level, Wilderness designation is designed to provide an enduring resource of Wilderness for generations to come.

A Brief History of Roadless Area Reviews and Evaluations

In 1970, the Forest Service studied all administratively designated primitive areas and inventoried and reviewed all roadless areas greater than 5,000 acres in the National Forest System. This study was known as the Roadless Area Review and Evaluation (RARE). RARE was terminated in 1972 due to legal challenges.

In 1977, the Forest Service began another nationwide Roadless Area Review and Evaluation (RARE II) to identify roadless and undeveloped areas suitable for inclusion in the National Wilderness Preservation System within the National Forest System. As a result of RARE II, the following areas were recommended for Wilderness: the 9,000-acre Twin Buttes area on the Little Missouri National Grassland and the 6,388-acre Pine Ridge area on the Nebraska National Forest. RARE II also was challenged in court and the court determined that RARE II did not fully comply with National Environmental Policy Act (NEPA) requirements.

In 1986, the Nebraska Wilderness Act established the 7,794-acre Soldier Creek Wilderness on the Nebraska National Forest and the 6,599-acre Pine Ridge National Recreation Area, though not as a Wilderness area.

Current Conditions

On the Little Missouri National Grasslands, formerly the Custer National Forest, RARE II areas were reevaluated and are identified as the Forest Service's inventoried roadless areas (on the Little Missouri National Grasslands) for purposes of this report. The 1987 management plan made the following determinations for roadless areas now on the Dakota Prairie Grasslands:

- Twin Buttes, Bennett-Cottonwood, and Lone Butte (total of about 74,700 acres) - Allocated to a Low Development Management Area.
- The remaining inventoried roadless areas, Ash Coulee, Bell Lake, Bullion Butte, Kinley Plateau, Magpie, Strom-Hanson, and Wannagan (about 53,300 acres) were allocated to a mix of multiple-use emphases that ranged from a range / wildlife / minerals prescription to a wildlife prescription.

No roadless areas were identified on the Thunder Basin National Grassland (administered by the Medicine Bow-Routt National Forest) during RARE II or the 1980s planning effort.

Chief of the Forest Service authorized the Nebraska National Forest to defer the reevaluation because the Forest was in the final stages of completing the *1984 Forest Land and Resource Management Plan* (Nebraska National Forest LRMP II-35). In addition, no activities were planned for any RARE II areas that would preclude future consideration as Wilderness. There have been no activities within these areas that would affect consideration as Wilderness. Of the five RARE II areas, the three located in South Dakota are reevaluated in this analysis: Indian Creek (24,670 acres), Red Shirt (9,700 acres), and Cheyenne River (7,750 acres). The special designations of the two RARE II areas in Nebraska were accomplished through the Nebraska Wilderness Act of 1985.

Table C-1 displays the roadless area acres as determined through the RARE II process, as adjusted immediately after each of the three forest plans currently in force were signed and as calculated as inventory acreage in 1998. Reduction in acreages for the Little Missouri roadless acres result from implementation of the present land and resource management plan, primarily oil and gas development. Increases in acreages resulted from the inventory process used for this analysis (see inventory process section). The Red Shirt roadless area on the Buffalo Gap National Grassland shows an approximately 6,000-acre decrease in size, although the current area has the same boundaries as the existing RARE II maps. Apparently there was an acreage calculation error during the RARE II process.

Table C-1: Roadless Area Status

Planning Unit/ Roadless Area	Original RARE II Acres	Acres When Forest Plan Signed	1998 Inventory Acreage
DAKOTA PRAIRIE GRASSLAND UNITS			
Little Missouri National Grassland			
Ash Coulee	28,560	13,040	0
Bennett-Cottonwood	18,240	18,760	19,700
Bell Lake	10,860	12,460	11,270
Bullion Butte	17,760	17,760	19,880
Kinley Plateau	19,360	19,360	16,900
Lone Butte	12,920	7,140	11,470
Magpie	34,960	6,080	21,280
Strom-Hanson	15,320	16,670	18,810
Twin Buttes	9,000	9,000	13.390
Wannagan	5,880	5,040	6,020
TOTAL	172,860	125,310	138,720
Grand River, Cedar River, and Sheyenne National Grasslands	0	0	0
TOTAL	**0**	**0**	**0**
MEDICINE BOW-ROUTT NATIONAL FOREST UNIT			
Thunder Basin National Grassland	0	0	0
TOTAL	**0**	**0**	**0**
NEBRASKA NATIONAL FOREST UNITS			
Buffalo Gap National Grassland			
Indian Creek	24,670	24,670	25,100
Red Shirt	15,720	15,720	9,210
Cheyenne River	7,050	7,050	7,570
Pine Ridge District			
Soldier Creek Wilderness	8,090	8,090	7,800
Pine Ridge National Recreation Area	6,390	6,560	6,540
TOTAL	**61,920**	**62,090**	**56,220**

(Information for table taken from *Custer National Forest Plan, Record of Decision,* page iii and *Nebraska National Forest Plan,* page II-36).

The 1998-acre figures were taken from computer-generated maps and rounded to the nearest 10 acres.

Within the 250 million acres of the Northern Great Plains planning area, nine federally designated Wilderness areas (none of which are located on a proclaimed national grassland) exist for a total of 158,234 acres. The following table shows the existing Wilderness acreages by the administering agency.

Table C-2: Existing Wilderness

Existing Wilderness	Administering Agency	Acres	Bailey's Section[1]
Chase Lake, ND	US Fish and Wildlife Service	4,155	331E
Alteredwood, ND	US Fish and Wildlife Service	5,577	332A
Medicine Lake, MT	US Fish and Wildlife Service	11,366	331E
UL Bend, MT	US Fish and Wildlife Service	20,819	331D
Fort Niobrara, NE	US Fish and Wildlife Service	4,635	332C / 332D
Theodore Roosevelt, ND - (Two units, North and South)	National Park Service	29,920	331F
Sage Creek, SD	National Park Service	64,144	331F
Black Elk, SD	US Forest Service	9,824	334A
Soldier Creek, NE	US Forest Service	7,794	331F

[1] Ecological section as defined by Robert Bailey

331 series is Great Plains-Palouse Dry Steppe Province Ecoregion. 331D is the Northwestern Glaciated Plains Section, 331E is the Northern Glaciated Plains Section, and 331F is the Northwestern Great Plains Section.

332 series is Great Plains Steppe Province Ecoregion. 332A is the Northeastern Glaciated Plains Section, 332C is the Nebraska Sand Hills Section, and 332D is the Northcentral Great Plains Section.

334 series is Black Hills Coniferous Forest Province Ecoregion. 334A is the Black Hills Section.

Additional information for table from "The National Wilderness Preservation System Map 1964-1989."

Benchmark Analyses Summary

Inventory Process

An inventory of areas essentially roadless and undeveloped in character has been completed for every unit. All inventories began with an identification of all public highways and Forest Service roads maintained for the administration of each unit. Once such roads were identified, areas more than 5,000 acres in size that excluded such roads were identified (user-developed, unclassified roads may be present in the inventoried areas). The process then varied by unit based on the information contained in each unit's GIS. On the Dakota Prairie Grasslands, maps identifying potential roadless areas were sent to district employees for review of existing developments within the areas. Direction in FSH 1909.12,7 was followed to determine whether existing developments would disqualify the area from the roadless inventory. To assess undeveloped character, the amount of other developments, such as fences, water tanks and other human-made structures, was evaluated. Areas identified with essentially undeveloped character became a part of the roadless inventory for evaluation as potential Wilderness.

On the units of the Nebraska National Forest and the Thunder Basin National Grassland, once roadless areas were preliminarily identified, fence density and structure density (e.g.: water tanks, corrals and windmills) were applied to identify areas with less than one mile of interior fence per section and less than three structures per section. Areas of more than 5,000 acres remaining from this analysis comprise the roadless inventory.

Results of Inventory

Table C-3 lists the areas meeting the roadless area inventory criteria. The inventory process identified several roadless areas on the planning area units that were not identified in previous analyses. Thus, there will be new roadless areas listed in Table C-3 that don't appear in Table C-1. In the case of Bennett-Cottonwood, an adjoining roadless area, Collar, was identified. These two roadless areas were joined into one, Collar / Bennett-Cottonwood

* Please Note: The number of acres for roadless areas shown in the tables in this appendix may differ slightly from the number of acres shown elsewhere in these plan revision documents due to computer modeling and mapping techniques.

Table C-3: Inventoried Roadless Areas

Planning Unit/Inventoried Roadless Area	Acres*
DAKOTA PRAIRIE GRASSLANDS	
Little Missouri National Grassland McKenzie	
Collar / Bennett-Cottonwood	19,700
Lone Butte	11,470
Long X Divide	10,100
Johns Town / Horse Creek	24,450
Magpie	6,700
Scairt Woman	640
Little Missouri National Grassland - Medora	
Magpie	14,580
Bell Lake	11,270
Little Missouri National Grassland - Medora, cont.	
Bullion Butte	19,780
Easy Hill	7,350
Kinley Plateau	16,900
Strom-Hanson	18,810
Twin Buttes	13,380
Wannagan	6,030
Scairt Woman	5,460
Blacktail	8,620
Dawson's Waterhole	6,090
Tracy Mountain	9,730
Ponderosa Pine	7,470
Sheyenne National Grassland	
Durler	12,470
McLeod	9,120
Delamere	5,090
Venlo	5,320
Sheyenne	14,540
MEDICINE BOW-ROUTT NATIONAL FOREST UNIT	
Thunder Basin National Grassland	
H A Divide	5,060
Red Hills	6,840
Cow Creek	10,960

Planning Unit/Inventoried Roadless Area	Acres*
NEBRASKA NATIONAL FOREST UNITS	
Buffalo Gap National Grassland - Fall River	
Red Shirt RARE II	9,210
Red Shirt	7,130
Cheyenne River	7,570
Jim Wilson Canyon	6,020
First Black Canyon	4,960
Buffalo Gap National Grassland - Wall	
Indian Creek	25,100

*Acreages are computer-generated and rounded to the nearest 10 acres.

In addition, during the initial public comment period, the Sierra Club requested that the Forest Service evaluate several other areas for Wilderness potential. Although these areas contain more than the one mile of interior fence per section allowed within official Forest Service inventoried roadless areas, they have been evaluated for their potential as Wilderness. The table below lists those areas by administrative unit.

Table C-4: Public Proposed Wilderness

Planning Unit/Inventoried Roadless Area	Acres*
DAKOTA PRAIRIE GRASSLANDS	
Grand River National Grassland	
Grand River	6,060
South Fork	12,830
Twin Butte	6,540
MEDICINE BOW-ROUTT NATIONAL FOREST UNIT	
Thunder Basin National Grassland	
Cow Creek Buttes	6,540
Miller Hills	10,370
Duck Creek	12,330
Downs	6,510
NEBRASKA NATIONAL FOREST UNITS	
Buffalo Gap National Grassland: Fall River Ranger District	
Indian Creek	3,210+
Buffalo Gap National Grassland: Wall Ranger District	
Rake Creek Badlands	12,300
Indian Creek	3,770+
Fort Pierre National Grassland	
Cedar Creek	8,730
Pine Ridge Ranger District/Oglala National Grassland	
Sugarloaf	9,090
Toadstool	5,280
Soldier Creek	1,830

Planning Unit/Inventoried Roadless Area	Acres*
Samuel R. McKelvie National Forest	
Steer Creek East	60,790
Steer Creek West	26,210
Dismal River	12,980

* Acreages are computer generated and rounded to nearest 10 acres.

+ Acreage outside of the RARE II area.

Demand Assessment

Various proposals have been advanced for designating areas as additions to the National Wilderness Preservation System. In 1993, a coalition of organizations submitted *Badlands on the Brink - North Dakota Wilderness and Wild and Scenic River Proposal*. Areas included in this proposal were:

Bell Lake: 9,920 acres

Bennett-Cottonwood: 18,366 acres

Bullion Butte: 19,130 acres

Horse Creek: 25,320 acres

Kinley Plateau: 21,120 acres

Lone Butte: 10,400 acres

Long X Divide: 18,366 acres

Ponderosa Pine: 7,800 acres

Sheyenne Grasslands: 18,120 acres

Strom Hanson: 16,510 acres

Twin Buttes: 11,880 acres

Wannagan: 7,480 acres

In 1994, the Governor of North Dakota established a task force of the North Dakota Game and Fish Department and the North Dakota Parks and Recreation Department. This task force, called Vision 20/20, was charged with reviewing roadless areas within the state for potential Wilderness recommendations. To date, the task force is in the process of gathering information (personal communication with Doug Prchal).

In 1993, a South Dakota Wilderness Act was proposed by the Sierra Club to designate the following areas as Wilderness:

- Indian Creek Badlands: 37,900 acres,
- Red Shirt: 9,600 acres,
- Rake Creek: 14,180 acres, and
- Cheyenne River: 9,600 acres.

None of these proposals have appeared as legislation before Congress.

Several recreation studies have identified that many recreationists prefer a natural appearing setting with minimal disturbance (*Recreation Assessment for Northern Great Plains Plan*, Revision 2, 8, and 12). Comments received during the formal public scoping period range from wanting all roadless areas designated as Wilderness to having no more Wilderness designated and to reexamining all existing Wilderness areas.

Laws and Policies that Drive this Process

The U.S. Forest Service is required, by law, to inventory, evaluate, and consider all roadless areas for possible inclusion in the National Wilderness Preservation System during the planning process (36 CFR 219.17).

Two Wilderness laws pertain to the Northern Great Plains planning area. The Wilderness Act of 1964 applies to land west of the 100th Meridian and includes all the planning units, except the Sheyenne National Grassland. The Eastern Wilderness Act of 1975 applies to land east of the 100th Meridian, including the Sheyenne National Grassland.

Proponents of designating grassland Wilderness areas state that the Forest Service currently administers no grassland Wilderness areas anywhere in the 3.8-million-acre National Grassland System. They also point out that although Wilderness areas administered by other federal agencies do exist on mixed-grass prairies, few Wilderness areas under any federal administration exist on either short-grass or tallgrass prairies.

Opponents of designating grassland Wilderness areas conclude that enough Wilderness exists elsewhere, under Forest Service or other federal agency administration, to satisfy the general public's desire and need.

This report follows direction as found in the *Forest Service Handbook* (FSH). It documents "capability," "availability," and "Evidence of Need for Wilderness" data for the 30 inventoried roadless areas identified by personnel at Forest Service ranger districts and the 15 public proposed areas. Inventoried roadless areas meet agency criteria as defined in FSH 1909.12 Chapter 7.

Mineral Leasing and the Wilderness System

The Mineral Leasing Act of 1920 authorizes the Secretary of Interior to issue leases for disposal of certain minerals. This act currently applies to coal, phosphate, sodium, potassium, oil, oil shale, gilsonite, and gas. In addition, this act, along with the Federal Onshore Oil and Gas Leasing Reform Act of 1987, provides that oil and gas leases cannot be issued without the approval of the Forest Service on lands administered by the U.S. Forest Service.

Once a lease is issued (including within Wilderness areas or areas proposed for Wilderness designation), the lessee may enter upon that lease to conduct oil and gas operations unless limited by special stipulations. Thus, the lessee has the right to explore for minerals on that lease and may construct roads to do so, and the lessee also has the right to develop that lease, which can include well pads for on-site production facilities. The life span of an issued lease averages 10 years. If that lease produces mineral products, the expected average life span of the lease held by production averages between 15 to 25 years. However, lease stipulations can dictate that surface development is disallowed over 100 percent of the lease area (known as No Surface Occupancy [NSO]). If the lease language does not describe any NSO conditions, the lessee has the right to occupy some portion of the lease area for exploration and development.

Private subsurface mineral ownership under a federal surface ownership (including Wilderness areas or areas proposed for Wilderness designation) can occur on the public lands. The owner of these subsurface mineral rights must be allowed reasonable access to those areas by the agency responsible for managing the surface (typically, the Forest Service). If the agency denies a lessee the opportunity to develop a lease, regardless of the mineral ownership (federal or private), such denial would constitute a taking and the agency must compensate the lessee for potential altered revenue that may have resulted from that lease's development.

For the purposes of the following analysis, each roadless area was researched to see if (1) oil and gas leases exist within the area's boundary and (2) if they do they exist, to determine the distribution of those leases and evaluate whether Wilderness potential would be degraded.

For more information about mineral leasing on lands administered by the U.S. Forest Service, please refer to the following documents:

- *Northern Little Missouri National Grassland Oil and Gas Leasing Final Environmental Impact Statement* (1991) pages 1-12 to 1-13 and Appendix C.
- *Southern Little Missouri and Cedar River National Grasslands Final Oil and Gas Leasing Environmental Impact Statement* (1995) pages 1-4 to 1-5 and Appendices B and C.

Livestock Grazing and the Wilderness System

Section 4(d)(4)(2) of the Wilderness Act states: "The grazing of livestock, where established prior to the effective date of the Act, shall be permitted to continue subject to such reasonable regulations as are deemed necessary by the Secretary of Agriculture." Congressional interpretation of the Wilderness Act makes it clear that the legislative intent of the Wilderness Act is to allow livestock grazing and the facilities needed to support grazing in Wilderness areas when such grazing was established prior to classification.

Congress has developed specific guidelines and policy statements that reflect and clarify its interpretation of livestock grazing within Wilderness areas. The following points derive from Forest Service Manual 2323.22:

- There shall be no curtailments of grazing in Wilderness areas simply because an area is, or has been, designated as Wilderness, nor should Wilderness designations be used as an excuse by administrators to slowly "phase out" grazing. Any adjustments in the numbers of livestock permitted to graze in Wilderness areas should be made as a result of revisions in the normal grazing and land management planning and policy setting process, giving consideration to legal mandates, range condition, and the protection of the range resource from deterioration.
- The maintenance of supporting facilities, existing in the area prior to its classification as Wilderness (including fences, line cabins, water wells and lines, stock tanks, etc.), is permissible within a Wilderness area. Where practical alternatives do not exist, maintenance or other activities may be accomplished through the occasional use of motorized equipment. This may include, for example, the use of backhoes to maintain stock ponds, pickup trucks for major fence repairs or specialized equipment to repair stock watering facilities.

Interpretation of livestock grazing within Wilderness areas, cont.

- Such occasional use of motorized equipment should be expressly authorized in the grazing permits for the area involved. The use of motorized equipment should be based on a rule of practical necessity and reasonableness. For example, motorized equipment need not be allowed for the placement of small quantities of salt or other activities where such activities can reasonably and practically be accomplished on horseback or foot. On the other hand, it may be appropriate to permit the occasional use of motorized equipment to haul large quantities of salt to distribution points. Moreover, under the rule of reasonableness, occasional use of motorized equipment should be permitted where practical alternatives are not available and when such use would not have a significant adverse impact on the natural environment. Such motorized equipment uses would be normally permitted only in those portions of a Wilderness area where they had occurred prior to the area's designation as Wilderness or where established by prior agreement.
- Placing or reconstructing deteriorated facilities or improvements should not require "natural materials" unless the material and labor costs or using natural materials would not impose unreasonable additional costs on grazing permittees.
- The construction of new improvements or replacement of deteriorated facilities in a Wilderness is permissible if in accordance with those guidelines and management plans governing the area involved. However, the construction of new improvements should be primarily for the purpose of resource protection and the more effective management of resources rather than to accommodate increased numbers of livestock.
- The use of motorized equipment for emergency purposes, such as rescuing sick animals or the placement of feed in emergency situations, is also permissible. This privilege is to be exercised only in true emergencies and should not be abused by permittees.

The general rule of thumb should be that activities or facilities established prior to the date of an area's designation as Wilderness should be allowed to continue/remain in place, and facilities may be replaced when necessary for the permittee to properly administer the grazing program.

Organization of this Report

Roadless area information is presented by administrative unit, beginning with the Dakota Prairie Grasslands, followed by the Medicine Bow-Routt National Forest (Thunder Basin National Grassland), and ending with the Nebraska National Forest. Each area begins with a description of its affected environment, followed by a Capability Analysis, Availability Analysis, Evidence of Need for Wilderness analysis and a presentation of management area allocations by alternative.

In addition, in order to reduce redundancy and the number of pages in this report, a section is added at the end of each administrative unit's discussion of roadless areas. This section is titled "Criteria Common to All Roadless Areas on this Unit." For example, rather than repeat the exact wording under the "Challenge" criterion each time for all of the McKenzie Ranger District's roadless areas, "Challenge" is moved to the end of the narrative for the McKenzie Ranger District's discussion of its roadless areas.

Based on the capability, availability, and Evidence of Need for Wilderness analyses, each roadless area carries ratings as to its suitability for recommendations to Congress as Wilderness areas. The criteria used to rate the roadless areas (high, moderate, or low) are attached to the end of this document, as are specific ratings for each of the 45 roadless areas.

Before the narratives for each roadless area begin, a few definitions and a discussion of applicable laws that pertain to this roadless area review are provided.

An Affected Environment Overview for Each Area

The description of the affected environment for each of the 45 areas offers a context for the capability, availability and Evidence of Need for Wilderness analyses. As required by *Forest Service Handbook* (FSH) 1909.12,4.19, each overview includes information such as the following:

- Roadless area name and number of acres.
- Location, vicinity, and type of access.
- Geography and topography.
- Vegetation, including ecosystem types.
- Current uses of the area.
- Appearance of the area.
- Surroundings, such as the characteristics of contiguous areas.
- Key attractions, if any, such as sensitive wildlife present and scenic landmarks.

Capability Analyses

FSH 1909.12.7,21 defines and clarifies how capability of a roadless area for purposes of Wilderness designation is determined:

> The capability of a potential wilderness is the degree to which that area contains the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness. The combinations of basic natural characteristics are of infinite variety. No two areas possess these characteristics in the same measure. The combinations that may be appraised in one section of the country as being highly desirable for wilderness designation might be appraised as nominal or adverse in another. The principal wilderness characteristics that follow are generally, but not necessarily, listed in order of importance or desirability. Consider these characteristics in analyzing the quality of the wilderness resource of an inventoried roadless area. If these characteristics are determined to be important, describe and refer to them in trade-off analyses when pertinent.

The characteristics include: environment, challenge, recreation opportunities, special features, and manageability.

Availability for Wilderness

FSH 1909.12.7,22 defines and clarifies how availability is determined:

> All National Forest System lands determined to meet wilderness capability requirements are generally available for consideration as wilderness. However, the determination of availability is conditioned by the value of and need for the wilderness resource compared to the value of and need for other resources. To be available for wilderness, the values of the wilderness resource, both tangible and intangible, should offset the value of resources that formal wilderness designation would forego. The predominant value does not necessarily reflect the use or combination of uses that would yield the greatest dollar return or the greatest unit output. In evaluating availability, describe the other resource demands and uses that the area under evaluation would satisfy. Include all other resource potentials--pertinent quantitative and qualitative information including current use, outputs, trends, and potential future use, and outputs of the various resources involved.

Based on this direction, availability information was gathered to address resource values and potential and management obligations, constraints and encumbrances. The wildlife species listed in the Plant and Animal section of the availability section either have been sighted within the area or the area contains habitat suitable for the species. Table C-13 through Table C-15 contain additional information about wildlife and rare plant species found within the roadless areas.

Furthermore, "Evidence of Need for Wilderness" has been evaluated to better understand the implications of additional recommendations to the National Wilderness Preservation System.

Roadless Areas on the Dakota Prairie Grasslands

Grand River National Grassland (Grand River Ranger District)

Grand River Badlands (Public Proposed): An Overview of the Affected Environment

The 6,060-acre Grand River Badlands area is located about 15 miles south of Lemmon, South Dakota. More specifically, the Grand River Badlands area is located, either partly or fully, in Township 20 North, Range 18 East, Sections 6-8, Township 20 North, Range 15 East, Sections 1-4 and 9-12, and Township 21 North, Range 16 East, Sections 32-35. This area is a scenic combination of roughly cut breaks and rolling prairie. Access from Lemmon is south for 15 miles on State Highway 73.

The Grand River Badlands area is located within the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division. The topography of the area varies from gently rolling grasslands to rough-cut, isolated butte terrain with moderately incised drainages. The Grand River Badlands area has few trees, except near creek bottoms. Elevation varies from 2,000 to 3,000 feet above sea level.

The Grand River drains the Grand River Badlands area to the north and east. Shadehill Reservoir lies about two miles to the west of this area.

Few shrub or tree components are present. Some intermittent American plum, buffalo berry, and green ash may be found. The primary vegetation consists of western wheatgrass, blue grama, needle-and-thread grass, and thread-leaf sedge. Vegetative health in the area is good to excellent.

The area supports viable populations of mule and white-tailed deer, pronghorn, sharp-tailed grouse, and black-tailed prairie dogs and their associated species.

Rutting along two-track roads is an existing management concern.

Recreational opportunities include hiking, hunting, horseback riding, nature study, and primitive camping and picnicking. Livestock grazing is common.

Grand River Badlands: Capability Analysis

Environment

Opportunity for Solitude and Serenity: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Natural Appearance and Integrity: Overall, this roadless area retains a natural appearance, representative of rolling grassland and isolated butte terrain. Most of the ecological processes, including flash flooding, remain intact, with the exception of frequent natural wildfire,. Closer examination reveals signs of mineral and livestock activities. Cattle may be frequently encountered during the warmer grazing season. About five miles of buried range-water pipeline exist in the area. Livestock developments (including developed springs, fences, water wells, primitive trails, stock tanks and dugouts) detract from the natural setting, although some range developments blend with the natural surroundings as much as possible.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Recreation Opportunities: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Special Features

Unique Characteristics and Scenic Features: Fossils found in Hell Creek Formation deposits represent the Cretaceous (130 to 65 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Manageability

Size and Shape: The 6,060-acre Grand River Badlands area is roughly rectangular in shape. It is about five miles wide east to west and three miles long north to south. It contains four inholdings, totaling approximately 1,640 acres.

Potential to Manage Boundaries: Under a Wilderness designation and without adequate signing to identify the Wilderness area boundaries, managing the intermingled ownership in the area would pose significant challenges. In addition, the lack of consistent law enforcement within the area would impede enforcement of motorized restrictions in the area.

Grand River Badlands: Availability Analyses

Resource Values and Potentials

Oil and Gas: The minerals potential for oil and gas is considered low. No oil and gas developments currently exist in the area.

Coal: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Livestock Grazing: Twelve permittees operate on one grazing allotment in the area. The area produces about 3,166 animal unit months of livestock grazing annually.

Locatable Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Common Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Timber: There is no merchantable timber within this area.

Recreation: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral, or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.
- Mountain plover: A Wilderness designation would likely reduce prairie dog shooting, thereby increasing the expansion of prairie dog towns, which in turn, enhances mountain plover habitat. Designation would reduce motorized activities that can disturb mountain plovers and destroy their nests.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitat. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access.

However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the anticipated reduction in predator control resulting from motorized restrictions. Finally, the mountain plover, which favors areas affected by fire, may be adversely affected due to reduced motorized support in conducting prescribed fires.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially due to reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Grand River National Grassland include the black-tailed prairie dog and the plains sharp-tailed grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the tables at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: Approximately 1,391 acres of subsurface rights are owned by private entities in the Grand River Badlands area. No mineral leases currently are held on the Grand River National Grassland.

Existing Contracts and Agreements: The Grand River Cooperative Grazing Association holds a 10-year grazing agreement for the area. This agreement started in 1992 and is in effect until 2002. Special-use permits for buried telephone and power lines are in effect in the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Effects on Adjacent Lands: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Grand River Badlands: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest designated Wilderness is the 10,510-acre Theodore Roosevelt Wilderness, South Unit, in Theodore Roosevelt National Park, located about 125 miles northwest of this area. The Theodore Roosevelt Wilderness, South Unit, represents a mixed-grass prairie in a badlands setting. The Grand River Badlands Wilderness would also represent a mixed-grass prairie, but in a rolling grassland setting rather than a true badlands setting.

Representation of Landforms and Ecosystems: This area represents a mixed-grass prairie in a rolling grassland terrain. Upland breaks and upland grasslands ecosystem types are present.

Biota: No species are dependent upon a Wilderness designation to remain viable in this area. However, most key species would benefit from a designation.

Public Interests and Concerns: The area is found in a sparsely populated region of the country. Dickinson and Bismarck/Mandan, North Dakota, with an estimated population of less than 125,000, are the nearest cities of any size, and neither urban area is closer than 90 miles from the area.

A considerable number of people and organizations have requested that the Forest Service designate some grassland Wilderness somewhere within the 191-million-acre National Forest System. Currently, Congress has not designated Wilderness area on any of the 20 national grasslands in that System.

Grand River Badlands: Environmental Consequences

Management Prescription Allocations by Alternative

Alternative 2:	MA 3.64	90 acres
	MA 6.1	5,970 acres
Alternative 3:	MA 6.1	6,010 acres
Alternative 4:	MA 3.64	90 acres
	MA 6.1	5,970 acres
Alternative 5:	MA 3.64	50 acres
	MA 6.1	6,010 acres

Designation: Wilderness

Prescription: MA 1.2A Suitable Wilderness

Alternatives: Wilderness designation is not considered in any alternative because of the area's existing level of development.

Designation: Non-Wilderness

Prescription: MA 3.64 Special Plant and Wildlife Habitat

Alternatives: 2, 4, and 5

Environmental Consequences: Suitable habitat will be maintained or enhanced for the full spectrum of plant and wildlife species, guilds, and communities. Riparian areas (streams, seeps, springs, fens) will be managed to retain the hydrologic regimes. Broadleaf deciduous trees characterize woodlands and hardwood draws. Prairie landscapes will have a diversity of warm season and cool season grasses and forbs. Plant communities of high species diversity will act as a seed source for other areas within the landscape where diversity may be reduced.

Mitigation Measures: These areas are managed to maintain and enhance specific plant and wildlife species of concern and plant and wildlife communities. Habitat enhancement is encouraged. Motorized access would be limited to administrative use. Although grazing could occur to meet management objectives, the area would normally be considered unsuitable for grazing.

Economic and Social Effects: Motorized recreation opportunities would not be available. Opportunities for those desiring solitude and isolation would be about the same as present. Opportunities for discovery and interpretation of ecological, biological, cultural, historic and paleontological resources would be good. Livestock grazing would likely remain the primary economic benefit from the area but would be reduced from present levels. The primitive to semi-primitive character of the area would be substantially retained.

Designation: Non-Wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternatives: 2, 4, and 5

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

South Fork (Public Proposed): An Overview of the Affected Environment

The 12,830-acre South Fork area is located about five miles north of Bison, South Dakota. More specifically, the South Fork area is located, either partly or fully, in Township 19 North, Range 13 East, Sections 1-15, and Township 20 North, Range 13 East, Sections 22-24, 26-29 and 31-35. This area is a scenic combination of rough cut breaks and rolling prairie. Access from Lemmon, South Dakota, is west on State Highway 12 for 10 miles, then south on County Highway 9 for 24 miles.

The South Fork area is located within the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division. The topography of the area varies from gently rolling grasslands to rough-cut, isolated butte terrain with moderately incised drainages. In the southern portion of this area, a rather unique “sand hills-like” landscape feature with exposed blowouts occurs. The South Fork area has few trees, except near creek bottoms. Elevation varies from 2,000 to 3,000 feet above sea level.

The Grand River drains the South Fork area to the north and east. Shadehill Reservoir is downstream from this area.

Few shrub or tree components are present. Some intermittent American plum, buffalo berry and green ash may be found. The primary vegetation consists of western wheatgrass, blue grama, needle-and-thread and thread-leaf sedge. This area is in good to excellent vegetative health.

The area supports viable populations of mule and white-tailed deer, pronghorn, sharp-tailed grouse and black-tailed prairie dogs and their associated species.

Rutting along two-track roads is an existing management concern.

Recreational opportunities include hiking, hunting, horseback riding, nature study and primitive camping and picnicking. Livestock grazing is common.

South Fork: Capability Analysis

Environment

Opportunity for Solitude and Serenity: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Natural Appearance and Integrity: Overall, this roadless area retains a natural appearance, representative of rolling grassland and isolated butte terrain. Most of the ecological processes, including flash flooding, but with the exception of frequent natural wildfire, remain intact. Closer examination will reveal signs of mineral and livestock activities. Cattle may be frequently encountered during the warmer grazing season. Up to seven miles of buried range-water pipeline may be developed in the area in the near future. Livestock developments, including developed springs, fences, water wells, primitive trails, stock tanks and dugouts, detract from the natural setting, although some range developments blend with the natural surroundings as much as possible.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Recreation Opportunities: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Special Features

Unique Characteristics and Scenic Features: Fossils found in Hell Creek Formation deposits represent the Cretaceous (130 to 65 million years ago) period. This area also includes a "sand dune-like" landscape feature characterized by exposed blowouts.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Manageability

Size and Shape: The 12,830-acre South Fork area is basically square in shape. It is about five miles wide north to south, and six miles long east to west. It contains four private and state inholdings, totaling approximately 1,595 acres.

Potential to Manage Boundaries: The potential to manage the intermingled ownership within the area under a Wilderness designation would pose significant challenges without adequate signing to identify the Wilderness area. In addition, the lack of consistent law enforcement within the area would impede enforcement of motorized restrictions in the area.

South Fork: Availability Analyses

Resource Values and Potentials

Oil and Gas: The minerals potential for oil and gas is considered low. No oil and gas developments currently exist in the area.

Coal: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Livestock Grazing: Eleven permittees operate on two allotments in the area. The area produces about 4,199 animal unit months of livestock grazing annually.

Locatable Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Common Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Timber: There is no merchantable timber within this area.

Recreation: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.
- Mountain plover: A Wilderness designation would likely reduce prairie dog shooting, thereby increasing the expansion of prairie dog towns which, in turn, enhances mountain plover habitat. Designation would reduce motorized activities that can disturb mountain plovers and destroy their nests.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions. Finally, the mountain plover, which favors areas affected by fire, may be adversely affected due to reduced motorized support in conducting prescribed fires.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially due to reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Grand River National Grassland include: the black-tailed prairie dog and the plains sharp-tailed grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the tables at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: Approximately 3,763 acres of subsurface rights are owned by private entities in the South Fork area. No mineral leases currently are held on the Grand River National Grassland.

Existing Contracts and Agreements: The Grand River Grazing Association holds the 10-year grazing agreement for the area. This agreement started in 1992 and is in effect until 2002. Special-use permits for honey bee apiaries are in effect in the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Effects on Adjacent Lands: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

South Fork: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest designated Wilderness is the 10,510-acre Theodore Roosevelt Wilderness, South Unit, in Theodore Roosevelt National Park, located about 130 miles northwest of this area. The Theodore Roosevelt Wilderness, South Unit, represents a mixed-grass prairie in a badlands setting. The South Fork Wilderness would also represent a mixed-grass prairie, but in a rolling grassland setting, not in a badlands setting.

Representation of Landforms and Ecosystems: This area represents a mixed-grass prairie in a rolling grassland terrain. The following ecosystem types are present: upland breaks and upland grasslands.

Biota: No species are dependent upon a Wilderness designation to remain viable in this area. Most key species would benefit, however, from a designation.

Public Interests and Concerns: The area is found in a sparsely populated region of the country. Dickinson and Bismarck / Mandan, North Dakota, with an estimated population of less than 125,000, are the nearest cities of any size, and neither urban area is closer than 90 miles from the area.

A considerable number of people and organizations have requested that the Forest Service designate some grassland Wilderness somewhere within the 191-million-acre National Forest System. Currently, Congress has not designated Wilderness area on any of the 20 national grasslands within that System.

South Fork: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 2.1	50 acres
	MA 6.1	12,780 acres
Alternative 3:	MA 6.1	5,180 acres
	MA 6.1 No Road	7,650 acres
Alternative 4:	MA 2.1	50 acres
	MA 6.1	12,780 acres
Alternative 5:	MA 2.1	50 acres
	MA 6.1	12,780 acres

Designation: Wilderness

Prescription: MA 1.2A Suitable Wilderness

Alternatives: Wilderness designation is not considered in any alternative because of the area's existing level of development.

Designation: Non-Wilderness

Prescription: MA 2.1 Special Interest Area

Alternatives: 2, 4, and 5

Environmental Consequences: Recreation opportunities that maintain and enhance the characteristics for which the SIA was designated will be available. Livestock grazing would continue as present. Valid existing rights and leases would be recognized

Mitigation Measures: OHV trail construction will be prohibited. Oil and gas leasing would be no surface occupancy.

Economic and Social Effects: Recreational and interpretive opportunities would be emphasized. The area would continue to provide a mix of economic benefits.

Designation: Non-Wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternatives: 2, 4, and 5

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Twin Butte Creek (Public Proposed): An Overview of the Affected Environment

The 6,540-acre Twin Butte Creek area is located about 25 miles south of Lemmon, South Dakota. More specifically, the Twin Butte Creek area is located, either partly or fully, in Township 18 North, Range 18 East, Sections 20-36 and Township 17 North, Range 18 East, Sections 3-4. This area is a scenic combination of rough cut breaks and rolling prairie. Access from Lemmon is 14 miles east on State Highway 73, then 4.5 miles south of County Road 4.

The Twin Butte Creek area is located within the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division. The topography of the area varies from gently rolling grasslands to rough-cut, isolated butte terrain with moderately incised drainages. The Twin Butte Creek area has few trees, except near creek bottoms. Elevation varies from 2,000 to 3,000 feet above sea level.

The Grand River drains the Twin Butte Creek area to the north and east.

Few shrub or tree components are present. Some intermittent American plum, buffalo berry and green ash may be found. The primary vegetation consists of western wheatgrass, blue grama, needle-and-thread and thread-leaf sedge. This area is in good to excellent vegetative health.

The area supports viable populations of mule and white-tailed deer, pronghorn, sharp-tailed grouse and black-tailed prairie dogs and their associated species.

Rutting along two-track roads is an existing management concern.

Recreational opportunities include hiking, hunting, horseback riding, nature study and primitive camping and picnicking. Livestock grazing is common. Traditional American Indian religious practices have historically occurred in the area.

Twin Butte Creek: Capability Analysis

Environment

Opportunity for Solitude and Serenity: Because of its rolling character, opportunities for solitude and serenity are available, though the area does not offer high opportunities for solitude and serenity. On open stretches of this area, the vast nature of the mixed-grass prairie and the relative lack of visible human developments allow the visitor to experience the grassland in a primitive or semi-primitive condition.

Natural Appearance and Integrity: Overall, this roadless area retains a natural appearance, representative of rolling grassland and isolated butte terrain. Most of the ecological processes, including flash flooding, but with the exception of frequent natural wildfire, remain intact. Closer examination will reveal signs of mineral and livestock activities. Cattle may be frequently encountered during the warmer grazing season. About one and one-half miles of buried range-water pipeline exists in the area. In addition, approximately three miles of a semi-improved road suitable for sedan traffic exists in the eastern portion of the area. Livestock developments, including developed springs, fences, water wells, primitive trails, stock tanks and dugouts, detract from the natural setting, although some range developments blend with the natural surroundings as much as possible. About three and one-half miles of buried range-water pipeline exist in the area.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Recreation Opportunities: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Special Features

Unique Characteristics and Scenic Features: Fossils found in Hell Creek Formation deposits represent the Cretaceous (130 to 65 million years ago) period. This area has been identified as a potential high-use area for traditional American Indian religious practices. Portions of this area are located in both the Cheyenne and Standing Rock Indian Reservations.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Manageability

Size and Shape: The 6,540 acre Twin Butte Creek area is rectangular in shape. It is about five miles wide east to west, and three miles long north to south. It contains one inholding of about two acres.

Potential to Manage Boundaries: The lack of consistent law enforcement within the area would impede enforcement of motorized restrictions in the area.

Twin Butte Creek: Availability Analyses

Resource Values and Potentials

Oil and Gas: The minerals potential for oil and gas is considered low. No oil and gas developments currently exist in the area.

Coal: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Livestock Grazing: Three permittees operate on three allotments in the area. The area produces about 1,101 animal unit months of livestock grazing annually.

Locatable Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Common Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Timber: There is no merchantable timber within this area.

Recreation: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.
- Mountain plover: A Wilderness designation would likely reduce prairie dog shooting, thereby increasing the expansion of prairie dog towns which, in turn, enhances mountain plover habitat. Designation would reduce motorized activities that can disturb mountain plovers and destroy their nests.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions. Finally, the mountain plover, which favors areas affected by fire, may be adversely affected due to reduced motorized support in conducting prescribed fires.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially due to reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Grand River National Grassland include: the black-tailed prairie dog and the plains sharp-tailed grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the tables at the very end of this document.

Management Obligations, Constraints or Encumbrances

Mineral Leases and Subsurface Rights: Approximately 1,085 acres of subsurface rights are owned by the Standing Rock Sioux Tribe in the Twin Butte area. No mineral leases currently are held on the Grand River National Grassland.

Existing Contracts and Agreements: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Effects on Adjacent Lands: Under a Wilderness designation, restrictions on motorized access into the area could diminish opportunities for traditional American Indian religious practices. For additional effects on adjacent lands, please refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Grand River Ranger District.

Twin Butte Creek: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest designated Wilderness is the 10,510-acre Theodore Roosevelt Wilderness, South Unit, in Theodore Roosevelt National Park, located about 150 miles northwest of this area. The Theodore Roosevelt Wilderness, South Unit, represents a mixed-grass prairie in a badlands setting. The Twin Butte Creek Wilderness would also represent a mixed-grass prairie, but in a rolling grassland setting, not in a badlands setting.

Representation of Landforms and Ecosystems: This area represents a mixed-grass prairie in a rolling grassland terrain. The following ecosystem types are present: upland breaks and upland grasslands.

Biota: No species are dependent upon a Wilderness designation to remain viable in this area. Most key species would benefit, however, from a designation.

Public Interests and Concerns: The area is found in a sparsely populated region of the country. Dickinson and Bismarck / Mandan, North Dakota, with an estimated population of less than 125,000, are the nearest cities of any size, and neither urban area is closer than 90 miles from the area.

A considerable number of people and organizations have requested that the Forest Service designate some grassland Wilderness somewhere within the 191-million-acre National Forest System. Currently, Congress has not designated Wilderness area on any of the 20 national grasslands within that System.

Twin Butte Creek: Environmental Consequences

Management Prescription Allocations by Alternative

Alternative 2	MA 6.1	6,540 acres
Alternative 3	MA 3.65 No Road	6,540 acres
Alternative 4	MA 6.1	6,540 acres
Alternative 5	MA 6.1	6,540 acres

Designation: Wilderness

Prescription: MA 1.2A Suitable Wilderness

Alternatives: Wilderness designation is not considered in any alternative because of the area's existing level of development.

Designation: Non-wilderness

Prescription: MA 3.65 Rangelands with Diverse Natural-appearing Landscapes (No Road)

Alternatives: 3

Environmental Consequences: The existing road system would remain open to motorized access unless specifically designated as closed or restricted. The construction of new roads would be prohibited in the area. A full spectrum of motorized recreation opportunities would be allowed. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines.

Economic and Social Effects: Opportunities for motorized activities would be present but would be lower than that in MA 3.65. Opportunities for solitude, lower human encounters, and nonmotorized settings may be increased over time. All users would be permitted the same motorized access. The area would continue to provide a mix of economic benefits.

Designation: Non-Wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternatives: 2, 4, and 5

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Criteria Common to All Roadless Areas on this Administrative Unit

Capability Analyses

Challenge: Challenge centers around survival in a dry and harsh environment. Summer temperatures can exceed 100° Fahrenheit with little or no drinkable water sources. Winter temperatures can drop to -35° Fahrenheit with wind-chill factors in excess of -80°. Broken terrain and open landscapes are deceptive and may disorient visitors' abilities to mark their directions. Hiking may be much more difficult than anticipated with steep slopes and difficult terrain. Prairie rattlesnakes may be encountered and can be dangerous.

Opportunities for Outdoor Education: A visitor should find features to stimulate curiosity: geology, grassland ecosystems, grassland flora and fauna, bared soil layers, shifting weather patterns and cloud types, incredibly clear night skies offering unimpeded views of the stars. Skills in maneuvering a rugged terrain, using a compass, taking precautions for snake and spider bites, heat stroke (and frostbite or freezing to death in the winter), setting up a primitive campsite, and outdoor cooking may all test and develop a visitor’s understanding of the outdoors.

Recreation Opportunities: Current recreation includes deer and pronghorn hunting, upland game hunting, hiking, dispersed camping, horseback riding, photography, nature study and other associated activities.

Availability Analyses

Coal: There are no known coal resources on the Grand River National Grassland. No current production occurs and previous historic development has been very minimal. Currently, there are no coal leases on the Grand River National Grassland.

Locatable Minerals: No records exist in geological literature that documents the occurrence or development of any hardrock minerals on or near the Grand River National Grassland, a region that is sedimentary in origin.

Common Minerals: Gravel, a common variety mineral, is found throughout the Grand River National Grassland. Gravel is the only local source of road-surfacing material. Adequate private sources for this aggregate exists. Therefore, a low potential exists for development of gravel resources on the Grand River National Grassland.

Recreation: Motorized recreation would be prohibited under a Wilderness designation. Current nonmotorized recreation, such as dispersed camping, hiking, horseback riding and nature study, would be allowed. Wilderness designation would preclude all off-highway motorized recreation, such as ATV and snowmobile use. Walk-in hunting opportunities would increase. Backcountry experiences would be enhanced with the exclusion of motorized activities. Opportunities for physically challenged and elderly access may be reduced or eliminated. Fishing opportunities within the Grand River Badlands and South Fork areas are available for warm-water species, such as perch and bass; however, fishing would be restricted to walk-in opportunities only under a Wilderness designation.

Biotic Control Measures and Fire Protection: Chemical, biological and mechanical control methods are used to stem the expansion of undesirable plant species, such as leafy spurge. Wildfire suppression would be addressed in Wilderness management plans that would be developed if any of the roadless areas are designated by Congress as Wilderness areas.

Effects on Adjacent Lands: Any increase in visitation, which may occur under a Wilderness designation, could increase the potential for accidental fire starts. Adjacent land values next to a designated Wilderness may rise or fall depending on local markets. As well, the potential for trespass from a designated Wilderness onto adjacent lands of other ownership might increase. These effects are estimated to be the same for all roadless areas on the Grand River National Grassland.

Little Missouri National Grassland

Medora Ranger District

Bell Lake: An Overview of the Affected Environment

The 11,270 acre Bell Lake area is located about 40 miles northwest of Dickinson, North Dakota, about 15 miles northwest of Medora, North Dakota, and about 11 miles northwest of the south unit of Theodore Roosevelt National Park. In addition, Bell Lake is just three miles west of the Elkhorn Ranch unit of Theodore Roosevelt National Park. Specifically, Bell Lake is located, either partly or fully, in: T. 143 N., R. 103 W., Sections 2-4, 7-15, 17-18, 20-21, 26-29 and 32-35. Bell Lake lies within the Little Missouri Badlands, a scenic combination of rugged terrain and open space. Access to the area is via Interstate 94 west from Medora for 14 miles, then north at the Camel Hump exit on Golden Valley County Road 14 for about 18 miles.

The Bell Lake area is located within the Little Missouri Badlands, a biogeographical sub-unit of the Great Plains Region. Robert G. Bailey further identifies the area as a part of the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division (71).

Topography varies from gentle rolling grasslands to rugged badlands terrain with deeply incised stream channels and numerous clay buttes. Extensive areas of upland grasslands are interspersed between upland breaks, particularly in the north and west side of the unit. Elevation varies from 2,300 feet to 2,700 feet above sea level. Two watersheds, Alkali and Bell Lake Creek, have helped sculpt the drainages and pinnacles in the area.

This area is a blend of vegetated landscapes and eroded badlands terrain. On some of the non-grass areas, predominate vegetation consists of big sagebrush, rubber rabbit brush, four-wing salt bush, and greasewood. Green ash and American elm occupy the wooded draws. Dominant grasses include western wheatgrass, green needle grass, and blue grama with little bluestem in the sandy areas and threadleaf sedge on the southern exposures. Understory shrub species in draws include buffaloberry, skunkbush sumac, chokecherry, snowberry, woods rose, and many others.

The alluvial floodplains along Bell Lake Creek support a riparian community consisting of cottonwoods and associated species. The terraces immediately above the floodplain tend to support silver sage and extensive western wheatgrass stands.

The Bell Lake area supports populations of mule deer, white-tailed deer, pronghorn antelope, sharp-tailed grouse and coyotes. Golden eagles frequently hunt in the area. Although the wildlife habitats and species represented within the Bell Lake area are not unique within the Little Missouri National Grassland, they are considered important to North Dakota.

Several two-track roads and about five miles of buried range-water pipeline exist in the area.

Recreational opportunities include hiking, hunting, horseback riding and camping. Other uses include livestock grazing and oil and gas production.

Bell Lake: Capability Analysis

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are available. The rugged terrain offers an opportunity for isolation among the broken landscape. In addition, on open stretches of this area, the vast nature of the mixed-grass prairie and the relative lack of visible human developments allow the visitor to experience the grassland in a primitive or semi-primitive condition.

Natural Appearance and Integrity: Overall, this roadless area retains a natural appearance, representative of rolling grasslands and rough badlands terrain. Most of the ecological processes, including flash flooding, but with the exception of frequent natural wildfire, remain intact. Cattle may be frequently encountered during the warmer grazing season. About five miles of buried range-water pipeline exists in the area. Livestock developments, including developed springs, fences, water wells, primitive trails, stock tanks and dugouts, detract from the natural setting, although some range developments blend with the natural surroundings as much as possible.

Challenge: Please, refer to “Criteria Common to All Roadless Areas on this Administrative Unit” at the end of the roadless report for the Medora Ranger District.

Recreation Opportunities: Current recreation in the area includes walk-in hunting, hiking, nature study, photography and other associated activities. The area is in a semi-primitive, low-development setting.

Special Features

Unique Characteristics and Scenic Features: Several archeological sites exist, representing prehistoric occupation and historic homestead occupation. A couple active prairie dog towns exist in the area. This area is scenic. It provides colorful badlands topography and open, native grassland landscapes. Fossils found in Fort Union (also known as Ludlow) Formation deposits represent the Paleocene (65 to 45 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Manageability

Size and Shape: The 11,270 acre Bell Lake area is roughly rectangular in shape. It is about two to five miles wide east to west, and six miles long north to south. It has no inholdings.

Potential to Manage Boundaries: Fencelines run for most of the boundary on the west, south and north sides. These existing fencelines could offer clear and visible signing should the area be designated as a Wilderness. Signing and posting along the eastern flank would be required. A major challenge may be enforcement of nonmotorized restrictions should the area be designated a Wilderness.

Bell Lake: Availability Analyses

Resource Values and Potentials

Oil and Gas: The minerals potential for oil and gas is considered high. At the time the DEIS was released for public review, the area was leased for oil and gas but no developments had yet occurred within the area. Since that time exploration has increased along the eastern border of the area. One well was drilled within the boundary but resulted in a dry hole. Oil and gas developments occur just outside the eastern flank of the area, with expectations for development to occur within the boundary.

Coal: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Livestock Grazing: Five permittees operate on five allotments in the area. The area produces, about 5,900 animal unit months of livestock grazing annually.

Locatable Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Common Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Timber: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation: Motorized recreation would be prohibited under a Wilderness designation. Current nonmotorized recreation activities, such as dispersed camping, hiking, horseback riding, and nature study, would be allowed. Wilderness designation would preclude off-

highway motorized recreation, such as ATV and snowmobile use. Walk-in hunting opportunities would increase. Backcountry experiences would be enhanced with the exclusion of motorized activities. Opportunities for physically challenged and elderly access may be reduced or eliminated in the area.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Little Missouri National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered that fall under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: Land origination within Bell Lake is about 10,749 acres acquired and 480 acres from the public domain. About 320 acres of private subsurface minerals ownership beneath federally owned surface occurs in the area and is subject to minerals leasing. These acres are subject to lease, but as yet have not been developed. Currently, leases are generally for a 10-year period. Once production on a lease is established, the lease is valid throughout the life of production. The life of production for an oil well on the district is between five and twenty- five years.

Existing Contracts and Agreements: The Medora Grazing Association holds a 10-year livestock grazing agreement in the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Effects on Adjacent Lands: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Bell Lake: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest designated Wilderness is the 10,510-acre Theodore Roosevelt Wilderness, South Unit, in Theodore Roosevelt National Park, located about 11 miles southeast of this area. The Theodore Roosevelt Wilderness, South Unit, represents a mixed-grass prairie in a badlands setting. The Bell Lake Wilderness would also represent a mixed-grass prairie in a badlands setting.

Representation of Landforms and Ecosystems: This area represents a mixed-grass prairie with the following ecosystem types present: upland breaks, hardwood draws and upland grasslands. The landscape includes badlands and rolling prairies.

Biota: No species are dependent upon Wilderness designation to remain viable in this area. Most species probably would benefit, however, from a designation.

Public Interests and Concerns: The area is found in a sparsely populated region of the country. Dickinson, Williston and Bismarck / Mandan, North Dakota, with an estimated population of less than 125,000, and Glendive and Sydney, Montana, with a combined population of about 25,000, are the nearest cities of any size, and none of them are closer than 35 miles from the area.

A considerable number of people and organizations have requested that the Forest Service designate some grassland Wilderness somewhere within the 191-million-acre National Forest System. Currently, Congress has not designated Wilderness area on any of the 20 national grasslands within that System.

Two Wilderness areas have been designated in the Little Missouri Badlands: the 10,510-acre Theodore Roosevelt Wilderness, South Unit, and the 19,410-acre Theodore Roosevelt Wilderness, North Unit, both of which are located in the Theodore Roosevelt National Park. These two Wilderness areas offer nearby designated Wilderness which, in most ways, represent most of the key characteristics found in the Bell Lake area, including appearance and vegetative cover types. No other designated Wilderness areas, however, exist in the Little Missouri Badlands, a recognized biogeographical sub-unit of the Great Plains.

Bell Lake: Environmental Consequences

Management Prescription Allocations by Alternative

Alternative 2	MA 6.1	11,270 acres
Alternative 3	MA 6.1	11,270 acres
Alternative 4	MA 1.31	11,270 acres
Alternative 5	MA 1.31	11,270 acres

Designation: Wilderness

Prescription: MA 1. 2A Suitable for Wilderness

Alternatives: Wilderness designation is not considered in any alternative because of the area's existing level of mineral development.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 4 and 5

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Overall wildlife would tend to benefit from reduced human activity. Opportunities for discovery of cultural, historical and paleontological resources would exist but interpretive opportunities would be limited or foregone. Livestock grazing would continue as present. Valid existing rights would be recognized. Because the area is leased for oil and gas and contains a small area of private minerals, additional oil and gas developments could occur. Where mineral development occurs, the semi-primitive, nonmotorized character of the area would be lost for the duration of the activity.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration, noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area. Oil and gas development on existing leases would require the area to be reclaimed to as near as possible its original condition at the close of the lease.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Because oil and gas development of existing leases could occur; restricting other users could cause conflict. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas developments would continue as long as production occurs in the area.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternatives: 2 and 3

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities would be reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character could be lost permanently making future wilderness designation unlikely.

Blacktail: An Overview of the Affected Environment

The 8,620-acre Blacktail area is located about 19 miles north of Medora, North Dakota, and about 12 miles north of the south unit of the Theodore Roosevelt National Park. Specifically, the Blacktail area is located, either partly or fully, in: T. 144 N., R. 101 W., Section 34, and T. 144 N., R. 100 W., Sections 31-33, and T. 143 N., R. 100 W., Sections 4, 6-7, 18 and 30, and T. 143 N., R. 101 W., Sections 1-3, 10-12, 13-14 and 23-25. Access to the area from Medora is via Interstate 94 east about 16 miles, then north on U.S. Highway 85 for about 15 miles, then seven miles west on Forest Highway 2, then six miles north and west on Forest Highway 717A.

The Blacktail area is located within the Little Missouri Badlands, a biogeographical sub-unit of the Great Plains Region. Robert G. Bailey further identifies the area as a part of the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division (71). The topography of the Blacktail area consists of ridgelines, plateaus and deeply incised drainages and cutbanks. Elevation ranges from about 2,500 to 2,767 feet above sea level.

Vegetation includes Rocky Mountain juniper, mixed grasses and sedges, and hardwoods in the draws and canyons. Wildlife include mule and white-tailed deer, upland and neotropical grassland birds, reptiles, such as the horned toad, and raptors. Scattered infestations of leafy spurge, a noxious weed, occur in the area.

About three miles of buried oil pipeline and one and a half miles of utility line exist in the area, along with range developments.

Blacktail: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Medium opportunities for solitude and serenity are available. Lower opportunities exist on the ridgetops, with higher opportunities in the canyons. The rugged terrain offers an opportunity for isolation among the canyons. In addition, on open stretches of this area, the vast nature of the mixed-grass prairie and the relative lack of visible human developments allow the visitor to experience the grassland in a primitive or semi-primitive condition.

Natural Appearance and Integrity: Overall, this roadless area retains a natural appearance, representative of rolling grasslands and rough badlands terrain. Most of the ecological processes, including flash flooding, but with the exception of frequent natural wildfire, remain intact. Closer examination will reveal signs of livestock activities. Cattle may be frequently encountered during the warmer grazing season. Livestock developments, including developed springs, fences, water wells, primitive trails, stock tanks and dugouts, detract from the natural setting, although most range developments have been constructed to blend with the natural surroundings as much as possible. In addition, there are about two miles of buried range-water pipeline in the area.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation Opportunities: Current recreation in the area includes a significant amount of big game, upland bird and turkey hunting, hiking, photography, nature study and other associated activities.

Special Features

Unique Characteristics and Scenic Features: Several archeological sites exist, representing prehistoric occupation and historic homestead occupation. Golden eagles are sighted in the area. The Blacktail area is scenic. It provides colorful badlands topography and open, native grassland landscapes. Fossils found in Fort Union (also known as Ludlow) Formation deposits represent the Paleocene (65 to 45 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Manageability

Size and Shape: The 8,620-acre Blacktail area is shaped something like wedge. It is about six miles long north to south and one to four miles wide east to west. It contains no inholdings.

Potential to Manage Boundaries: Posting and signing the boundaries to this area would be difficult due to the broken nature of the area's terrain. A major challenge may be enforcement of nonmotorized restrictions should the area be designated a Wilderness.

Blacktail: Availability Analyses

Resource Values and Potentials

Oil and Gas: The minerals potential for oil and gas is considered high. A couple of oil wells exist just outside the eastern boundary. The potential for oil and gas developments to expand into the area is moderate. The area is currently under lease by private oil and gas producers but not yet developed.

Coal: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Livestock Grazing: Ten permittees operate on seven allotments in the area. The area produces about 3,843 animal unit months of livestock grazing annually.

Locatable Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Common Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Timber: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation: Motorized recreation would be prohibited under a Wilderness designation. Current nonmotorized recreation activities, such as dispersed camping, hiking, horseback riding, and nature study, would be allowed. Wilderness designation would preclude off-highway motorized recreation, such as ATV and snowmobile use. Walk-in hunting opportunities would increase. Backcountry experiences would be enhanced with the exclusion of motorized activities. Opportunities for physically challenged and elderly access may be reduced or eliminated in the area.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Little Missouri National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered that fall under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: Land origination within the Blacktail area is about 7,350 acres acquired and 1,270 acres from the public domain. About 320 acres of private subsurface minerals ownership beneath federally owned surface occurs in the area and is subject to minerals leasing. These acres are subject to lease, but as yet have not been developed. Currently, leases are generally for a 10-year period. Once production on a lease is established, the lease is valid throughout the life of production. The life of production for an oil well on the district is between five and twenty-five years.

Existing Contracts and Agreements: The Medora Grazing Association holds a 10-year livestock grazing agreement for the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Effects on Adjacent Lands: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Blacktail: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest Wilderness area is the 10,510-acre Theodore Roosevelt Wilderness, South Unit, in the Theodore Roosevelt National Park. The Theodore Roosevelt Wilderness, South Unit, is about 14 miles to the southwest. The 19,410-acre Theodore Roosevelt Wilderness, North Unit, lies about 21 miles to the north. Both of these Wilderness areas represent mixed-grass prairies in a badlands setting. The Blacktail Wilderness would also represent a mixed-grass prairie in a badlands setting.

Representation of Landforms and Ecosystems: This area represents a mixed-grass prairie with the following ecosystem types present: hardwood draws, upland grasslands, upland breaks and rolling grasslands. The landscape includes badlands and rolling prairies.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species would benefit, however, from a designation.

Public Interests and Concerns: The area is found in a sparsely populated region of the country. Dickinson, Williston and Bismarck / Mandan, North Dakota, with an estimated population of less than 125,000, and Glendive and Sydney, Montana, with a combined population of about 25,000, are the nearest cities of any size, and none of them are closer than 40 miles from the area.

A considerable number of people and organizations have requested that the Forest Service designate some grassland Wilderness somewhere within the 191-million-acre National Forest System. Currently, Congress has not designated Wilderness area on any of the 20 national grasslands within that System.

Two Wilderness areas have been designated in the Little Missouri Badlands: the 10,510-acre Theodore Roosevelt Wilderness, South Unit, and the 19,410-acre Theodore Roosevelt Wilderness, North Unit, both of which are located in the Theodore Roosevelt National Park. These two Wilderness areas offer nearby designated Wilderness which, in most ways, represent most of the key characteristics found in the Blacktail area, including appearance and vegetative cover types. No other designated Wilderness areas, however, exist in the Little Missouri Badlands, a recognized biogeographical sub-unit of the Great Plains.

Blacktail: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2	MA 6.1	8,620 acres
Alternative 3	MA 3.65	8,620 acres
Alternative 4	MA 1.31	8,620 acres
Alternative 5	MA 6.1	8,620 acres

Designation: Wilderness

Prescription: MA 1.2A Suitable Wilderness

Alternatives: Wilderness designation is not considered in any alternative because of the area's existing level of mineral development.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 4

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Overall wildlife would tend to benefit from reduced human activity. Opportunities for discovery of cultural, historical and paleontological resources would exist but interpretive opportunities would be limited or forgone. Livestock grazing would continue as present. Valid existing rights would be recognized. Because the area is leased for oil and gas and contains a small area of private minerals, oil and gas developments could occur. Where mineral development occurs, the semi-primitive, nonmotorized character of the area would be lost for the duration of the activity.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration, noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area. Oil and gas development on existing leases would require the area to be reclaimed to as near as possible its original condition at the close of the lease.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Because oil and gas development of existing leases could occur; restricting other users could cause conflict. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas developments would continue as long as production occurs in the area.

Designation: Non-wilderness

Prescription: MA 3.65 Rangelands with Diverse Natural-appearing Landscapes

Alternatives: 3

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 3.65 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities would be reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character would be lost permanently making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternatives: 2, 3, and 5

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities would be reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Bullion Butte: An Overview of the Affected Environment

The 19,780-acre Bullion Butte area is located about 45 miles southwest of Dickinson, North Dakota, and about 16 miles south of the south unit of Theodore Roosevelt National Park. More specifically, Bullion Butte is located, either partly or fully, in: T. 136 N., R. 102 W., Sections 3-4, 6, 8-9, and T. 137 N., R. 103 W., Sections 13, 23, 25-27 and T. 137 N., R. 102 W., Sections 1-5, 8-15, 17-30, 32-35, and T. 137 N., R. 101 W., Section 19. It lies within the Little Missouri Badlands, a scenic combination of rugged terrain and open space. Access to the area is via Interstate 94 west from Medora, North Dakota, about three miles, then south on Forest Development Road 745 for about 20 miles, which takes the visitor to just beyond the northern perimeter of the area.

The Bullion Butte area is located within the Little Missouri Badlands, a biogeographical sub-unit of the Great Plains Region. Robert G. Bailey further identifies the area as a part of the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division (71).

The topography of the Bullion Butte area varies widely and is different from much of the rest of the Little Missouri National Grassland. Bullion Butte is the highest point (2,749 feet above sea level) on the national grassland, is an easily identifiable landmark, and provides impressive vistas. This butte is capped with sandstone, a remnant of a much earlier land surface. Adjacent to Bullion Butte is a large flat area named Big Plateau, which has been dissected by feeder tributaries to the Little Missouri River. The Little Missouri River runs through the northeastern portion of the area, and offers canoeing and fishing opportunities. Total vertical relief of the area is about 369 feet, from a low of 2,380 feet at the Little Missouri River to a high of 2,749 feet atop Bullion Butte.

The dominant ecosystems are upland and river breaks, toe slopes, river bottoms and upland grasslands. Vegetation ranges from native prairie grassland on much of the area to hardwood trees (mainly cottonwood, green ash and American elm) and brush in the drainages. Rocky Mountain juniper pockets are extensive throughout the area as are arid shrub types on steep south-facing slopes. Typical native grasses include western wheatgrass, green needlegrass, blue grama, little bluestem and threadleaf sedge, often found interspersed with silver sagebrush. The area also contains a ponderosa pine stand, unique to this part of North Dakota. A light infestation of leafy spurge, a noxious weed, occurs in the area.

The Bullion Butte area provides prime habitat for a variety of big game including mule deer, white-tailed deer, pronghorn antelope, and bighorn sheep, as well as non-game species. Game birds such as sharp-tailed grouse, wild turkey, and pheasant are found, as well as non-game birds and raptors such as golden eagles, hawks, and falcons. The Kinley Plateau area is immediately adjacent to Bullion Butte.

Recreational opportunities include hiking, hunting, canoeing, fishing, horseback riding, and camping. Other uses of the area include livestock grazing and oil and gas production.

Bullion Butte: Capability Analyses

Environment

Opportunity for Solitude and Serenity: The remote and massive Bullion Butte and its immediate area provide a high potential for solitude and serenity. This scenic area is rather inaccessible. The rugged crags and rocky escarpments surrounding Bullion Butte offer isolation from the sights and sounds of people. On the flat plateau of the butte, grand vistas can be had far above and away from people, although evidence of developments will be clearly evident in the surrounding countryside.

Natural Appearance and Integrity: Overall, this roadless area retains a highly natural appearance, representative of rolling grasslands and rough badlands terrain. Grand, sweeping vistas of the scenic badlands are provided from the top of Bullion Butte. Most of the ecological processes, including flash flooding, but with the exception of frequent natural wildfire, remain intact. Closer examination will reveal signs of livestock activities. Cattle may be frequently encountered during the warmer grazing season. Livestock developments, including developed springs, fences, water wells, primitive trails, stock tanks and dugouts, detract from the natural setting, although most range developments have been constructed to blend with the natural surroundings as much as possible. About one-half mile of buried range-water pipeline exists in the area. The general vegetative integrity of the area is fairly high.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation Opportunities: Current recreation includes excellent walk-in recreational opportunities, such as hiking and hunting, horseback riding, some off-highway motorized recreation, limited rock climbing, photography, and nature study. Canoeing is available on the Little Missouri River. The massive Bullion Butte offers very good scenic vista opportunities, rising more than 350 feet above the surrounding area.

Special Features

Unique Characteristics and Scenic Features: The view from the top of Bullion Butte is very scenic and quite spectacular. The mountain-like scree slopes are very unusual for North Dakota, and so the geologic interest in this area is high. Bullion Butte is one of the largest buttes in the Little Missouri badlands. Fossils found in Fort Union (also known as Ludlow) Formation deposits represent the Paleocene (64 to 45 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Manageability

Size and Shape: The 19,780 acre Bullion Butte area is more or less rectangular. It is about six miles wide east to west and eight miles long north to south. The area includes five inholdings, two of which are owned by the State of North Dakota for about 960 acres and three of which are privately owned for about 560 acres.

Potential to Manage Boundaries: Due to the number of access points around this large area, the potential to enforce nonmotorized restrictions under a Wilderness designation is low. Signing the boundaries may be highly challenging due to the broken terrain. Defining the boundary should not prove too difficult due to the existing fence lines.

Bullion Butte: Availability Analyses

Resource Values and Potentials

Oil and Gas: The potential for oil and gas development is high. The area is available for lease under no surface occupancy (NSO) stipulations. There are no current leases in the area at this time. If the leases expire without development, the area may then be designated administratively unavailable for leasing.

Coal: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Livestock Grazing: Four permittees operate on four allotments in the area. The area produces about 6,701 animal unit months of livestock grazing annually.

Locatable Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Common Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Timber: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation: Motorized recreation would be prohibited under a Wilderness designation. Current nonmotorized recreation activities, such as dispersed camping, hiking, horseback riding, and nature study, would be allowed. Wilderness designation would preclude off-highway motorized recreation, such as ATV and snowmobile use. Walk-in hunting opportunities would increase. Backcountry experiences would be enhanced with the exclusion of motorized activities. Opportunities for physically challenged and elderly access into the area may be reduced.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.

- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Bighorn Sheep: Wilderness designation would have beneficial effects on bighorn sheep due to the lack of human disturbances and reductions in motorized activities a designation would bring, especially during the birthing season.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Little Missouri National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered that fall under this category. For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: Land origination for the Bullion Butte area is about 19,636 acres acquired and 240 acres from the public domain. About 7,534 acres of private, subsurface minerals ownership exists beneath federal land in the area. Private ownership is entitled access to and development of these subsurface resources. The Forest Service can develop stipulations, to protect the surface resources, but the agency cannot deny these private parties access to the development of their resources. Bullion Butte will only be leased under no-surface occupancy stipulations. No private mineral developments exist in the area at this time.

Existing Contracts and Agreements: The existing livestock grazing agreement is with the Medora Grazing Association.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Effects on Adjacent Lands: Impacts on adjacent lands due to a Wilderness designation are considered quite low. Bullion Butte itself is an ample landmark that should help visitors determine their location, and clear and visible signing of the boundary should alert visitors to the adjacent landownership. Any increase in visitation to the area, which may occur under a Wilderness designation, could increase the potential for accidental human fire starts. Adjacent land values next to a designated Wilderness may rise or fall depending on local markets. As well, the potential for trespass from a designated Wilderness onto adjacent lands of other ownership might increase.

Bullion Butte: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest designated Wilderness is the 10,510-acre Theodore Roosevelt Wilderness, South Unit, in Theodore Roosevelt National Park located about 20 miles north of this area. This Wilderness represents a mixed-grass prairie in a badlands setting. It would share many of the same characteristics of a Bullion Butte Wilderness area.

Representation of Landforms and Ecosystems: Bullion Butte represents a mixed-grass prairie on a massive stand-alone butte. The following ecosystem types are present: hardwood draws, upland grasslands, rolling grasslands, terraces, upland breaks, toe slopes and river breaks.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: The area is found in a sparsely populated region of the country. Dickinson, Williston, and Bismarck/Mandan, North Dakota, with an estimated population of less than 125,000, and Glendive and Sydney, Montana, with a combined population of about 25,000, are the nearest cities of any size, and none of them are closer than 30 miles from the area.

A considerable number of people and organizations have requested that the Forest Service designate some grassland Wilderness somewhere within the 191-million-acre National Forest System. Currently, Congress has not designated Wilderness area on any of the 20 national grasslands within that System.

Two Wilderness areas have been designated in the Little Missouri Badlands: the 10,510-acre Theodore Roosevelt Wilderness, South Unit, and the 19,410-acre Theodore Roosevelt Wilderness, North Unit, both of which are located in the Theodore Roosevelt National Park. These two Wilderness areas offer nearby designated Wilderness which, in most ways, represent most of the key characteristics found in the Bullion Butte area, including appearance and vegetative cover types. No other designated Wilderness areas, however, exist in the Little Missouri Badlands, a recognized biogeographical sub-unit of the Great Plains.

Bullion Butte: Environmental Consequences

Management Prescription Allocations by Alternative

Alternative 2:	MA 3.51	8,630 acres
	MA 6.1	11,150 acres
Alternative 3:	MA 1.2A	8,880 acres
	MA 1.31	3,430 acres
	MA 2.2	1,250 acres
	MA 3.65	4,390 acres
	MA 4.22	1,830 acres
Alternative 4:	MA 1.2	8,400 acres
	MA 1.31	8,530 acres
	MA 2.2	200 acres
	MA 3.4	2,640 acres
Alternative 5:	MA 1.31	16,980 acres
	MA 3.4	2,800 acres

Designation: Wilderness

Prescription: MA 1.2 or 1.2A Recommended or Suitable Wilderness

Alternatives: 3 and 4

Environmental Consequences: Travel would be by nonmotorized, nonmechanical. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities may be limited or foregone. Wildlife would tend to benefit from reduced human activity, but some opportunities for fish and wildlife enhancement, and ecosystem restoration would be foregone. Grazing of livestock would continue where grazing was established at the time the wilderness is designated. Valid existing rights would be recognized. Oil and gas developments could occur on the areas of private mineral ownership.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration, noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Maintenance of existing range developments would be permitted. Construction of new range developments would not be allowed to detract from the wilderness character of the area. Stipulations, such as no surface occupancy, and reclamation efforts designed at protecting the wilderness values to the extent possible, may be authorized by Congress on existing rights and leases. The area may be Congressionally designated as administratively unavailable.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be increased while at the same time reducing opportunities for motorized recreation. If the area is withdrawn from leasing, oil and gas development opportunities would be foregone.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 3, 4, and 5

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Overall wildlife would tend to benefit from reduced human activity. Opportunities for discovery of cultural, historical and paleontological resources would exist but interpretive opportunities would be limited or foregone. Livestock grazing would continue as present. Valid existing rights would be recognized. Because the area is leased for oil and gas and contains an area of private minerals, oil and gas development could occur. Where mineral development occurs, the semi-primitive, nonmotorized character of the area would be lost for the duration of the activity.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area. Oil and gas development on existing leases would require the area to being reclaimed to as near as possible its original condition at the close of the lease.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Because oil and gas development of existing leases could occur; restricting other users could cause conflict. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas developments would continue as long as production occurs in the area.

Designation: Non-wilderness

Prescription: MA 2.2 Research Natural Areas

Alternatives: 3 and 4

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and semi-primitive end of the spectrum such as walking and hiking. Uses that maintain or improve the ecological characteristics for which the RNA was designated would be allowed. Livestock grazing would continue as present. The area would be made unavailable for leasing until establishment of the RNA, at which time it would be withdrawn from mineral entry.

Mitigation Measures: Motorized travel is limited to administrative, law enforcement, emergency, and scientific purposes. Existing roads would be closed or obliterated unless necessary for administrative, scientific, or valid private access. Recreational use would be restricted if is hinders achievement of the desired condition for the RNA. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be increased while at the same time reducing opportunities for motorized recreation. Those accustomed to accessing the area by motorized means might resent vehicle restrictions. If the area is withdrawn from leasing, oil and gas development opportunities would be foregone.

Mitigation Measures: Motorized travel routes may be designated with restrictions. Livestock grazing would be managed to maintain the values for which the river is designated. For segments recommended for wild designation, oil and gas leases would require no surface occupancy. "Scenic" or "recreational" segments would be stipulated to maintain the scenic values of the area.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas revenues may be reduced if development opportunities are foregone.

Designation: Non-wilderness

Prescription: MA 3.51 Bighorn Sheep

Alternatives: 2

Environmental Consequences: Recreational activities and motorized travel would be discouraged during breeding and lambing periods. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Construction of new travel routes would be prohibited except to honor valid and existing rights and leases. Snowmobile use would be prohibited. Existing and adjoining allotments in this area would not permit conversion to domestic sheep. Oil and gas leasing would be no surface occupancy.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas revenues may be reduced if development opportunities are foregone.

Designation: Non-wilderness

Prescription: MA 3.65 Rangelands with Diverse Natural-appearing Landscapes

Alternatives: 3

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power

lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 3.65 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character would be lost permanently making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 4.22 River and Travel Corridors

Alternatives: 3

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A variety of recreation opportunities would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted.

Mitigation Measures: Constructed public launch sites will be visually subordinate to the river and river corridor. OHV trail construction would be prohibited. Timing, seasonal, or location stipulations may be appropriate related to oil and gas development to maintain the scenic values of the area. Leasing within the corridor would be NSO.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings would be moderate. Economic benefits from oil and gas revenues may be reduced if development opportunities are foregone due to restrictions and stipulations.

Designation: Non-wilderness

Prescription: MA 6.1 Rangelands with Broad Resource Emphasis

Alternatives: 2

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Dawson's Waterhole: An Overview of the Affected Environment

The 6,090-acre Dawson's Waterhole area is located about 32 miles northwest of Dickinson, North Dakota, and about three miles north of Theodore Roosevelt National Park. More specifically, Dawson's Waterhole is located, either partly or fully, in: T. 142 N., R. 101 W., Sections 19-22, 27-30 and 32-34. It lies within the Little Missouri Badlands, a scenic combination of rugged terrain and open space. Access from Belfield, North Dakota, is north on U.S. Highway 85 for 12 miles, then west on Forest Development Road 732 for 14 miles.

The Dawson's Waterhole area is located within the Little Missouri Badlands, a biogeographical sub-unit of the Great Plains Region. Robert G. Bailey further identifies the area as a part of the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division (71). Topography of the area consists of highly dissected and eroded badlands terrain. Exposed soils and clays are quite evident. This area drains to the west toward the Little Missouri River. Elevation ranges from 2,284 feet to about 2,650 feet above sea level.

Dominant vegetation includes western wheatgrass, green needlegrass, blue grama, little bluestem and threadleaf sedge, often found interspersed with silver sagebrush. Deciduous woody species include green ash, boxelder, cottonwood near drainage bottoms, chokecherry, American plum, juneberry and hawthorne. Coniferous species include Rocky Mountain juniper. A light to moderate infestation of leafy spurge, a noxious weed, occurs in the area.

Representative wildlife include mule and white-tailed deer, pronghorn antelope, elk, wild turkey, upland birds, neotropical grassland birds, numerous raptors and numerous reptiles.

Recreation, livestock grazing, and oil and gas production occur in the area.

Dawson's Waterhole: Capability Analyses

Environment

Opportunity for Solitude and Serenity: A high potential for solitude and serenity is available in the lower-elevation bottoms of the area. Overall, the area provides moderate to high opportunities for solitude and serenity. The area is generally inaccessible, though some two-tracks are found in the area. Generally, the sights and/or sounds of people are minimal.

Natural Appearance and Integrity: Overall, this roadless area retains a natural appearance, representative of rolling grasslands and rough badlands terrain. Most of the ecological processes, including flash flooding, but with the exception of frequent natural wildfire, remain intact. Closer examination reveals signs of livestock activities. Cattle may be frequently encountered during the warmer grazing season. Livestock developments, including developed springs, fences, water wells, primitive trails, stock tanks and dugouts, detract from the natural setting, although most range developments have been constructed to blend with the natural surroundings as much as possible. In addition, about 15 miles of buried range-water pipeline and one mile of utility line exist in the area.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation Opportunities: Current recreation includes hiking, horseback riding, prairie dog viewing and shooting, dispersed camping, and big game and upland game hunting.

Special Features

Unique Characteristics and Scenic Features: Fossils found in Fort Union (also known as Ludlow) Formation deposits represent the Paleocene (65 to 45 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Manageability

Size and Shape: The 6,090-acre Dawson's Waterhole is roughly rectangular in shape. It is about four miles wide east to west and three miles long north to south. It contains no inholdings.

Potential to Manage Boundaries: Most of this area is defined by roads or fencelines, so visible and clear signing and posting of the area should be relatively easy. Enforcing nonmotorized use under a Wilderness designation would pose a major challenge due to the lack of law enforcement on the district.

Dawson's Waterhole: Availability Analyses

Resource Values and Potentials

Oil and Gas: The potential for oil and gas is high. The area is currently under lease but as yet has not been developed.

Coal: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Livestock Grazing: Two permittees operate on two allotments in the area. The area produces about 2,100 animal unit months of livestock grazing annually.

Locatable Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Common Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Timber: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation: Motorized recreation would be prohibited under a Wilderness designation. Current nonmotorized recreation activities, such as dispersed camping, hiking, horseback riding, and nature study, would be allowed. Wilderness designation would preclude off-highway motorized recreation, such as ATV and snowmobile use. Walk-in hunting opportunities would increase. Backcountry experiences would be enhanced with the exclusion of motorized activities. Opportunities for physically challenged and elderly access may be reduced or eliminated in the area.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor site sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Little Missouri National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered that fall under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: Land origination within the Dawson's Waterhole area is about 5,770 acres acquired and 320 acres from the public domain. About 1,000 acres of private, subsurface minerals ownership beneath federal lands exist in the area and is subject to minerals leasing. Leases may be exercised at any point in the life of the lease. Currently, leases are generally for a 10-year period. Once production on a lease is established, the lease is valid throughout the life of production. The life of production from an oil well on the district is between five and twenty-five years.

Existing Contracts and Agreements: The Medora Grazing Association holds a 10-year livestock grazing agreement for the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Effects on Adjacent Lands: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Dawson's Waterhole: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest Wilderness area is the 10,510-acre Theodore Roosevelt Wilderness, South Unit, in the Theodore Roosevelt National Park. The Theodore Roosevelt Wilderness, South Unit is about three miles to the south. The 19,410-acre Theodore Roosevelt Wilderness, North Unit, lies about 30 miles to the north. Both of these Wilderness areas represent mixed-grass prairies in a badlands setting. The Dawson's Waterhole Wilderness would also represent a mixed-grass prairie in a badlands setting.

Representation of Landforms and Ecosystems: This area represents a mixed-grass prairie with the following ecosystem types present: hardwoods draws, upland grasslands, rolling grasslands and hilly scoria. The landscape includes badlands and rolling prairies.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species would benefit, however, from a designation.

Public Interests and Concerns: The area is found in a sparsely populated region of the country. Dickinson, Williston and Bismarck / Mandan, North Dakota, with an estimated population of less than 125,000, and Glendive and Sydney, Montana, with a combined population of about 25,000, are the nearest cities of any size, and none of them are closer than 30 miles from the area.

A considerable number of people and organizations have requested that the Forest Service designate some grassland Wilderness somewhere within the 191-million-acre National Forest System. Currently, Congress has not designated Wilderness area on any of the 20 national grasslands within that System.

Two Wilderness areas have been designated in the Little Missouri Badlands: the 10,510-acre Theodore Roosevelt Wilderness, South Unit, and the 19,410-acre Theodore Roosevelt Wilderness, North Unit, both of which are located in the Theodore Roosevelt National Park. These two Wilderness areas offer nearby designated Wilderness which, in most ways, represent most of the key characteristics found in the Dawson's Waterhole area, including appearance and vegetative cover types. No other designated Wilderness areas, however, exist in the Little Missouri Badlands, a recognized biogeographical sub-unit of the Great Plains.

Dawson's Waterhole: Environmental Consequences

Management Prescription Allocations by Alternative

Alternative 2:	MA 3.51	110 acres
	MA 6.1	5,980 acres
Alternative 3:	MA 3.65	6,090 acres
Alternative 4:	MA 1.31	6,090 acres
Alternative 5:	MA 3.51	110 acres
	MA 6.1	5,980 acres

Designation: Wilderness

Prescription: MA 1.2A

Alternatives: Wilderness designation is not considered in any alternative because of the area's existing level of mineral development.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 4

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Overall wildlife would tend to benefit from reduced human activity. Opportunities for discovery of cultural, historical and paleontological resources would exist but interpretive opportunities would be limited or forgone. Livestock grazing would continue as present. Valid existing rights would be recognized. Because the area is leased for oil and gas and contains a small area of private minerals, oil and gas developments could occur. Where mineral development occurs, the semi-primitive, nonmotorized character of the area would be lost for the duration of the activity.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration, noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area. Oil and gas developments on existing leases would require the area to be reclaimed to as near as possible its original condition at the close of the lease.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Because oil and gas development of existing leases could occur; restricting other users could cause conflict. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas developments would continue as long as production occurs in the area.

Designation: Non-wilderness

Prescription: MA 3.51 Bighorn Sheep

Alternatives: 2 and 5

Environmental Consequences: Recreational activities and motorized travel would be discouraged during breeding and lambing periods. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Construction of new travel routes would be prohibited except to honor valid and existing rights and leases. Snowmobile use would be prohibited. Existing and adjoining allotments in this area would not permit conversion to domestic sheep. Oil and gas leasing would be no surface occupancy.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas revenues may be reduced if development opportunities are foregone.

Designation: Non-wilderness

Prescription: MA 3.65 Rangelands with Diverse Natural-appearing Landscapes

Alternatives: 3

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 3.65 it would lose its roadless character due to increased oil and gas development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character would likely be lost permanently making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 6.1

Alternatives: 2,5

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power

lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Easy Hill: An Overview of the Affected Environment

The 7,350-acre Easy Hill area is located about 25 miles southwest of Dickinson, North Dakota, and about eight miles south of Theodore Roosevelt National Park. More specifically, Easy Hill is located, either partly or fully, in: T. 138 N., R. 101 W., Sections 23-26 and 35, and T. 138 N, R. 100 W., Sections 19 and 30-32. It lies within the Little Missouri Badlands, a scenic combination of rugged terrain and open space. Access from Belfield, North Dakota, is south via U.S. Highway 85 for 12 miles, then west on Forest Development Road 767 for about 10 miles, then north on Forest Development Road 765 for about two miles.

The Easy Hill area is located within the Little Missouri Badlands, a biogeographical sub-unit of the Great Plains Region. Robert G. Bailey further identifies the area as a part of the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division (71). Topography varies from rolling grasslands to moderately rugged badlands terrain. The area displays incised drainages and numerous clay buttes. Elevation ranges from about 2,650 feet to 2,840 feet above sea level. This area includes a portion of the headwaters to Sully Creek. Drainage of the area is to the west, eventually emptying into the Little Missouri River.

On some of the non-grassy areas, predominate vegetation consists of big sagebrush, rabbit brush and four-wing salt brush. Many of the steep drainages on north-facing slopes are occupied by a dense growth of Rocky Mountain juniper. Green ash and American elm occupy the wooded draws. Dominant grasses include western wheatgrass, green needlegrass, and blue grama, with some little bluestem in the sandy areas and threadleaf sedge on the southern exposures. Understory shrub species in draws include buffaloberry, skunkbush sumac, chokecherry, snowberry, woods rose, and many others. A scattered infestation of leafy spurge, a noxious weed, occurs in the area.

The area's wildlife includes ferruginous hawks and other raptors, mule deer, pronghorn antelope, coyotes, bobcats, badgers, rattlesnakes and other reptiles and numerous other species. Golden eagles have been known to nest in the area.

There are a number of two-track roads in the area, as well as two and one-half miles of buried range-water pipeline.

Easy Hill: Capability Analyses

Environment

Opportunity for Solitude and Serenity: A high potential for solitude and serenity is available in the breaks and drainages; however, on the flatter areas at higher elevations, only a moderate potential for solitude and serenity is available, if only because adjacent developments outside the boundary, including oil wells, roads and ranches, are visible. Traffic through the area during the fall hunting season is rather high.

Natural Appearance and Integrity: Overall, this roadless area retains a natural appearance, representative of rolling grasslands and moderately rugged badlands terrain. Most of the ecological processes, including flash flooding, but with the exception of frequent natural wildfire, remain intact. Closer examination reveals signs of mineral and livestock activities. Cattle may be frequently encountered during the warmer grazing season. Livestock developments, including developed springs, fences, water wells, primitive trails, stock tanks and dugouts, detract from the natural setting, although most range developments have been constructed to blend with the natural surroundings as much as possible.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation Opportunities: Current recreation includes hiking, horseback riding, dispersed camping, nature study and big game and upland game hunting.

Special Features

Unique Characteristics and Scenic Features: Fossils found in Fort Union (also known as Ludlow) Formation deposits represent the Paleocene (65 to 45 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Manageability

Size and Shape: The 7,350-acre Easy Hill is roughly square in shape. It is about four miles wide east to west and four and one-half miles long north to south. It contains no inholdings.

Potential to Manage Boundaries: Significant posting and boundary signing would be needed for this area. A high potential for illegal motorized trespass under a Wilderness designation could be expected, especially since many two-track roads enter the area and because this area is sought after by hunters in the fall. Few, if any, natural barriers exist that might restrict illegal entry. In addition, enforcing nonmotorized use under a Wilderness designation would pose a major challenge due to the lack of law enforcement on the district.

Easy Hill: Availability Analyses

Resource Values and Potentials

Oil and Gas: The potential for oil and gas is high. At the time the DEIS was released for public review, the area was leased for oil and gas but no developments occurred within the area. Since that time the area has been developed for oil and gas with approximately 1 mile of road and 1 well site.

Coal: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Livestock Grazing: Three permittees operate on three allotments in the area. The area produces about 2,020 animal unit months of livestock grazing annually.

Locatable Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Common Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Timber: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation: Motorized recreation would be prohibited under a Wilderness designation. Current nonmotorized recreation activities, such as dispersed camping, hiking, horseback riding, and nature study, would be allowed. Wilderness designation would preclude off-highway motorized recreation, such as ATV and snowmobile use. Walk-in hunting opportunities would increase. Backcountry experiences would be enhanced with the exclusion of motorized activities. Opportunities for physically challenged and elderly access may be reduced or eliminated in the area.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Little Missouri National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered that fall under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints or Encumbrances

Mineral Leases and Subsurface Rights: Land origination within the Easy Hill area is about 7,184 acres acquired and about 160 acres from the public domain. About 322 acres of private, subsurface minerals ownership exist in the area. Some on-the-ground staking of possible oil well locations has recently occurred.

Existing Contracts and Agreements: The Medora Grazing Association holds a 10-year livestock grazing agreement for the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Effects on Adjacent Lands: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Easy Hill: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest Wilderness area is the 10,510-acre Theodore Roosevelt Wilderness, South Unit, in the Theodore Roosevelt National Park. The Theodore Roosevelt Wilderness, South Unit is about 13 miles to the northwest. The 19,410-acre Theodore Roosevelt Wilderness, North Unit, lies about 60 miles to the north. Both of these Wilderness areas represent mixed-grass prairies in a badlands setting. The Easy Hill Wilderness would also represent a mixed-grass prairie in a badlands setting.

Representation of Landforms and Ecosystems: This area represents a mixed-grass prairie with the following ecosystem types present: hardwoods draws, upland grasslands, rolling grasslands and upland breaks. The landscape includes badlands and rolling prairies.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species would benefit, however, from a designation.

Public Interests and Concerns: The area is found in a sparsely populated region of the country. Dickinson, Williston and Bismarck / Mandan, North Dakota, with an estimated population of less than 125,000, and Glendive and Sydney, Montana, with a combined population of about 25,000, are the nearest cities of any size, and none of them are closer than 25 miles from the area.

A considerable number of people and organizations have requested that the Forest Service designate some grassland Wilderness somewhere within the 191-million-acre National Forest System. Currently, Congress has not designated Wilderness area on any of the 20 national grasslands within that System.

Two Wilderness areas have been designated in the Little Missouri Badlands: the 10,510-acre Theodore Roosevelt Wilderness, South Unit, and the 19,410-acre Theodore Roosevelt Wilderness, North Unit, both of which are located in the Theodore Roosevelt National Park.

These two Wilderness areas offer nearby designated Wilderness which, in most ways, represent most of the key characteristics found in the Easy Hill area, including appearance and vegetative cover types. No other designated Wilderness areas, however, exist in the Little Missouri Badlands, a recognized biogeographical sub-unit of the Great Plains.

Easy Hill: Environmental Consequences

Management Prescription Allocations by Alternative

Alternative 2:	MA 3.51	70 acres
	MA 6.1	7,280 acres
Alternative 3:	MA 3.65	7,220 acres
	MA 6.1	130 acres
	MA 1.31	7,340 acres
Alternative 4:	MA 3.51	70 acres
Alternative 5:	MA 6.1	7,280 acres

Designation: Wilderness

Prescription: MA 1.2A Suitable Wilderness

Alternatives: Wilderness designation is not considered in any alternative because of the area's existing level of mineral development.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 4

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Overall wildlife would tend to benefit from reduced human activity. Opportunities for discovery of cultural, historical and paleontological resources would exist but interpretive opportunities would be limited or forgone. Livestock grazing would continue as present. Valid existing rights would be recognized. Because the area is leased for oil and gas and contains a small area of private minerals, additional oil and gas developments could occur. Where mineral development occurs, the semi-primitive, nonmotorized character of the area would be lost for the duration of the activity.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration, noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area. Oil and gas development on existing leases would require the area to be reclaimed to as near as possible its original condition at the close of the lease.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Because oil and gas development of existing leases could occur; restricting other users could cause conflict. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas developments would continue as long as production occurs in the area.

Designation: Non-wilderness

Prescription: MA 3.51

Alternatives: 2 and 5

Environmental Consequences: Recreational activities and motorized travel would be discouraged during breeding and lambing periods. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Construction of new travel routes would be prohibited except to honor valid and existing rights and leases. Snowmobile use would be prohibited. Existing and adjoining allotments in this area would not permit conversion to domestic sheep. Oil and gas leasing would be no surface occupancy.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas revenues may be reduced if development opportunities are foregone.

Designation: Non-wilderness

Prescription: MA 3.65

Alternatives: 3

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 3.65 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character would be lost permanently making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 6.1

Alternatives: 2, 3, and 5

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Kinley Plateau: An Overview of the Affected Environment

The 16,900-acre Kinley Plateau area is located about 35 miles southwest of Dickinson, North Dakota, and about 10 miles south of the south unit of Theodore Roosevelt National Park. More specifically, Kinley Plateau is located, either partly or fully, in: T. 138 N., R. 101 W., Sections 19-22 and 27-33, and T. 137 N., R. 101 W., Sections 4-8, 14-15, 17-19, 21-23, 26-28 and 34, and T. 138 N., R. 102 W., Sections 22-25 and 35, and T. 137 N., R. 102 W., Sections 1-2 and 12-13. It lies within the Little Missouri Badlands, a scenic combination of rugged terrain and open space. Access to the area is via Forest Highway 3 south from Medora, North Dakota, for about 11 miles, then east on Forest Development Road 762 for about five miles, which takes the visitor to the northeastern perimeter of the area.

The Kinley Plateau area is located within the Little Missouri Badlands, a biogeographical sub-unit of the Great Plains Region. Robert G. Bailey further identifies the area as a part of the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division (71). Topography of the area varies from gentle rolling grasslands, flat ridges and plateaus, to extremely rugged badlands terrain with deeply incised stream channels. Elevation varies from 2,500 feet to 2,900 feet above sea level. The geology of Kinley Plateau makes it quite scenic, with color-banded clay buttes with exposed scoria layers.

The rough, broken terrain within the area has a variety of plant growth. On some of the non-grassy areas, predominate vegetation consists of big sagebrush, rabbit brush and four-wing salt brush. Many of the steep drainages on north-facing slopes are occupied by a dense growth of Rocky Mountain juniper. Green ash and American elm occupy the wooded draws. Dominant grasses include western wheatgrass, green needlegrass, and blue grama, with some little bluestem in the sandy areas and threadleaf sedge on the southern exposures. Understory shrub species in draws include buffaloberry, skunkbush sumac, chokecherry, snowberry, woods rose,

and many others. A light infestation of leafy spurge, and a scattered infestation of spotted knapweed, both noxious weeds, occurs in the area.

The alluvial floodplains support a riparian community consisting of cottonwoods and associated species. The terraces immediately above the floodplain tend to support silver sage and extensive western wheatgrass stands.

Over the years, many of the area's two-track roads have become impassable due to erosion along ridges and within ravines. Other two-tracks occur in the area, as do allotment and pasture fences.

The Kinley Plateau area provides prime habitat for a variety of big game including mule deer, white-tailed deer, pronghorn antelope, and bighorn sheep, as well as non-game species. Kinley Plateau provides home range for the state's largest herd of bighorn sheep. Game birds such as sharp-tailed grouse, wild turkey, and pheasant are found, as well as non-game birds and raptors.

The Kinley Plateau area borders the Bullion Butte area on the southwest.

Recreational opportunities include hiking, hunting, horseback riding, and camping. Livestock grazing also occurs in the area.

Kinley Plateau: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Due to the rugged terrain of this area, the opportunity for solitude and serenity is high. Visitors should be able to isolate themselves in the buttes, removing themselves from the sights and sounds of others.

Natural Appearance and Integrity: Overall, this roadless area retains a relatively high natural appearance, representative of rolling grasslands and rough badlands terrain. Most of the ecological processes, including flash flooding, but with the exception of frequent natural wildfire, remain intact. Closer examination reveals signs of livestock activities. Cattle may be frequently encountered during the warmer grazing season. Generally, the vegetative integrity of this area is high. Livestock developments, including developed springs, fences, water wells, primitive trails, stock tanks and dugouts, detract from the natural setting, although most range developments have been constructed to blend with the natural surroundings as much as possible. About four and a half miles of buried range-water pipeline is located in the area and light infestations of leafy spurge and scattered infestations of spotted knapweed have been recorded.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation Opportunities: Current recreation includes hiking into primitive and semi-primitive tranquil settings, hunting, dispersed camping, canoeing on the Little Missouri River, mountain biking, horseback riding, wildlife viewing, wildflower viewing, scenic driving, nature study and associated activities. This area is a good day-use area because of its close proximity to both Medora and Dickinson, North Dakota.

Special Features

Unique Characteristics and Scenic Features: This area is highly scenic, characterized by two or three high plateaus. Bighorn sheep frequent the area. Fossils found in Fort Union (also known as Ludlow) Formation deposits represent the Paleocene (65 to 45 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Manageability

Size and Shape: The 16,900-acre Kinley Plateau area is rather irregular in shape, with two roughly rectangular segments, the smaller to the southeast of the larger. The larger segment is about six miles long north to south and five miles wide east to west. The smaller segment is about three miles long north to south and two miles wide east to west. One inholding, owned by the State of North Dakota, of about 640 acres, is located in the area.

Potential to Manage Boundaries: Most of this area is defined by roads or fencelines, so visible and clear signing and posting of the area should be relatively easy. Enforcing nonmotorized use under a Wilderness designation would pose a major challenge due to the lack of law enforcement on the district.

Kinley Plateau: Availability Analyses

Resource Values and Potentials

Oil and Gas: The potential for oil and gas developments is high. The area is available for lease under no surface occupancy (NSO) stipulations. There are no current leases in the area at this time. If the leases expire without development the area may then be designated administratively unavailable for leasing.

Coal: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Livestock Grazing: The area produces about 8,354 animal unit months of livestock grazing annually. Nine permittees operate on eight allotments in the area.

Locatable Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Common Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Timber: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation: Motorized recreation would be prohibited under a Wilderness designation. Current nonmotorized recreation activities, such as dispersed camping, hiking, horseback riding, and nature study, would be allowed. Wilderness designation would preclude off-highway motorized recreation, such as ATV and snowmobile use. Walk-in hunting opportunities would increase. Backcountry experiences would be enhanced with the exclusion of motorized activities. Opportunities for physically challenged and elderly access into the area may be reduced.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Bighorn Sheep: Wilderness designation would have beneficial effects on bighorn sheep due to the lack of human disturbances and reductions in motorized activities a designation would bring, especially during the birthing season.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Little Missouri National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered that fall under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: Land origination within the Kinley Plateau area is about 16,240 acres acquired and 1,136 acres from the public domain. About 5,904 acres of private, subsurface ownership beneath federal lands were recently acquired from Burlington Resources Oil and Gas Company. About 380 acres are available for leasing, but only under no-surface occupancy stipulations. Seismic exploration is allowed.

Existing Contracts and Agreements: The Medora Grazing Association holds the grazing agreement in the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Effects on Adjacent Lands: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Kinley Plateau: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest Wilderness area is the 10,510-acre Theodore Roosevelt Wilderness, South Unit, in the Theodore Roosevelt National Park. The Theodore Roosevelt Wilderness, South Unit is about 17 miles to the north. The Theodore Roosevelt Wilderness, South Unit, represents a mixed-grass prairie in a badlands setting. The Kinley Plateau Wilderness would also represent a mixed-grass prairie in a badlands setting.

Representation of Landforms and Ecosystems: This area represents a mixed-grass prairie with the following ecosystem types present: hardwood draws, upland grasslands, rolling grasslands, upland breaks, and hilly scoria. The landscape includes rugged, relatively pristine badlands.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: The area is found in a sparsely populated region of the country. Dickinson, Williston, and Bismarck / Mandan, North Dakota, with an estimated population of less than 125,000, and Glendive and Sydney, Montana, with a combined population of about 25,000, are the nearest cities of any size, and none of them are closer than 30 miles from the area.

A considerable number of people and organizations have requested that the Forest Service designate some grassland Wilderness somewhere within the 191-million-acre National Forest System. Currently, Congress has not designated Wilderness area on any of the 20 national grasslands within that System.

Two Wilderness areas have been designated in the Little Missouri Badlands: the 10,510-acre Theodore Roosevelt Wilderness, South Unit, and the 19,410-acre Theodore Roosevelt Wilderness, North Unit, both of which are located in the Theodore Roosevelt National Park. These two Wilderness areas offer nearby designated Wilderness which, in most ways, represent most of the key characteristics found in the Kinley Plateau area, including appearance and vegetative cover types. No other designated Wilderness areas, however, exist in the Little Missouri Badlands, a recognized biogeographical sub-unit of the Great Plains.

Kinley Plateau: Environmental Consequences

Management Prescription Allocations by Alternative

Alternative 2:	MA 3.51	11,790 acres
	MA 6.1	5,110 acres
Alternative 3:	MA 1.2A	12,770 acres
	MA 1.31	4,130 acres
Alternative 4:	MA 1.2	16,900 acres
Alternative 5:	MA 1.31	16,780 acres
	MA 6.1	120 acres

Designation: Wilderness

Prescription: MA 1.2 or 1.2A Recommended or Suitable Wilderness

Alternatives: 3 and 4

Environmental Consequences: Travel would be by nonmotorized, nonmechanical. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities may be limited or foregone. Wildlife would tend to benefit from reduced human activity, but some opportunities for fish and wildlife enhancement, and ecosystem restoration would be foregone. Grazing of livestock would continue where grazing was established at the time the wilderness is designated. Valid existing rights and leases would be recognized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Maintenance of existing range developments would be permitted. Construction of new range developments would not be allowed to detract from the wilderness character of the area. Stipulations, such as no surface occupancy, and reclamation efforts designed at protecting the wilderness values to the extent possible may be authorized by Congress on existing rights and leases. The area may be Congressionally designated as administratively unavailable.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be increased while at the same time reducing opportunities for motorized recreation. If the area is withdrawn from leasing, oil and gas development opportunities would be foregone.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 3 and 5

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Overall wildlife would tend to benefit from reduced human activity. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities would be limited or forgone. Livestock grazing would continue as present. Valid existing rights would be recognized. Because the area is leased for oil and gas and contains a small area of private minerals, oil and gas developments could occur. Where mineral development occurs, the semi-primitive, nonmotorized character of the area would be lost for the duration of the activity.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area. Oil and gas development on existing leases would require the area to be reclaimed to as near as possible its original condition at the close of the lease.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Because oil and gas development of existing leases could occur; restricting other users could cause conflict. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas developments would continue as long as production occurs in the area.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternatives: 2 and 5

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Magpie: An Overview of the Affected Environment

The 21,280-acre Magpie area (14,580-acres on the Medora Ranger District and 6,700 acres of the McKenzie Ranger District) is located about 36 miles south and west of Watford City, North Dakota, and about 12 miles south of the north unit of Theodore Roosevelt National Park. More specifically, the Magpie area is located, either partly or fully, in: T. 145 N., R. 100 W., Section 14-15, 19, 21-23 and 26-35, and T. 144 N., R. 101 W., Sections 1-5, 10-14 and 23-25, and T. 144 N., R. 100 W., Sections 6, 18-20, 22-23, 26-30 and 32-34, and T. 143 N., R. 100 W., Section 4. Access to the area from Watford City is via U.S. Highway 85 south for 28 miles, then west on McKenzie County Road 50 for six miles, then south on Forest Development Road 809 for about two and a half miles. The area lies to the southwest.

The Magpie area is located within the Little Missouri Badlands, a biogeographical sub-unit of the Great Plains Region. Robert G. Bailey further identifies the area as a part of the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division (71). Topography of the area varies from gentle rolling grasslands to extremely rugged badlands terrain with deeply incised stream channels and numerous clay buttes. Extensive areas of upland grasslands are interspersed between upland breaks. Elevation varies from 2,100 feet to 2,600 feet above sea level.

The rough, broken terrain within the area has a variety of plant growth. Many of the steep drainages on north-facing slopes are occupied by a dense growth of Rocky Mountain juniper. Green ash and American elm occupy the wooded draws. Dominant grasses include western wheatgrass, green needlegrass, and blue grama with some little bluestem in the sandy areas and threadleaf sedge on the southern exposures. Understory shrub species in draws include buffaloberry, skunkbush sumac, chokecherry, snowberry, woods rose and many others. A scattered infestation of leafy spurge, a noxious weed, occurs in the area.

The Magpie area supports populations of mule deer, white-tailed deer, pronghorn antelope, turkeys, and sharp-tailed grouse. Although the wildlife habitats and species represented are not unique within the Little Missouri National Grassland, they are listed by the State of North Dakota as high-interest species.

Present recreational use includes hunting in the fall, hiking, nature study, dispersed camping, and wildlife viewing. Livestock grazing also occurs in the area.

Magpie: Capability Analyses

Environment

Opportunity for Solitude and Serenity: The opportunities for solitude and serenity are high as a result of the rugged terrain. Some two-tracks do occur in the area; however, the overall area remains relatively inaccessible.

Natural Appearance and Integrity: Overall, this roadless area retains a natural appearance, representative of rolling grasslands and rough badlands terrain. Most of the ecological processes, including flash flooding, but with the exception of frequent natural wildfire, remain intact. Closer examination reveals signs of livestock activities. Cattle may be frequently encountered during the warmer grazing season. Livestock developments, including developed springs, fences, water wells, primitive trails, stock tanks and dugouts, detract from the natural setting, although most range developments have been constructed to blend with the natural surroundings as much as possible. In addition, about five miles of buried range-water pipeline and six miles of utility line exist in the area. The Maah-Daah-Hey Trail is located in the area.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation Opportunities: Current recreation includes hiking, hunting, sight-seeing, viewing wildlife, photography, picnicking, viewing wildflowers, nature study, and related activities. The Maah-Daah-Hey Trail winds through about seven and a half miles of the area. The Ice Caves, a nominated Special Interest Area and one of only two known cave systems in North Dakota, lie in the area; the Ice Caves are a day-use and picnicking destination, with geological features of some interest. Horseback riding is popular in the Magpie area.

Special Features

Unique Characteristics and Scenic Features: The Ice Caves, nominated as a 240-acre Special Interest Area, is found in the Magpie area. Fossils found in Fort Union (also known as Ludlow)

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Manageability

Size and Shape: The 21,280-acre Magpie area straddles the Medora and McKenzie Ranger Districts. Most of the area (14,580 acres) lies on the Medora District, while 6,700 acres lies on the McKenzie District. The Magpie area is more or less shaped like a boot. It is about four miles wide east to west and seven miles long north to south at its widest points. It contains no inholdings.

Potential to Manage Boundaries: Significant signing and posting would be required. Some illegal motorized trespass may be expected, especially during fall hunting season.

Magpie: Availability Analyses

Resource Values and Potentials

Oil and Gas: The potential for oil and gas in the area is high. Part of the area is currently leased but has not yet been developed. The remaining portion is available for leasing. A permit application for seismic exploration is currently being analyzed.

Coal: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Livestock Grazing: Eighteen permittees operate in the area. The area produces about 8,544 animal units months of livestock grazing annually. About 23 allotments are either fully or partially located in the area.

Locatable Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Common Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Timber: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation: Motorized recreation would be prohibited under a Wilderness designation. Current nonmotorized recreation activities, such as dispersed camping, hiking, horseback riding, and nature study, would be allowed. Wilderness designation would preclude off-highway motorized recreation, such as ATV and snowmobile use. Walk-in hunting opportunities would increase. Backcountry experiences would be enhanced with the exclusion of motorized activities. Opportunities for physically challenged and elderly access may be reduced or eliminated in the area.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Bighorn Sheep: Wilderness designation would have beneficial effects on bighorn sheep due to the lack of human disturbances and reductions in motorized activities a designation would bring, especially during the birthing season.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Little Missouri National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered that fall under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: Land origination in the Magpie area is about 19,540 acres acquired and 1,740 acres from the public domain. About 2,427 acres of private, subsurface minerals ownership beneath federal lands exist in the area and is subject to minerals leasing. Leasing may be exercised at any point in the life of the lease. Currently, leases are generally for a 10-year period. Once production on a lease is established, the lease is valid throughout the life of production. The life of production from an oil well on the district is between five and twenty-five years.

Existing Contracts and Agreements: Both the Medora Grazing Association and the McKenzie County Grazing Association hold 10-year livestock grazing agreements in the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Effects on Adjacent Lands: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Magpie: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest Wilderness areas are in Theodore Roosevelt National Park. The 19,410-acre Theodore Roosevelt Wilderness, North Unit, is about 12 miles to the north, while the 10,510-acre Theodore Roosevelt Wilderness, South Unit, is 19 miles to the south. Both Wilderness areas represent mixed-grass prairies in a badlands setting. The Magpie Wilderness would also represent a mixed-grass prairie in a badlands setting.

Representation of Landforms and Ecosystems: This area represents a mixed-grass prairie with the following ecosystem types present: hardwood draws, upland grasslands, rolling grasslands and upland breaks. The landscape includes badlands and rolling prairies.

Biota: No species are dependent upon a Wilderness designation to remain viable in this area. Most key species would benefit, however, from a designation.

Public Interests and Concerns: The area is found in a sparsely populated region of the country. Dickinson, Williston, and Bismarck / Mandan, North Dakota, with an estimated population of less than 125,000, and Glendive and Sydney, Montana, with a combined population of about 25,000, are the nearest cities of any size, and none of them is closer than 40 miles from the area.

A considerable number of people and organizations have requested that the Forest Service designate some grassland Wilderness somewhere within the 191-million-acre National Forest System. Currently, Congress has not designated Wilderness area on any of the 20 national grasslands within that System.

Two Wilderness areas have been designated in the Little Missouri Badlands: the 10,510-acre Theodore Roosevelt Wilderness, South Unit, and the 19,410-acre Theodore Roosevelt Wilderness, North Unit, both of which are located in the Theodore Roosevelt National Park. These two Wilderness areas offer nearby designated Wilderness which, in most ways, represent most of the key characteristics found in the Magpie area, including appearance and vegetative cover types. No other designated Wilderness areas, however, exist in the Little Missouri Badlands, a recognized biogeographical sub-unit of the Great Plains.

Magpie: Environmental Consequences

Management Prescription Allocations by Alternative:

Medora Ranger District			McKenzie Ranger District		
Alternative 2:	MA 2.1	240 acres	Alternative 2:	MA 6.1	6,700 acres
	MA 2.2	60 acres			
	MA 3.51	480 acres			
	MA 6.1	13,800 acres			
Alternative 3:	MA 1.31	7,490 acres	Alternative 3:	MA 1.31	6,700 acres
	MA 2.1	240 acres			
	MA 2.2	60 acres			
	MA 3.65	6,790 acres			
Alternative 4:	MA 1.31	14,280 acres	Alternative 4:	MA 1.31	6,700 acres
	MA 2.1	240 acres			
	MA 2.2	60 acres			

Medora Ranger District			McKenzie Ranger District		
Alternative 5:	MA 2.2	60 acres	Alternative 5:	MA 6.1	6,700 acres
	MA 3.51	480 acres			
	MA 6.1	14,040 acres			

Designation: Wilderness

Prescription: MA 1.2A Suitable Wilderness

Alternatives: Wilderness designation is not considered in any alternative because of the area's existing level of mineral development.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 3 and 4

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Overall wildlife would tend to benefit from reduced human activity. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities would be limited or forgone. Livestock grazing would continue as present. Valid existing rights would be recognized. Because the area is leased for oil and gas and contains a small area of private minerals, oil and gas developments could occur. Where mineral development occurs, the semi-primitive, nonmotorized character of the area would be lost for the duration of the activity.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area. Oil and gas development on existing leases would require the area to be reclaimed to as near as possible its original condition at the close of the lease.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Because oil and gas development of existing leases could occur; restricting other users could cause conflict. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas developments would continue as long as production occurs in the area.

Designation: Non-wilderness

Prescription: MA 2.1 Special Interest Areas

Alternatives: 2, 3, and 4

Environmental Consequences: Recreation opportunities that maintain and enhance the characteristics for which the SIA was designated will be available. Livestock grazing would continue as present. Valid existing rights and leases would be recognized

Mitigation Measures: OHV trail construction will be prohibited. Oil and gas leasing would be no surface occupancy.

Economic and Social Effects: Recreational and interpretive opportunities would be emphasized. The area would continue to provide the existing mix of economic benefits.

Designation: Non-wilderness

Prescription: MA 2.2 Research Natural Areas

Alternatives: 2, 4, and 5

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and semi-primitive end of the spectrum such as walking and hiking. Uses that maintain or improve the ecological characteristics for which the RNA was designated would be allowed. Livestock grazing would continue as present. The area would be made unavailable for leasing until establishment of the RNA, at which time it would be withdrawn from mineral entry.

Mitigation Measures: Motorized travel is limited to administrative, law enforcement, emergency, and scientific purposes. Existing roads would be closed or obliterated unless necessary for administrative, scientific, or valid private access. Recreational use would be restricted if is hinders achievement of the desired condition for the RNA. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be increased while at the same time reducing opportunities for motorized recreation. Those accustomed to accessing the area by motorized means might resent vehicle restrictions. If the area is withdrawn from leasing, oil and gas development opportunities would be foregone.

Designation: Non-wilderness

Prescription: MA 3.51 Bighorn Sheep

Alternatives: 2 and 5

Environmental Consequences: Recreational activities and motorized travel would be discouraged during breeding and lambing periods. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Construction of new travel routes would be prohibited except to honor valid and existing rights and leases. Snowmobile use would be prohibited. Existing and adjoining allotments in this area would not permit conversion to domestic sheep. Oil and gas leasing would be no surface occupancy.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas revenues may be reduced if development opportunities are foregone.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternatives: 2 and 5

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Ponderosa Pine: An Overview of the Affected Environment

The 7,470-acre Ponderosa Pine area is located about 8 miles northwest of Amidon, North Dakota, and about 20 miles south of the south unit of Theodore Roosevelt National Park. More specifically, the Ponderosa Pine area is located, either partly or fully, in: T. 136 N., R. 102 W., Sections 10, 15, 22-23, 27-29 and 32-35, and T. 135 N., R. 102 W., Sections 2-4. It lies within the Little Missouri Badlands, a scenic combination of rugged terrain and open space. Access from Belfield, North Dakota, is south on U.S. Highway 85 for 11 miles, then west and south on Forest Development Road 767 for about 18 miles, then west on Forest Development Road 769 for about three miles, then south on Forest Development Road 727 for about two miles.

The Ponderosa Pine area is located within the Little Missouri Badlands, a biogeographical sub-unit of the Great Plains Region. Robert G. Bailey further identifies the area as a part of the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division (71). Topography varies from rolling grasslands to rugged badlands terrain. Extensive areas of ponderosa pine forests intermix with pine/grassland savanna and upland grasslands. Elevation varies from about 2,400 to 2,600 feet above sea level.

The most remarkable feature of the area is the forest of ponderosa pine. An area of blue bunch grass occurs in association with the ponderosa pine, as does wolfberry and creeping cedar. Except for two minor stands within 20 miles to the north, this site provides the most northeasterly natural stand of ponderosa pine in North America. Other representative vegetation includes dwarf sage, western wheatgrass, big sandgrass, and blue grama. The area has light to moderate levels of leafy spurge infestations.

Some of the ponderosa pine are more than 200 years old. Theodore Roosevelt may have taken logs from the area to build his Maltese Cross ranch house in the 1880s. The historic Dakota National Forest was located in the area. North Dakota's only national forest lasted less than ten years, from 1908 to 1917.

Wildlife typical of the area includes white-tailed deer, mule deer, turkey, neotropical grassland birds, upland birds, badgers, coyotes, and a variety of reptiles.

Sand Creek flows through the area, and drains into the Little Missouri River to the north.

Several two-track roads and a water tank are found in the southern portion of the Ponderosa Pine area.

Typical recreation includes hiking, hunting, horseback riding, and camping. The Forest Service's Burning Coal Vein Campground, including the atypical "columnar junipers," is about a mile east of the area. Livestock grazing occurs in the area. Oil and gas leases exist in the southern three sections of the area.

Ponderosa Pine: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Within the ponderosa pine stands, a visitor should find a high degree of solitude and serenity, accentuated by the sights and smells of a forested community and the sounds of wind blowing through the trees.

Natural Appearance and Integrity: Overall, this roadless area retains a natural appearance, representative of rolling grasslands savanna and moderately rough badlands terrain. Most of the ecological processes, including flash flooding, but with the exception of frequent natural wildfire, remain intact. Closer examination reveals signs of livestock activities. Cattle may be frequently encountered during the warmer grazing season. Livestock developments, including developed springs, fences, water wells, primitive trails, stock tanks and dugouts, detract from the natural setting, although most range developments have been constructed to blend with the natural surroundings as much as possible. In addition, about one and a half miles of utility line exist in the area.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation Opportunities: This is a good day-use destination because of its proximity to Medora and Dickinson, North Dakota. The ponderosa pine stands are unique this far north in the Little Missouri Badlands and provide good hiking, picnicking, and scenic viewing opportunities. A local outfitter / guide holds a permit to bring visitors into the area. Hunting, hiking, photography, and dispersed camping occur. The Burning Coal Vein Campground is about a mile to the east of the Ponderosa Pine area. The area is historic as the former Dakota National Forest, established in 1908 and decommissioned in 1917. Off-highway motorized

recreation, horseback riding, nature study, mountain biking, canoeing in the nearby Little Missouri River and other associated activities are common.

Special Features

Unique Characteristics and Scenic Features: The ponderosa pine forest, essentially the most northeasterly occurrence of ponderosa pine in North America, and a forest in the middle of the Great Plains, is found in this area. Fossils found in Fort Union (also known as Ludlow) Formation deposits represent the Paleocene (65 to 45 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Manageability

Size and Shape: The 7,470-acre Ponderosa Pine area is irregular in shape, sort of like a thin zigzag sitting to the north atop a square. It is about four miles wide east to west and six miles long north to south. It contains no inholdings.

Potential to Manage Boundaries: The irregular shape of the area should not pose major challenges in signing and posting the boundaries, especially since most of the boundaries are already fenced. The potential for illegal trespass may be high given the number of nearby roads in the area and the large amount of adjacent private land.

Ponderosa Pine: Availability Analyses

Resource Values and Potentials

Oil and Gas: Oil and gas potential is high. The area is available for lease under no surface occupancy stipulations.

Coal: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Livestock Grazing: Eight permittees operate on eight allotments in the area. The area produces about 7,987 animal unit months of livestock grazing annually.

Locatable Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Common Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Timber: Currently, no commercial timber-cutting activities exist in the area. No timber management plan exists for the area. However, to maintain the integrity and health of the ponderosa pine stands, a plan should be written that would address selective cutting and prescribed burning.

Recreation: Motorized recreation would be prohibited under a Wilderness designation. Current nonmotorized recreation activities, such as dispersed camping, hiking, horseback riding, and nature study, would be allowed. Wilderness designation would preclude off-highway motorized recreation, such as ATV and snowmobile use. Walk-in hunting opportunities would increase. Backcountry experiences would be enhanced with the exclusion of motorized activities. Opportunities for physically challenged and elderly access may be reduced or eliminated in the area.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Little Missouri National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered that fall under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: Land origination in the Ponderosa Pine area is about 7,471 acres acquired and 70 acres from the public domain. No acres of private, subsurface minerals ownership exist in the area. Any leasing in the Ponderosa Pine area would be allowed only under no-surface-occupancy stipulations.

Existing Contracts and Agreements: The Little Missouri Grazing Association holds a 10-year livestock grazing agreement for the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Effects on Adjacent Lands: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Ponderosa Pine: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest Wilderness area is the 10,510-acre Theodore Roosevelt Wilderness, South Unit, in the Theodore Roosevelt National Park. The Theodore Roosevelt Wilderness, South Unit is about 20 miles to the north. The Theodore Roosevelt Wilderness, South Unit, represents a mixed-grass prairie in a badlands setting. The Ponderosa Pine Wilderness would also represent a mixed-grass / ponderosa pine savanna in a badlands setting.

Representation of Landforms and Ecosystems: This area represents a mixed-grass prairie with the following ecosystem types present: ponderosa pine, upland grasslands, and terraces. The landscape includes badlands and rolling savanna.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: The area is found in a sparsely populated region of the country. Dickinson, Williston, and Bismarck / Mandan, North Dakota, with an estimated population of less than 125,000, and Glendive and Sydney, Montana, with a combined population of about 25,000, are the nearest cities of any size, and none of them are closer than 40 miles from the area.

A considerable number of people and organizations have requested that the Forest Service designate some grassland Wilderness somewhere within the 190-million-acre National Forest System. Currently, the Forest Service provides no Wilderness area on any of the 20 national grasslands within that System.

Two Wilderness areas have been designated in the Little Missouri Badlands: the 10,510-acre Theodore Roosevelt Wilderness, South Unit, and the 19,410-acre Theodore Roosevelt Wilderness, North Unit, both of which are located in the Theodore Roosevelt National Park. These two Wilderness areas offer nearby designated Wilderness which, in most ways, represent most of the key characteristics found in the Ponderosa Pine area, including appearance and vegetative cover types. No other designated Wilderness areas, however, exist in the Little Missouri Badlands, a recognized biogeographical sub-unit of the Great Plains.

Ponderosa Pine: Environmental Consequences

Management Prescription Allocations by Alternative

Alternative 2:	MA 6.1	7,470 acres
Alternative 3:	MA 1.31	3,880 acres
	MA 2.2	3,560 acres
	MA 4.22	30 acres
Alternative 4:	MA 1.2	7,470 acres
Alternative 5:	MA 1.31	7,440 acres
	MA 3.4	30 acres

Designation: Wilderness

Prescription: MA 1.2 or 1.2A Recommended or Suitable Wilderness

Alternatives: 4

Environmental Consequences: Travel would be by nonmotorized, nonmechanical. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities may be limited or foregone. Wildlife would tend to benefit from reduced human activity, but some opportunities for fish and wildlife enhancement, and ecosystem restoration would be foregone. Grazing of livestock would continue where grazing was established at the time the wilderness is designated. Valid existing rights would be recognized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Maintenance of existing range developments would be permitted. Construction of new range developments would not be allowed to detract from the wilderness character of the area. Stipulations, such as no surface occupancy and reclamation efforts designed at protecting the wilderness values to the extent possible, may be authorized by Congress on existing rights and leases. The area may be Congressionally designated as administratively unavailable.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be increased while at the same time reducing opportunities for motorized recreation. If the area is withdrawn from leasing, oil and gas development opportunities would be foregone.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 3, 5

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Overall, wildlife would tend to benefit from reduced human activity. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities would be limited or forgone. Livestock grazing would continue as present. Valid existing rights would be recognized. Where mineral development occurs, the semi-primitive, nonmotorized character of the area would be lost for the duration of the activity.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area. Oil and gas development on existing leases would require the area to be reclaimed to as near as possible its original condition at the close of the lease.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Because oil and gas development of existing leases could occur; restricting other users could cause conflict. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas developments would continue as long as production occurs in the area.

Designation: Non-wilderness

Prescription: MA 2.2 Research Natural Areas

Alternatives: 3

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and semi-primitive end of the spectrum such as walking and hiking. Uses that maintain or improve the ecological characteristics for which the RNA was designated would be allowed. Livestock grazing would continue as present. The area would be made unavailable for leasing until establishment of the RNA, at which time it would be withdrawn from mineral entry.

Mitigation Measures: Motorized travel is limited to administrative, law enforcement, emergency, and scientific purposes. Existing roads would be closed or obliterated unless necessary for administrative, scientific or valid private access. Recreational use would be restricted if is hinders achievement of the desired condition for the RNA. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be increased while at the same time reducing opportunities for motorized recreation. Those accustomed to accessing the area by motorized means might resent vehicle restrictions. If the area is withdrawn from leasing, oil and gas development opportunities would be foregone.

Designation: Non-wilderness

Prescription: MA 3.4 Scenic River Recommendation

Alternatives: 5

Environmental Consequences: Recreation opportunities would be those associated with the primitive and semi-primitive end of the spectrum such as walking, hiking, horseback riding, and canoeing. Motorized water-bound-craft would be allowed. Recreational developments necessary for river access may be present. Livestock grazing would continue. Existing oil and gas leases and rights would be recognized.

Mitigation Measures: Motorized travel routes may be designated with restrictions. Livestock grazing would be managed to maintain the values for which the river is designated. For segments recommended for wild designation, oil and gas leases would require no surface occupancy. “Scenic” or “recreational” segments would be stipulated to maintain the scenic values of the area.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas revenues may be reduced if development opportunities are foregone.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternatives: 2

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Scairt Woman: An Overview of the Affected Environment

The 6,100-acre Scairt Woman area (5,460 acres on the Medora Ranger District and 640 acres on the McKenzie Ranger District) is located about 40 miles northwest of Dickinson, North Dakota, and about 16 miles south of Theodore Roosevelt National Park, North Unit. More specifically, the Scairt Woman area is located, either partly or fully, in: T. 144 N., R. 100 W., Sections 2-5, 8-10, 14-15 and 22-23, and T. 145 N., R. 99 W., Section 31. It lies within the Little Missouri Badlands, a scenic combination of rugged terrain and open space. Access from Belfield, North Dakota, is north on U.S. Highway 85 for about 25 miles, then west on Forest Development Road 713 for about five miles.

The Scairt Woman area is located within the Little Missouri Badlands, a biogeographical sub-unit of the Great Plains Region. Robert G. Bailey further identifies the area as a part of the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division (71). Topography of the area varies from gently rolling grasslands to rugged badlands with deeply incised drainages and numerous clay buttes. Elevation ranges from about 2,600 feet to 2,700 feet above sea level.

The terrain offers a variety of plant growth. Many of the steep drainages on north-facing slopes are occupied by a dense growth of Rocky Mountain juniper. Green ash and American elm occupy the wooded draws. Dominant grasses include western wheatgrass, green needlegrass, and blue grama with some little bluestem in the sandy areas and threadleaf sedge on the

southern exposures. Understory shrub species in draws include buffaloberry, skunkbush sumac, chokecherry, snowberry, woods rose, and many others. A scattered infestation of leafy spurge, a noxious weed, occurs in the area.

Representative wildlife includes numerous raptors, numerous predators, like bobcats and coyotes, mule and white-tailed deer, pronghorn antelope; numerous reptiles, like the bull snake and rattlesnake; and neotropical grassland birds.

Typical uses of the area include recreation and livestock grazing.

Scairt Woman: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are high when the visitor moves into more rugged drainages. On high-elevation areas, the opportunities diminish. There, visitors are isolated, but may see signs of human activity outside the area's boundaries.

Natural Appearance and Integrity: Overall, this roadless area retains a natural appearance, representative of rolling grasslands and rough badlands terrain. Most of the ecological processes, including flash flooding, but with the exception of frequent natural wildfire, remain intact. Closer examination reveals signs of livestock activities. Cattle may be frequently encountered during the warmer grazing season. Livestock developments, including developed springs, fences, water wells, primitive trails, stock tanks and dugouts, detract from the natural setting, although most range developments have been constructed to blend with the natural surroundings as much as possible. In addition, about half a mile of buried pipeline and seven miles of utility line exist in the area.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation Opportunities: Current recreation includes big game and upland bird hunting, nature study, photography, dispersed camping and other associated activities.

Special Features

Unique Characteristics and Scenic Features: Fossils found in Fort Union (also known as Ludlow) Formation deposits represent the Paleocene (65 to 45 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Manageability

Size and Shape: The 6,100-acre Scairt Woman area is more or less rectangular in shape. This area straddles the Medora and McKenzie Ranger Districts. About 5,460 acres lie on the Medora District and about 640 acres lie on the McKenzie District. It contains no inholdings.

Potential to Manage Boundaries: Significant signing and posting would be required. Some illegal motorized trespass may be expected, especially during the fall hunting season.

Scairt Woman: Availability Analyses

Resource Values and Potentials

Oil and Gas: Oil and gas potential for the area is high. Part of the area is currently leased but has not yet been developed. The remaining portion is available for leasing. A permit application for seismic exploration is currently being analyzed.

Coal: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Livestock Grazing: Five permittees operate in the area. About 2,810 animal unit months of livestock grazing are produced annually. Eight allotments are either fully or partially located in the area.

Locatable Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Common Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Timber: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation: Motorized recreation would be prohibited under a Wilderness designation. Current nonmotorized recreation activities, such as dispersed camping, hiking, horseback riding, and nature study, would be allowed. Wilderness designation would preclude off-highway motorized recreation, such as ATV and snowmobile use. Walk-in hunting opportunities would increase. Backcountry experiences would be enhanced with the exclusion of motorized activities. Opportunities for physically challenged and elderly access may be reduced or eliminated in the area.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor site sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Little Missouri National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered that fall under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: No oil and gas leases exist on the portion within the McKenzie Ranger District. Land origination within the Scairt Woman area is about 6,020 acres acquired and 80 acres (on the Medora Ranger District) from the public domain. About 1,280 acres of private, subsurface minerals ownership beneath federal lands on the Medora Ranger District exist in the area. These acres are subject to minerals leasing. Leases may be exercised at any point in the life of the lease. Currently, leases are generally for a 10-year period. Once production on a lease is established, the lease is valid throughout the life of production. The life of production from an oil well on the district is between five and twenty-five years.

Existing Contracts and Agreements: Both the Medora Grazing Association and the McKenzie County Grazing Association hold 10-year grazing agreements in the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Effects on Adjacent Lands: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Scairt Woman: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest Wilderness areas are in Theodore Roosevelt National Park. The 19,410-acre Theodore Roosevelt Wilderness, North Unit, is about 15 miles to the north, while the 10,510-acre Theodore Roosevelt Wilderness, South Unit, is about 21 miles to the southwest. Both Wilderness areas represent mixed-grass prairies in a badlands setting. The Scairt Woman Wilderness would also represent a mixed-grass prairie in a rugged badlands setting.

Representation of Landforms and Ecosystems: This area represents a mixed-grass prairie with the following ecosystem types present: hardwood draws, upland grasslands, rolling grasslands and upland breaks. The landscape includes badlands and rolling prairies.

Biota: No species are dependent upon a Wilderness designation to remain viable in this area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: The area is found in a sparsely populated region of the country. Dickinson, Williston, and Bismarck / Mandan, North Dakota, with an estimated population of less than 125,000, and Glendive and Sydney, Montana, with a combined population of about 25,000, are the nearest cities of any size, and none of them are closer than 40 miles from the area.

A considerable number of people and organizations have requested that the Forest Service designate some grassland Wilderness somewhere within the 191-million-acre National Forest System. Currently, Congress has not designated Wilderness area on any of the 20 national grasslands within that System.

Two Wilderness areas have been designated in the Little Missouri Badlands: the 10,510-acre Theodore Roosevelt Wilderness, South Unit, and the 19,410-acre Theodore Roosevelt Wilderness, North Unit, both of which are located in the Theodore Roosevelt National Park. These two Wilderness areas offer nearby designated Wilderness which, in most ways, represent most of the key characteristics found in the Scairt Woman area, including appearance and vegetative cover types. No other designated Wilderness areas, however, exist in the Little Missouri Badlands, a recognized biogeographical sub-unit of the Great Plains.

Scairt Woman: Environmental Consequences

Management Prescription Allocations by Alternative

Medora Ranger District			McKenzie Ranger District		
Alternative 2:	MA 6.1	5,460 acres	Alternative 2:	MA 6.1	640 acres
Alternative 3:	MA 3.65	3,500 acres	Alternative 3:	MA 3.65	640 acres
	MA 6.1	1,960 acres			
Alternative 4:	MA 1.31	5,460 acres	Alternative 4:	MA 1.31	640 acres
Alternative 5:	MA 6.1	5,460 acres	Alternative 5:	MA 6.1	640 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended Wilderness

Alternatives: Wilderness designation is not considered in any alternative because of the area's existing level of mineral development.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 4, 5

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Overall wildlife would tend to benefit from reduced human activity. Opportunities for discovery of cultural, historical and paleontological resources would exist but interpretive opportunities would be limited or forgone. Livestock grazing would continue as present. Valid existing rights would be recognized. Because the area is leased for oil and gas and contains a small area of private minerals, oil and gas developments could occur. Where mineral development occurs, the semi-primitive, nonmotorized character of the area would be lost for the duration of the activity.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area. Oil and gas development on existing leases would require the area to be reclaimed to as near as possible its original condition at the close of the lease.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Because oil and gas development of existing leases could occur; restricting other users could cause conflict. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas developments would continue as long as production occurs in the area.

Designation: Non-wilderness

Prescription: MA 3.65 Rangelands with Diverse Natural-appearing Landscapes

Alternatives: 3

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 3.65 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character would be lost permanently making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternatives: 2,3

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Strom Hanson: An Overview of the Affected Environment

The 18,810-acre Strom Hanson area is located about 30 miles southwest of Beach, North Dakota, and about 40 miles south of the south unit of Theodore Roosevelt National Park. In addition, Strom Hanson lies about 15 miles northeast of Marmarth, North Dakota. More specifically, this area is located, either partly or fully, in: T. 134 N., R. 105 W., Sections 1-2 and 11-12, and T. 134 N., R. 104 W., Sections 5-7 and 18, and T. 135 N. R. 105 W., Sections 1-15, 17-28 and 34-35, and T. 136 N., R. 105 W., Section 31, and T. 135 N., R. 104 W., Sections 18 and 29-31. Strom Hanson lies within the Little Missouri Badlands, a scenic combination of rugged terrain and open space. Access from Beach, North Dakota, is south on North Dakota State Highway 16 for about 27 miles, then east on Forest Development Road 867 for about five miles.

The Strom Hanson area is located within the Little Missouri Badlands, a biogeographical sub-unit of the Great Plains Region. Robert G. Bailey further identifies the area as a part of the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division (71). Topography varies from gentle rolling grasslands to extremely rugged badlands terrain with deeply incised stream channels and numerous clay buttes. Extensive areas of upland grasslands are interspersed between upland breaks. The Little Missouri River curls through the area, providing dense stands of large cottonwood forests. Elevation varies from about 2,400 feet along the Little Missouri River to 2,713 feet above sea level in the southeastern portion of the area.

The rough, broken terrain within the area has varied plant growth. Many of the steep drainages on north-facing slopes are occupied by a dense growth of Rocky Mountain juniper. Green ash and American elm occupy the wooded draws. Deer Creek and Boyce Creek support healthy stands of boxelder and cottonwood, as does the Little Missouri River. Dominant grasses include western wheatgrass, green needlegrass, and blue grama, with some little bluestem in the sandy areas and threadleaf sedge on the southern exposures. Understory shrub species in draws include buffaloberry, skunkbush sumac, chokecherry, snowberry, woods rose, and many others. An area of limber pine can be found about two miles to the south and west of the Strom Hanson area. A light and scattered infestation of leafy spurge, a noxious weed, occurs in the area.

The alluvial floodplains support a riparian community consisting of cottonwoods and associated species. The terraces immediately above the floodplain tend to support silver sage and extensive western wheatgrass stands.

The Strom Hanson area supports viable populations of mule deer, white-tailed deer, pronghorn antelope, turkeys, and sharp-tailed grouse. Some cliffs drop to the Little Missouri River providing nest sites for golden eagles as well as aerie sites for prairie falcons. Prairie dogs exist in the area. Although the wildlife habitats and species represented with the Strom Hanson area are not unique to the Little Missouri National Grassland, they are considered important to North Dakota.

Several two-track roads have been formed in the area. Ranchers use livestock water wells within the Strom Hanson area.

Typical recreation includes hiking, hunting canoeing, inner-tubing, fishing, horseback riding, and camping. Other uses include livestock grazing.

Strom Hanson: Capability Analyses

Environment

Opportunity for Solitude and Serenity: This area is remote. It remains miles away from any frequently used travelways. The area does offer high opportunities for solitude and serenity, although the overall terrain of Strom Hanson is not particularly rugged.

Natural Appearance and Integrity: Overall, this roadless area retains a natural appearance, representative of rolling grasslands and rough badlands terrain. Most of the ecological processes, including flash flooding, but with the exception of frequent natural wildfire, remain intact. Closer examination reveals signs of livestock activities. Cattle may be frequently encountered during the warmer grazing season. Livestock developments, including developed springs, fences, water wells, primitive trails, stock tanks and dugouts, detract from the natural setting, although most range developments have been constructed to blend with the natural surroundings as much as possible. About two miles of range-water pipeline and about two and a half miles of utility line exist in the area.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation Opportunities: Current recreation is mostly determined by its rather remote and rugged location. Big game and upland bird hunting occurs, as does dispersed camping, hiking, photography, nature study, and other associated activities. Some petrified wood is collected for personal use from the area. Horseback riding, canoeing on the nearby Little Missouri River and driving for pleasure also occur.

Special Features

Unique Characteristics and Scenic Features: Fossils found in Fort Union (also known as Ludlow) Formation deposits represent the Paleocene (65 to 45 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Manageability

Size and Shape: The 18,810-acre Strom Hanson area is irregular in shape. It is about eight miles wide east to west and about 10 miles long north to south. It contains nine inholdings, one of which is a section of state school land. About 2,570 acres of inholdings exist in the area. Most of the inholding acreage exists north and west of the Little Missouri River.

Potential to Manage Boundaries: Due to the high number of inholdings in the area, boundary management would be complicated. In addition, the highly irregular shape of the area would make signing and posting of the boundary quite difficult.

Strom Hanson: Availability Analyses

Resource Values and Potentials

Oil and Gas: Oil and gas potential is moderate. The area is available for lease under no surface occupancy stipulations. There are no current leases or development in the area.

Coal: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Livestock Grazing: Six permittees operate on six allotments. The area produces about 6,704 animal unit months of livestock grazing annually.

Locatable Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Common Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Timber: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation: Motorized recreation would be prohibited under a Wilderness designation. Current nonmotorized recreation activities, such as dispersed camping, hiking, horseback riding, and nature study, would be allowed. Wilderness designation would preclude off-highway motorized recreation, such as ATV and snowmobile use. Walk-in hunting opportunities would increase. Backcountry experiences would be enhanced with the exclusion of motorized activities. Opportunities for physically challenged and elderly access may be reduced or eliminated in the area.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Little Missouri National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: Land origination within the Strom-Hanson area is about 17,750 acres acquired and 1,060 acres from the public domain. About 160 acres of private, subsurface minerals ownership exists in the area under federal surface ownership. Owners of these private subsurface minerals have the right to explore and develop these minerals and these private subsurface ownership areas are subject to minerals leasing. Leases may be exercised at any point in the life of the lease. Currently, leases are generally for a 10-year period. Once production on a lease is established, the lease is valid throughout the life of production. The life of production from an oil well on the district is between five and twenty-five years. Leasing in the Strom Hanson area will be allowed only under no-surface occupancy stipulations.

Existing Contracts and Agreements: The Little Missouri Grazing Association holds the 10-year grazing agreement in the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Effects on Adjacent Lands: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Strom Hanson: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest Wilderness area is the 10,510-acre Theodore Roosevelt Wilderness, South Unit, in the Theodore Roosevelt National Park. The Theodore Roosevelt Wilderness, South Unit is about 36 miles to the northeast. The Theodore Roosevelt Wilderness, South Unit, represents a mixed-grass prairie in a badlands setting. The Strom Hanson Wilderness would also represent a mixed-grass prairie in a badlands setting.

Representation of Landforms and Ecosystems: This area represents a mixed-grass prairie with the following ecosystem types present: river bottoms, hardwood draws, upland grasslands, rolling grasslands, terraces, upland breaks and river breaks. The landscape includes badlands and rolling prairies.

Biota: No species are dependent upon a Wilderness designation to remain viable in this area. Most key species would benefit, however, from a designation.

Public Interests and Concerns: The area is found in a sparsely populated region of the country. Dickinson, Williston, and Bismarck / Mandan, North Dakota, with an estimated population of less than 125,000, and Glendive and Sydney, Montana, with a combined population of about 25,000, are the nearest cities of any size, and none of them is closer than 50 miles from the area.

A considerable number of people and organizations have requested that the Forest Service designate some grassland Wilderness somewhere within the 191-million-acre National Forest System. Currently, Congress has not designated Wilderness area on any of the 20 national grasslands within that System.

Two Wilderness areas have been designated in the Little Missouri Badlands: the 10,510-acre Theodore Roosevelt Wilderness, South Unit, and the 19,410-acre Theodore Roosevelt Wilderness, North Unit, both of which are located in the Theodore Roosevelt National Park. These two Wilderness areas offer nearby designated Wilderness which, in most ways, represent many of the characteristics found in the Strom Hanson area. No other designated Wilderness areas, however, exist in the Little Missouri Badlands, a recognized biogeographical sub-unit of the Great Plains.

Strom Hanson: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 2.1	250 acres
	MA 6.1	18,560 acres
Alternative 3:	MA 2.1	250 acres
	MA 3.65	12,910 acres
	MA 4.22	1,980 acres
	MA 6.1	3,670 acres

Alternative 4:	MA 2.1	70 acres
	MA 3.4	1,010 acres
	MA 3.65	12,940 acres
	MA 4.4	1,150 acres
	MA 6.1	3,640 acres
Alternative 5:	MA 2.1	70 acres
	MA 3.4	1,010 acres
	MA 4.4	1,040 acres
	MA 6.1	16,690 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended Wilderness

Alternatives: Wilderness designation is not considered in any alternative because of the area's existing level of mineral development.

Designation: Non-wilderness

Prescription: MA 2.1 Special Interest Areas

Alternatives: 2, 3, 4, and 5

Environmental Consequences: Recreation opportunities that maintain and enhance the characteristics for which the SIA was designated will be available. Livestock grazing would continue as present. Valid existing rights and leases would be recognized

Mitigation Measures: OHV trail construction will be prohibited. Oil and gas leasing would be no surface occupancy.

Economic and Social Effects: Recreational and interpretive opportunities would be emphasized. The area would continue to provide the existing mix of economic benefits.

Designation: Non-wilderness

Prescription: MA 3.4 Scenic River Recommendation

Alternatives: 4 and 5

Environmental Consequences: Recreation opportunities would be those associated with the primitive and semi-primitive end of the spectrum such as walking, hiking, horseback riding, and canoeing. Motorized water-bound-craft would be allowed. Recreational developments necessary for river access may be present. Livestock grazing would continue. Existing oil and gas leases and rights would be recognized.

Mitigation Measures: Motorized travel routes may be designated with restrictions. Livestock grazing would be managed to maintain the values for which the river is designated. For segments recommended for wild designation, oil and gas leases would require no surface occupancy. "Scenic" or "recreational" segments would be stipulated to maintain the scenic values of the area.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas revenues may be reduced if development opportunities are foregone.

Designation: Non-wilderness

Prescription: MA 3.65 Rangelands with Diverse Natural-appearing Landscapes

Alternatives: 3

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: **Although**, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 3.65 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character would be lost permanently making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 4.22 River and Travel Corridors

Alternatives: 3

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A variety of recreation opportunities would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted.

Mitigation Measures: Constructed public launch sites will be visually subordinate to the river and river corridor. OHV trail construction would be prohibited. Timing, seasonal, or location stipulations may be appropriate related to oil and gas development to maintain the scenic values of the area. Leasing within the corridor would be NSO.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings would be moderate. Economic benefits from oil and gas revenues may be reduced if development opportunities are foregone due to restrictions and stipulations.

Designation: Non-wilderness

Prescription: MA 4.4 Recreation Rivers Recommendation

Alternatives: 4 and 5

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A variety of recreational opportunities would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted.

Mitigation Measures: Timing, seasonal, or location stipulations may be appropriate related to oil and gas development to maintain the scenic values of the area. Leasing within the corridor would be no surface occupancy.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. Economic benefits from oil and gas revenues may be reduced if development opportunities are foregone.

Designation: Non-wilderness

Prescription: MA 6.1 Rangelands with Broad Resource Emphasis

Alternatives: 2, 3, 4, and 5

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Tracy Mountain: An Overview of the Affected Environment

The 9,730-acre Tracy Mountain area is located about six miles south of Medora, North Dakota, and about six miles south of Theodore Roosevelt National Park, South Unit. More specifically, the Tracy Mountain area is located, either partly or fully, in: T. 138 N., R. 101 W., Sections 2-7, 9, 11 and 18, and T. 139 N., R. 101 W., Sections 27-34, and T. 139 N., R. 102 W., Sections 25-26, and T. 138 N., R. 102 W., Sections 1-2 and 11-13. It lies within the Little Missouri Badlands, a scenic combination of rugged terrain and open space. Access from Medora is south on Forest Highway 3 for six miles.

The Tracy Mountain area is located within the Little Missouri Badlands, a biogeographical sub-unit of the Great Plains Region. Robert G. Bailey further identifies the area as a part of the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division (71). Topography includes moderately rugged badlands with some incised drainages. The area is bordered on the north by Sully Creek. The area drains to the west into the Little Missouri River. The most prominent landmark is Tracy Mountain in the southeastern portion of the area. Elevation ranges from about 2,550 to 2,900 feet above sea level.

The semi-rugged nature of the terrain offers a variety of vegetation, including Rocky Mountain juniper, green ash, cottonwood, and silver sage in the bottomlands. Dominant grasses include blue grama, western wheatgrass, green needlegrass, little bluestem, and needle-and-thread. Understory shrub species include wild rose, green sage, wolfberry, buffalo berry, dwarf juniper, and rabbit brush. A light infestation of leafy spurge, a noxious weed, occurs in the area.

Western portions of this area provide a lambing area for bighorn sheep. Winter range for pronghorn antelope exists, as well. In addition, other species include white-tailed and mule deer, coyotes, badgers, a number of reptiles, neotropical grassland birds, upland birds, and a number of raptors, including kestrels, owls, golden eagles, and hawks.

Recreation and livestock grazing are typical uses in the area.

Tracy Mountain: Capability Analyses

Environment

Opportunity for Solitude and Serenity: The western half of the area provides fairly high opportunities for solitude and serenity because of the broken terrain. The eastern half doesn't have as much relief as the western half. In addition, developments on adjacent lands are visible from the eastern half. Opportunities for solitude and serenity in the eastern half are moderate.

Natural Appearance and Integrity: Overall, this roadless area retains a natural appearance, representative of rolling grasslands and rough badlands terrain. Most of the ecological processes, including flash flooding, but with the exception of frequent natural wildfire, remain intact. Closer examination reveals signs of livestock activities. Cattle may be frequently encountered during the warmer grazing season. Livestock developments, including developed springs, fences, water wells, primitive trails, stock tanks and dugouts, detract from the natural setting, although most range developments have been constructed to blend with the natural surroundings as much as possible. In addition, about two and one-half miles of buried range-water pipeline exist in the area.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation Opportunities: Current recreation includes hiking, dispersed camping, photography, horseback riding, nature study and other associated activities. "Initial Rock," where troops under General George Custer etched their initials into rock on his 1876 campaign to the Little Bighorn, is found in this area. Good sharp-tailed grouse and deer hunting exist in the area. Birdwatching and wildflower viewing are also common.

Special Features

Unique Characteristics and Scenic Features: Western portions of this area provide lambing for bighorn sheep. Antelope winter range also exists. Black cottonwood is also found in the area. Fossils found in Fort Union (also known as Ludlow) Formation deposits represent the Paleocene (65 to 45 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Manageability

Size and Shape: The 9,730-acre Tracy Mountain area is irregular in shape, appearing something like a half circle. It is about six-mile wide east to west and five miles long north to south. It contains no inholdings.

Potential to Manage Boundaries: Significant signing and posting would be necessary under a Wilderness designation. The potential for illegal motorized trespass under a Wilderness designation is high, due to the number of nearby roads. Overall, the potential to manage this area under a Wilderness designation is fairly high.

Tracy Mountain: Availability Analyses

Resource Values and Potentials

Oil and Gas: Oil and gas potential in the area is high. The eastern half of the area is providing opportunities for oil and gas development. Since the DEIS was released, approximately 1 mile of road has been developed. Staking for drilling is occurring on several sites. Two applications for permit to drill have been approved and two more are being processed.

Coal: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Livestock Grazing: Seven permittees operate on six allotments in the area. The area produces about 2,712 animal unit months of livestock grazing annually.

Locatable Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Common Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Timber: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation: Motorized recreation would be prohibited under a Wilderness designation. Current nonmotorized recreation activities, such as dispersed camping, hiking, horseback riding and nature study, would be allowed. Wilderness designation would preclude off-highway motorized recreation, such as ATV and snowmobile use. Walk-in hunting opportunities would increase. Backcountry experiences would be enhanced with the exclusion of motorized activities. Opportunities for physically challenged and elderly access into the area may be reduced.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Bighorn Sheep: Wilderness designation would have beneficial effects on bighorn sheep due to the lack of human disturbances and reductions in motorized activities a designation would bring, especially during the birthing season.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Little Missouri National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered that fall under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: Land origination within the Tracy Mountain area is about 8,975 acres acquired and 780 acres from the public domain. About 1,549 acres of private, subsurface minerals ownership beneath federal lands exist in the area. These acres are subject to minerals leasing. Leases may be exercised at any point in the life of the lease. Currently, leases are generally for a 10-year period. Once production on a lease is established, the lease is valid throughout the life of production. The life of production from an oil well on the district is between five and twenty-five years. Some on-the-ground staking of possible oil well locations has recently occurred in the southeastern corner of the area.

Existing Contracts and Agreements: The Medora Grazing Association holds a 10-year grazing agreement for the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Effects on Adjacent Lands: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Tracy Mountain: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest Wilderness area is the 10,510-acre Theodore Roosevelt Wilderness, South Unit, in the Theodore Roosevelt National Park. The Theodore Roosevelt Wilderness, South Unit is about 11 miles to the north. The Theodore Roosevelt Wilderness, South Unit, represents a mixed-grass prairie in a badlands setting. The Tracy Mountain Wilderness would also represent a mixed-grass prairie in a badlands setting.

Representation of Landforms and Ecosystems: This area represents a mixed-grass prairie with the following ecosystem types present: hardwood draws, upland grasslands, rolling grasslands, upland breaks, and hilly scoria. The landscape includes badlands and rolling prairies.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: The area is found in a sparsely populated region of the country. Dickinson, Williston, and Bismarck / Mandan, North Dakota, with an estimated population of less than 125,000, and Glendive and Sydney, Montana, with a combined population of about 25,000, are the nearest cities of any size, and none of them are closer than 25 miles from the area.

A considerable number of people and organizations have requested that the Forest Service designate some grassland Wilderness somewhere within the 191-million-acre National Forest System. Currently, Congress has not designated Wilderness area on any of the 20 national grasslands within that System.

Two Wilderness areas have been designated in the Little Missouri Badlands: the 10,510-acre Theodore Roosevelt Wilderness, South Unit, and the 19,410-acre Theodore Roosevelt Wilderness, North Unit, both of which are located in the Theodore Roosevelt National Park. These two Wilderness areas offer nearby designated Wilderness which, in most ways, represent most of the key characteristics found in the Tracy Mountain area, including appearance and vegetative cover types. No other designated Wilderness areas, however, exist in the Little Missouri Badlands, a recognized biogeographical sub-unit of the Great Plains.

Tracy Mountain: Environmental Consequences

Management Prescription Allocations by Alternative

Alternative 2:	MA 2.1	290 acres
	MA 3.51	6,340 acres
	MA 6.1	3,100 acres
Alternative 3:	MA 1.31	8,840 acres
	MA 2.1	290 acres
	MA 3.65	600 acres
Alternative 4:	MA 1.31	9,730 acres

Alternative 5:	MA 1.31	6,630 acres
	MA 6.1	3,100 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended Wilderness

Alternatives: Wilderness designation is not considered in any alternative because of the area's existing level of mineral development.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 3, 4, and 5

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Overall, wildlife would tend to benefit from reduced human activity. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities would be limited or forgone. Livestock grazing would continue as present. Valid existing rights would be recognized. Because the area is leased for oil and gas and contains a small area of private minerals, additional oil and gas developments could occur. Where mineral development occurs, the semi-primitive, nonmotorized character of the area would be lost for the duration of the activity.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area. Oil and gas development on existing leases would require the area to be reclaimed to as near as possible its original condition at the close of the lease.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Because oil and gas development of existing leases could occur; restricting other users could cause conflict. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas developments would continue as long as production occurs in the area.

Designation: Non-wilderness

Prescription: MA 2.1 Special Interest Area

Alternatives: 2 and 3

Environmental Consequences: Recreation opportunities that maintain and enhance the characteristics for which the SIA was designated will be available. Livestock grazing would continue as present. Valid existing rights and leases would be recognized

Mitigation Measures: OHV trail construction will be prohibited. Oil and gas leasing would be no surface occupancy.

Economic and Social Effects: Recreational and interpretive opportunities would be emphasized. The area would continue to provide the existing mix of economic benefits.

Designation: Non-wilderness

Prescription: MA 3.51 Bighorn Sheep

Alternatives: 2

Environmental Consequences: Recreational activities and motorized travel would be discouraged during breeding and lambing periods. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Construction of new travel routes would be prohibited except to honor valid and existing rights and leases. Snowmobile use would be prohibited. Existing and adjoining allotments in this area would not permit conversion to domestic sheep. Oil and gas leasing would be no surface occupancy.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas revenues may be reduced if development opportunities are foregone.

Designation: Non-wilderness

Prescription: MA 3.65 Rangeland with Diverse Natural-appearing Landscapes

Alternatives: 3

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 3.65 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character would be lost permanently making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternatives: 2 and 5

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Twin Buttes: An Overview of the Affected Environment

The 13,380-acre Twin Buttes area is located about 45 miles west of Dickinson, North Dakota, and about five miles west of the south unit of Theodore Roosevelt National Park. In addition, Twin Buttes is about eight miles northeast of Sentinel Butte, North Dakota. More specifically, the Twin Buttes area is located, either partly or fully, in: T. 141 N., R. 102 W., Sections 4-5 and 7-9, and T. 142 N., R. 102 W., Sections 29-33, and T. 141 N., R. 103 W., Sections 1-4, 9-11, 13-15, 21-24, 26-27 and 34. It lies within the Little Missouri Badlands, a scenic combination of rugged terrain and open space. Access from Medora is west about two miles on Interstate 94, then north for about eight miles on Forest Development Road 730.

The Twin Buttes area is located within the Little Missouri Badlands, a biogeographical sub-unit of the Great Plains Region. Robert G. Bailey further identifies the area as a part of the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division (71). Topography consists of rolling grasslands to moderately rugged badlands terrain with deeply incised drainages and numerous clay buttes. Areas of rolling grasslands occur along the western third of the area. In addition, intermittent sandstone caps exist, as do petrified logs. Elevation varies from 2,400 feet to 2,900 feet above sea level.

The rough, broken terrain within the area has varied plant growth. On some of the non-grassy areas, predominate vegetation consists of big sagebrush, rabbit brush, four-wing salt brush, yucca and cactus. Green ash, Rocky Mountain juniper, willow, and cottonwood occupy the wooded draws and north-facing slopes. Dominant grasses include western wheatgrass, green needlegrass, and blue grama with little bluestem in the sandy areas and threadleaf sedge on the southern exposures. Understory shrub species in the draws include buffaloberry, skunkbrush sumac, chokecherry, wild plum, snowberry, woods rose, and many others. The area shows a heavy infestation of leafy spurge.

The alluvial floodplains along the lower reaches of Wannagan Creek support a riparian community consisting of cottonwoods and associated species. The terraces immediately above the floodplain tend to support silver sage and extensive western wheatgrass stands.

The Twin Buttes area supports viable populations of mule deer, pronghorn antelope, and sharp-tailed grouse. Also present are rattlesnakes, horned toads, turkey, fox, coyote, jack rabbits, and prairie dogs. Although the wildlife habitats and species represented within the Twin Buttes area are not unique within the Little Missouri National Grassland, they are considered important to North Dakota.

Typical recreation includes hiking, hunting, horseback riding, and camping. Livestock grazing occurs in the area.

Twin Buttes: Capability Analyses

Environment

Opportunity for Solitude and Serenity: This area is remote and is generally removed from frequently used travelways. In addition, the open nature of the area's badlands and rolling hills offer opportunities to experience high levels of solitude and serenity.

Natural Appearance and Integrity: Overall, this roadless area retains a natural appearance, representative of rolling grasslands and rough badlands terrain. Most of the ecological processes, including flash flooding, but with the exception of frequent natural wildfire, remain intact. Closer examination reveals signs of livestock activities. Cattle may be frequently encountered during the warmer grazing season. Livestock developments, including developed springs, fences, water wells, primitive trails, stock tanks and dugouts, detract from the natural setting, although most range developments have been constructed to blend with the natural surroundings as much as possible. In addition, about two miles of utility line and two and one-half miles of buried range-water pipeline exist in the area.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation Opportunities: Current recreation includes elk, bighorn sheep and deer hunting, upland bird hunting, hiking, mountain biking, horseback riding, photography, nature study and other associated activities.

Special Features

Unique Characteristics and Scenic Features: Fossils found in Fort Union (also known as Ludlow) Formation deposits represent the Paleocene (65 to 45 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Manageability

Size and Shape: The 13,380-acre Twin Buttes area is rather irregular in shape. It is about seven miles wide east to west and seven-mile long north to south. It contains four inholdings, three of which are state lands. About 2,240 acres of inholdings are found in the area.

Potential to Manage Boundaries: The generally open nature of the topography, with few natural barriers, would require significant signing and posting under a Wilderness designation. The potential for illegal motorized trespass under a Wilderness designation exists, especially during the fall hunting season.

Twin Buttes: Availability Analyses

Resource Values and Potentials

Oil and Gas: Oil and gas potential is high. Portions of this area are available for lease and other portions are not administratively available for lease. **Coal**: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Livestock Grazing: Seven permittees operate on six allotments in the area. The area produces about 3,068 animal unit months of livestock grazing annually.

Locatable Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Common Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Timber: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation: Motorized recreation would be prohibited under a Wilderness designation. Current nonmotorized recreation activities, such as dispersed camping, hiking, horseback riding, and nature study, would be allowed. Wilderness designation would preclude off-highway motorized recreation, such as ATV and snowmobile use. Walk-in hunting opportunities would increase. Backcountry experiences would be enhanced with the exclusion of motorized activities. Opportunities for physically challenged and elderly access may be reduced or eliminated in the area.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with

motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor site sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Little Missouri National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered that fall under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: Land origination within the Twin Buttes area is about 12,633 acres acquired and 760 acres from the public domain. About 905 acres of private, subsurface minerals ownership beneath federal lands exist in the area.

Existing Contracts and Agreements: The Medora Grazing Association holds the 10-year grazing agreement in the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Effects on Adjacent Lands: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Twin Buttes: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest Wilderness area is the 10,510-acre Theodore Roosevelt Wilderness, South Unit, in the Theodore Roosevelt National Park. The Theodore Roosevelt Wilderness, South Unit is about two miles to the southeast. The 19,410-acre Theodore Roosevelt Wilderness, North Unit, lies about 31 miles to the north. Both Wilderness areas represent mixed-grass prairies in a badlands setting. The Twin Buttes Wilderness would also represent a mixed-grass prairie in a badlands setting.

Representation of Landforms and Ecosystems: This area represents a mixed-grass prairie with the following ecosystem types present: hardwood draws, upland grasslands, and upland breaks. The landscape includes badlands and rolling prairies.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: The area is found in a sparsely populated region of the country. Dickinson, Williston, and Bismarck / Mandan, North Dakota, with an estimated population of less than 125,000, and Glendive and Sydney, Montana, with a combined population of about 25,000, are the nearest cities of any size, and none of them are closer than 40 miles from the area.

A considerable number of people and organizations have requested that the Forest Service designate some grassland Wilderness somewhere within the 191-million-acre National Forest System. Currently, Congress has not designated Wilderness area on any of the 20 national grasslands within that System.

Two Wilderness areas have been designated in the Little Missouri Badlands: the 10,510-acre Theodore Roosevelt Wilderness, South Unit, and the 19,410-acre Theodore Roosevelt Wilderness, North Unit, both of which are located in the Theodore Roosevelt National Park. These two Wilderness areas offer nearby designated Wilderness which, in most ways, represent most of the key characteristics found in the Twin Buttes area, including appearance and vegetative cover types. No other designated Wilderness areas, however, exist in the Little Missouri Badlands, a recognized biogeographical sub-unit of the Great Plains.

Twin Buttes: Environmental Consequences

Management Prescription Allocations by Alternative

Alternative 2:	MA 3.51	420 acres
	MA 6.1	12,960 acres
Alternative 3:	MA 1.2A	8,020 acres
	MA 1.31	930 acres
	MA 6.1	4,430 acres
Alternative 4:	MA 1.2	8,940 acres
	MA 1.31	4,440 acres
Alternative 5:	MA 1.2	8,940 acres
	MA 3.51	420 acres
	MA 6.1	4,020 acres

Designation: Wilderness

Prescription: MA 1.2 or 1.2A Recommended or Suitable Wilderness

Alternatives: 3, 4, and 5

Environmental Consequences: Travel would be by nonmotorized, nonmechanical. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities may be limited or foregone. Wildlife would tend to benefit from reduced human activity, but some opportunities for fish and wildlife enhancement, and ecosystem restoration would be foregone. Grazing of livestock would continue where grazing was established at the time the wilderness is designated. Valid existing rights and leases would be recognized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Maintenance of existing range developments would be permitted. Construction of new range developments would not be allowed to detract from the wilderness character of the area. Stipulations, such as no surface occupancy, and reclamation efforts designed at protecting the wilderness values to the extent possible may be authorized by Congress on existing rights and leases. The area may be Congressionally designated as administratively unavailable.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be increased while at the same time reducing opportunities for motorized recreation. If the area is withdrawn from leasing, oil and gas development opportunities would be foregone.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 3 and 4

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Overall, wildlife would tend to benefit from reduced human activity. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities would be limited or forgone. Livestock grazing would continue as present. Valid existing rights would be recognized. Because the area is leased for oil and gas and contains a small area of private minerals, oil and gas developments could occur. Where mineral development occurs, the semi-primitive, nonmotorized character of the area would be lost for the duration of the activity.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area. Oil and gas development on existing leases would require the area to be reclaimed to as near as possible its original condition at the close of the lease.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Because oil and gas development of existing leases could occur; restricting other users could cause conflict. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas developments would continue as long as production occurs in the area.

Designation: Non-wilderness

Prescription: MA 3.51 Bighorn Sheep

Alternatives: 2 and 5

Environmental Consequences: Recreational activities and motorized travel would be discouraged during breeding and lambing periods. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Construction of new travel routes would be prohibited except to honor valid and existing rights and leases. Snowmobile use would be prohibited. Existing and adjoining allotments in this area would not permit conversion to domestic sheep. Oil and gas leasing would be no surface occupancy.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas revenues may be reduced if development opportunities are foregone.

Designation: Non-wilderness

Prescription: MA 6.1 Rangelands with Broad Resource Emphasis

Alternatives: 2 and 5

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Wannagan: An Overview of the Affected Environment

The 6,030-acre Wannagan area is located about 40 miles west of Dickinson, North Dakota, and adjoins the northwestern boundary of the south unit of Theodore Roosevelt National Park. More specifically, the Wannagan area is located, either partly or fully, in: T. 141 N., R. 102 W., Sections 9-11, 14-15, 17, 20-23, 27-30, and T. 141 N., R. 103 W., Sections 13 and 23-25. It lies within the Little Missouri Badlands, a scenic combination of rugged terrain and open space. Access from Medora is west for two miles on Interstate 94, then north on Forest Development Road 730 for five miles.

The Wannagan area is located within the Little Missouri Badlands, a biogeographical sub-unit of the Great Plains Region. Robert G. Bailey further identifies the area as a part of the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division (71). Topography of the area varies from gently rolling grasslands to extremely rugged badlands terrain with deeply incised drainages and numerous clay buttes. The badlands of the Wannagan area are rugged, with few trees, except near creek bottoms. Elevation varies from 2,600 feet along portions of the area adjoining the Theodore Roosevelt National Park to 2,200 feet above sea level along the Little Missouri River.

The rough, broken terrain within the area has varied plant growth. On some of the non-grassy areas, predominate vegetation consists of big sagebrush, rabbit brush and four-wing salt brush. Many of the steep drainages on north-facing slopes are occupied by a dense growth of Rocky Mountain juniper. Green ash and American elm occupy the wooded draws. Dominant grasses include western wheatgrass, green needlegrass, and blue grama with some little bluestem in the sandy areas. A heavy infestation of leafy spurge, a noxious weed, occurs in the area.

The alluvial floodplains along the lower reaches of Wannagan Creek support a riparian community consisting of cottonwoods and associated species. The terraces immediately above the floodplain tend to support silver sage and extensive western wheatgrass stands.

Rutting along two-track roads is an existing management concern.

The Wannagan area supports viable populations of mule deer, pronghorn antelope, turkeys, and sharp-tailed grouse. Bighorn sheep may be using the northern portions of the area. Elk, including many of trophy size, also live in the area. Although the wildlife habitats and species represented within the Wannagan area are not unique within the Little Missouri National Grassland, they are considered important to North Dakota.

The Wannagan area adjoins a portion of the Theodore Roosevelt National Park (Petrified Forest Plateau) that is an official Wilderness area (the 10,510-acre Theodore Roosevelt, South Unit, Wilderness) as classified by Congress. Consequently, the essentially roadless character of Wannagan serves as a buffer to the Wilderness area within the national park.

Wannagan: Capability Analyses

Environment

Opportunity for Solitude and Serenity: The topography of the area does not offer a high opportunity for solitude and serenity.

Natural Appearance and Integrity: Overall, this roadless area retains a natural appearance, representative of rolling grasslands and rough badlands terrain. Most of the ecological processes, including flash flooding, but with the exception of frequent natural wildfire, remain intact. Closer examination reveals signs of livestock activities. Cattle may be frequently encountered during the warmer grazing season. Livestock developments, including developed springs, fences, water wells, primitive trails, stock tanks and dugouts, detract from the natural setting, although most range developments have been constructed to blend with the natural surroundings as much as possible. In addition, about one and a half miles of utility line and one mile of buried range-water pipeline exist in the area.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation Opportunities: Current recreation includes elk, bighorn sheep and deer hunting, upland game hunting, hiking, dispersed camping, horseback riding, mountain biking, photography, nature study and other associated activities. The Maah-Daah-Hey Trail winds through about a mile and a half of the area. Some visitors to the Wannagan area probably access it on foot or horseback through the 10,510-acre Theodore Roosevelt Wilderness, South Unit, which lies adjacent to the southeast.

Special Features

Unique Characteristics and Scenic Features: Fossils found in Fort Union (also known as Ludlow) Formation deposits represent the Paleocene (65 to 45 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Manageability

Size and Shape: The 6,030-acre Wannagan area is sort of rectangular in shape. It is about five miles wide east to west and four miles long north to south. It contains no inholdings.

Potential to Manage Boundaries: The potential to manage the northern, western, and eastern boundaries of the area would be low due to the intermingling of adjacent lands of other ownership. A high probability of trespass exists, too, by hunters looking for trophy-sized elk in the area. The southern boundary would be easy to manage due to the adjacent Theodore Roosevelt National Park.

Wannagan: Availability Analyses

Resource Values and Potentials

Oil and Gas: Oil and gas potential is high. The southeastern portion of the area next to Theodore Roosevelt National Park carries no-surface-occupancy stipulations, essentially protecting this portion of the Wannagan area from future oil and gas development. The remaining area is currently leased but not yet developed.

Coal: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Livestock Grazing: Five permittees operate on five allotments in the area. The area produces about 2,343 animal unit months of livestock grazing annually.

Locatable Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Common Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Timber: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Recreation: Motorized recreation would be prohibited under a Wilderness designation. Current nonmotorized recreation activities, such as dispersed camping, hiking, horseback riding, and nature study, would be allowed. Wilderness designation would preclude off-highway motorized recreation, such as ATV and snowmobile use. Walk-in hunting opportunities would increase. Backcountry experiences would be enhanced with the exclusion

of motorized activities. Opportunities for physically challenged and elderly access may be reduced or eliminated in the area.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Bighorn Sheep: Wilderness designation would have beneficial effects on bighorn sheep due to the lack of human disturbances and reductions in motorized activities a designation would bring, especially during the birthing season.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Little Missouri National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered that fall under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: Land origination within the Wannagan area is about 5,410 acres acquired and 620 acres from the public domain. Nearly the whole area is under lease; however, the southeastern portion, comprising about 1,300 acres, carries a no-surface occupancy stipulation for visual purposes. The southeastern area essentially serves as a buffer zone for the existing 10,510-acre Wilderness area in the South Unit of Theodore Roosevelt National Park. Less than one acre of private, subsurface minerals ownership beneath federal lands exist in the area

Existing Contracts and Agreements: The Medora Grazing Association holds a 10-year grazing agreement for the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Effects on Adjacent Lands: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Medora Ranger District.

Wannagan: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest Wilderness area is the 10,510-acre Theodore Roosevelt Wilderness, South Unit, in the Theodore Roosevelt National Park. The Theodore Roosevelt Wilderness, South Unit is directly adjacent to the Wannagan area to the southeast. The 19,410-acre Theodore Roosevelt Wilderness, North Unit, lies about 35 miles to the north. Both Wilderness areas represent mixed-grass prairies in a badlands setting. The Wannagan Wilderness would also represent a mixed-grass prairie in a badlands setting and would essentially increase the overall contiguous acreage of the 10,510-acre Theodore Roosevelt Wilderness, South Unit.

Representation of Landforms and Ecosystems: This area represents a mixed-grass prairie with the following ecosystem types present: hardwood draws, upland grasslands, hilly scoria and upland breaks. The landscape includes badlands and rolling prairies.

Biota: No species are dependent upon a Wilderness designation to remain viable in this area. Most key species would benefit, however, from a designation.

Public Interests and Concerns: The area is found in a sparsely populated region of the country. Dickinson, Williston, and Bismarck/Mandan, North Dakota, with an estimated population of less than 125,000, and Glendive and Sydney, Montana, with a combined population of about 25,000, are the nearest cities of any size, and none of them are closer than 35 miles from the area.

A considerable number of people and organizations have requested that the Forest Service designate some grassland Wilderness somewhere within the 191-million-acre National Forest System. Currently, Congress has not designated Wilderness area on any of the 20 national grasslands within that System.

Two Wilderness areas have been designated in the Little Missouri Badlands: the 10,510-acre Theodore Roosevelt Wilderness, South Unit, and the 19,410-acre Theodore Roosevelt Wilderness, North Unit, both of which are located in the Theodore Roosevelt National Park. These two Wilderness areas offer nearby designated Wilderness which, in most ways, represent most of the key characteristics found in the Wannagan area, including appearance and

vegetative cover types. No other designated Wilderness areas, however, exist in the Little Missouri Badlands, a recognized biogeographical sub-unit of the Great Plains.

Wannagan: Environmental Consequences

Management Prescription Allocations by Alternative

Alternative 2:	MA 3.51	150 acres
	MA 6.1	5,880 acres
Alternative 3:	MA 1.31	4,900 acres
	MA 6.1	1,130 acres
Alternative 4:	MA 1.2	1,600 acres
	MA 1.31	4,430 acres
Alternative 5:	MA 1.2	1,600 acres
	MA 3.51	150 acres
	MA 6.1	4,280 acres

Designation: Wilderness

Prescription: MA 1.2 or 1.2A Recommended or Suitable Wilderness

Alternatives: 4 and 5

Environmental Consequences: Travel would be by nonmotorized, nonmechanical. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities may be limited or foregone. Wildlife would tend to benefit from reduced human activity, but some opportunities for fish and wildlife enhancement, and ecosystem restoration would be foregone. Grazing of livestock would continue where grazing was established at the time the wilderness is designated. Valid existing rights and leases would be recognized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Maintenance of existing range developments would be permitted. Construction of new range developments would not be allowed to detract from the wilderness character of the area. Stipulations, such as no surface occupancy, and reclamation efforts designed at protecting the wilderness values to the extent possible may be authorized by Congress on existing rights and leases. The area may be Congressionally designated as administratively unavailable.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be increased while at the same time reducing opportunities for motorized recreation. If the area is withdrawn from leasing, oil and gas development opportunities would be foregone.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 3 and 4

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Overall, wildlife would tend to benefit from reduced human activity. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities would be limited or forgone. Livestock grazing would continue as present. Valid existing rights would be recognized. Because the area is leased for oil and gas and contains a small area of private minerals, oil and gas developments could occur. Where mineral development occurs, the semi-primitive, nonmotorized character of the area would be lost for the duration of the activity.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area. Oil and gas development on existing leases would require the area to be reclaimed to as near as possible its original condition at the close of the lease.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Because oil and gas development of existing leases could occur; restricting other users could cause conflict. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas developments would continue as long as production occurs in the area.

Designation: Non-wilderness

Prescription: MA 3.51 Bighorn Sheep

Alternatives: 2 and 5

Environmental Consequences: Recreational activities and motorized travel would be discouraged during breeding and lambing periods. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Construction of new travel routes would be prohibited except to honor valid and existing rights and leases. Snowmobile use would be prohibited. Existing and adjoining allotments in this area would not permit conversion to domestic sheep. Oil and gas leasing would be no surface occupancy.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas revenues may be reduced if development opportunities are foregone.

Designation: Non-wilderness

Prescription: MA 6.1 Rangelands with Broad Resource Emphasis

Alternatives: 2, 3 and 5

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Criteria Common to All Roadless Areas on this Administrative Unit

Capability Criteria

Challenge: Challenge centers around survival in a dry and harsh environment. Summer temperatures can exceed 100° Fahrenheit with no drinkable water sources. Winter temperatures can drop to -35° Fahrenheit with wind-chill factors in excess of -80°. Broken terrain and open landscapes are deceptive and may disorient the visitor's ability to mark their directions. Hiking may be much more difficult than anticipated with steep slopes and difficult terrain. Prairie rattlesnakes may be encountered and can be dangerous.

Opportunities for Outdoor Education: A visitor should find features to stimulate curiosity: geology, grassland ecosystems, grassland flora and fauna, bared soil layers, shifting weather patterns and cloud types, incredibly clear night skies offering unimpeded views of the stars. Skills in maneuvering a rugged terrain, using a compass, taking precautions for snake and spider bites, heat stroke (and frostbite or freezing to death in the winter), setting up a primitive campsite, and outdoor cooking may all test and develop a visitor's understanding of the outdoors.

Availability Criteria

Coal: Although significant lignite coal reserves exist on the Little Missouri National Grassland (LMNG), no current production occurs and previous historic development has been minimal. Currently, no coal-leased acres exist on the Little Missouri National Grassland. Several lignite-fueled power plants exist in North Dakota, and 1991 estimates indicate that 29 million tons of lignite were mined in the state. Therefore, because a market exists, the potential for development is low to moderate.

Locatable Minerals: No records exist in geological literature that documents the occurrence or development of any hardrock minerals on or near the LMNG, a region that is sedimentary in origin. Uranium, sometimes considered a locatable mineral, is available for location if it is found on public domain lands. If uranium is found on acquired lands, it is available only by lease. Uranium deposits on the LMNG are generally of low grade. Although the occurrence potential for uranium is moderate to high, the current development potential is low.

Common Minerals: Scoria, a baked and fused clay, is common throughout the LMNG. Although it wears quickly, scoria is the only local source for road surfacing material. Adequate private sources for this aggregate exist. Therefore, a low potential exists for development of scoria resources on the LMNG.

Timber: With the exception of the Ponderosa Pine area, no merchantable timber exists. Rocky Mountain juniper is widespread enough to provide some post and pole timbers; however, the location of the juniper often makes it quite uneconomical to harvest.

Biotic Control Measures and Fire Protection: Chemical, biological and mechanical control methods are used to stem the expansion of undesirable plant species, such as leafy spurge and spotted knapweed. Wildfire suppression would be addressed in Wilderness management plans that would be developed if any of the roadless areas are designated by Congress as Wilderness.

Effects on Adjacent Lands: Any increase in visitation, which may occur under a Wilderness designation, could increase the potential for accidental fire starts. Adjacent land values next to a designated Wilderness may rise or fall depending on local markets. As well, the potential for trespass from a designated Wilderness onto adjacent lands of other ownership might increase. These effects are estimated to be the same for all roadless areas on the Medora Ranger District, although additional effects are presented in this report for the Bullion Butte area (see "Effects on Adjacent Lands" under the Bullion Butte section).

Little Missouri National Grassland

McKenzie Ranger District

Collar/Bennett-Cottonwood: An Overview of the Affected Environment

The 19,700-acre Collar/Bennett-Cottonwood area is located about 45 miles southeast of Williston, North Dakota, about 30 miles southwest of Watford City, South Dakota, and about two and one-half miles northwest of Grassy Butte, North Dakota. More specifically, the Collar/Bennett-Cottonwood area is located, either partly or fully, in: T. 147 N., R 100 W., Sections 22, 27-28 and 30-34, and T. 146 N., R. 100 W., Sections 1-6, 8-14 and 23-26, and T. 146 N., R. 99 W., Sections 6-7, 18-21, 27-30 and 32-33, and T. 145 N., R. 99 W., Section 4 and 5. Access from Watford City is via U.S. Highway 85 south for about 25 miles, then west on Forest Development Road 823 for eight miles.

The Collar/Bennett-Cottonwood area is located within the Little Missouri Badlands, a biogeographical sub-unit of the Great Plains Region. Robert G. Bailey further identifies the area as a part of the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division (71). Topography of the area varies from gentle rolling grasslands to extremely rugged

badlands terrain with deeply incised stream channels and numerous clay buttes. Extensive areas of upland grasslands are interspersed between upland breaks. The area is drained to the northwest via Bennett, Collar, and Cottonwood Creeks. The Bennett, Collar, and Cottonwood Creeks are prominent landscape features. The Little Missouri River forms a portion of the northwestern boundary. Elevation varies from 2,000 feet to 2,628 feet above sea level. The rough, broken terrain within the area has limited plant growth.

On some of the non-grass areas, predominate vegetation consists of big sagebrush, rabbit brush and four-wing salt brush. Many of the steep drainages on north-facing slopes are occupied by a dense growth of Rocky Mountain juniper. Green ash and American elm occupy the wooded draws. Dominant grasses include western wheatgrass, green needlegrass, and blue grama with some little bluestem in the sandy areas and threadleaf sedge on the southern exposures. Understory shrub species in draws include buffaloberry, woods rose, and many others. Leafy spurge, a noxious weed, exists within the Little Missouri River corridor along the area's northwestern boundary.

The alluvial floodplains along Bennett, Collar, and Cottonwood Creeks support a riparian community consisting of cottonwoods and associated species. The terraces immediately above the floodplain tend to support silver sage and extensive western wheatgrass stands.

Various two-track roads exist in the area. A scoria pit can also be found in the area, but has not been used for several years. Oil and gas facilities exist along Bennett Creek.

The Collar/Bennett-Cottonwood area supports populations of bighorn sheep, mule deer, white-tailed deer, turkeys, and sharp-tailed grouse. Active prairie dog towns occur in the flat-bottomed canyon of Bennett Creek. Although the wildlife habitats and species represented are not unique within the Little Missouri National Grassland, they are considered important to North Dakota.

Present recreation use includes hiking, hunting, horseback riding, and camping. The Maah-Daah-Hey Trail winds through the area. The northern portion of Collar/Bennett-Cottonwood is managed for livestock grazing and oil and gas production. The long-term intent for the remaining area is to minimize development of oil and gas in the area and to provide a key bighorn sheep area.

Collar/Bennett-Cottonwood: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Collar/Bennett-Cottonwood offers a relatively high opportunity for solitude and serenity. The northern portion of the area provides a high level of solitude and serenity resulting from its very rugged and dissected topographic character. The canyonland terrain allows the visitor to separate from developments and become isolated from others. Some two-track roads exist; however, developed roads only exist along the perimeter of the area and along Bennett Creek. Agricultural fields may be viewed from some areas. Flat ridgelines in the area provide fewer opportunities to become isolated from others.

Natural Appearance and Integrity: The area is quite natural in appearance. Developments are fairly sparse. Collar / Bennett-Cottonwood is one of the most scenic areas on the McKenzie Ranger District. Scenic panorama views can be had from the ridgetops. A visitor can view canyonland topography across the badlands and well into the North Unit of Theodore Roosevelt National Park. The area is high in plant diversity. A healthy mosaic of vegetation in the uplands, bottomlands, and woody draws is apparent. Most of the natural processes, including flash flooding, are intact; however, fire has been suppressed in the past. Livestock use the area from summer to fall. Livestock developments, including developed springs, fences, water wells, primitive trails, stock tanks and dugouts, detract from the natural setting, although most range developments have been constructed to blend with the natural surroundings as much as possible.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Recreation Opportunities: The area provides hiking, hunting, horseback riding, birdwatching, scenic sight-seeing, dispersed camping, wildlife viewing, photography and picnicking, among other activities. The Maah-Daah-Hey Trail winds through about eight miles of the area.

Special Features

Unique Characteristics and Scenic Features: This area is one of the most scenic areas on the McKenzie Ranger District. It consists of rugged canyonlands and color-banded buttes. The scenic Little Missouri River can be viewed from the area. A flat ridgeline and the abrupt breaks into the Badlands Breaks afford a very scenic view into the Little Missouri River Valley and associated canyonlands. A high incidence of woody draws can be found. A nominated Research Natural Area of about 11,000 acres, which is notable for its diverse botanical features, exists within Collar / Bennett-Cottonwood. Bighorn sheep frequently use the area. Fossils found in Fort Union (also known as Ludlow) Formation deposits represent the Paleocene (65 to 45 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Manageability

Size and Shape: The 19,700-acre Collar / Bennett-Cottonwood area is irregular in shape, stretching southeast to northwest across the landscape. It is as narrow as two mile across, but as wide as four miles elsewhere. The area is about 13 miles long northwest to southeast and two to four miles wide northeast to southwest. Two private inholdings of about 300 acres exist in the area. One mile of common boundary on a northern section of the area is shared with the North Unit of Theodore Roosevelt National Park.

Potential to Manage Boundaries: Boundary management would be somewhat challenging due to the rugged terrain of the area. Surveys and signing may be required, especially adjacent to private land. Trespass onto private land from the area is a concern. Motorized trespass into Collar / Bennett-Cottonwood, should it be designated as a Wilderness, is a concern, particularly because of the relative lack of law enforcement available for the area. Existing fencelines could serve to provide clear and visible signing. Other areas, including the Badlands Breaks, would require new signing. The one mile of shared boundary with Theodore Roosevelt National Park would offer cooperative boundary management opportunities.

Collar/Bennett-Cottonwood: Availability Analyses

Resource Values and Potentials

Oil and Gas: Oil and gas potential is high. The northern portion of the area has current leases and development. The remaining area is available for lease under no surface occupancy stipulations. Four oil and gas wells currently exist along Bennett Creek and there is oil and gas development along the eastern and southern boundaries of the area.

Coal: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Livestock Grazing: The area produces about 4,925 animal unit months of livestock grazing annually. Ten permittees operate in the area. Nine allotments are either fully or partly located in the area.

Locatable Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Common Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Timber: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Recreation: The Maah-Daah-Hey Trail provides a developed trail experience and is used by hikers, mountain bikers, and horseback riders. Big game and upland game hunting is popular in the fall. Other recreation includes dispersed camping, outfitter rides, sight-seeing, birdwatching, mountain biking, photography, and prairie dog shooting.

Motorized recreation would be prohibited under a Wilderness designation. Current nonmotorized recreation activities, such as dispersed camping, hiking, horseback riding and nature study, would be allowed. Wilderness designation would preclude off-highway motorized recreation, such as ATV and snowmobile use. Walk-in hunting opportunities would increase. Backcountry experiences would be enhanced with the exclusion of motorized activities. Opportunities for physically challenged and elderly access into the area may be reduced.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Bighorn Sheep: Wilderness designation would have beneficial effects on bighorn sheep due to the lack of human disturbances and reductions in motorized activities a designation would bring, especially during the birthing season.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Little Missouri National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered that fall under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: Land origination within the Collar/Bennett-Cottonwood area is about 14,860 acres acquired and 4,840 acres from the public domain. About 1,730 acres of private subsurface minerals ownership beneath federally owned surface occurs in the area and are subject to minerals leasing. Currently, leases are generally for a 10-year period. Once production on a lease is established, the lease is valid throughout the life of production. The life of production for an oil well on the district is between five and twenty years.

Existing Contracts and Agreements: The McKenzie County Grazing Association holds the existing grazing agreement in the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Effects on Adjacent Lands: Designation could increase vehicular traffic on adjacent roads. Any increase in visitation to the area, which may occur under a Wilderness designation, could increase the potential for accidental fire starts. Adjacent land values next to a designated Wilderness may rise or fall depending upon local markets. As well, the potential for trespass from a designated Wilderness onto adjacent lands of other ownership might increase.

Collar/Bennett-Cottonwood: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest Wilderness areas are in Theodore Roosevelt National Park. The 19,410-acre Theodore Roosevelt Wilderness, North Unit, lies directly adjacent to the area on the north, while the 10,510-acre Theodore Roosevelt Wilderness, South Unit, is 33 miles to the south. Both Wilderness areas represent mixed-grass prairies in a badlands setting. Bennett-Cottonwood would also represent a mixed-grass prairie in a badlands setting.

Representation of Landforms and Ecosystems: Collar / Bennett-Cottonwood represents a mixed-grass prairie with the following ecosystem types present: hardwood draws, river bottoms, upland grasslands, rolling grasslands, terraces, and upland breaks. The landscape includes badlands and rolling prairies.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: The area is found in a sparsely populated region of the country. Dickinson, Williston, and Bismarck / Mandan, North Dakota, with an estimated population of less than 125,000, and Glendive and Sydney, Montana, with a combined population of about 25,000, are the nearest cities of any size, and none of them is closer than 45 miles from the area.

A considerable number of people and organizations have requested that the Forest Service designate some grassland Wilderness somewhere within the 191-million-acre National Forest System. Currently, Congress has not designated Wilderness area on any of the 20 national grasslands within that System.

Two Wilderness areas have been designated in the Little Missouri Badlands: the 10,510-acre Theodore Roosevelt Wilderness, South Unit, and the 19,410-acre Theodore Roosevelt Wilderness, North Unit, both of which are located in the Theodore Roosevelt National Park. These two Wilderness areas offer nearby designated Wilderness which, in most ways, represent most of the key characteristics found in the Collar / Bennett-Cottonwood area, including appearance and vegetative cover types. No other designated Wilderness areas, however, exist in the Little Missouri Badlands, a recognized biogeographical sub-unit of the Great Plains.

Collar/Bennett-Cottonwood: Environmental Consequences

Management Prescription Allocations by Alternative

Alternative 2:	MA 3.51	6,270 acres
	MA 6.1	13,430 acres
Alternative 3:	MA 1.31	13,550 acres
	MA 2.2	5,890 acres
	MA 3.65	100 acres
	MA 4.22	160 acres
Alternative 4:	MA 1.2	15,590 acres
	MA 1.3	13,960 acres
	MA 3.4	150 acres
Alternative 5:	MA 1.3	119,550 acres
	MA 3.4	150 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended Wilderness

Alternatives: 4

Environmental Consequences: Travel would be by nonmotorized, nonmechanical. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities may be limited or foregone. Wildlife would tend to benefit from reduced human activity, but some opportunities for fish and wildlife enhancement, and ecosystem restoration would be foregone. Grazing of livestock would continue where grazing was established at the time the wilderness is designated. Valid existing rights and leases would be recognized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Maintenance of existing range developments would be permitted. Construction of new range developments would not be allowed to detract from the wilderness character of the area. Stipulations, such as no surface occupancy, and reclamation efforts designed at protecting the wilderness values to the extent possible may be authorized by Congress on existing rights and leases. The area may be Congressionally designated as administratively unavailable.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be increased while at the same time reducing opportunities for motorized recreation. If the area is withdrawn from leasing, oil and gas development opportunities would be foregone.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 3, 4, and 5

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Overall, wildlife would tend to benefit from reduced human activity. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities would be limited or forgone. Livestock grazing would continue as present. Valid existing rights would be recognized. Because the area is leased for oil and gas and contains a small area of private minerals, additional oil and gas developments could occur. Where mineral development occurs, the semi-primitive, nonmotorized character of the area would be lost for the duration of the activity.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area. Oil and gas development on existing leases would require the area to be reclaimed to as near as possible its original condition at the close of the lease.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Because oil and gas development of existing leases could occur; restricting other users could cause conflict. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas developments would continue as long as production occurs in the area.

Designation: Non-wilderness

Prescription: MA 2.2 Research Natural Areas

Alternatives: 3

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and semi-primitive end of the spectrum such as walking and hiking. Uses that maintain or improve the ecological characteristics for which the RNA was designated would be allowed. Livestock grazing would continue as present. The area would be made unavailable for leasing until establishment of the RNA, at which time it would be withdrawn from mineral entry.

Mitigation Measures: Motorized travel is limited to administrative, law enforcement, emergency, and scientific purposes. Existing roads would be closed or obliterated unless necessary for administrative, scientific, or valid private access. Recreational use would be restricted if is hinders achievement of the desired condition for the RNA. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be increased while at the same time reducing opportunities for motorized recreation. Those accustomed to accessing the area by motorized means might resent vehicle restrictions. If the area is withdrawn from leasing, oil and gas development opportunities would be foregone.

Designation: Non-wilderness

Prescription: MA 3.4 Scenic River Recommendation

Alternatives: 4 and 5

Environmental Consequences: Recreation opportunities would be those associated with the primitive and semi-primitive end of the spectrum such as walking, hiking, horseback riding, and canoeing. Motorized water-bound-craft would be allowed. Recreational developments necessary for river access may be present. Livestock grazing would continue. Existing oil and gas leases and rights would be recognized.

Mitigation Measures: Motorized travel routes may be designated with restrictions. Livestock grazing would be managed to maintain the values for which the river is designated. For segments recommended for wild designation, oil and gas leases would require no surface occupancy. "Scenic" or "recreational" segments would be stipulated to maintain the scenic values of the area.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas revenues may be reduced if development opportunities are foregone.

Designation: Non-wilderness

Prescription: MA 3.51 Bighorn Sheep

Alternatives: 2

Environmental Consequences: Recreational activities and motorized travel would be discouraged during breeding and lambing periods. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Construction of new travel routes would be prohibited except to honor valid and existing rights and leases. Snowmobile use would be prohibited. Existing and adjoining allotments in this area would not permit conversion to domestic sheep. Oil and gas leasing would be no surface occupancy.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas revenues may be reduced if development opportunities are foregone.

Designation: Non-wilderness

Prescription: MA 4.22 River and Travel Corridors

Alternatives: 3

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A variety of recreation opportunities would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted.

Mitigation Measures: Constructed public launch sites will be visually subordinate to the river and river corridor. OHV trail construction would be prohibited. Timing, seasonal, or location stipulations may be appropriate related to oil and gas development to maintain the scenic values of the area. Leasing within the corridor would be NSO.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings would be moderate. Economic benefits from oil and gas revenues may be reduced if development opportunities are foregone due to restrictions and stipulations.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternatives: 2

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Johns Town/Horse Creek: An Overview of the Affected Environment

The 24,450-acre Johns Town / Horse Creek area is located about 20 miles southwest of Watford City, North Dakota. More specifically, the Johns Town / Horse Creek area is located, either partly or fully, in: T. 150 N., R104 W., Section 25, T. 149 N., R. 104 W., Sections 1 and 12, T 148 N., R. 103 W., Sections 4 and 5, T. 150 N., R. 103 W., Sections 26-35, and T. 149 N., R. 103 W., Sections 1-15, 17-19 and 32-35. It lies within the Rolling Prairie Geographic Area, a scenic grasslands landscape characterized by open space. Access to the area from Watford City is via U.S. Highway 85 west for 17 miles, then eight miles south and nine miles west on State Highway 68, then two and a half miles north on Forest Development Road (FDR) 849. FDR 849 defines the western boundary to the area.

The Johns Town / Horse Creek area is located in the Little Missouri Badlands, a biogeographical sub-unit of the Great Plains Region. Robert G. Bailey further identifies the area as a part of the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division (71).

Johns Town / Horse Creek features rolling mixed-grass prairie dissected by small, woody draws. It is far less rugged and more characteristic of rolling prairie than the other Little Missouri National Grassland areas examined in this report. The elevation of the area is around 2,000 to 2,200 feet above sea level.

Mixed-grass prairie is the dominant plant community, and includes western wheatgrass, needle-and-thread, and junegrass. Forbs are plentiful. Green ash and American elm are the most common trees in the area.

Sharp-tailed grouse leks (mating and dancing grounds) exist in the area, as does a prairie dog colony. Upland birds, antelope, and deer are plentiful.

Two-track roads, a small wooden corral, and several livestock reservoirs exist in the area. Two buried pipelines exist, but do not detract from the primitive setting of the area.

Johns Town/Horse Creek: Capability Analyses

Environment

Opportunity for Solitude and Serenity: The area offers moderate opportunities for solitude and serenity. Use increases during the fall hunting season. The area has been ranched heavily in the past, and displays a high number of range developments, such as stock tanks and developed springs. These developments do detract from the grassland experience. The area is vast, with big open skies. The best opportunities for solitude and serenity lie to the eastern portions of Johns Town / Horse Creek where the fewest range developments exist.

Natural Appearance and Integrity: The area is a scenic rolling grassland, although not rugged. A moderate level of range developments detracts from the natural appearance. Developments occur most often on the western portions of the area. Upland vegetation is in fairly good health, although the woody draws may be in decline. Livestock developments, including developed springs, fences, water wells, primitive trails, stock tanks and dugouts, detract from the natural setting, although most range developments have been constructed to blend with the natural surroundings as much as possible.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Recreation Opportunities: Current recreation includes hiking, hunting, dispersed camping, birdwatching, nature study, and other associated activities.

Special Features

Unique Characteristics and Scenic Features: The rolling grasslands and topography can be scenic. Antelope hunting is quite popular in this area. Opportunities to witness traditional ranching operations may be found in this area. Fossils found in Fort Union (also known as Ludlow) Formation deposits represent the Paleocene (65 to 45 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Manageability

Size and Shape: The 24,450-acre Johns Town / Horse Creek area is somewhat triangular in shape. It is about eight miles long north to south and about six miles wide east to west at its widest point. The area has one section of state land that is considered an inholding.

Potential to Manage Boundaries: Roads and fences generally surround the area, which would make the potential to manage the area's boundaries high. Some concern exists for trespass from the area onto private lands to the east. Enforcing no motorized access under a Wilderness designation would prove very difficult.

Johns Town/Horse Creek: Availability Analyses

Resource Values and Potentials

Oil and Gas: Oil and gas potential is high. The northern part of the area is leased and developed with four well sites. The southern portion of the area was determined to be available for leasing; however, the site-specific decision was made not to lease the area.

Coal: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Livestock Grazing: Nineteen permittees operate in the area. The area produces about 9,587 animal unit months of livestock grazing annually. Three allotments are either fully or partially located in the area.

Locatable Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Common Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Timber: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Recreation: Motorized recreation would be prohibited under a Wilderness designation. Current nonmotorized recreation activities, such as dispersed camping, hiking, horseback riding and nature study, would be allowed. Wilderness designation would preclude off-highway motorized recreation, such as ATV and snowmobile use. Walk-in hunting opportunities would increase. Backcountry experiences would be enhanced with the exclusion of motorized activities. Opportunities for physically challenged and elderly access into the area may be reduced.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.
- Black-footed ferret: Effects from Wilderness designation would be both beneficial and adverse. Beneficial effects result from the reduced human disturbances and reduced potential mortality due to motorized vehicles. In addition, ferrets would benefit from the significant reduction in prairie dog shooters, who would lose motorized access to prairie dog towns in a Wilderness area. Adverse effects result from restrictions on the motorized support to aid in ferret reintroduction projects. Ferrets may be targeted for reintroduction projects in the future in several areas on the Northern Great Plains, including this area.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Little Missouri National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered that fall under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: Land origination within the Johns Town / Horse Creek area is about 24,250 acres acquired and 200 acres from the public domain. No acres of private subsurface minerals ownership occur in the area.

Existing Contracts and Agreements: The McKenzie County Grazing Association holds the livestock grazing permit in force in the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Effects on Adjacent Lands: Designation could increase vehicular traffic on adjacent roads. Any increase in visitation to the area, which may occur under a Wilderness designation, could increase the potential for accidental fire starts. Adjacent land values next to a designated Wilderness may rise or fall depending upon local markets. As well, the potential for trespass from a designated Wilderness onto adjacent lands of other ownership might increase.

Johns Town/Horse Creek: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest Wilderness areas are in Theodore Roosevelt National Park. The 19,410-acre Theodore Roosevelt Wilderness, North Unit, is about 15 miles to the southeast, while the 10,510-acre Theodore Roosevelt Wilderness, South Unit, is more than 50 miles to the south-southeast. Both represent mixed-grass prairies in a badlands setting. Johns Town / Horse Creek would more closely represent a mixed-grass prairie in a rolling plains setting.

Representation of Landforms and Ecosystems: The Johns Town / Horse Creek area represents a mixed-grass prairie with the following ecosystem types present: hardwood draws, upland grasslands, terraces, rolling grasslands and upland breaks. The landscape is primarily characterized as rolling prairie.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. A Wilderness area may impede any future reintroductions of the black-footed ferret in the area. Most other key species would probably benefit from a Wilderness designation.

Public Interests and Concerns: The area is found in a sparsely populated region of the country. Dickinson, Williston, and Bismarck / Mandan, North Dakota, with an estimated population of less than 125,000, and Glendive and Sydney, Montana, with a combined population of about 25,000, are the nearest cities of any size, and none of them is closer than 30 miles from the area.

A considerable number of people and organizations have requested that the Forest Service designate some grassland Wilderness somewhere within the 191-million-acre National Forest System. Currently, Congress has not designated Wilderness area on any of the 20 national grasslands within that System.

Two Wilderness areas have been designated in the Little Missouri Badlands: the 10,510-acre Theodore Roosevelt Wilderness, South Unit, and the 19,410-acre Theodore Roosevelt Wilderness, North Unit, both of which are located in the Theodore Roosevelt National Park. These two Wilderness areas offer share some of the characteristics found in the Johns Town / Horse Creek area. However, Johns Town / Horse Creek more closely represents a rolling plains, while the two Theodore Roosevelt Wilderness areas represent badlands terrain. No other designated Wilderness areas, however, exist in the Little Missouri Badlands, a recognized biogeographical sub-unit of the Great Plains.

Johns Town/Horse Creek: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 6.1	24,450 acres
Alternative 3:	MA 3.63	23,750 acres
	MA 6.1	700 acres
Alternative 4:	MA 1.2	5,460 acres
	MA 1.31	7,450 acres
	MA 3.63	10,830acres
	MA 6.1	710 acres
Alternative 5:	MA 1.2	5,460 acres
	MA 6.1	18,990 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended Wilderness

Alternatives: 4 and 5

Environmental Consequences: Travel would be by nonmotorized, nonmechanical. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities may be limited or foregone. Wildlife would tend to benefit from reduced human activity, but some opportunities for fish and wildlife enhancement, and ecosystem restoration would be foregone. Grazing of livestock would continue where grazing was established at the time the wilderness is designated. Valid existing rights and leases would be recognized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Maintenance of existing range developments would be permitted. Construction of new range developments would not be allowed to detract from the wilderness character of the area. Stipulations, such as no surface occupancy, and reclamation efforts designed at protecting the wilderness values to the extent possible may be authorized by Congress on existing rights and leases. The area may be Congressionally designated as administratively unavailable.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be increased while at the same time reducing opportunities for motorized recreation. If the area is withdrawn from leasing, oil and gas development opportunities would be foregone.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 4

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Overall, wildlife would tend to benefit from reduced human activity. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities would be limited or forgone. Livestock grazing would continue as present. Valid existing rights would be recognized. Because the area is leased for oil and gas and contains a small area of private minerals, additional oil and gas developments could occur. Where mineral development occurs, the semi-primitive, nonmotorized character of the area would be lost for the duration of the activity.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area. Oil and gas development on existing leases would require the area to be reclaimed to as near as possible its original condition at the close of the lease.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Because oil and gas development of existing leases could occur; restricting other users could cause conflict. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas developments would continue as long as production occurs in the area.

Designation: Non-wilderness

Prescription: MA 3.63 Black-Footed Ferret Reintroduction Habitat

Alternatives: 3 and 4

Environmental Consequences: Motorized travel would be allowed. Recreation activities would be allowed. Livestock grazing would continue as present. Valid existing rights would be recognized. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Motorized travel associated with oil and gas development would be limited to daylight hours and existing roads. No new road construction would occur in the southern portion of the area under no surface occupancy stipulations. Recreational shooting of prairie dogs would be prohibited.

Economic and Social Effects: The area would continue to provide a mix of economic benefits.

Designation: Non-wilderness

Prescription: MA 6.1 Rangelands with Broad Resource Emphasis

Alternatives: 2, 4, and 5

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Lone Butte: An Overview of the Affected Environment

The 11,470-acre Lone Butte area is located about 50 miles southeast of Williston, North Dakota, 18 miles southeast of Watford City, and about three miles southeast of the north unit of Theodore Roosevelt National Park. More specifically, the Lone Butte area is located, either partly or fully, in: T. 147 N., R. 98 W., Sections 8, 10-11, 14-15, 17, 19-24, 26-30 and 32-35. It lies within the Little Missouri Badlands, a scenic combination of rugged terrain and open space. Access to the area from Watford City is via U.S. Highway 85 south for 18 miles. U.S. Highway 85 forms the area's western boundary.

The Lone Butte area is located within the Little Missouri Badlands, a biogeographical sub-unit of the Great Plains Region. Robert G. Bailey further identifies the area as a part of the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division (71). Topography varies from gentle rolling grasslands to extremely rugged badlands terrain with deeply incised stream channels and numerous clay buttes. Extensive areas of upland grasslands are interspersed between upland breaks. Elevation varies from about 2,000 feet to 2,750 feet above sea level. Lone Butte is the area's most prominent landmark. Dry Creek is also a recognizable feature.

The rough, broken terrain within the area has limited plant growth. On some of the non-grass areas, predominate vegetation consists of big sagebrush, rabbit brush and four-wing salt brush. Many of the steep drainages on north-facing slopes are occupied by a dense growth of Rocky Mountain juniper. Green ash and American elm occupy the wooded draws. Dominant grasses include western wheatgrass, green needlegrass, and blue grama with some little bluestem in the sandy areas and threadleaf sedge on the southern exposures. Understory shrub species in draws include buffaloberry, skunkbush sumac, chokecherry, snowberry, woods rose, and many others. Leafy spurge, a noxious weed, occurs along the Little Missouri River corridor north of the area.

The alluvial floodplains along Dry Creek support a riparian community consisting of cottonwoods and associated species. The terraces immediately above the floodplain tend to support silver sage and extensive western wheatgrass stands.

The Lone Butte area lies directly to the east of Summit Campground, a Forest Service facility. Combined with its proximity to Theodore Roosevelt National Park, Lone Butte is a frequent destination for recreationists. Typical recreation includes hiking, hunting, horseback riding, and camping. The northern portion of the area provides excellent views of the Little Missouri River.

The Lone Butte area supports populations of bighorn sheep, mule deer, white-tailed deer, turkeys, and sharp-tailed grouse. Golden eagles and prairie falcons have been known to form aeries in the area. Several sharp-tailed grouse leks (mating and dancing grounds) have been sighted on the area's ridgetops. Although the wildlife habitats and species represented within

the area are not unique to the Little Missouri National Grassland, they are considered important to North Dakota.

Lone Butte: Capability Analyses

Environment

Opportunity for Solitude and Serenity: The opportunities for solitude and serenity are very high in the Lone Butte area. The nature of the topography, which is rugged and remote, provides only poor vehicular access. The rolling grasslands and ridgetops break steeply and abruptly into badlands terrain where visitors can become isolated and removed from the signs and sounds of other people.

Natural Appearance: This area is very high in natural appearance. Fencing is limited, as are two-tracks roads. Some range developments exist. The area is considered very scenic and relatively pristine. The area contains a good deal of woody draws, riparian vegetation along Dry Creek and upland grasslands in fairly high condition. Livestock developments, including developed springs, fences, water wells, primitive trails, stock tanks and dugouts, detract from the natural setting, although most range developments have been constructed to blend with the natural surroundings as much as possible.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Recreation Opportunities: Current recreation in the area includes hiking, dispersed camping, photography, hunting, horseback riding, birdwatching, and other associated activities.

Special Features

Unique Characteristics and Scenic Features: This area is very scenic and rugged, with extremely sharp slopes slicing away from ridgetops. The north end of the area provides excellent vista views across the Little Missouri River Valley. Bighorn sheep frequently use the area. Other fine panoramic views can be had from the ridgetops. Fossils found in Fort Union (also known as Ludlow) Formation deposits represent the Paleocene (65 to 45 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Manageability

Size and Shape: The 11,470-acre Lone Butte area is more or less square. It is about six and a half miles wide east to west at its widest point and four miles long north to south at its widest point. It is contiguous with no inholdings.

Potential to Manage Boundaries: The potential to manage the area is moderate to high. The highway on its western flank and fence lines or steep topography elsewhere would allow for visible signing and would pose difficulties for those who would try to illegally trespass with motorized vehicles. The southern and eastern boundaries are adjacent to private land, which have road access to the area.

Lone Butte: Availability Analyses

Resource Values and Potentials

Oil and Gas: Oil and gas potential is high. The area is administratively available for lease; however, the land is not being offered for lease at this time. There is one productive well site located within the eastern boundary of the area. This well was developed under a previous leasing decision. Once production on a lease is established, the lease is valid throughout the life of production. In addition, there is also development outside the eastern boundary of the area.
Coal: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Livestock Grazing: The area produces about 2,037 animal unit months of livestock grazing annually. Eight permittees operate in the area. Three allotments are either fully or partly located in the area.

Locatable Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Common Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Timber: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Recreation: Motorized recreation would be prohibited under a Wilderness designation. Current nonmotorized recreation activities, such as dispersed camping, hiking, horseback riding, and nature study, would be allowed. Wilderness designation would preclude off-highway motorized recreation, such as ATV and snowmobile use. Walk-in hunting opportunities would increase. Backcountry experiences would be enhanced with the exclusion of motorized activities. Opportunities for physically challenged and elderly access into the area may be reduced.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Bighorn Sheep: Wilderness designation would have beneficial effects on bighorn sheep due to the lack of human disturbances and reductions in motorized activities a designation would bring, especially during the birthing season.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Little Missouri National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered that fall under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: Land origination within the Lone Butte area is about 7,070 acres acquired and 4,400 acres from the public domain. No acres of private, subsurface minerals ownership exist in the area.

Existing Contracts and Agreements: The McKenzie County Grazing Association holds the livestock grazing permit in the area. An individual currently holds a permit to provide outfitting and guiding into the Lone Butte area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Effects on Adjacent Lands: Few impacts are anticipated because the topography of the area is so rugged. Such topography would likely restrict visitor trespass onto adjacent land. Lone Butte is surrounded by National Forest System land on the western and northern boundaries and by private land on the southern and eastern boundaries. Leafy spurge is known to be present along the Little Missouri River and its drainage bottoms. The presence of noxious weeds, such as leafy spurge, must be monitored and addressed, regardless of the management of the area, including Wilderness. Any increase in visitation to the area, which may occur under a Wilderness designation, could increase the potential for accidental fire starts. Adjacent land values next to a designated Wilderness may rise or fall depending on local markets.

Lone Butte: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest Wilderness areas are in Theodore Roosevelt National Park. The 19,410-acre Theodore Roosevelt Wilderness, North Unit, is about four miles to the northwest, while the 10,510-acre Theodore Roosevelt Wilderness, South Unit, is 43 miles to the south. Both represent a mixed-grass prairie in a badlands setting. Lone Butte would also represent a mixed-grass prairie in a badlands setting.

Representation of Landforms and Ecosystems: This area represents a mixed-grass prairie with the following ecosystem types present: hardwood draws, upland grasslands, rolling grasslands and upland breaks. The landscape includes badlands and rolling prairies.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: The area is found in a sparsely populated region of the country. Dickinson, Williston, and Bismarck / Mandan, North Dakota, with an estimated population of less than 125,000, and Glendive and Sydney, Montana, with a combined population of about 25,000, are the nearest cities of any size, and none of them is closer than 50 miles from the area.

A considerable number of people and organizations have requested that the Forest Service designate some grassland Wilderness somewhere within the 191-million-acre National Forest System. Currently, Congress has not designated Wilderness area on any of the 20 national grasslands within that System.

Two Wilderness areas have been designated in the Little Missouri Badlands: the 10,510-acre Theodore Roosevelt Wilderness, South Unit, and the 19,410-acre Theodore Roosevelt Wilderness, North Unit, both of which are located in the Theodore Roosevelt National Park. These two Wilderness areas offer nearby designated Wilderness which, in most ways, represent most of the key characteristics found in the Lone Butte area, including appearance and vegetative cover types. No other designated Wilderness areas, however, exist in the Little Missouri Badlands, a recognized biogeographical sub-unit of the Great Plains.

Lone Butte: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 3.51	8,160 acres
	MA 6.1	3,310 acres
Alternative 3:	MA 1.31	10,950 acres
	MA 3.51	400 acres
	MA 3.65	60 acres
	MA 4.22	60 acres
Alternative 4:	MA 1.2	11,470 acres
Alternative 5:	MA 3.51	8,160 acres
	MA 4.4	60 acres
	MA 6.1	3,250 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended Wilderness

Alternatives: 4

Environmental Consequences: Travel would be by nonmotorized, nonmechanical. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities may be limited or foregone. Wildlife would tend to benefit from reduced human activity, but some opportunities for fish and wildlife enhancement, and ecosystem restoration would be foregone. Grazing of livestock would continue where grazing was established at the time the wilderness is designated. Valid existing rights and leases would be recognized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Maintenance of existing range developments would be permitted. Construction of new range developments would not be allowed to detract from the wilderness character of the area. Stipulations, such as no surface occupancy, and reclamation efforts designed at protecting the wilderness values to the extent possible may be authorized by Congress on existing rights and leases. The area may be Congressionally designated as administratively unavailable.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be increased while at the same time reducing opportunities for motorized recreation. If the area is withdrawn from leasing, oil and gas development opportunities would be foregone.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 3

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Overall, wildlife would tend to benefit from reduced human activity. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities would be limited or forgone. Livestock grazing would continue as present. Valid existing rights would be recognized. Because the area is leased for oil and gas and contains a small area of private minerals, additional oil and gas developments could occur. Where mineral development occurs, the semi-primitive, nonmotorized character of the area would be lost for the duration of the activity.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area. Oil and gas development on existing leases would require the area to be reclaimed to as near as possible its original condition at the close of the lease.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Because oil and gas development of existing leases could occur; restricting other users could cause conflict. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas developments would continue as long as production occurs in the area.

Designation: Non-wilderness

Prescription: MA 3.51 Bighorn Sheep

Alternatives: 2, 3, and 5

Environmental Consequences: Recreational activities and motorized travel would be discouraged during breeding and lambing periods. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Construction of new travel routes would be prohibited except to honor valid and existing rights and leases. Snowmobile use would be prohibited. Existing and adjoining allotments in this area would not permit conversion to domestic sheep. Oil and gas leasing would be no surface occupancy.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas revenues may be reduced if development opportunities are foregone.

Designation: Non-wilderness

Prescription: MA 3.65 Rangeland with Diverse Natural-appearing Landscapes

Alternatives: 3

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 3.65 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character would be lost permanently making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 4.22 River and Travel Corridors

Alternatives: 3

Environmental Consequences: Motorized: access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A variety of recreation opportunities would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted.

Mitigation Measures: Constructed public launch sites will be visually subordinate to the river and river corridor. OHV trail construction would be prohibited. Timing, seasonal, or location stipulations may be appropriate related to oil and gas development to maintain the scenic values of the area. Leasing within the corridor would be NSO.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings would be moderate. Economic benefits from oil and gas revenues may be reduced if development opportunities are foregone due to restrictions and stipulations.

Designation: Non-wilderness

Prescription: MA 4.4 Recreation River Recommendation

Alternatives: 5

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A variety of recreational opportunities would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted.

Mitigation Measures: Timing, seasonal, or location stipulations may be appropriate related to oil and gas development to maintain the scenic values of the area. Leasing within the corridor would be no surface occupancy.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. Economic benefits from oil and gas revenues may be reduced if development opportunities are foregone.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternatives: 2 and 5

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Long X Divide: An Overview of the Affected Environment

The 10,100-acre Long X Divide area is located about 15 miles south of Watford City, North Dakota. The north unit of Theodore Roosevelt National Park shares a boundary with Long X Divide immediately to the north and west. More specifically, the Long X Divide area is located, either partly or fully, in: T. 147 N., R. 99 W., Sections 2-4, 7-11, 13-15 and 17-19, 22-24 and T. 147 N., R. 100 W., Sections 12-13 and 23-24. It lies within the Little Missouri Badlands, a scenic combination of rugged terrain and open space. Access to the area from Watford City is south for 15 miles via U.S. Highway 85, then west for one mile on Forest Development Road 842. The area lies directly to the south and west of this road.

The Long X Divide area is located within the Little Missouri Badlands, a biogeographical sub-unit of the Great Plains Region. Robert G. Bailey further identifies the area as a part of the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division (71). Topography varies from gentle rolling grasslands to extremely rugged badlands terrain with deeply incised stream channels and numerous clay buttes. The area is located in the steepest and deepest section of the Little Missouri Badlands. Extensive areas of upland grasslands are interspersed between upland breaks. Elevation varies from between about 2,300 and 2,500 feet above sea level.

The vegetation ranges from riparian forests along the Little Missouri River to juniper-forested slopes to rolling, mixed-grass prairie on the uplands. Small pockets of aspen forests can be found in the area, a rather unusual community for the Little Missouri Badlands. Leafy spurge, a noxious weed, occurs along the Little Missouri River corridor.

Populations of mule deer, neotropical grassland birds, upland birds, reptiles, and some furbearers are common to the area.

The Job Corps Spike Camp, also known as the Long X Spike Camp and mapped as the CCC (Civilian Conservation Corps) Camp, sits just to the north of the Long X Divide area. This developed campground has historical CCC connections and serves as an entry point into the rugged Long X Divide area and the trailhead for the Maah-Daah-Hey Trail.

Two-track roads do exist in the area. The Maah-Daah-Hey Trail also passes through the area for about six and one-half miles. The 19,410-acre Theodore Roosevelt Wilderness, North Unit, lies adjacent to the Long X Divide area.

Long X Divide: Capability Analyses

Environment

Opportunity for Solitude and Serenity: The area offers a relatively high opportunity for solitude and serenity, especially in the eastern portion of the area where the terrain is more rugged. A visitor can become isolated from the sounds and sights of other people.

Natural Appearance and Integrity: The eastern portion of the area appears nearly pristine. In the western portions, some areas, where flat, contain a number of range developments. Elsewhere in the western portions, the land is rugged and appears very natural. Overall, this area contains a high level of natural integrity. Vegetative health is relatively high, and natural processes, including flash flooding, but excluding wildfire, are intact. Livestock developments, including developed springs, fences, water wells, primitive trails, stock tanks and dugouts, detract from the natural setting, although most range developments have been constructed to blend with the natural surroundings as much as possible.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Recreation Opportunities: Current recreation includes hunting, horseback riding, hiking, dispersed camping, photography, nature study and other associated activities. The Maah-Daah-Hey Trail winds for about six and one-half miles through the area. Other trails in Long X Divide include the four and one-half mile Summit Trail and the eight and one-half mile Long X Loop. The Job Corps Spike Camp, also known as the Long X Spike Camp and mapped as the CCC (Civilian Conservation Corps) Camp, sits just to the north of the Long X Divide area. This developed campground has historical CCC connections and serves as an entry point into the rugged Long X Divide area.

Special Features

Unique Characteristics and Scenic Features: Aspen is found in the area, which is relatively rare for the North Dakota badlands. The historic Long X Cattle Trail, used in the late 19th century, cuts through the Long X Divide area. The area is very scenic and offers views into the Theodore Roosevelt National Park. Fossils found in Fort Union (also known as Ludlow) Formation deposits represent the Paleocene (65 to 45 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Manageability

Size and Shape: The 10,100-acre Long X Divide is more or less rectangular. It is about six and one-half miles wide east to west and about four miles long north to south. The Long X Divide area is contiguous with no inholdings.

Potential to Manage Boundaries: The area offers high potential to manage boundaries. The national park shares the northern and western boundaries while National Forest System lands lie to the east. Only on the southern flank is the private land interface significant. This southern boundary is also marked by a fence, which could be easily signed and visible to the public. Some potential motorized trespass is possible under a Wilderness designation, especially in the south or northeast along U.S. Highway 85.

Long X Divide: Availability Analyses

Resource Values and Potentials

Oil and Gas: Oil and gas potential is high. There is no existing development and the area is not administratively available for lease.

Coal: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Livestock Grazing: Six permittees operate in the area. The area produces about 2,246 animal unit months of livestock grazing annually. Three allotments are either fully or partially located in the area.

Locatable Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Common Minerals: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Timber: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Recreation: Motorized recreation would be prohibited under a Wilderness designation. Current nonmotorized recreation activities, such as dispersed camping, hiking, horseback riding and nature study, would be allowed. Currently, an outfitter holds a permit for taking visitors by horseback into the area. That permit would not be affected by Wilderness designation. Wilderness designation would preclude off-highway motorized recreation, such as ATV and snowmobile use. Walk-in hunting opportunities would increase. Backcountry experiences would be enhanced with the exclusion of motorized activities. Opportunities for physically challenged and elderly access into the area may be reduced.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Bighorn Sheep: Wilderness designation would have beneficial effects on bighorn sheep due to the lack of human disturbances and reductions in motorized activities a designation would bring, especially during the birthing season.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Little Missouri National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered that fall under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: About 1,780 acres within Long X Divide originate from the public domain and about 8,320 acres originate from acquired lands. No acres of private, subsurface minerals ownership exist in the area.

Existing Contracts and Agreements: The McKenzie County Grazing Association holds the livestock permit for the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the McKenzie Ranger District.

Effects on Adjacent Lands: Low impacts would be anticipated under a Wilderness designation. The most likely impact might occur along the southern boundary where private lands intersect with the Long X Divide area. Leafy spurge is known to be present along the Little Missouri River and its drainage bottoms. The presence of noxious weeds, such as leafy spurge, must be monitored and addressed, regardless of the management of the area, including Wilderness. Any increase in visitation to the area, which may occur under a Wilderness designation, could increase the potential for accidental fire starts. Adjacent land values next to a designated Wilderness might rise or fall depending upon the local markets. As well, the potential for trespass from a designated Wilderness onto adjacent lands of other ownership might increase.

Long X Divide: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest Wilderness areas are in Theodore Roosevelt National Park. The 19,410-acre Theodore Roosevelt Wilderness, North Unit, lies directly adjacent to the Long X Divide area to the north, while the 10,510-acre Theodore Roosevelt Wilderness, South Unit, is 41 miles to the south. Both represent mixed-grass prairies in a badlands setting. Long X Divide would also represent a mixed-grass prairie in a rugged badlands setting.

Representation of Landforms and Ecosystems: This area represents a mixed-grass prairie with the following ecosystem types present: river bottoms, upland grasslands, terraces, rolling grasslands and upland breaks. The landscape includes badlands and rolling prairies.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: The area is found in a sparsely populated region of the country. Dickinson, Williston, and Bismarck/Mandan, North Dakota, with an estimated population of less than 125,000, and Glendive and Sydney, Montana, with a combined population of about 25,000, are the nearest cities of any size, and none of them is closer than 40 miles from the area.

A considerable number of people and organizations have requested that the Forest Service designate some grassland Wilderness somewhere within the 191-million-acre National Forest System. Currently, the Forest Service provides no Wilderness area on any of the 20 national grasslands within that System.

Two Wilderness areas have been designated in the Little Missouri Badlands: the 10,510-acre Theodore Roosevelt Wilderness, South Unit, and the 19,410-acre Theodore Roosevelt Wilderness, North Unit, both of which are located in the Theodore Roosevelt National Park. These two Wilderness areas offer nearby designated Wilderness which, in most ways, represent most of the key characteristics found in the Long X Divide area, including appearance and vegetative cover types. No other designated Wilderness areas, however, exist in the Little Missouri Badlands, a recognized biogeographical sub-unit of the Great Plains.

Long X Divide: Environmental Consequences

Management Prescription Allocations by Alternative

Alternative 2:	MA 3.51	20 acres
	MA 6.1	10,080 acres
Alternative 3:	MA 1.2A	10,100 acres
Alternative 4:	MA 1.2	10,100 acres
Alternative 5:	MA 1.2	10,100 acres

Designation: Wilderness

Prescription: MA 1.2 or 1.2A Recommended or Suitable Wilderness

Alternatives: 3, 4, and 5

Environmental Consequences: Travel would be by nonmotorized, nonmechanical. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities may be limited or foregone. Wildlife would tend to benefit from reduced human activity, but some opportunities for fish and wildlife enhancement, and ecosystem restoration would be foregone. Grazing of livestock would continue where grazing was established at the time the wilderness is designated. Valid existing rights and leases would be recognized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Maintenance of existing range developments would be permitted. Construction of new range developments would not be allowed to detract from the wilderness character of the area. Stipulations, such as no surface occupancy, and reclamation efforts

designed at protecting the wilderness values to the extent possible may be authorized by Congress on existing rights and leases. The area may be Congressionally designated as administratively unavailable.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be increased while at the same time reducing opportunities for motorized recreation. If the area is withdrawn from leasing, oil and gas development opportunities would be foregone.

Designation: Non-wilderness

Prescription: MA 3.51 Bighorn Sheep

Alternatives: 2

Environmental Consequences: Recreational activities and motorized travel would be discouraged during breeding and lambing periods. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Construction of new travel routes would be prohibited except to honor valid and existing rights and leases. Snowmobile use would be prohibited. Existing and adjoining allotments in this area would not permit conversion to domestic sheep. Oil and gas leasing would be no surface occupancy.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. Economic benefits from oil and gas revenues may be reduced if development opportunities are foregone.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternatives: 2

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Existing oil and gas leasing would continue and new leasing would be permitted. Oil and gas developments such as roads, pipelines, and drilling pads would likely occur.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users, including oil and gas, would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Magpie

The 6,100-acre portion of the Magpie area on the McKenzie Ranger District shares a contiguous boundary with the Medora Ranger District. Since 14,580 acres of the Magpie lie within the Medora Ranger District, the narrative for the Magpie area is found under the Medora Ranger District section.

Scairt Woman

The 240-acre portion of the Scairt Woman area on the McKenzie Ranger District shares a contiguous boundary with the Medora Ranger District. Since 5,460 acres in the Scairt Woman area lie within the Medora Ranger District, the narrative for the Scairt Woman area is found under the Medora Ranger District section.

Criteria Common to All Roadless Areas on this Administrative Unit

Capability Criteria

Challenge: centers around survival in a dry and harsh environment. Summer temperatures can exceed 100° Fahrenheit with no drinkable water sources. Winter temperatures can drop to -35° Fahrenheit with wind-chill factors in excess of -80° F. Broken terrain and open landscapes are deceptive and may disorient the visitor's ability to mark their directions. Hiking may be much more difficult than anticipated with steep slopes and difficult terrain. Prairie rattlesnakes may be encountered and can be dangerous.

Opportunities for Outdoor Education: A visitor should find features to stimulate curiosity: geology, grassland ecosystems, grassland flora and fauna, bared soil layers, shifting weather patterns and cloud types, incredibly clear night skies offering unimpeded views of the stars. Skills in maneuvering a rugged terrain, using a compass, taking precautions for snake and spider bites, heat stroke (and frostbite or freezing to death in the winter), setting up a primitive campsite, and outdoor cooking may all test and develop a visitor's understanding of the outdoors.

Availability Criteria

Coal: Although significant lignite coal reserves exist on the Little Missouri National Grassland (LMNG), no current production occurs and previous historic development has been minimal. Currently, no coal-leased acres exist on the LMNG. Several lignite-fueled power plants exist in North Dakota and 1991 estimates indicate that 29 million tons of lignite were mined in the state. Therefore, because a market exists, the potential for development is low to moderate.

Locatable Minerals: No records exist in geological literature that documents the occurrence or development of any hardrock minerals on or near the Little Missouri National Grassland (LMNG), a region that is sedimentary in origin. Uranium, sometimes considered a locatable mineral, is available for location if it is found on public domain lands. If uranium is found on acquired lands, it is available only by lease. Uranium deposits on the LMNG are generally of low grade. Although the occurrence potential for uranium is moderate to high, the current development potential is low.

Common Minerals: Scoria, a baked and fused clay, is common throughout the LMNG. Although it wears quickly, scoria is the only local source for road surfacing material. Adequate private sources for this aggregate exist. Therefore, a low potential exists for development of scoria resources on the LMNG.

Timber: No merchantable timber exists. Rocky Mountain juniper is widespread enough to provide some post and pole timbers; however, the location of the juniper often makes it quite uneconomical to harvest

Management Obligations, Constraints, or Encumbrances

Biotic Control Measures and Fire Protection: Chemical, biological and mechanical control methods are used to stem the expansion of undesirable plant species, such as leafy spurge and spotted knapweed. Wildfire suppression would be addressed in Wilderness management plans that would be developed if any of the roadless areas are designated by Congress as Wilderness.

Sheyenne National Grassland

Delamere: An Overview of the Affected Environment

The 5,090-acre Delamere area lies about 12 miles east of Lisbon, North Dakota, and one mile south of McLeod, North Dakota. Specifically, the Delamere area is located, either partly or fully, in: Township 134 North, Range 52 West, Section 31, Township 134 North, Range 53 West, Section 36, Township 133 North, Range 52 West, Sections 5-8 and 17-18, and Township 133 North, Range 53 West, Sections 1 and 12-13. Access is via State Highway 27, then south on Ransom County Road 53 to Ransom County Road 133. Drive west on Road 133 for one mile. The Delamere area lies north of Road 133.

The Delamere area lies within the Prairie Parkland (Temperate) Province ecoregion of the Prairie Division as identified by Robert G. Bailey (45-46). Its topography consists of drifting swales of tallgrass prairie, the result of an ancient glacial delta, which formed this sand dune region some 10,000 to 25,000 years ago. Elevation in this area ranges between 1,071 and 1,081 feet above sea level.

Tallgrass and mixed-grass species thrive in the area, including big bluestem, little bluestem, switchgrass, and prairie junegrass. Tree species include bur oak and aspen. Shrub species include willow buckbrush. The threatened western prairie-fringed orchid occurs on the national grassland, one of only a few meta-populations in the nation. Nationally, both tallgrass and oak savanna are tiny remnants of their historic occurrence. At least 42 rare or sensitive plant species (as identified by the Forest Service) exist on the national grassland. The last of just two appreciable populations of the greater prairie chicken in North Dakota are found on the Sheyenne National Grassland.

Wildlife include white-tailed deer, red fox, prairie grouse, many species of grassland songbirds, raptors, reptiles and amphibians.

There are a number of range developments, including fencing, water structures (such as windmills), and two-track roads.

Typical recreation includes hiking, hunting, horseback riding, nature photography, off-highway vehicle recreation, snowmobiling, and camping. Canoeing on the nearby Sheyenne River is popular. Livestock grazing is a seasonal use.

Delamere: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are available. The low rolling hills, lack of roads and high number of wetlands combine to restrict access and provide for a high level of solitude. A rail line creates the eastern border to the Delamere area. Trains run several times per day, creating some noise. In addition, a few farms are visible from lands just within the borders to Delamere. However, on open stretches, the vast nature of prairie and the relative lack of visible human developments allow the visitor to experience the grassland much as early settlers and American Indians did more than a century ago.

Natural Appearance and Integrity: Overall, this area retains a natural appearance; however, the area was homesteaded, so some signs of homesteading may still be visible, which may reduce the area's natural appearance. Ecologically, the Delamere area is not the healthiest portion of the Sheyenne National Grassland. Most of the ecological processes, including seasonal flooding, remain intact. Natural fire is rare. Closer examination reveals signs of livestock activities. Cattle graze the area from May through October. Developments in the area do suggest human encroachment. The area shows about 15 miles of exterior fence, 13 miles of interior fence, seven windmills, four dugouts, and five stock tanks. Some people consider windmills to be scenic in a rustic sense, a reminder of an earlier era. Noxious and exotic plants have encroached into the area, reducing the natural integrity of the native tallgrass ecosystem.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Sheyenne National Grassland.

Recreation Opportunities: Opportunities for recreation are low, but do include nature study, photography, hunting, hiking, and camping.

Special Features

Unique Characteristics and Scenic Features: The area is remote, with no maintained roads. A great many grassland birds, including neotropical migrants, can be found in the area. The greater prairie chicken and the western prairie-fringed orchid, a threatened species, are also known to occur in the Delamere area.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Sheyenne National Grassland.

Manageability

Size and Shape: This 5,090-acre Delamere area is a contiguous block of National Forest System land with no inholdings under other ownership. It is more or less square in shape and about two and a half miles across east to west and about two and a half mile across north to south. Existing developments pose management challenges. Fence lines, for instance, need to be maintained on an annual basis.

Potential to Manage Boundaries: The current boundaries consist of fence lines. Fence lines offer the opportunity for clear and visible signing. They also prevent unauthorized motorized access.

Delamere: Availability Analyses

Resource Values and Potentials

Oil and Gas: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Sheyenne National Grassland.

Coal: No coal resources exist on the Sheyenne National Grassland.

Livestock Grazing: Eight permittees graze up to 5,300 AUMs annually in five allotments May through November.

Locatable Minerals: No records exist in geological literature that documents the occurrence or development of any hardrock minerals on or near the Sheyenne National Grassland.

Common Minerals: Some sand and gravel may exist in the area, but mining it would not prove economically viable.

Timber: No appreciable timber resources exist in the area.

Recreation: The area receives only limited recreational use. No developed trails or other recreational facilities exist in the area. There is a noticeable lack of trees. Sloughs make travel and access very difficult.

Wilderness designation would prohibit off-road motorized recreation and other motorized access. Walk-in hunting opportunities would increase. Handicapped and elderly access may be reduced, though not eliminated, under a Wilderness designation.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Western prairie-fringed orchid: Effects from Wilderness designation would be beneficial due to the reduction in mortality caused by motorized or mechanized vehicles and equipment, restrictions that accompany Wilderness designations. However, effects would also be adverse on the Sheyenne National Grasslands because motorized support in the suppression of leafy spurge would be reduced, which may favor the spread of leafy spurge at the expense of the western prairie-fringed orchid.
- Peregrine falcon: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Sheyenne National Grassland include: the greater prairie chicken and the plains sharp-tailed grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: No mineral leases are held by private entities in the Delamere area.

Existing Contracts and Agreements: A grazing and management agreement with the Sheyenne Valley Grazing Association is in effect through 2002.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Sheyenne National Grassland.

Effects on Adjacent Lands: About 200 to 300 acres of leafy spurge occur in the area. Regardless of this area's designation, noxious weed control methods must take place in the area. Any increase in recreational use resulting from designation would increase the use of adjacent roads. More people in the area would impact adjacent landowners.

Delamere: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The closest designated Wilderness is the 4,155-acre Chase Lake Wilderness inside Chase Lake National Wildlife Refuge, about 126 miles northwest of the area. Chase Lake Wilderness represents a mixed-grass prairie ecosystem, while the Delemere area represents a tallgrass prairie ecosystem.

Representation of Landforms and Ecosystems: The area is representative of the Northern tallgrass prairie, deltaic plains, and hummocky sandhills.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. A Wilderness designation may impede the control of leafy spurge, which adversely affects the western prairie-fringed orchid. Most other key species probably would benefit from a designation.

Public Interests and Concerns: The public has shown very little interest in designation or nondesignation. Local livestock permittees would be concerned about their ability to graze their cattle and about access to range developments.

Delemere: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2	MA 6.1	5,090 acres
Alternative 3	MA 3.66	5,090 acres
Alternative 4	MA 3.66	5,090 acres
Alternative 5	MA 1.2	5,090 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended Wilderness

Alternatives: 5

Environmental Consequences: Travel would be by nonmotorized, nonmechanical. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities may be limited or foregone. Wildlife would tend to benefit from reduced human activity, but some opportunities for fish and wildlife enhancement, and ecosystem restoration would be foregone. Grazing of livestock would continue where grazing was established at the time the wilderness is designated. Valid existing rights and leases would be recognized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Maintenance of existing range developments would be permitted. Construction of new range developments would not be allowed to detract from the wilderness character of the area. The area may be Congressionally designated as administratively unavailable.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be increased while at the same time reducing opportunities for motorized recreation. If the area is withdrawn from leasing, oil and gas development opportunities would be foregone.

Designation: Wilderness

Prescription: MA 3.66 Ecosystem Restoration

Alternatives: 3 and 4

Environmental Consequences: Tall grass prairie communities will have a high degree of biodiversity. Sensitive plants and animal populations are maintained or restored. Habitat is provided for the greater prairie chicken in the tall-grass prairie and habitat for the sharp-tailed grouse is provided in the choppy sand hills. Habitat for the federally listed western prairie fringed orchid is provided in the wet meadows. Invasive species and other exotic plant species are reduced. Riparian areas, including seeps and springs, are properly functioning.

Mitigation Measures: These areas are managed to restore and maintain native plant and animal species and communities and ecological processes and functions for tall-grass prairie and oak savanna Motorized access would be restricted to roads and trails. Livestock grazing would be allowed at levels commensurate with prairie restoration. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would temporarily lose its roadless character during ecosystem restoration activities.

Economic and Social Effects: Both motorized and nonmotorized opportunities would be available. Opportunities for those desiring solitude and isolation would be reduced temporarily while restoration activities were in progress. Once restoration was substantially completed, opportunities for isolation and solitude would be restored to approximately the present level. Livestock grazing would likely remain the primary economic benefit from the area but would be reduced during restoration activities. The primitive to semi-primitive character of the area could be temporarily altered but would be restored over time.

Designation: Non-wilderness

Prescription: MA 6.1Rangeland with Broad Resource Emphasis

Alternatives: 2

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Durler: An Overview of the Affected Environment

The 12,470-acre Durler area lies about 13 miles east of Lisbon, North Dakota. Specifically, the Durler area is located, either partly or fully, in: Township 134 North, Range 54 West, Sections 11-15, 22-27 and 36, Township 133 North, Range 53 West, Sections 3 and 5-8, and Township 134 North, Range 53 West, Sections 7-8, 17-20 and 29-32. Access from Lisbon is east on State Highway 27. The Durler area lies just south of the highway.

The Durler area lies within the Prairie Parkland (Temperate) Province ecoregion of the Prairie Division as identified by Robert G. Bailey (45-46). Its topography consists of drifting swales of tallgrass prairie, the result of an ancient glacial delta, which formed this sand dune region some 10,000 to 25,000 years ago. The elevation of the area ranges from between 1,069 and 1,076 feet above sea level.

Tallgrass and mixed-grass species thrive in the area, including big bluestem, little bluestem, switchgrass, and prairie junegrass. Tree species include bur oak, green ash, and aspen. Shrub species include willow buckbrush and snowberry. The threatened western prairie-fringed orchid occurs on the national grassland, one of only a few meta-populations in the nation. Nationally, both tallgrass and oak savanna are tiny remnants of their historic occurrence. At least 42 rare or sensitive plant species (as identified by the Forest Service) exist on the national grassland. The last of just two appreciable populations of the greater prairie chicken in North Dakota are found on the Sheyenne National Grassland.

Wildlife include white-tailed deer, red fox, prairie grouse, many species of grassland songbirds, raptors, reptiles, and amphibians.

There are a number of range developments, including fencing, water structures (such as windmills), and two-track roads.

Typical recreation includes hiking, hunting, horseback riding, nature photography, off-highway vehicle recreation, snowmobiling, and camping. The North Country National Scenic Trail cuts through the area. Canoeing on the nearby Sheyenne River is popular. Livestock grazing is a seasonal use.

Durler: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are available. The low rolling hills, lack of roads and high number of wetlands combine to restrict access and provide for a high level of solitude. A rail line creates the extreme northeastern border to the Durler area. Trains run several times per day, creating some noise. Some noise associated with State Highway 27 may also be heard close to the roadway. In addition, a few farms are visible from lands just within the borders to Delamere. However, on open stretches, the vast nature of prairie and the relative lack of visible human developments allow the visitor to experience the grassland much as early settlers and American Indians did more than a century ago.

Natural Appearance and Integrity: This area does retain a natural appearance, representative of prairie terrain. The Horseshoe Hills lie in the Durler area and exhibit oak savanna, a very scenic component. Most of the ecological processes, with the possible exception of natural fire, remain intact. Signs of livestock activities exist. Cattle are encountered during the grazing season. Developments in the area do suggest human encroachment. The area shows about 23 miles of exterior fence, 22 miles of interior fence, 18 windmills, 13 dugouts, four fenced exclosures, and 10 stock tanks. Some people consider windmills to be scenic in a rustic sense, a reminder of an earlier era. Noxious and exotic plants have encroached into the area, reducing the natural integrity of the native tallgrass ecosystem.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Sheyenne National Grassland.

Recreation Opportunities: Opportunities for recreation are fairly low but do include nature study, photography, hunting, hiking, and camping.

Special Features

Unique Characteristics and Scenic Features: The Horseshoe Hills, draped in oak savanna, are very scenic, especially in autumn. Several archeological sites may exist, representing prehistoric and historic occupations, including homestead foundations and a battle site between rival tribes.

A potential Research Natural Area of 80 acres may be included in the Durler area, depending upon future management area classifications. The area includes unfarmed, ungrazed prairie. The 80 acres have been hayed in the past.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Sheyenne National Grassland.

Manageability

Size and Shape: The 12,470-acre Durler area is more or less square in shape. The area is about five miles long north to south and five miles wide east to west. Two small private inholdings, one of 40 acres and another of 160 acres, exist in the area. Public access to the inholdings must be allowed.

Potential to Manage Boundaries: The current boundaries consist of fencelines that may require annual maintenance. The potential to manage these fencelines is high. Fencelines do offer the opportunity for clear and visible signing.

Durler: Availability Analyses

Resource Values and Potentials

Oil and Gas: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Sheyenne National Grassland.

Coal: No coal resources exist on the Sheyenne National Grassland.

Livestock Grazing: Eighteen permittees graze up to 12,175 AUMs annually on 11 allotments. Livestock are typically run from May through November.

Locatable Minerals: No records exist in geological literature that documents the occurrence or development of any hardrock minerals on or near the Sheyenne National Grassland.

Common Minerals: Some sand and gravel may exist in the area, but mining it would not prove economically viable.

Timber: No appreciable timber resources exist in the area.

Recreation: Wilderness designation would prohibit off-road motorized recreation and other motorized access. Walk-in hunting opportunities would increase. Handicapped and elderly access may be reduced, though not eliminated under a Wilderness designation.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Western prairie-fringed orchid: Effects from Wilderness designation would be beneficial due to the reduction in mortality caused by motorized or mechanized vehicles and equipment, restrictions that accompany Wilderness designations. However, effects would also be adverse on the Sheyenne National Grasslands because motorized support in the suppression of leafy spurge would be reduced, which may favor the spread of leafy spurge at the expense of the western prairie-fringed orchid.
- Peregrine falcon: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Sheyenne National Grassland include: the greater prairie chicken and the plains sharp-tailed grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: No mineral leases exist in the area.

Existing Contracts and Agreements: A grazing and management agreement with the Sheyenne Valley Grazing Association is in effect through 2002. No power lines requiring special-use permits exist in the area. No other special-use permits are in force in the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Sheyenne National Grassland.

Effects on Adjacent Lands: About 2,000 to 3,000 acres of leafy spurge occurs in the area. Regardless of this area's designation, noxious weed control methods must take place in the area. Any increase in recreational use resulting from designation would increase the use of adjacent roads. More people in the area would impact adjacent landowners.

Durler: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The closest designated Wilderness is the 4,155-acre Chase Lake Wilderness inside Chase Lake National Wildlife Refuge, about 116 miles northwest of the area. Chase Lake Wilderness represents a mixed-grass prairie ecosystem, while the Durler area represents a tallgrass prairie ecosystem.

Representation of Landforms and Ecosystems: This area is representative of the Northern tallgrass prairie, deltaic plains, hummocky sand dunes, and choppy sand dunes.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. A Wilderness designation may impede the control of leafy spurge, which adversely affects the western prairie-fringed orchid. Most other key species probably would benefit from a designation.

Public Interests and Concerns: The nearest metropolitan area, Fargo / Moorhead, with about 175,000 people, is only about an hour away by car. Some increase in visitation due to designation might be expected. Local livestock permittees would be concerned about their ability to graze their cattle and about access to range developments. A consortium of groups recently published Badlands on the Brink. The publication calls for more Wilderness areas in North Dakota. The Durler area was one of two areas the groups identified as desirable as Wilderness under the Eastern Wilderness Act.

Durler: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 6.1	12,470 acres
Alternative 3:	MA 3.64	80 acres
	MA 3.66	12,390 acres
Alternative 4:	MA 2.2	80 acres
	MA 3.66	11,590 acres
	MA 5.12	800 acres
Alternative 5:	MA 1.2	12,470 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended Wilderness

Alternatives: 5

Environmental Consequences: Travel would be by nonmotorized, nonmechanical. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities may be limited or foregone. Wildlife would tend to benefit from reduced human activity, but some opportunities for fish and wildlife enhancement, and ecosystem restoration

would be foregone. Grazing of livestock would continue where grazing was established at the time the wilderness is designated. Valid existing rights and leases would be recognized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Maintenance of existing range developments would be permitted. Construction of new range developments would not be allowed to detract from the wilderness character of the area. The area may be Congressionally designated as administratively unavailable.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be increased while at the same time reducing opportunities for motorized recreation. If the area is withdrawn from leasing, oil and gas development opportunities would be foregone.

Designation: Non-wilderness

Prescription: MA 2.2 Research Natural Areas

Alternatives: 4

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and semi-primitive end of the spectrum such as walking and hiking. Uses that maintain or improve the ecological characteristics for which the RNA was designated would be allowed. Livestock grazing would continue as present. The area would be made unavailable for leasing until establishment of the RNA, at which time it would be withdrawn from mineral entry.

Mitigation Measures: Motorized travel is limited to administrative, law enforcement, emergency, and scientific purposes. Existing roads would be closed or obliterated unless necessary for administrative, scientific, or valid private access. Recreational use would be restricted if is hinders achievement of the desired condition for the RNA. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be increased while at the same time reducing opportunities for motorized recreation. Those accustomed to accessing the area by motorized means might resent vehicle restrictions. If the area is withdrawn from leasing, oil and gas development opportunities would be foregone.

Designation: Non-Wilderness

Prescription: MA 3.64 Special Plant and Wildlife Habitat

Alternatives: 3

Environmental Consequences: Suitable habitat will be maintained or enhanced for the full spectrum of plant and wildlife species, guilds, and communities. Riparian areas (streams, seeps, springs, fens) are managed so they maintain their hydrologic regimes. Broadleaf deciduous trees characterize woodlands and hardwood draws. Prairie landscapes will have a diversity of warm season and cool season grasses and forbs. Plant communities of high species diversity will act as a seed source for other areas within the landscape where diversity may be reduced.

Mitigation Measures: These areas are managed to maintain and enhance specific plant and wildlife species of concern and plant and wildlife communities. Habitat enhancement is encouraged. Motorized access would be limited to administrative use. Although grazing could occur to meet management objectives, the area would normally be considered unsuitable for grazing.

Economic and Social Effects: Motorized recreation opportunities would not be available. Opportunities for those desiring solitude and isolation would be about the same as present. Opportunities for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources would be good. Livestock grazing would likely remain the primary economic benefit from the area but would be reduced from present levels. The primitive to semi-primitive character of the area would be substantially retained.

Designation: Wilderness

Prescription: MA 3.66 Ecosystem Restoration

Alternatives: 3 and 4

Environmental Consequences: Tall grass prairie communities will have a high degree of biodiversity. Sensitive plants and animal populations are maintained or restored. Habitat is provided for the greater prairie chicken in the tall-grass prairie and habitat for the sharp-tailed grouse is provided in the choppy sand hills. Habitat for the federally listed western prairie fringed orchid is provided in the wet meadows. Invasive species and other exotic plant species are reduced. Riparian areas, including seeps and springs, are properly functioning.

Mitigation Measures: These areas are managed to restore and maintain native plant and animal species and communities and ecological processes and functions for tall-grass prairie and oak savanna Motorized access would be restricted to roads and trails. Livestock grazing would be allowed at levels commensurate with prairie restoration. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would temporarily lose its roadless character during ecosystem restoration activities.

Economic and Social Effects: Both motorized and nonmotorized opportunities would be available. Opportunities for those desiring solitude and isolation would be reduced temporarily while restoration activities were in progress. Once restoration was substantially completed, opportunities for isolation and solitude would be restored to approximately the present level. Livestock grazing would likely remain the primary economic benefit from the area but would be reduced during restoration activities. The primitive to semi-primitive character of the area could be temporarily altered but would be restored over time.

Designation: Non-wilderness

Prescription: MA 5.12 General Forest and Rangelands: Range Vegetation Emphasis

Alternatives: 3 and 4

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 5.12 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character would be lost permanently making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 6.1Rangeland with Broad Resource Emphasis

Alternatives: 2

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

McLeod: An Overview of the Affected Environment

The 9,120-acre McLeod area lies about 13 miles east of Lisbon, North Dakota. Specifically, the McLeod area is located, either partly or fully, in: Township 133 North, Range 52 West, Sections 1-5 and 8-12 and Township 134 North, Range 52 West, Sections 26-27 and 30-35. Access from Lisbon is via State Highway 27, then south along Ransom County Road 53 to the town of McLeod, four miles east along Ransom County Road 134 and south one-half mile on a township road.

The McLeod area lies within the Prairie Parkland (Temperate) Province ecoregion of the Prairie Division as identified by Robert G. Bailey (45-46). Its topography consists of drifting swales of tallgrass prairie, the result of an ancient glacial delta, which formed this sand dune region some 10,000 to 25,000 years ago. The elevation of the area ranges between 1,071 to 1,080 feet above sea level.

Tallgrass and mixed-grass species thrive in the area, including big bluestem, little bluestem, switchgrass, and prairie junegrass. Tree species include bur oak, green ash, and aspen. Shrub species include willow buckbrush and snowberry. The threatened western prairie-fringed orchid occurs on the national grassland, one of only a few meta-populations in the nation. Nationally, tallgrass remains only a tiny remnant of its historic occurrence. At least 42 rare or sensitive plant species (as identified by the Forest Service) exist on the national grassland. The last of just two appreciable populations of the greater prairie chicken in North Dakota are found on the Sheyenne National Grassland.

Wildlife include white-tailed deer, red fox, prairie grouse, many species of grassland songbirds, raptors, reptiles and amphibians.

There are a number of range developments, including fencing, water structures (such as windmills) and two-track roads.

Typical recreation includes hiking, hunting, horseback riding, snowmobiling, off-highway motorized recreation, nature photography, off-highway vehicle recreation, snowmobiling and camping. Canoeing on the nearby Sheyenne River is popular. Livestock grazing is a seasonal use.

McLeod: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude are available. The rolling to flat tallgrass prairie does provide opportunities for isolation. The open nature of the landscape offers some opportunities to experience the grassland in a semi-primitive condition. Nearby developments, including a railroad and county roads, can create some background noise.

Natural Appearance and Integrity: Overall, this area retains a natural appearance; however, the area was homesteaded, so some signs of homesteading may still be visible, which may reduce the area's natural appearance. Most of the ecological processes, including seasonal flooding, remain intact. Natural fire is rare. Closer examination reveals signs of livestock activities. Along boundary areas, adjacent land is tilled and may carry little in terms of scenic value. Cattle graze the area from May through November.

Developments in the area do suggest human encroachment. The area shows about 17 miles of exterior fence, 15 miles of interior fence, seven windmills, 13 dugouts, two fenced exclosures

and six stock tanks. Some people consider windmills to be scenic in a rustic sense, a reminder of an earlier era. Noxious and exotic plants have encroached into the area, reducing the natural integrity of the native tallgrass ecosystem.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Sheyenne National Grassland.

Recreation Opportunities: Opportunities for recreation include nature study, photography, hunting, hiking, and camping.

Special Features

Unique Characteristics and Scenic Features: The area is a scenic grassland, with isolated stands of trees, some of them planted during the homesteading era early this century. The ecological condition of the tallgrass component in the McLeod area is of high quality.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Sheyenne National Grassland.

Manageability

Size and Shape: The 9,120-acre McLeod area is more or less rectangular in shape and is a contiguous block with no private inholdings. The area is about five miles wide east to west and four miles long north to south.

Potential to Manage Boundaries: The current boundaries consist of fence lines. Fence lines offer the opportunity for clear and visible signing. They also prevent unauthorized motorized access.

McLeod: Availability Analyses

Resource Values and Potentials

Oil and Gas: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Sheyenne National Grassland.

Coal: No coal resources exist on the Sheyenne National Grassland.

Livestock Grazing: Eighteen permittees graze up to 9,300 AUMs annually on five allotments. Livestock grazing typically runs from May through November.

Locatable Minerals: No records exist in geological literature that documents the occurrence or development of any hardrock minerals on or near the Sheyenne National Grassland.

Common Minerals: Some sand and gravel may exist in the area, but mining it would not prove economically viable.

Timber: No appreciable timber resources exist in the area.

Recreation: Wilderness designation would prohibit off-road motorized recreation and other motorized access. Walk-in hunting opportunities would increase. Handicapped and elderly access may be reduced, though not eliminated under a Wilderness designation.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Western prairie-fringed orchid: Effects from Wilderness designation would be beneficial due to the reduction in mortality caused by motorized or mechanized vehicles and equipment, restrictions that accompany Wilderness designations. However, effects would also be adverse on the Sheyenne National Grasslands because motorized support in the suppression of leafy spurge would be reduced, which may favor the spread of leafy spurge at the expense of the western prairie-fringed orchid.
- Peregrine falcon: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Sheyenne National Grassland include: the greater prairie chicken and the plains sharp-tailed grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: No mineral leases exist in the area.

Existing Contracts and Agreements: A grazing and management agreement with the Sheyenne Valley Grazing Association is in effect through 2002. No power lines requiring special-use permits exist in the area. No other special-use permits are in force in the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Sheyenne National Grassland.

Effects on Adjacent Lands: About 300 to 400 acres of leafy spurge occur in the area. Regardless of this area's designation, noxious weed control methods must take place in the area. Any increase in recreational use resulting from designation would increase the use of adjacent roads. More people in the area would impact adjacent landowners.

McLeod: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The closest designated Wilderness is the 4,155-acre Chase Lake Wilderness inside Chase Lake National Wildlife Refuge, about 130 miles northwest of the area. Chase Lake Wilderness represents a mixed-grass prairie ecosystem, while the McLeod area represents a tallgrass prairie ecosystem.

Representation of Landforms and Ecosystems: This area is representative of Northern tallgrass prairie, glacial deltaic plains, and hummocky sand dunes.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. A Wilderness designation may impede the control of leafy spurge, which adversely affects the western prairie-fringed orchid. Most other key species probably would benefit from a designation.

Public Interests and Concerns: The nearest metropolitan area, Fargo / Moorhead, with about 175,000 people, is only about an hour away by car. Some increase in visitation due to designation might be expected. Local livestock permittees would be concerned about their ability to graze their cattle and about access to range developments.

McLeod: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2	MA 6.1	9,120 acres
Alternative 3	MA 3.66	9,120 acres
Alternative 4	MA 3.66	9,120 acres
Alternative 5	MA 1.2	9,120 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended Wilderness

Alternatives: 5

Environmental Consequences: Travel would be by nonmotorized, nonmechanical. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities may be limited or foregone. Wildlife would tend to benefit from reduced human activity, but some opportunities for fish and wildlife enhancement, and ecosystem restoration would be foregone. Grazing of livestock would continue where grazing was established at the time the wilderness is designated. Valid existing rights and leases would be recognized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Maintenance of existing range developments would be permitted. Construction of new range developments would not be allowed to detract from the wilderness character of the area. The area may be Congressionally designated as administratively unavailable.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be increased while at the same time reducing opportunities for motorized recreation. If the area is withdrawn from leasing, oil and gas development opportunities would be foregone.

Designation: Wilderness

Prescription: MA 3.66 Ecosystem Restoration

Alternatives: 3 and 4

Environmental Consequences: Tall grass prairie communities will have a high degree of biodiversity. Sensitive plants and animal populations are maintained or restored. Habitat is provided for the greater prairie chicken in the tall-grass prairie and habitat for the sharp-tailed grouse is provided in the choppy sand hills. Habitat for the federally listed western prairie fringed orchid is provided in the wet meadows. Invasive species and other exotic plant species are reduced. Riparian areas, including seeps and springs, are properly functioning.

Mitigation Measures: These areas are managed to restore and maintain native plant and animal species and communities and ecological processes and functions for tall-grass prairie and oak savanna Motorized access would be restricted to roads and trails. Livestock grazing would be allowed at levels commensurate with prairie restoration. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would temporarily lose its roadless character during ecosystem restoration activities.

Economic and Social Effects: Both motorized and nonmotorized opportunities would be available. Opportunities for those desiring solitude and isolation would be reduced temporarily while restoration activities were in progress. Once restoration was substantially completed, opportunities for isolation and solitude would be restored to approximately the present level. Livestock grazing would likely remain the primary economic benefit from the area but would be reduced during restoration activities. The primitive to semi-primitive character of the area could be temporarily altered but would be restored over time.

Designation: Non-wilderness

Prescription: MA 6.1Rangeland with Broad Resource Emphasis

Alternatives: 2

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Sheyenne: An Overview of the Affected Environment

The 14,540-acre Sheyenne area lies about 20 miles east of Lisbon, North Dakota, and four miles northeast of McLeod, North Dakota. Specifically, the Sheyenne area is located, either partly or fully, in: Township 134 North, Range 52 West, Sections 5-6, Township 134 North, Range 53 West, Section 1, Township 135 North, Range 52 West, Sections 4, 7, 9-10, 15-21 and 29-32, and Township 135 North, Range 53 West, Sections 12-13, 22-27 and 34-36. Access from Lisbon is east on State Highway 27 for about 18 miles, then north on Ransom County Road 53. The Sheyenne area is to the east.

The Sheyenne area lies within the Prairie Parkland (Temperate) Province ecoregion of the Prairie Division as identified by Robert G. Bailey (45-46). Its topography consists of drifting swales of tallgrass prairie, the result of an ancient glacial delta, which formed this sand dune region some 10,000 to 25,000 years ago. The elevation of the area ranges from between 1,039 to 1,072 feet above sea level.

Tallgrass and mixed-grass species thrive in the area, including big bluestem, little bluestem, switchgrass, and prairie junegrass. Tree species include bur oak, American elm, basswood, cottonwood, and aspen. A very large proportion of this area is considered oak savanna, a very rare and threatened prairie component in North America. Shrub species include willow buckbrush, sumac, and snowberry. The threatened western prairie-fringed orchid occurs on the national grassland, one of only a few meta-populations in the nation. Nationally, both tallgrass and oak savanna are tiny remnants of their historic occurrence. At least 42 rare or sensitive plant species (as identified by the Forest Service) exist on the national grassland. The last of just two appreciable populations of the greater prairie chicken in North Dakota are found on the Sheyenne National Grassland.

Wildlife include white-tailed deer, red fox, prairie grouse, many species of grassland songbirds, raptors, reptiles, and amphibians.

There are a number of range developments, including fencing, water structures (such as windmills), and two-track roads.

Typical recreation includes hiking, hunting, horseback riding, nature photography, off-highway vehicle recreation, snowmobiling, and camping. Canoeing on the nearby Sheyenne River is popular. The North Country National Scenic Trail cuts through this area. Livestock grazing is a seasonal use.

Sheyenne: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are quite high. There is little or no background noise and limited motorized activity. Some people, however, may be encountered in the area. This rolling, vegetated, choppy-dune oak savanna offers isolation and a vast quiet environment.

Natural Appearance and Integrity: A natural appearance is evident, representative of the characteristic choppy-dune oak savanna. Most of the ecological processes are intact, including rapidly moving wildfire, although suppression is conducted as quickly as possible. Signs of livestock grazing are evident. Recreational use is also evident, including spring birdwatching, autumn hunting, and summer camping, and horseback riding. Developments in the area do suggest human encroachment. The area shows about 36 miles of exterior fence, 35 miles of interior fence, 17 windmills, 13 dugouts, five fenced exclosures and 10 stock tanks. Some people consider windmills to be scenic in a rustic sense, a reminder of an earlier era. Noxious and exotic plants have encroached into the area, reducing the natural integrity of the native tallgrass ecosystem. Some old shelterbelt plantings also may be seen in the area.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Sheyenne National Grassland.

Recreation Opportunities: Opportunities for recreation include nature study, photography, wildflower identification, hunting, hiking, and camping. The North Country National Recreation Trail cuts through this area and is increasingly becoming popular with the recreational public.

Special Features

Unique Characteristics and Scenic Features: Some archeological sites may exist, especially representative of prehistoric and homesteading era occupation. The oak savanna is rare nationally and can be very scenic, especially seasonally.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Sheyenne National Grassland.

Manageability

Size and Shape: The 14,540-acre Sheyenne area is more or less rectangular in shape. Two 160-acre inholdings exist. The area is about six miles wide east to west and about five mile long north to south.

Potential to Manage Boundaries: Boundary management would be relatively easy, since there are only limited entry points and the area is entirely fenced on the exterior. Signing the area as a Wilderness may prove expensive and maintenance of the signing could be time-consuming, since the exterior fence is about 36 miles in length.

Sheyenne: Availability Analyses

Resource Values and Potentials

Oil and Gas: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Sheyenne National Grassland.

Coal: No coal resources exist on the Sheyenne National Grassland.

Livestock Grazing: Twelve permittees graze up to 8,000 AUMs annually in seven allotments.

Locatable Minerals: No records exist in geological literature that documents the occurrence or development of any hardrock minerals on or near the Sheyenne National Grassland.

Common Minerals: Some sand and gravel may exist in the area, but mining it would not prove economically viable.

Timber: The thinning of hardwood stands could prove economically viable at some point. Some cottonwood could be harvested for pallet mills. No sales have ever been conducted in the area; however, past interest has been expressed. Perhaps 1,000 acres of harvestable timber exists in the area.

Recreation: Wilderness designation would prohibit off-road motorized recreation and other motorized access. Walk-in hunting opportunities would increase. Handicapped and elderly access may be reduced, though not eliminated under a Wilderness designation. Overall, more recreational use could be expected, as Wilderness designation would provide the area with a more visible public profile. The designation, coupled with the North Country National Recreation Trail in the area, could increase recreational use dramatically.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Western prairie-fringed orchid: Effects from Wilderness designation would be beneficial due to the reduction in mortality caused by motorized or mechanized vehicles and equipment, restrictions that accompany Wilderness designations. However, effects would also be adverse on the Sheyenne National Grasslands because motorized support in the suppression of leafy spurge would be reduced, which may favor the spread of leafy spurge at the expense of the western prairie-fringed orchid.
- Peregrine falcon: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Sheyenne National Grassland include the greater prairie chicken and the plains sharp-tailed grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: No mineral leases exist in the area.

Existing Contracts and Agreements: A grazing and management agreement with the Sheyenne Valley Grazing Association is in effect through 2002. No power lines requiring special-use permits exist in the area. No other special-use permits are in force in the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Sheyenne National Grassland.

Effects on Adjacent Lands: About 4,000 to 5,000 acres of leafy spurge occur in the area. Regardless of this area's designation, noxious weed control methods must take place in the area. The potential always exists for fast-moving wildfire in the area. Any increase in recreational use resulting from designation would increase the use of adjacent roads. More people in the area would impact adjacent landowners.

Sheyenne: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The closest designated Wilderness is the 4,155-acre Chase Lake Wilderness inside Chase Lake National Wildlife Refuge, about 125 miles northwest of the area. Chase Lake Wilderness represents a mixed-grass prairie, while the Sheyenne area represents tallgrass prairie.

Representation of Landforms and Ecosystems: This area represents the Northern tallgrass prairie, with hummocky and choppy sandhills, a small area of river terraces, and a small area of deltaic plains.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. A Wilderness designation may impede the control of leafy spurge, which adversely affects the western prairie-fringed orchid. Most other key species probably would benefit from a designation.

Public Interests and Concerns: The nearest metropolitan area, Fargo/Moorhead, with about 175,000 people, is only about an hour away by car. Some increase in visitation due to designation might be expected. Local livestock permittees would be concerned about their

ability to graze their cattle and about access to range developments. A consortium of groups recently published Badlands on the Brink. The publication calls for more Wilderness areas in North Dakota. The Sheyenne area was one of two areas the groups identified as desirable as Wilderness under the Eastern Wilderness Act.

Two proposed Research Natural Areas (RNAs) of between 500 to 600 acres exist in the area. These proposals are for scenic oak savanna.

A considerable number of people and organizations have called on the Forest Service to designate a grassland Wilderness somewhere on the Northern Great Plains. Currently, the Forest Service provides for no grassland Wilderness areas anywhere within the National Forest System.

Sheyenne: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 6.1	14,540 acres
Alternative 3:	MA 1.31	4,560 acres
	MA 2.2	370 acres
	MA 3.64	40 acres
	MA 3.66	9,570 acres
Alternative 4:	MA 2.2	370 acres
	MA 3.66	7,630 acres
	MA 4.32	140 acres
	MA 5.12	6,400 acres
Alternative 5:	MA 1.2	14,540 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended Wilderness

Alternatives: 5

Environmental Consequences: Travel would be by nonmotorized, nonmechanical. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities may be limited or foregone. Wildlife would tend to benefit from reduced human activity, but some opportunities for fish and wildlife enhancement, and ecosystem restoration would be foregone. Grazing of livestock would continue where grazing was established at the time the wilderness is designated. Valid existing rights and leases would be recognized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Maintenance of existing range developments would be permitted. Construction of new range developments would not be allowed to detract from the wilderness character of the area. The area may be Congressionally designated as administratively unavailable.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be increased while at the same time reducing opportunities for motorized recreation. If the area is withdrawn from leasing, oil and gas development opportunities would be foregone.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 3

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Overall, wildlife would tend to benefit from reduced human activity. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities would be limited or forgone. Livestock grazing would continue as present. Valid existing rights would be recognized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area.

Economic and Social Effects: Opportunities for nonmotorized activities would be increased while at the same time reducing opportunities for motorized activities. Those accustomed to accessing the area by vehicle might resent vehicle restrictions. The area would provide a mix of economic benefits.

Designation: Non-wilderness

Prescription: MA 2.2 Research Natural Areas

Alternatives: 3 and 4

Environmental Consequences: With rare exceptions, travel is nonmotorized. Recreation opportunities would be those associated with the primitive and semi-primitive end of the spectrum such as walking and hiking. Uses that maintain or improve the ecological characteristics for which the RNA was designated would be allowed. Livestock grazing would continue as present. The area would be made unavailable for leasing until establishment of the RNA, at which time it would be withdrawn from mineral entry.

Mitigation Measures: Motorized travel is limited to administrative, law enforcement, emergency, and scientific purposes. Existing roads would be closed or obliterated unless necessary for administrative, scientific, or valid private access. Recreational use would be restricted if is hinders achievement of the desired condition for the RNA. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Construction of new range developments would not be allowed to detract from the semi-primitive character of the area.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be increased while at the same time reducing opportunities for motorized recreation. Those accustomed to accessing the area by motorized means might resent vehicle restrictions. If the area is withdrawn from leasing, oil and gas development opportunities would be foregone.

Designation: Non-Wilderness

Prescription: MA 3.64 Special Plant and Wildlife Habitat

Alternatives: 3

Environmental Consequences: Suitable habitat will be maintained or enhanced for the full spectrum of plant and wildlife species, guilds, and communities. Riparian areas (streams, seeps, springs, fens) are managed so they maintain their hydrologic regimes. Broadleaf deciduous trees characterize woodlands and hardwood draws. Prairie landscapes will have a diversity of warm season and cool season grasses and forbs. Plant communities of high species diversity will act as a seed source for other areas within the landscape where diversity may be reduced.

Mitigation Measures: These areas are managed to maintain and enhance specific plant and wildlife species of concern and plant and wildlife communities. Habitat enhancement is encouraged. Motorized access would be limited to administrative use. Although grazing could occur to meet management objectives, the area would normally be considered unsuitable for grazing.

Economic and Social Effects: Motorized recreation opportunities would not be available. Opportunities for those desiring solitude and isolation would be about the same as present. Opportunities for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources would be good. Livestock grazing would likely remain the primary economic benefit from the area but would be reduced from present levels. The primitive to semi-primitive character of the area would be substantially retained.

Designation: Wilderness

Prescription: MA 3.66 Ecosystem Restoration

Alternatives: 3 and 4

Environmental Consequences: Tall grass prairie communities will have a high degree of biodiversity. Sensitive plants and animal populations are maintained or restored. Habitat is provided for the greater prairie chicken in the tall-grass prairie and habitat for the sharp-tailed grouse is provided in the choppy sand hills. Habitat for the federally listed western prairie fringed orchid is provided in the wet meadows. Invasive species and other exotic plant species are reduced. Riparian areas, including seeps and springs, are properly functioning.

Mitigation Measures: These areas are managed to restore and maintain native plant and animal species and communities and ecological processes and functions for tall-grass prairie and oak savanna Motorized access would be restricted to roads and trails. Livestock grazing would be allowed at levels commensurate with prairie restoration. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would temporarily lose its roadless character during ecosystem restoration activities.

Economic and Social Effects: Both motorized and nonmotorized opportunities would be available. Opportunities for those desiring solitude and isolation would be reduced temporarily while restoration activities were in progress. Once restoration was substantially completed, opportunities for isolation and solitude would be restored to approximately the present level. Livestock grazing would likely remain the primary economic benefit from the area but would be reduced during restoration activities. The primitive to semi-primitive character of the area could be temporarily altered but would be restored over time.

Designation: Wilderness

Prescription: MA 4.32 Dispersed Recreation

Alternatives: 3 and 4

Environmental Consequences: Generally, the area appears natural over large areas with small-scale modifications that blend with the areas natural features. Biological communities complement the recreational values. The potential for contact with other users is moderate to high. The opportunity to participate in desired recreational activities is more important than isolation and solitude. Motorized access would be allowed unless specific areas are designated as closed or restricted roads and trails. A full spectrum of motorized recreation activities would be allowed. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: These areas are managed for recreational opportunities and scenic qualities adjacent to high use developed recreation sites and bodies of water. Construction of roads, OHV trails, power lines, recreation facilities, and other features would be permitted based on their impact on recreational opportunities in the area. Mineral leasing and development are permitted.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings may be decreased over time. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 5.12 General Forest and Rangelands: Range Vegetation Emphasis

Alternatives: 3 and 4

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 5.12 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users would be permitted the same motorized access. The area would

continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character would be lost permanently making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternatives: 5

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Although, mitigation measures would be applied to meet grassland-wide plan standards and guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Venlo: An Overview of the Affected Environment

The 5,320-acre Venlo area lies about 11 miles east of Lisbon, North Dakota, and four miles northwest of McLeod, North Dakota. Specifically, the Venlo area is located, either partly or fully, in: Township 135 North, Range 54 West, Section 25-26 and 36, Township 135 North, Range 53 West, Section 28-33, and Township 134 North, Range 53 West, Sections 4-6. Access from Lisbon is 15 miles east via State Highway 27. The area lies north of the highway.

The Venlo area lies within the Prairie Parkland (Temperate) Province ecoregion of the Prairie Division as identified by Robert G. Bailey (45-46). Its topography consists of drifting swales of tallgrass prairie, the result of an ancient glacial delta, which formed this sand dune region some 10,000 to 25,000 years ago. The elevation of the area ranges from between 1,061 and 1,072 feet above sea level.

Tallgrass and mixed-grass species thrive in the area, including big bluestem, little bluestem, switchgrass, and prairie junegrass. Tree species include bur oak and aspen. Shrub species include willow buckbrush. The threatened western prairie-fringed orchid occurs on the national grassland, one of only a few meta-populations in the nation. Nationally, both tallgrass and oak savanna are tiny remnants of their historic occurrence. At least 42 rare or sensitive plant species (as identified by the Forest Service) exist on the national grassland. The last of just two appreciable populations of the greater prairie chicken in North Dakota are found on the Sheyenne National Grassland.

Wildlife include white-tailed deer, red fox, prairie grouse, many species of grassland songbirds, raptors, reptiles, and amphibians.

There are a number of range developments, including fencing, water structures (such as windmills), and two-track roads.

Typical recreation includes hiking, hunting, horseback riding, snowmobiling, nature photography, and camping. Canoeing on the nearby Sheyenne River is popular. The North Country National Scenic Trail cuts through the area. Livestock grazing is a seasonal use.

Venlo: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are relatively low. The adjacent highway and railroad line create background noise. Farmsteads may be visible from the outer edges of the area. Some isolation can be found in the sand-dune landscape.

Natural Appearance and Integrity: A natural appearance is evident, representative of the characteristic sand-dune grassland pattern. Most of the ecological processes are intact, including rapidly moving wildfire, although suppression is conducted as quickly as possible. Signs of livestock grazing are evident. Some recreational use is also evident, including spring birdwatching and autumn hunting. Plantings of green ash, cottonwood, and conifer trees can be scenic but are artificial and can detract from the native appearance. The hummocky topography sprinkled with sloughs is natural and can be scenic. Developments do suggest human encroachment. The area shows about 14 miles of exterior fence, 17 miles of interior fence, seven windmills, five dugouts, two fenced exclosures, and six stock tanks. Some people consider windmills to be scenic in a rustic sense, a reminder of an earlier era. Noxious and exotic plants have encroached into the area, reducing the natural integrity of the native tallgrass ecosystem.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Sheyenne National Grassland.

Recreation Opportunities: Opportunities for recreation include nature study, photography, hunting, hiking, and camping. The North Country National Recreation Trail cuts through the Venlo area.

Special Features

Unique Characteristics and Scenic Features: Some archeological sites may exist in the area, especially representative of prehistoric and homesteading era occupation. The area is fairly scenic, though not remarkable. The sand-dune landscape of swales and lowlands may hold some interest for some people.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Sheyenne National Grassland.

Manageability

Size and Shape: The 5,320-acre Venlo area is more or less triangular in shape. One inholding of about 160 acres exists in the area. The Venlo area is about four miles wide east to west and three miles long north to south.

Potential to Manage Boundaries: Boundary management under a Wilderness designation would be relatively easy. The exterior fence line that surrounds the area could be signed quite easily, though some expense would be associated with such signing. Maintenance would be moderately time-consuming.

Venlo: Availability Analyses

Resource Values and Potentials

Oil and Gas: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Sheyenne National Grassland.

Coal: No coal resources exist on the Sheyenne National Grassland.

Livestock Grazing: Four permittees graze up to 3,500 AUMs annually in four allotments. Grazing typically ranges from May through November.

Locatable Minerals: No records exist in geological literature that documents the occurrence or development of any hardrock minerals on or near the Sheyenne National Grassland.

Common Minerals: Some sand and gravel may exist in the area, but mining it would not prove economically viable.

Timber: No merchantable timber exists in the area.

Recreation: Wilderness designation would prohibit off-road motorized recreation and other motorized access. Walk-in hunting opportunities would increase. Handicapped and elderly access may be reduced, though not eliminated under a Wilderness designation.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Western prairie-fringed orchid: Effects from Wilderness designation would be beneficial due to the reduction in mortality caused by motorized or mechanized vehicles and equipment, restrictions that accompany Wilderness designations. However, effects would also be adverse on the Sheyenne National Grasslands because motorized support in the suppression of leafy spurge would be reduced, which may favor the spread of leafy spurge at the expense of the western prairie-fringed orchid.
- Peregrine falcon: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Sheyenne National Grassland include: the greater prairie chicken and the plains sharp-tailed grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Existing Contracts and Agreements: A grazing and management agreement with the Sheyenne Valley Grazing Association is in effect through 2002. No power lines requiring special-use permits exist in the area. No other special-use permits are in force in the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Sheyenne National Grassland.

Effects on Adjacent Lands: About 1,500 acres of leafy spurge occur in the area. Regardless of this area's designation, noxious weed control methods must take place in the area. The potential always exists for fast-moving wildfire in the area. Any increase in recreational use resulting from designation would increase the use of adjacent roads. More people in the area would impact adjacent landowners.

Venlo: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The closest designated Wilderness is the 4,155-acre Chase Lake Wilderness inside Chase Lake National Wildlife Refuge, about 123 miles northwest of the area. Chase Lake Wilderness represents a mixed-grass prairie, while the Sheyenne area represents tallgrass prairie.

Representation of Landforms and Ecosystems: This area represents the Northern tallgrass prairie and hummocky sandhills.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. A Wilderness designation may impede the control of leafy spurge, which adversely affects the western prairie-fringed orchid. Most other key species probably would benefit from a designation.

Public Interests and Concerns: The nearest metropolitan area, Fargo/Moorhead, with about 175,000 people, is only about an hour away by car. Some increase in visitation due to designation might be expected. Local livestock permittees would be concerned about their ability to graze their cattle and about access to range developments.

A considerable number of people and organizations have called on the Forest Service to designate a grassland Wilderness somewhere on the Northern Great Plains. Currently, the Forest Service provides for no grassland Wilderness areas anywhere within the National Forest System.

Venlo: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 6.1	5,320 acres
Alternative 3:	MA 3.66	5,320 acres
Alternative 4:	MA 3.66	4,880 acres
	MA 4.32	20 acres
	MA 5.12	420 acres
Alternative 5:	MA 1.2	5,320 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended Wilderness

Alternatives: 5

Environmental Consequences: Travel would be by nonmotorized, nonmechanical. Recreation opportunities would be those associated with the primitive and nonmotorized end of the spectrum such as walking, hiking, horseback riding, and nonmotorized hunting. Opportunities for discovery of cultural, historical, and paleontological resources would exist but interpretive opportunities may be limited or foregone. Wildlife would tend to benefit from reduced human activity, but some opportunities for fish and wildlife enhancement, and ecosystem restoration would be foregone. Grazing of livestock would continue where grazing was established at the time the wilderness is designated. Valid existing rights and leases would be recognized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Maintenance of existing range developments would be permitted. Construction of new range developments would not be allowed to detract from the wilderness character of the area. The area may be Congressionally designated as administratively unavailable.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be increased while at the same time reducing opportunities for motorized recreation. If the area is withdrawn from leasing, oil and gas development opportunities would be foregone.

Designation: Wilderness

Prescription: MA 3.66 Ecosystem Restoration

Alternatives: 3 and 4

Environmental Consequences: Tall grass prairie communities will have a high degree of biodiversity. Sensitive plants and animal populations are maintained or restored. Habitat is provided for the greater prairie chicken in the tall-grass prairie and habitat for the sharp-tailed grouse is provided in the choppy sand hills. Habitat for the federally listed western prairie fringed orchid is provided in the wet meadows. Invasive species and other exotic plant species are reduced. Riparian areas, including seeps and springs, are properly functioning.

Mitigation Measures: These areas are managed to restore and maintain native plant and animal species and communities and ecological processes and functions for tall-grass prairie and oak savanna Motorized access would be restricted to roads and trails. Livestock grazing would be allowed at levels commensurate with prairie restoration. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would temporarily lose its roadless character during ecosystem restoration activities.

Economic and Social Effects: Both motorized and nonmotorized opportunities would be available. Opportunities for those desiring solitude and isolation would be reduced temporarily while restoration activities were in progress. Once restoration was substantially completed, opportunities for isolation and solitude would be restored to approximately the present level. Livestock grazing would likely remain the primary economic benefit from the area but would be reduced during restoration activities. The primitive to semi-primitive character of the area could be temporarily altered but would be restored over time.

Designation: Wilderness

Prescription: MA 4.32 Dispersed Recreation

Alternatives: 3 and 4

Environmental Consequences: Generally, the area appears natural over large areas with small-scale modifications that blend with the areas natural features. Biological communities complement the recreational values. The potential for contact with other users is moderate to high. The opportunity to participate in desired recreational activities is more important than isolation and solitude. Motorized access would be allowed unless specific areas are designated as closed or restricted roads and trails. A full spectrum of motorized recreation activities would be allowed. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: These areas are managed for recreational opportunities and scenic qualities adjacent to high use developed recreation sites and bodies of water. Construction of roads, OHV trails, power lines, recreation facilities and other features would be permitted based on their impact on recreational opportunities in the area. Mineral leasing and development are permitted.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings may be decreased over time. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 5.12 General Forest and Rangelands: Range Vegetation Emphasis

Alternatives: 3 and 4

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 5.12 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character would be lost permanently making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 6.1Rangeland with Broad Resource Emphasis

Alternatives: 5

Environmental Consequences: Motorized access would be allowed unless specific areas are designated as closed or restricted to designated roads and trails. A full spectrum of motorized recreation opportunities would be allowed. Construction of recreation facilities, roads, power lines, and other features would be allowed. Livestock grazing would continue. Valid existing rights and leases would be recognized.

Mitigation Measures: Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is a high probability, if the area is designated MA 6.1 it would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased while at the same time opportunities for nonmotorized activities reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would be reduced. All users would be permitted the same motorized access. The area would continue to provide the existing mix of economic benefits while roadless primitive and semi-primitive character could be lost permanently making future wilderness designation unlikely.

Criteria Common to All Roadless Areas on this Administrative Unit

Capability Criteria

Challenge: Summer temperatures can exceed 100° Fahrenheit in an area of few easily located and drinkable water sources. Winter temperatures can drop to more than -40° Fahrenheit with wind-chill factors well in excess of -100° Fahrenheit. During winter, blowing snow can create white-out conditions, and can lead to death for those get lost. The open terrain can be deceptive and may disorient the visitor's ability to mark his or her directions. No developed trails exist. Seasonal flooding creates water hazards and may test a visitor's skill in adapting to this natural phenomenon. A great many insects are found around the many wetlands and sloughs and can be irritating.

Opportunities for Outdoor Education: A visitor should find plenty of features to stimulate curiosity: glacial-lake sand dunes, grassland ecosystems, grassland flora and fauna, sandy blowouts, shifting weather patterns and cloud types, and clear nights with excellent views of stars. Skills in maneuvering an open terrain, using a compass, taking precautions for insect bites, heat stroke (and frostbite or freezing to death in the winter), setting up a primitive campsite, and outdoor cooking may all test and develop a visitor's understanding of the outdoors.

Availability Criteria

Oil and Gas: No exploratory drilling has ever been conducted on or near the Sheyenne National Grassland. The closest known drilling occurred about 20 miles to the west, but it led to no discoveries. The Reasonably Foreseeable Development Scenario for the Sheyenne National Grassland projects one exploratory well in the next 10 to 15 years, but no discovery or development.

Biotic Control Measures and Fire Protection: Chemical, biological and mechanical control methods are used to stem the expansion of undesirable plant species, such as leafy spurge. Wildfire suppression would be addressed in Wilderness management plans that would be developed if any of the roadless areas are designated by Congress as Wilderness.

Roadless Areas on Thunder Basin National Grassland

Douglas Ranger District

Cow Creek: An Overview of the Affected Environment

The 17, 500-acre Cow Creek area is located about 38 miles northeast of Douglas, Wyoming, and 13 miles east of Bill, Wyoming. Specifically, Cow Creek is located, either fully or partly, in: T. 37 N., R. 67 W., Section 4, T. 37 N., R. 68 W., Sections 2 and 3, T. 38 N., R. 67 W., Sections 5, 6, 17-19 and 29-30, and T. 39 N., R. 67 W., Section 32 and T. 38 N., R. 68 W., Sections 1, 2, 7-15 and 17-35. Access to Cow Creek is: from Bill, take Dull Center Road (Converse County Road 38) 10 miles east, then take Forest Development Road 959 (Converse County Road 45) another three miles east.

The Cow Creek area lies within the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division as identified by Robert G. Bailey (71). This area lies within an unglaciated portion of the Missouri Basin, and is characterized by rolling to undulating hills, rocky escarpments and buttes, and is dissected by mostly easterly flowing drainages. Scoria buttes in this area are near the southern-most extent of scoria buttes in Wyoming. Geologically, this area is unique. A resistant sandstone cap has protected softer strata of shale, sandstone, claystone and siltstone from eroding. Elevation is around 4,500 to 5,000 feet above sea level.

This area is a mixed-grass prairie, blended with sagebrush, cottonwood, greasewood, ponderosa pine, and Rocky Mountain juniper. Ponderosa pine is patchy and scattered about the lower slopes of buttes and atop mesas. Wildlife includes prairie dogs, pronghorn antelope, occasional elk, mule and white-tailed deer, grassland birds, an abundance of raptors (such as bald and golden eagles), reptiles, and amphibians.

Current recreation includes hiking, viewing scenery and wildlife, dispersed camping, horseback riding, prairie dog shooting, hunting, and off-highway motorized recreation.

Livestock grazing and big game hunting are the two predominate uses in the area.

Cow Creek: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are very high. The broken terrain and buttes and bluff topography allow people to isolate themselves and disappear from view. Current use is relatively low. The population of people living in the area is very low.

Natural Appearance and Integrity: The area is characterized by gently sloping country as well as rugged, isolated country, both of which display incised drainages. Overall, it is relatively unmarked by the signs of people. Most of the ecological processes, including seasonal flash flooding, remain intact. Signs of livestock grazing are evident. Cattle frequent the area intermittently throughout the year. Grazing is conducted on a rotational basis. The central sections of Cow Creek display cottonwood in the drainages. Elsewhere, sagebrush is quite abundant. The vegetative integrity is quite high, although some exotic and noxious plants can be found. Fence densities are low. Over time, significant losses in perennial stream flows have occurred. Fifteen water impoundments, three water wells, three windmills, and two-track roads can be found. Oil and gas activity can be seen adjacent to the area. FDR 958 enters just into the area on the east and south. This native-surfaced road is crowned and ditched. It would have to be obliterated or reconstructed to trail standards under a Wilderness designation.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Thunder Basin National Grassland.

Recreation Opportunities: Opportunities exist for hiking across an isolated grassland area. Currently, hunting pressure in the fall, especially for big game, is high. Under a Wilderness designation, hunting would be permitted on a walk-in basis only. Any motorized activities, including off-highway motorized recreation, would be prohibited, except for those authorized under grazing permits for grazing management needs. Designation may also increase the potential for outfitting into the area, including hiking, hunting, and horseback riding.

Special Features

Unique Characteristics and Scenic Features: This area rates as one of the highest scenic areas on the Thunder Basin National Grassland. Some spectacular views of the surrounding plains and Miller Hills are available from the top of the area's mesas. The terrain within the area is often rugged and visually attractive and includes color-banded buttes. Stands of ponderosa pine and scattered cottonwoods along drainages add to the grassland setting. Cottonwoods are scattered along such creeks and draws as Deer Creek, Bobcat Creek, Coal Draw, and Piney Creek. These sites can be very scenic, especially in the autumn. Cottonwood regeneration is sparse, however, possibly due to past livestock grazing and cottonwood regeneration cycles.

Fossils found in Fort Union Formation and Lance Formation deposits represent the Paleocene (65 to 45 million years ago) and Late Cretaceous (80 to 65 million years ago) periods.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Thunder Basin National Grassland.

Manageability

Size and Shape: The 17,500-acre Cow Creek area is more or less rectangular in shape. Two inholdings are located within the area. One inholding of about 320 acres is in private hands while the other inholding of about 640 acres is state school land. Cow Creek is generally about seven miles wide east to west and generally about four to five miles long north to south. The area is buffered on the north and west by contiguous Forest System lands. Private lands lie to the east and south. The boundary on the north, west, and south would be 100 feet within the existing Forest Development Roads that circumvent the area. Existing developments pose only minor management challenges.

Potential to Manage Boundaries: Management potential is high. Trailheads could be developed at a couple of access points. The potential to expand interpretation and environmental education opportunities is also high. Major access points could easily be signed. Under a Wilderness designation, however, illegal motorized trespass may be difficult to prevent, especially because of the rolling nature of the area. Maintenance of windmills via motorized units may have to be authorized until opportunities arise during which the windmills can be replaced with water sources that lessen the imprint of people.

On most of both the eastern and southern ends, private land abuts the Cow Creek area, which may create management concerns resulting from land use on the private lands. Management within the area itself should pose no significant management challenges. The buttes and rugged terrain of the area would likely make management of this area under a Wilderness designation rather easy. Some surveying and posting of boundaries would be necessary under a Wilderness designation. A Wilderness management plan would have to be developed to address such topics as trails, signing, interpretation, and motorized authorizations for grazing permittees.

Cow Creek: Availability Analyses

Resource Values and Potentials

Oil and Gas: Oil and gas production is occurring adjacent to the area. Part of the area is currently under no-surface occupancy stipulations. Past exploration has occurred; however, no production is occurring at present. Oil and gas potential for the area is rated as high. Leased areas in the western part of the area, which do not have no surface occupancy stipulations, could result in road and well development requests. Such developments would be of a short-term nature and restoration of the road and well pads would be required following production.

Coal: This area is outside of moderate to high potential for coal development as defined by Bureau of Land Management specialists.

Livestock Grazing: Livestock grazing has been the dominant use of the area since the late 1800s. Livestock grazing would continue under a Wilderness designation but would be continued as a compatible land use with Wilderness. Adjustments in allotment management plans would be made to meet Wilderness objectives. Portions of four allotments exist within the area.

Locatable Minerals: Uranium is the primary locatable mineral found in the area. Past exploration for uranium has taken place; however, no claims are active in the area now.

Common Minerals: The potential for common minerals is very low. Isolated gravel pits have historically been located in road cuts. The commercial marketability of these minerals in the area is very low.

Timber: Some ponderosa pine and Rocky Mountain juniper can be found on some of the slopes of area bluffs. Cottonwood can be found along some streams and draws. No suitable timber lands are found in the area.

Recreation: Currently, motorized big-game hunting dominates recreational use in the area. Wilderness designation would likely reduce big-game harvest levels, especially for pronghorn, at least in the short term. Long-term harvest levels may level out as hunters disperse elsewhere on the national grassland. Walk-in hunting would likely increase. Other recreation could increase, including hiking and nature study. Wilderness designation would give the area a higher public profile, which could increase visitation to the area.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Ute ladies-tresses: Effects from Wilderness designation would be beneficial due to a reduction in mortality or damage caused by motorized and mechanical vehicles and equipment.
- Peregrine falcon: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.

Plant and Animal Species,cont.

- Bald eagle: Effects from Wilderness designation would have a beneficial effect on the nesting success and wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.
- Mountain plover: A Wilderness designation would likely reduce prairie dog shooting, thereby increasing the expansion of prairie dog towns which, in turn, enhances mountain plover habitat. Designation would reduce motorized activities that can disturb mountain plovers and destroy their nests.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions. Finally, the mountain plover, which favors areas affected by fire, may be adversely affected due to reduced motorized support in conducting prescribed fires.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Thunder Basin National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: No private subsurface minerals ownership exists in the area.

Existing Contracts and Agreements: This area is permitted under a grazing agreement with the Thunder Basin Grazing Association. The Thunder Basin Grazing Association issues permits to four members who operate ranches that adjoin the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Thunder Basin National Grassland.

Effects on Adjacent Lands: Strategies to identify public/private interface boundaries and to educate the public about landownership patterns may be needed. Some control of noxious or exotic plants is currently done in the area and may need to be conducted under a Wilderness designation.

Under a Wilderness designation, vehicles would be used, but only in extreme situations, such as for fire suppression or as specifically authorized in grazing permits and operating plans. A new fire management plan would have to be written should the area be designated.

Cow Creek: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The following are the closest designated Wilderness areas:

- Soldier Creek Wilderness (7,810 acres) in the Pine Ridge of Nebraska about 85 miles to the southeast. Represents a wheatgrass-needlegrass-ponderosa pine ecosystem.
- Black Elk Wilderness (9,824 acres) in the Black Hills about 115 miles to the northeast. Represents a ponderosa pine ecosystem.
- Cloud Peak Wilderness (189,039 acres) about 125 miles to the northwest in the Big Horn Mountains. Represents an alpine ecosystem.

Representation of Landforms and Ecosystems: This area represents a fairly complete mixed-grass prairie ecosystem from the lower-elevation grassland and sagebrush flats and cottonwood-lined drainages to the pine and juniper around the bluffs and buttes.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: The area is very sparsely populated. Douglas, with a population of about 6,000 and about 45 miles to the southwest, is the closest area of any significant population. More people may visit the Cow Creek area under a Wilderness designation. Opposition to designation may be anticipated from the local livestock industry. Proponents may include the Sierra Club and other Wilderness and environmental advocacy groups as well as local tourism and chamber of commerce associations.

Cow Creek: Environmental Consequences

Management Prescription Allocations by Alternative:

	Forest Service Inventoried Roadless Acres		Public Proposed Wilderness Acres
Alternative 2:	MA 5.12	10,960 acres	6,540 acres
Alternative 3:	MA 2.1	8,980 acres	5,200 acres
	MA 3.65	1,980 acres	1,350 acres
Alternative 4:	MA 1.2	10,960 acres	6,540 acres
Alternative 5:	MA 1.2	8,980 acres	5,610 acres
	MA 6.1	1,980 acres	930 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended for Wilderness

Alternatives: 3, 4, and 5

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized. Oil and gas facilities could be present.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the primitive character of the area. The area has high oil and gas potential and is leased. Part of the area is leased with stipulations prohibiting surface occupancy but the leases in the western portion allow surface oil and gas developments. Valid outstanding mineral rights would be honored.

Economic and Social Effects Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased, while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation, and hunting would no longer be able to do so. Opportunities for those desiring walk-in hunting would increase. Some interpretive opportunities would be forgone. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be retained unless outstanding minerals were developed. If outstanding mineral rights were developed, the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely. New leases requiring no surface occupancy would make oil and gas development more difficult and expensive. If the area is withdrawn from leasing oil and gas development would be forgone

Designation: Non-wilderness

Prescription: MA 2.1, Special Interest Areas

Alternatives: 3

Environmental Consequences: Vegetation, terrestrial and aquatic habitats would usually but not always appear natural. There would be some evidence of vegetative manipulation. Past human use, such as fences, trails, water developments, and primitive roads, would be evident. The natural appearance is broken in portions by rectangular, hand planted, conifer forest blocks of trees. Opportunities for isolation and solitude in a motorized setting would be available. At various times wildlife would be disturbed by human activities. There would be an opportunity for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources. Livestock and livestock facilities would be apparent.

Mitigation Measures: Motorized travel would be restricted to designated routes to protect the special values of the area. Livestock grazing and recreation use would be restricted if it hinders achievement of the desired condition for the SIA. Roads not necessary for administrative, scientific, or valid private access would be closed or obliterated. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act

Economic and Social Effects: Opportunities for recreation, interpretation, and educational activities would be increased. The need to provide good public access for recreation, interpretation, and educational opportunities would increase. If better access were provided, the challenge to protect the special features of the area would increase. Opportunities for those desiring solitude and isolation would still exist but would be less than in a nonmotorized designation. Those desiring motorized opportunities would be limited and off-road vehicle opportunities would be forgone. Those accustomed to accessing the area by vehicle would continue to have limited access. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be substantially retained.

Designation: Non-wilderness

Prescription: MA 3.65, Rangelands with Diverse Natural- appearing Landscapes

Alternatives: 3

Environmental Consequences: Vegetation, terrestrial, and aquatic habitats would usually, but not always, appear natural. There would be some evidence of vegetative manipulation to maintain and restore high levels of plant and animal diversity, and ecological processes and function. Past human use, such as fences, trails, water developments, and primitive roads, would be evident but would decrease over time. Opportunities for isolation and solitude in a motorized setting would be available. There would be an opportunity for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources. Livestock grazing would occur periodically to meet management objectives. Oil and gas facilities could be present.

Mitigation Measures: The area would be managed for long-term increase in pasture size and for no net gain of fences, water developments, and roads. The area has high oil and gas potential and is leased. Part of the area is leased with stipulations prohibiting surface occupancy but the leases in the western portion allow surface oil and gas developments. Valid outstanding mineral rights would be honored and new leasing would be allowed.

Economic and Social Effects: The area would continue to provide approximately the same mix of economic and social benefits as present. Both motorized and nonmotorized opportunities would be available. Livestock grazing would continue with limited restrictions on improvements. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area likely would be retained unless minerals were developed. If mineral development occurs, the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 5.12

Alternatives: 3

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be evident. Open meadows, grasslands, shrublands, and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available. Oil and gas facilities could be present.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, mineral development, and other features would be allowed. The area would be managed for a balance of sustainable physical, biological, and scenic values associated with woody vegetation and open grassland. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually, while at the same time, opportunities for nonmotorized activities would be reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing and oil and gas exploration and development would likely remain the primary economic activities. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character would be lost through time and perhaps permanently lost making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternative: 5

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be apparent. Open meadows, grasslands, shrublands, and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available. Oil and gas facilities could be present.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, mineral developments, and other features would be allowed. The area would be managed for a diversity of plants, animals, and ecological functions and processes, while providing livestock forage and other amenity values. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while at the same time opportunities for nonmotorized activities would be reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing and mineral development would remain the primary economic activities. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character could be lost through time and perhaps permanently lost making future wilderness designation unlikely.

Downs (Public Proposed): An Overview of the Affected Environment

The 6,510-acre Downs area is located about 31 miles northeast of Douglas, Wyoming, and about nine miles southeast of Bill, Wyoming. Specifically, the Downs area is located, either partly or fully, in: T. 37 N., R. 68 W., Sections 5, 7-10, 14-15, 17-21, 23 and 28. Access to the area from Douglas is via State Highway 59 for 35 miles north to Bill, then east on Converse County Road 38 for three miles to Forest Development Road 958, then for five miles east on Forest Development Road 958, to a private road for three miles south. Currently, no public rights-of-way exist into the Downs area.

The Downs area lies within the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division as identified by Robert G. Bailey (71). This area lies within an unglaciated portion of the Missouri Basin, and is characterized by open country of rolling to undulating hills, rocky escarpments and buttes, dissected with incised drainages flowing mostly to the east and south. The Downs area is an outstanding area of badlands formed in the Lebo Shale Member of the Fort Union Formation. Its canyons and rugged badlands are unique to the Thunder Basin National Grassland. The elevation of the area is about 4,800 feet above sea level.

This area is a mixed-grass prairie, blended with sagebrush, cactus, and some greasewood. The landscape has a high degree of patchiness due to the substrate. Many shrubland communities occur in the area. Outstanding among these are patches of the birdsfoot sagebrush community. This uncommon community type grows only on specialized clay and shale exposures. Wildlife includes prairie dogs, pronghorn antelope, mule and white-tailed deer, grassland birds, raptors, reptiles, and amphibians.

Livestock and hunting are the two most frequent activities; however, public access for hunting opportunities is very limited.

Downs: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are very high. The area is remote, with a rolling topography. Currently, public access is very limited. Should public access be acquired, opportunities for solitude and serenity would remain high, based on the remote nature of this area.

Natural Appearance: Some stock dams and some capped oil and gas wells are visible. A couple miles of native-surfaced road exist; however, the area contains only a minimal amount of two-track travelways. Two interior fences exist in the area. Overall, this area does appear natural, with relatively few indications of human presence. Fourteen ponds are found in the area. This area has to be considered a high-quality grassland. The vegetative integrity is high. However, some changes have occurred over time, including the limited establishment of some exotic plants and noxious weeds.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Thunder Basin National Grassland.

Recreation Opportunities: Although opportunities exist for such activities as hunting and hiking across an isolated grassland area, the lack of public access greatly reduces the actual recreational use of the area. Some rock hounding opportunities exist in the area, especially for the personal collection of crystallized gypsum. Under a Wilderness designation, hunting would be permitted on a walk-in basis only. Any motorized activities, including off-highway motorized recreation, would be prohibited; however, motorized use may be authorized to livestock permittees in order that they can manage their grazing interests. Designation may also increase the potential for outfitting into the area, including hiking, hunting, and horseback riding.

Special Features

Unique Characteristics and Scenic Features: Viewsheds include scenic grasslands on a rolling terrain. The Cow Creek Buttes can be seen to the northeast, and the Laramie Mountains can be viewed to the south. Crystallized gypsum exists in the area and is unique. Fossils found in Fort Union Formation deposits represent the Paleocene (65 to 45 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Thunder Basin National Grassland.

Manageability

Size and Shape: The 6,510-acre Downs area is more or less rectangular. It is about four miles wide east to west and three miles long north to south. One inholding (state school land) of 160 acres exists within the area.

Potential to Manage Boundaries: The potential to fully manage this area hinges upon gaining public rights-of-way into the area. Currently, a private landowner controls access. The potential to manage the area and its boundaries would be high given public access. Exterior boundaries would have to be surveyed and signed to identify the Downs area as a Wilderness area. The two interior fences would require minimal annual maintenance. A Wilderness management plan would have to be developed to address such topics as trails, signing, interpretation, and motorized access by grazing permittees.

Downs: Availability Analyses

Resource Values and Potentials

Oil and Gas: Oil and gas potential for the area is rated as moderate.

Coal: This area is outside of moderate to high potential for coal development as defined by Bureau of Land Management specialists.

Livestock Grazing: Livestock grazing has been the dominant use of the area since the late 1800s. Livestock grazing would continue under a Wilderness designation but would be continued as a compatible land use with Wilderness. Adjustments in allotment management plans would be made to meet Wilderness objectives. Portions of two allotments exist in the area.

Locatable Minerals: A significant amount of uranium exists in the Downs area; however, the potential for development is low.

Common Minerals: Some scoria is found in the area, but the potential for commercial development is very low.

Timber: No suitable timber resources exist in the area.

Recreation: Recreational activities would likely increase should public access into the Downs area be acquired. Under Wilderness, walk-in hunting would likely increase, as would hiking and nature study.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Ute ladies-tresses: Effects from Wilderness designation would be beneficial due to the reduction in mortality caused by motorized or mechanized vehicles and equipment, restrictions that accompany Wilderness designations.
- Peregrine falcon: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on the nesting success and wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.
- Mountain plover: A Wilderness designation would likely reduce prairie dog shooting, thereby increasing the expansion of prairie dog towns which, in turn, enhances mountain plover habitat. Designation would reduce motorized activities that can disturb mountain plovers and destroy their nests.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions. Finally, the mountain plover, which favors areas affected by fire, may be adversely affected due to reduced motorized support in conducting prescribed fires.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Thunder Basin National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: No private subsurface minerals ownership exists in the area.

Existing Contracts and Agreements: The Thunder Basin Grazing Association holds an agreement for livestock grazing in the Downs area. Two association members are issued permits to grazing livestock in the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Thunder Basin National Grassland.

Effects on Adjacent Lands: The Downs area is completely surrounded by private land. Should public access be gained into the area, and should the Downs area become a designated Wilderness, the potential for visitors to trespass onto private lands would increase. Adequate signing of the boundary, however, could reduce this potential.

Downs: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The following are the closest designated Wilderness areas:

- Soldier Creek Wilderness (7,810 acres) in the Pine Ridge of Nebraska about 70 miles to the southeast. Represents a wheatgrass-needlegrass-ponderosa pine ecosystem.
- Black Elk Wilderness (9,824 acres) in the Black Hills about 125 miles to the northeast. Represents a ponderosa pine ecosystem.
- Cloud Peak Wilderness (189,039 acres) about 135 miles to the northwest in the Big Horn Mountains. Represents an alpine ecosystem.

Representation of Landforms and Ecosystems: The Downs area is representative of a mixed-grass prairie. It represents a mostly rolling grassland terrain that is highly dissected by gullies and draws.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: The area is very sparsely populated. Douglas, with a population of about 6,000 and about 43 miles to the southwest, is the closest area of any significant population. More people may visit the Downs area under a Wilderness designation; however, additional visitation may only occur if public access into the area is secured. Opposition to designation may be anticipated from the local livestock industry. Proponents may include the Sierra Club and other Wilderness advocacy and environmental groups and local tourism and chamber of commerce associations.

Downs: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 5.12	6,510 acres
Alternative 3:	MA 1.31	6,510 acres
Alternative 4:	MA 1.2	6,510 acres
Alternative 5:	MA 1.31	6,510 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended for Wilderness

Alternatives: 4

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized. Oil and gas facilities could be present.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the primitive to semi-primitive character of the area. The area has high oil and gas potential and is leased. Part of the area is leased with stipulations prohibiting surface occupancy but the leases in the western portion allow surface oil and gas developments. Valid outstanding mineral rights would be honored.

Economic and Social Effects Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be retained unless outstanding minerals were developed. If outstanding mineral rights were developed, the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely. New leases requiring no surface occupancy would make oil and gas development more difficult and expensive. If the area is withdrawn from leasing oil and gas development would be forgone.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 3 and 5

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized. Oil and gas facilities could be present.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the semi-primitive character of the area. The area has high oil and gas potential and is leased. Part of the area is leased with stipulations prohibiting surface occupancy, but the leases in the western portion allow surface oil and gas developments. Valid outstanding mineral rights would be honored.

Economic and Social Effects Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Livestock

grazing would likely remain the primary economic benefit from the area. The semi-primitive character of the area would be retained unless outstanding minerals were developed. If outstanding mineral rights were developed, the semi-primitive character of the development area could be altered making future wilderness designation unlikely. New leases requiring no surface occupancy would make oil and gas development more difficult and expensive. If the area were withdrawn from leasing, oil and gas development would be forgone.

Designation: Non-wilderness

Prescription: MA 5.12

Alternatives: 2

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be evident. Open meadows, grasslands, shrublands, and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available. Oil and gas facilities could be present.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, mineral development, and other features would be allowed. The area would be managed for a balance of sustainable physical, biological, and scenic values associated with woody vegetation and open grassland. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while, at the same time opportunities for nonmotorized activities would be reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing and oil and gas exploration and development would likely remain the primary economic activities. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character would be lost through time and perhaps permanently lost making future wilderness designation unlikely.

Duck Creek (Public Proposed): An Overview of the Affected Environment

The 12,330-acre Duck Creek area is located about 30 miles northeast of Gillette, Wyoming, and about five miles northeast of Weston, Wyoming. Specifically, Duck Creek is located, either partly or fully, in: T. 55 N., R. 70 W., Sections 12-13 and 24, and T. 55 N., R. 69 W., Sections 7, 13-15, 17-26 and 28-33, and T. 55 N., R. 68 W., Section 19, and T. 54 N., R. 69 W., Section 4-5. Access into the area from Gillette is via State Highway 59 for 31 miles north, then nine miles east on Campbell County Road 49, then one mile north on Forest Development Road 903.

The Duck Creek area lies within the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division as identified by Robert G. Bailey (71). This area lies within an unglaciated portion of the Missouri Basin and is characterized by grassy lowlands, woody draws, rolling hills, rocky shale and limestone escarpments, and mesas. The elevation of the area is about 4,600 feet above sea level.

This area is representative of a mixed-grass prairie ecosystem at the lower elevations, rising to pine-covered mesas. Vegetation includes little bluestem grasslands, patches of sagebrush steppe, several kinds of shrublands, including greasewood, ponderosa pine woodlands, and Rocky Mountain juniper. Wildlife includes prairie dogs, pronghorn antelope, mule and white-tailed deer, sage grouse, grassland birds, raptors, reptiles, and amphibians.

Livestock grazing and hunting are the two most frequent activities in the area.

Duck Creek: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are high. Visitors can get tucked away in the rolling terrain or can isolate themselves atop the ridges and mesas. The sparse population of the area and infrequent visitation into Duck Creek provide a remote and undisturbed experience.

Natural Appearance: The landscape in this area appears quite natural, although a fair amount of off-highway motorized recreation occurs, creating several two-track trails. Thirty-four ponds and 14 water points, including windmills, are found in the area. One water pipeline with four water tanks exist in the area, as do several power lines and some oil and gas pipeline. The vegetative integrity in this area is excellent, although some exotic plants and noxious weeds have established themselves.

Challenge: Please refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Thunder Basin National Grassland.

Recreation Opportunities: Opportunities exist for hiking across an isolated grassland area. Currently, hunting pressure in the fall, especially for big game, is relatively high. Under a Wilderness designation, hunting would be permitted on a walk-in basis only. Any motorized activities, including off-highway motorized recreation, would be prohibited; however, livestock permittees may be authorized motorized access in order to allow them to maintain their grazing interests. Designation may also increase the potential for outfitting into the area, including hiking, hunting, and horseback riding.

Special Features

Unique Characteristics and Scenic Features: The pine-covered slopes, ridges and mesas and lowland grasslands are very scenic. Outstanding opportunities for vista views of Devils Tower, about 40 miles to the east and the Missouri Buttes are available. The healthy populations of sage grouse are important.

Fossils found in Fort Union, Lance and Pierre Shale Formation deposits represent the Paleocene, (65 to 45 million years ago) and Late Cretaceous (100 to 65 million years ago) periods.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Thunder Basin National Grassland.

Manageability

Size and Shape: The 12,330-acre Duck Creek area consists more or less of a rectangular chunk of public land set aside a smaller square section. The larger western section is about four miles long north to south and three miles wide east to west. The smaller eastern section is about two miles long north to south and two miles wide east to west. A half-mile wide corridor connects the two sections. No inholdings occur in the area.

Potential to Manage Boundaries: A moderate potential to manage the boundaries exists. Surveys and signing would be completed should the area be designated as a Wilderness. The relatively high number of two-tracks in the area and the substantial amount of private lands immediately surrounding the area would be management challenges.

Duck Creek: Availability Analyses

Resource Values and Potentials

Oil and Gas: Oil and gas potential for the area is rated as high.

Coal: This area is outside of moderate to high potential for coal development as defined by Bureau of Land Management specialists.

Livestock Grazing: Livestock grazing has been the dominant use of the area since the late 1800s. Livestock grazing would continue under a Wilderness designation but would be continued as a compatible land use with Wilderness. Adjustments in allotment management plans would be made to meet Wilderness objectives. Portions of six allotments are located in the area.

Locatable Minerals: No known deposits of locatable minerals are known to exist within the area. No exploration or development is currently occurring in the area.

Common Minerals: No significant amounts of common minerals are known to exist in the area and no current development is occurring.

Timber: No suitable timber base exists in the area; however, a potential for some timber harvests may exist in the Duck Creek area but only as a result of other resource objectives, such as wildlife habitat improvement projects.

Recreation: Recreational activities would likely increase should public access into the Duck Creek area be acquired. Under Wilderness, walk-in hunting would likely increase, as would hiking and nature study. The current recreational off-highway use would be prohibited.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Ute ladies-tresses: Effects from Wilderness designation would be beneficial due to the reduction in mortality caused by motorized or mechanized vehicles and equipment, restrictions that accompany Wilderness designations.
- Peregrine falcon: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.

Plant and Animal Species, cont.

- Bald eagle: Effects from Wilderness designation would have a beneficial effect on the nesting success and wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.
- Mountain plover: A Wilderness designation would likely reduce prairie dog shooting, thereby increasing the expansion of prairie dog towns which, in turn, enhances mountain plover habitat. Designation would reduce motorized activities that can disturb mountain plovers and destroy their nests.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions. Finally, the mountain plover, which favors areas affected by fire, may be adversely affected due to reduced motorized support in conducting prescribed fires.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Thunder Basin National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: No private subsurface minerals ownership exists in the area.

Existing Contracts and Agreements: The Spring Creek Grazing Association holds the permit to graze livestock in the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Thunder Basin National Grassland.

Effects on Adjacent Lands: The Duck Creek area is almost completely surrounded by private land. Should Duck Creek become a designated Wilderness, the potential for visitors to trespass onto private lands from the Duck Creek area would increase. Adequate signing of the boundary, however, could reduce this potential.

Duck Creek: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The following are the closest designated Wilderness areas:

- Soldier Creek Wilderness (7,810 acres) in the Pine Ridge of Nebraska about 150 miles to the southeast. Represents a wheatgrass-needlegrass-ponderosa pine ecosystem.
- Black Elk Wilderness (9,824 acres) in the Black Hills about 120 miles to the southeast. Represents a ponderosa pine ecosystem.
- Cloud Peak Wilderness (189,039 acres) about 100 miles to the west in the Big Horn Mountains. Represents an alpine ecosystem.

Representation of Landforms and Ecosystems: The Duck Creek area is representative of a mixed-grass prairie ecosystem blended with sage, and pine-covered mesas of shale and limestone escarpments.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: The general area is sparsely populated. Gillette, with a population of about 20,000 and about 32 miles to the southwest, is the closest area of any significant population. More people may visit the area under a Wilderness designation. Opposition to designation may be anticipated from the local livestock industry, minerals interests and area motorized recreation associations. Proponents may include the Sierra Club, Wilderness advocacy and other environmental groups and local tourism and chamber of commerce associations.

Duck Creek: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 5.12	12,330 acres
Alternative 3:	MA 3.65	12,330 acres
Alternative 4:	MA 1.2	12,330 acres
Alternative 5:	MA 6.1	12,330 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended for Wilderness

Alternatives: 4

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized. Oil and gas facilities could be present.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the primitive character of the area. The area has high oil and gas potential and is leased. Part of the area is leased with stipulations prohibiting surface occupancy but the leases in the western portion allow surface oil and gas developments. Valid outstanding mineral rights would be honored.

Economic and Social Effects Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be retained unless outstanding minerals were developed. If outstanding mineral rights were developed, the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely. New leases requiring no surface occupancy would make oil and gas development more difficult and expensive. If the area is withdrawn from leasing, oil and gas development would be forgone.

Designation: Non-wilderness

Prescription: MA 3.65, Rangelands with Diverse Natural- appearing Landscapes

Alternatives: 3

Environmental Consequences: Vegetation, terrestrial and aquatic habitats would usually but not always appear natural. There would be some evidence of vegetative manipulation to maintain and restore high levels of plant and animal diversity, and ecological processes and function. Past human use, such as fences, trails, water developments, and primitive roads, would be evident but would decrease over time. Opportunities for isolation and solitude in a motorized setting would be available. There would be an opportunity for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources. Livestock grazing would occur periodically to meet management objectives Oil and gas facilities could be present.

Mitigation Measures: The area would be managed for long term increase in pasture size and for no net gain of fences, water developments and roads. The area has high oil and gas potential and is leased. Part of the area is leased with stipulations prohibiting surface occupancy but the leases in the western portion allow surface oil and gas developments. Valid outstanding mineral rights would be honored and new leasing would be allowed.

Economic and Social Effects: The area would continue to provide approximately the same mix of economic and social benefits as present. Both motorized and nonmotorized opportunities would be available. Livestock grazing would continue with limited restrictions on improvements. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area likely would be retained unless minerals were developed. If mineral development occurs, the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 5.12

Alternatives: 2

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be evident. Open meadows, grasslands, shrublands, and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available. Oil and gas facilities could be present.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, mineral development, and other features would be allowed. The area would be managed for a balance of sustainable physical, biological, and scenic values associated with woody vegetation and open grassland. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while, at the same time opportunities for nonmotorized activities would be reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing and oil and gas exploration and development would likely remain the primary economic activities. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character would be lost through time and perhaps permanently lost making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternative: 5

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be apparent. Open meadows, grasslands, shrublands, and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available. Oil and gas facilities could be present.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, mineral developments and other features would be allowed. The area would be managed for a diversity of plants, animals, and ecological functions and processes, while providing livestock forage and other amenity values. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually, while at the same time, opportunities for nonmotorized activities would be reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing and mineral development would remain the primary economic activities. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character could be lost through time and perhaps permanently lost making future wilderness designation unlikely.

H A Divide: An Overview of the Affected Environment

The 5,060-acre H A Divide is located about 37 miles southeast of Gillette, Wyoming, and about 16 miles east of Wright, Wyoming. Specifically, H A Divide is located, either partly or fully, in: T. 43 N., R. 68 W., Sections 18-20, and T. 43 N., R. 69 W., Sections 1-2, 8-14, 17, 22 and 24. Access from Gillette is south via State Highway 59 for 49 miles, then east 21 miles on State Highway 450, then north three miles on Forest Development Road 930.

The H A Divide area lies within the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division as identified by Robert G. Bailey (71). This area lies within an unglaciated portion of the Missouri Basin. H A Divide is characterized by one large mesa, with color-banded buttes tapering away from the mesa. Side slopes on the mesa and area buttes display shale and limestone escarpments. The elevation of the area is around 4,500 feet above sea level.

The top of the mesa shows ponderosa pine and Rocky Mountain juniper. Side slopes are partially barren. In general, H A Divide is a mixed-grass prairie, blended with sagebrush, limited cottonwood, some greasewood, ponderosa pine and Rocky Mountain juniper. Wildlife includes prairie dogs, pronghorn antelope, mule and white-tailed deer, grassland birds, raptors (including the bald eagle and peregrine falcon), reptiles, and amphibians.

Livestock grazing and hunting are two frequent activities in the area.

H A Divide: Capability Analyses

Environment

Opportunity for Solitude and Serenity: H A Divide provides moderate opportunities for solitude and serenity. Oil and gas developments outside of the area are clearly visible from the top of the mesa, as are coal mining activities, such as Black Thunder Coal Mine, the largest strip mine in North America. No interior fences are found in the area, although several medium-standard roads jut into H A Divide.

Natural Appearance and Integrity: H A Divide is moderately natural in appearance, a consequence of the adjacent minerals activities visible from the area. Most of the ecological processes, including seasonal flash flooding, remain intact. Signs of livestock grazing are evident. Cattle can be found in the area intermittently throughout the year. The vegetative integrity of the area is high. The biggest impact upon the vegetation is livestock grazing. Two-track roads, windmills, and stock tanks exist. Ponderosa pine may be expanding due to fire suppression. Six ponds and three water points are found in the area.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Thunder Basin National Grassland.

Recreation Opportunities: Hiking is available year-round. H A Divide is a destination for those engaged in off-road motorized recreation. Others drive into the area to gain vista points at the top of the mesa where the surrounding grassland can be viewed. Hunting occurs in the fall. Some camping probably takes place.

Special Features

Unique Characteristics and Scenic Features: The large mesa may be the most unique characteristic in Ha Divide. The ponderosa pine and scenic vistas provide excellent opportunities to view the surrounding countryside. Fossils found in Fort Union deposits represent the Paleocene (65 to 45 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Thunder Basin National Grassland.

Manageability

Size and Shape: The 5,060-acre H A Divide area is very irregular in shape. Generally, H A Divide is linear, with three prongs jutting into adjacent landownership. The area is about five miles wide east to west and two miles long north to south. One private inholding of about 180 acres exists in the area.

Potential to Manage Boundaries: The irregular shape and lengthy boundaries provide only a low potential to successfully manage the area's boundaries. Boundaries would have to be surveyed and posted. The current high use of the area for off-road motorized recreation would pose a law enforcement challenge should the area be designated as a Wilderness.

H A Divide: Availability Analyses

Resource Values and Potentials

Oil and Gas: Two buried pipelines exist in the area. Oil and gas potential for the area is rated as high.

Coal: This area is outside of moderate to high potential for coal development as defined by Bureau of Land Management specialists.

Livestock Grazing: Livestock grazing has been the dominant use of the area since the late 1800s. Livestock grazing would continue under a Wilderness designation, but would be continued as a compatible land use with Wilderness. Adjustments in allotment management plans would be made to meet Wilderness objectives. One allotment exists in the area.

Locatable Minerals: No known locatable minerals exist in the area.

Common Minerals: Scoria exists in the area, but does not offer many commercial opportunities at the present time.

Timber: The area provides no suitable timber acres; however, a potential for some harvest of ponderosa pine may exist in support of wildlife habitat projects.

Recreation: Nonmotorized recreation might increase should the area be designated as a Wilderness; however, motorized recreation would decrease since motorized recreation would be prohibited. Under Wilderness, walk-in hunting would likely increase, as would hiking and nature study.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Ute ladies-tresses: Effects from Wilderness designation would be beneficial due to the reduction in mortality caused by motorized or mechanized vehicles and equipment, restrictions that accompany Wilderness designations.
- Peregrine falcon: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on the nesting success and wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.
- Mountain plover: A Wilderness designation would likely reduce prairie dog shooting, thereby increasing the expansion of prairie dog towns which, in turn, enhances mountain plover habitat. Designation would reduce motorized activities that can disturb mountain plovers and destroy their nests.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions. Finally, the mountain plover, which favors areas affected by fire, may be adversely affected due to reduced motorized support in conducting prescribed fires.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Thunder Basin National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: No private subsurface minerals ownership exists in the area.

Existing Contracts and Agreements: The Thunder Basin Grazing Association holds the grazing agreement to the area. The Thunder Basin Grazing Association issues a grazing permit to one member who utilizes the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Thunder Basin National Grassland.

Effects on Adjacent Lands: H A Divide is partially surrounded by private land. Should H A Divide become a designated Wilderness, the potential for visitors to trespass onto private lands from H A Divide will increase. Adequate signing of the boundary, however, could reduce this potential.

H A Divide: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The following are the closest designated Wilderness areas:

- Soldier Creek Wilderness (7,810 acres) in the Pine Ridge of Nebraska about 110 miles to the southeast. Represents a wheatgrass-needlegrass-ponderosa pine ecosystem.
- Black Elk Wilderness (9,824 acres) in the Black Hills about 90 miles to the east. Represents a ponderosa pine ecosystem.
- Cloud Peak Wilderness (189,039 acres) about 100 miles to the northwest in the Big Horn Mountains. Represents an alpine ecosystem.

Representation of Ecosystems and Landforms: The area is represented by a pine-covered mesa, with mixed-grass prairie and badlands topography.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit from a designation.

Public Interests and Concerns: The general area is sparsely populated. Wright, Wyoming, with a population of about 2,000, is about 20 miles west of the area. Gillette, with a population of about 20,000, is about 37 miles to the northwest. More people may visit the area under a Wilderness designation. Opposition to designation may be anticipated from the local livestock industry and area motorized recreation associations. Proponents may include the Sierra Club and local tourism and chamber of commerce associations.

H A Divide: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 5.12	5,060 acres
Alternative 3:	MA 3.65	5,060 acres
Alternative 4:	MA 1.2	5,060 acres
Alternative 5:	MA 6.1	5,060 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended for Wilderness

Alternatives: 4

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized. Oil and gas facilities could be present.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the primitive character of the area. The area has high oil and gas potential and is leased. Part of the area is leased with stipulations prohibiting surface occupancy, but the leases in the western portion allow surface oil and gas developments. Valid outstanding mineral rights would be honored.

Economic and Social Effects Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be retained unless outstanding minerals were developed. If outstanding mineral rights were developed, the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely. New leases requiring no surface occupancy would make oil and gas development more difficult and expensive. If the area is withdrawn from leasing, oil and gas development would be forgone.

Designation: Non-wilderness

Prescription: MA 3.65, Rangelands with Diverse Natural- appearing Landscapes

Alternatives: 3

Environmental Consequences: Vegetation, terrestrial and aquatic habitats would usually but not always appear natural. There would be some evidence of vegetative manipulation to maintain and restore high levels of plant and animal diversity, and ecological processes and function. Past human use, such as fences, trails, water developments, and primitive roads, would be evident but would decrease over time. Opportunities for isolation and solitude in a motorized setting would be available. There would be an opportunity for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources. Livestock grazing would occur periodically to meet management objectives Oil and gas facilities could be present.

Mitigation Measures: The area would be managed for long term increase in pasture size and for no net gain of fences, water developments and roads. The area has high oil and gas potential and is leased. Part of the area is leased with stipulations prohibiting surface occupancy but the leases in the western portion allow surface oil and gas developments. Valid outstanding mineral rights would be honored and new leasing would be allowed.

Economic and Social Effects: The area would continue to provide approximately the same mix of economic and social benefits as present. Both motorized and nonmotorized opportunities would be available. Livestock grazing would continue with limited restrictions on improvements. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area likely would be retained unless minerals were developed. If mineral development occurs, the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 5.12

Alternatives: 2

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be evident. Open meadows, grasslands, shrublands, and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available. Oil and gas facilities could be present.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, mineral development, and other features would be allowed. The area would be managed for a balance of sustainable physical, biological, and scenic values associated with woody vegetation and open grassland. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while, at the same time opportunities for nonmotorized activities would be reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing and oil and gas exploration and development would likely remain the primary economic activities. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character would be lost through time and perhaps permanently lost making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternative: 5

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be apparent. Open meadows, grasslands, shrublands, and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available. Oil and gas facilities could be present.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, mineral developments and other features would be allowed. The area would be managed for a diversity of plants, animals, and ecological functions and processes, while providing livestock forage and other amenity values. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while at the same time opportunities for nonmotorized activities would be reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing and mineral development would remain the primary economic activities. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character could be lost through time and perhaps permanently lost making future wilderness designation unlikely.

Miller Hills (Public Proposed): An Overview of the Affected Environment

The 10,370-acre Miller Hills is located about 50 miles northeast of Douglas, Wyoming, and about 19 miles northeast of Bill, Wyoming. Specifically, the Miller Hills is found, either partly or fully, in: T. 39 N., R. 67 W., Sections 4-9, 17 and 19, and T. 39 N., R. 68 W., Sections 1-4, 9-15, and 23-24. Access from Douglas is north on State Highway 59 for 37 miles to Bill, then east on Forest Development Road 38 for 10 miles, then east on Converse County Road 45 for eight miles, then north on a private road for two miles. There is no motorized public access into the Miller Hills, although people can hike into the area from National Forest System lands to the west.

The Miller Hills area lies within the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division as identified by Robert G. Bailey (71). This area lies within an unglaciated portion of the Missouri Basin and is characterized by rolling hills and badlands rising into shale and sandstone escarpments and flat-topped mesas. The Miller Hills, with its scoria buttes and remnant sandstone, are an island of woodland communities. The elevation of the area is around 4,800 feet above sea level.

This area is a mixed-grass prairie, blended with sagebrush, cottonwood, greasewood, ponderosa pine, and Rocky Mountain juniper. Shrublands are found in the canyons on the north side of the Miller Hills around the base of the elevated plateau. The woodlands provide important habitat for bald eagle winter roosts. Wildlife includes prairie dogs, pronghorn antelope, mule and white-tailed deer, grassland birds, raptors, reptiles, and amphibians.

Miller Hills: Capability Analyses

Environment

Opportunity for Solitude and Serenity: The Miller Hills provide very high opportunities for solitude and serenity, because of the area's rugged terrain, remote location, and lack of public access into the area.

Natural Appearance and Integrity: The area is moderately natural in appearance due to the fairly obvious intrusion of people over the years. Numerous windmills, ponds, and stock tanks are located in the area. Some historical dry-land farming occurred just north of the Miller Hills. An extensive network of two-track roads exists in the area, as do five interior fencelines. The vegetative integrity is quite high, although some exotic and noxious plants can be found. Twenty-one ponds and nine water points are located in the area.

Challenge: Please refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Thunder Basin National Grassland.

Recreation Opportunities: Hunting comprises the majority of recreation in the area; however, all recreational activities are limited presently due to the lack of public access to the Miller Hills. Should public access be gained in the future, a whole host of recreational activities could be had, including hiking, nature study, camping, and birdwatching.

Special Features

Unique Characteristics and Scenic Features: Although the Miller Hills area doesn't provide spectacular scenery, the area does offer nice scenery, including rather barren prairie badlands, some rugged topography, and some scattered timber, including ponderosa pine and Rocky Mountain juniper. Important habitat for bald eagle winter roost sites is located in the Miller Hills. Fossils found in Fort Union Formation deposits represent the Paleocene (65 to 45 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Thunder Basin National Grassland.

Manageability

Size and Shape: The 10,370-acre Miller Hills area is more or less rectangular in shape, with one private inholding of about 40 acres. The Miller Hills area is about five miles wide east to west and three miles long north to south.

Potential to Manage Boundaries: The potential to fully manage this area hinges largely upon gaining public rights-of-way into the area. Currently, private landowners control motorized access. The potential to manage the area and its boundaries would be high given improved public access. Exterior boundaries would have to be surveyed and signed to identify the Miller Hills as a Wilderness area. The five interior fences would require minimal annual maintenance. A Wilderness management plan would have to be written to address such topics as trails, signing, interpretation, and the authorization for grazing permittees to use motorized means to access their grazing interests.

Miller Hills: Availability Analyses

Resource Values and Potentials

Oil and Gas: Oil and gas potential for the area is rated as high.

Coal: This area is outside of moderate to high potential for coal development as defined by Bureau of Land Management specialists.

Livestock Grazing: Livestock grazing has been the dominant use of the area since the late 1800s. Livestock grazing would continue under a Wilderness designation, but would be continued as a compatible land use with Wilderness. Adjustments in allotment management plans would be made to meet Wilderness objectives. Portions of four allotments exist in the area.

Locatable Minerals: Some uranium deposits are known to exist in the area.

Common Minerals: Some scoria exists in the area, but development of this common mineral is not considered economically feasible.

Timber: No suitable commercial timber exists in the area.

Recreation: Nonmotorized recreation might increase should the area be designated as a Wilderness; however, motorized recreation would be prohibited. Grazing permittees may be allowed to use motorized means to access their grazing interests. Under Wilderness, walk-in hunting would likely increase, as would hiking and nature study.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Ute ladies-tresses: Effects from Wilderness designation would be beneficial due to the reduction in mortality caused by motorized or mechanized vehicles and equipment, restrictions that accompany Wilderness designations.
- Peregrine falcon: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on the nesting success and wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.
- Black-footed ferret: Black-footed ferrets do not currently occupy the area but it is suitable reintroduction habitat. Effects from Wilderness designation would be both beneficial and adverse. Beneficial effects result from the reduced human disturbances and reduced potential mortality due to motorized vehicles. In addition, ferrets would benefit from the significant reduction in prairie dog shooters, who would lose motorized access to prairie dog towns in a Wilderness area. Adverse effects result from restrictions on the motorized support to aid in ferret reintroduction projects. Ferrets may be targeted for reintroduction projects in the future in several areas on the Northern Great Plains, including this area.
- Mountain plover: A Wilderness designation would likely reduce prairie dog shooting, thereby increasing the expansion of prairie dog towns which, in turn, enhances mountain plover habitat. Designation would reduce motorized activities that can disturb mountain plovers and destroy their nests.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions. Finally, the mountain plover, which favors areas affected by fire, may be adversely affected due to reduced motorized support in conducting prescribed fires.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Thunder Basin National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: No private subsurface minerals ownership exists in the area.

Existing Contracts and Agreements: The Thunder Basin Grazing Association holds the livestock grazing agreement to the area. Grazing permits have been issued to four association members who graze livestock in the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Thunder Basin National Grassland.

Effects on Adjacent Lands: Miller Hills is partially surrounded by private land. Should Miller Hills become a designated Wilderness, the potential for visitors to trespass onto private lands from Miller Hills would probably increase. Adequate signing of the boundary, however, could reduce this potential.

Miller Hills: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The following are the closest designated Wilderness areas:

- Soldier Creek Wilderness (7,810 acres) in the Pine Ridge of Nebraska about 85 miles to the southeast. Represents a wheatgrass-needlegrass-ponderosa pine ecosystem.
- Black Elk Wilderness (9,824 acres) in the Black Hills about 90 miles to the east. Represents a ponderosa pine ecosystem.
- Cloud Peak Wilderness (189,039 acres) about 130 miles to the northwest in the Big Horn Mountains. Represents an alpine ecosystem.

Representation of Landforms and Ecosystems: The area consists of mixed-grass badlands prairie and mesa escarpment.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. A Wilderness designation may impede any future reintroductions of the black-footed ferret into the area. Most other key species probably would benefit from a designation.

Public Interests and Concerns: The general area is sparsely populated. Douglas, with a population of about 6,000 and about 53 miles to the southwest, is the closest area of any significant population. More people may visit the area under a Wilderness designation. Opposition to designation may be anticipated from the local livestock industry and area motorized recreation associations. Proponents may include the Sierra Club and local tourism and chamber of commerce associations.

Miller Hills: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 5.12	10,370 acres
Alternative 3:	MA 3.65	10,370 acres
Alternative 4:	MA 1.2	10,370 acres
Alternative 5:	MA 6.1	10,370 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended for Wilderness

Alternatives: 4

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized. Oil and gas facilities could be present.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the primitive character of the area. The area has high oil and gas potential and is leased. Part of the area is leased with stipulations prohibiting surface occupancy but the leases in the western portion allow surface oil and gas developments. Valid outstanding mineral rights would be honored.

Economic and Social Effects Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be retained unless outstanding minerals were developed. If outstanding mineral rights were developed, the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely. New leases requiring no surface occupancy would make oil and gas development more difficult and expensive. If the area is withdrawn from leasing, oil and gas development would be forgone.

Designation: Non-wilderness

Prescription: MA 3.65, Rangelands with Diverse Natural- appearing Landscapes

Alternatives: 3

Environmental Consequences: Vegetation, terrestrial and aquatic habitats would usually but not always appear natural. There would be some evidence of vegetative manipulation to maintain and restore high levels of plant and animal diversity, and ecological processes and function. Past human use, such as fences, trails, water developments, and primitive roads, would be evident but would decrease over time. Opportunities for isolation and solitude in a motorized setting would be available. There would be an opportunity for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources. Livestock grazing would occur periodically to meet management objectives Oil and gas facilities could be present.

Mitigation Measures: The area would be managed for long-term increase in pasture size and for no net gain of fences, water developments and roads. The area has high oil and gas potential and is leased. Part of the area is leased with stipulations prohibiting surface occupancy but the leases in the western portion allow surface oil and gas developments. Valid outstanding mineral rights would be honored and new leasing would be allowed.

Economic and Social Effects: The area would continue to provide approximately the same mix of economic and social benefits as present. Both motorized and nonmotorized opportunities would be available. Livestock grazing would continue with limited restrictions on improvements. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area likely would be retained unless minerals were developed. If mineral development occurs, the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 5.12

Alternatives: 2

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be evident. Open meadows, grasslands, shrub lands and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available. Oil and gas facilities could be present.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, mineral development, and other features would be allowed. The area would be managed for a balance of sustainable physical, biological, and scenic values associated with woody vegetation and open grassland. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while, at the same time opportunities for nonmotorized activities would be reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing and oil and gas exploration and development would likely remain the primary economic activities. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character would be lost through time and perhaps permanently lost making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternative: 5

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be apparent. Open meadows, grasslands, shrublands, and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available. Oil and gas facilities could be present.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, mineral developments and other features would be allowed. The area would be managed for a diversity of plants, animals, and ecological functions and processes, while providing livestock forage and other amenity values. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while at the same time opportunities for nonmotorized activities would be reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing and mineral development would remain the primary economic activities. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character could be lost through time and perhaps permanently lost making future wilderness designation unlikely.

Red Hills: An Overview of the Affected Environment

The 6,840-acre Red Hills area is located about 42 miles north of Douglas, Wyoming, and about 10 miles north of Bill, Wyoming. Specifically, the Red Hills area is found, either partly or fully, in: T. 40 N., R. 70 W., Sections 11-15, 20-29 and 32-35. Access from Douglas is north via State Highway 59 for 48 miles, then five miles east on Forest Development Road 942. The area is directly east of Forest Development Road 942.

The Red Hills area lies within the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division as identified by Robert G. Bailey (71). This area lies within an unglaciated portion of the Missouri Basin and is characterized by rolling sage- and grass-covered hills, red scoria escarpments and buttes, dissected by mostly easterly flowing drainages. The area's elevation is between about 4,800 feet and 5,000 feet above sea level. The Red Hills area is a visible landmark on the grassland.

This area is a mixed-grass prairie, blended with sagebrush, cottonwood, greasewood, ponderosa pine, and Rocky Mountain juniper. Wildlife includes prairie dogs, pronghorn antelope, mule and white-tailed deer, grassland birds, raptors, reptiles, and amphibians.

Red Hills: Capability Analyses

Environment

Opportunity for Solitude and Serenity: The Red Hills area offers very high opportunities for solitude and serenity, particularly because of the rugged terrain and remote nature of its location. The lack of two-track roads into the area and the highly incised drainages offer the visitor the opportunity to disappear into the topography.

Natural Appearance and Integrity: This area is highly natural in appearance. Some stock ponds, occasional windmills and two-tracks exist, but they do not overly intrude upon the landscape. No interior fences exist in the area. The vegetative integrity of the area is high, although some changes have occurred over time, including the establishment of some exotic plants and noxious weeds. The biggest impact upon the vegetation is livestock grazing. Seven ponds and two water points are located in the area.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Thunder Basin National Grassland.

Recreation Opportunities: Opportunities for recreation in the Red Hills are high, including hunting, hiking, some camping, viewing scenery and wildlife, nature study, and off-road motorized recreation.

Special Features

Unique Characteristics and Scenic Features: The Red Hills area, so named for the many reddened scoria slopes found in the area, is very scenic. The area is rich in plant and animal diversity, including frequent use by elk. The surrounding countryside can be viewed from many of the higher bluffs. Fossils found in Fort Union Formation deposits represent the Paleocene (65 to 45 million years ago) period.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Thunder Basin National Grassland.

Manageability

Size and Shape: The 6,840-acre Red Hills area is more or less oblong in shape. One private inholding of about 480 acres exists. The Red Hills area is about four miles wide east to west and four miles long north to south.

Potential to Manage Boundaries: The area's boundaries would be fairly easy to sign since much of the boundary follows roads or natural topographic features. Surveys and posting would be required under a Wilderness designation. Since no interior fences exist, no maintenance would be required. A Wilderness management plan would have to be written.

Red Hills: Availability Analyses

Resource Values and Potentials

Oil and Gas: Oil and gas potential for the area is rated as high.

Coal: This area is outside of moderate to high potential for coal development as defined by Bureau of Land Management specialists.

Livestock Grazing: Livestock grazing has been the dominant use of the area since the late 1800s. Livestock grazing would continue under a Wilderness designation but would be continued as a compatible land use with Wilderness. Adjustments in allotment management plans would be made to meet Wilderness objectives. A portion of one allotment exists in the area.

Locatable Minerals: Uranium is known to exist in the area.

Common Minerals: A great deal of scoria exists in the area, but its potential to be developed for commercial purposes is low.

Timber: The Red Hills area is not suitable for timber harvesting.

Recreation: Nonmotorized recreation might increase should the area be designated as a Wilderness, but motorized recreation would be prohibited. Under Wilderness, walk-in hunting would likely increase, as would hiking and nature study.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Ute ladies-tresses: Effects from Wilderness designation would be beneficial due to the reduction in mortality caused by motorized or mechanized vehicles and equipment, restrictions that accompany Wilderness designations.

Plant and Animal Species, cont.

- Peregrine falcon: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on the nesting success and wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.
- Black-footed ferret: The area is currently potential black-footed ferret reintroduction habitat. Effects from Wilderness designation would be both beneficial and adverse. Beneficial effects result from the reduced human disturbances and reduced potential mortality due to motorized vehicles. In addition, ferrets would benefit from the significant reduction in prairie dog shooters, who would lose motorized access to prairie dog towns in a Wilderness area. Adverse effects result from restrictions on the motorized support to aid in ferret reintroduction projects. Ferrets may be targeted for reintroduction projects in the future in several areas on the Northern Great Plains, including this area.
- Mountain plover: A Wilderness designation would likely reduce prairie dog shooting, thereby increasing the expansion of prairie dog towns which, in turn, enhances mountain plover habitat. Designation would reduce motorized activities that can disturb mountain plovers and destroy their nests.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions. Finally, the mountain plover, which favors areas affected by fire, may be adversely affected due to reduced motorized support in conducting prescribed fires.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Thunder Basin National Grassland include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: No private subsurface minerals ownership exists in the area.

Existing Contracts and Agreements: Cannon Livestock Corporation holds the grazing permit to the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Thunder Basin National Grassland.

Effects on Adjacent Lands: The Red Hills area is partially surrounded by private land. Should the Red Hills area become a designated Wilderness, the potential for visitors to trespass onto private lands from the Red Hills area would increase. Adequate signing of the boundary, however, could reduce this potential.

Red Hills: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The following are the closest designated Wilderness areas:

- Soldier Creek Wilderness (7,810 acres) in the Pine Ridge of Nebraska about 105 miles to the southeast. Represents a wheatgrass-needlegrass-ponderosa pine ecosystem.
- Black Elk Wilderness (9,824 acres) in the Black Hills about 115 miles to the east. Represents a ponderosa pine ecosystem.
- Cloud Peak Wilderness (189,039 acres) about 85 miles to the northwest in the Big Horn Mountains. Represents an alpine ecosystem.

Representation of Landforms and Ecosystems: The area consists of mixed-grass badlands prairie.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. A Wilderness designation may impede any future reintroductions of the black-footed ferret into the area. Most other key species probably would benefit from a designation.

Public Interests and Concerns: The general area is sparsely populated. Douglas, with a population of about 6,000 and about 60 miles to the south, is the closest area of any significant population. More people may visit the area under a Wilderness designation. Opposition to designation may be anticipated from the local livestock industry, the minerals industry and area motorized recreation associations. Proponents may include the Sierra Club and local tourism and chamber of commerce associations.

Red Hills: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 5.12	6,840 acres
Alternative 3:	MA 3.65	6,840 acres
Alternative 4:	MA 1.2	6,840 acres
Alternative 5:	MA 6.1	6,840 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended for Wilderness

Alternatives: 4

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized. Oil and gas facilities could be present.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the primitive character of the area. The area has high oil and gas potential and is leased. Part of the area is leased with stipulations prohibiting surface occupancy, but the leases in the western portion allow surface oil and gas developments. Valid outstanding mineral rights would be honored.

Economic and Social Effects Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be retained unless outstanding minerals were developed. If outstanding mineral rights were developed, the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely. New leases requiring no surface occupancy would make oil and gas development more difficult and expensive. If the area is withdrawn from leasing, oil and gas development would be forgone.

Designation: Non-wilderness

Prescription: MA 3.65, Rangelands with Diverse Natural- appearing Landscapes

Alternatives: 3

Environmental Consequences: Vegetation, terrestrial and aquatic habitats would usually but not always appear natural. There would be some evidence of vegetative manipulation to maintain and restore high levels of plant and animal diversity, and ecological processes and function. Past human use, such as fences, trails, water developments, and primitive roads, would be evident but would decrease over time. Opportunities for isolation and solitude in a motorized setting would be available. There would be an opportunity for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources. Livestock grazing would occur periodically to meet management objectives Oil and gas facilities could be present.

Mitigation Measures: The area would be managed for long term increase in pasture size and for no net gain of fences, water developments and roads. The area has high oil and gas potential and is leased. Part of the area is leased with stipulations prohibiting surface occupancy but the leases in the western portion allow surface oil and gas developments. Valid outstanding mineral rights would be honored and new leasing would be allowed.

Economic and Social Effects: The area would continue to provide approximately the same mix of economic and social benefits as present. Both motorized and nonmotorized opportunities would be available. Livestock grazing would continue with limited restrictions on improvements. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area likely would be retained unless minerals were developed. If mineral development occurs, the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 5.12

Alternatives: 2

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be evident. Open meadows, grasslands, shrublands, and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available. Oil and gas facilities could be present.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, mineral development, and other features would be allowed. The area would be managed for a balance of sustainable physical, biological, and scenic values associated with woody vegetation and open grassland. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while, at the same time opportunities for nonmotorized activities would be reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing and oil and gas exploration and development would likely remain the primary economic activities. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character would be lost through time and perhaps permanently lost making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternative: 5

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be apparent. Open meadows, grasslands, shrublands, and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available. Oil and gas facilities could be present.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, mineral developments and other features would be allowed. The area would be managed for a diversity of plants, animals, and ecological functions and processes, while providing livestock forage and other amenity values. Although, mitigation measures would be applied to meet Grassland-wide Plan standards and guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while at the same time opportunities for nonmotorized activities would be reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing and mineral development would remain the primary economic activities. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character could be lost through time and perhaps permanently lost making future wilderness designation unlikely.

Criteria Common to All Roadless Areas on this Administrative Unit

Capability Criteria

Challenge: Challenges center around survival in a harsh and dry environment. Perennial water sources are sparse, although they can be found in Bobcat and Deer Creek Drainages of the Cow Creek area only. Water from developments used for livestock is not suitable for human consumption. Summer temperatures can exceed 100° Fahrenheit. Winter temperatures can drop to more than -30° Fahrenheit, with wind-chill factors well in excess of -85° Fahrenheit. Both the broken and open terrain can be deceptive and may disorient visitors' abilities to mark their directions. No developed recreation trails exist. Prairie rattlesnakes may be encountered

and can be dangerous. In the warmer months, mosquitoes and deer flies can be significant pests. Brown recluse spiders are found (rarely) throughout the grassland and can deliver a dangerous bite. Seasonal flash flooding may test a visitor's skill in adapting to this natural phenomenon and can create water hazards and slick gumbo conditions.

Opportunities for Outdoor Education: A visitor should find plenty of features to stimulate curiosity: grassland ecosystems, grassland flora and fauna, shifting weather patterns and cloud types, and clear night skies with unimpeded views of the stars. Skills in maneuvering a rugged terrain, using a compass, taking precautions for snake and spider bites, heat stroke, frostbite, setting up a primitive campsite, and outdoor cooking may all test and develop a visitor's understanding of the outdoors. However, no interpretive resources, such as brochures or interpretive signing, exist in these areas.

Availability Criteria

Biotic Control Measures and Fire Protection: Chemical, biological and mechanical control methods may be used in these areas to stem the expansion of undesirable plant species. Wildfire suppression would be addressed in Wilderness management plans that would be developed if any of the roadless areas are designated by Congress as Wilderness.

Roadless Areas on the Nebraska National Forest

Bessey Ranger District - Samuel R. McKelvie National Forest

Steer Creek East (Public Proposed): An Overview of the Affected Environment

The 60,790-acre Steer Creek East area is located about 20 miles southwest of Valentine, Nebraska, and 10 miles south of Nenzel, Nebraska. Specifically, Steer Creek East in located, either partly or fully, in Township 32 North, Range 32 West, Section 1-36, and Township 31 North, Range 32 West, Sections 1-4 and 10-12, and Township 32 North, Range 32 West, Sections 1-36, and Township 31 North, Range 31 West, Section 1-18 and 22-24, and Township 32 North, Range 30 West, Sections 7, 18-19 and 30-31, and Township 31 North, Range 30 West, Sections 5-8 and 17-20. Access is via U.S. Highway 20 to Nenzel, then south along State Highway 16F.

This area lies within the Great Plains Steppe Province ecoregion of the Temperate Steppe Division as identified by Robert G. Bailey (71). The Sand Hills of Nebraska, where the area is located, is the largest area of grass-covered sand dunes in the Western Hemisphere. This area was formed by blowing sand and reached its present size during the last 8,000 years. Elevation rises to about 3,200 feet above sea level and the topography consists of low rolling hills, ridges and grass-covered dunes.

This area is a unique mixture of plant communities known as Sand Hills prairie, with such species as sand bluestem, prairie sandreed, little bluestem, switchgrass, Indiangrass, needle-and-thread, western wheatgrass and prairie junegrass. A variety of introduced grasses occur, too, including Kentucky bluegrass, timothy, redtop and red clover. In part as a result of successful fire suppression, red cedar is encroaching upon the prairie, presenting some management challenges. Some hand-planted stands and windrows containing ponderosa pine,

Eastern red cedar, jack pine, Austrian pine and Scotch pine occur in the area. Habitat for the endangered blow-out penstemon and the threatened western prairie fringed orchid is found in Steer Creek East.

Wildlife include prairie chicken, sharp-tailed grouse, mule and white-tailed deer, coyote and other furbearers, grassland songbirds, waterfowl, raptors, amphibians and reptiles, including the box turtle.

Forest Development Road 602 provides access into the area. Although this road is identified as a forest development road, it is only minimally maintained and travelers are advised to operate only four-wheel-drive vehicles on it.

Typical recreation includes hunting and off-highway motorized use. Livestock grazing also occurs in the area, typically May 15 to November 1.

Current fire management requires immediate, initial-attack suppression due to the proximity of adjacent private land.

Steer Creek East: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are very high. There is little to no background noise, limited motorized activity, and very few people to be encountered in these areas. The rolling, vegetated sand-dune grassland offers isolation and a vast quiet environment.

Natural Appearance and Integrity: A natural appearance is evident, representative of the characteristic, sand-dune grassland pattern. Most of the ecological processes are intact, including frequent, rapidly moving wildfire, although suppression is conducted as quickly as possible. Signs of livestock grazing are clearly evident. Some recreational use is also evident, including spring birdwatching and hunting in the fall. The natural appearance is broken in isolated portions by square or rectangular hand-planted conifer forest blocks and lines of trees in well-defined, straight rows. Livestock developments include 145 windmills and stock tanks, one pipeline, and 160 miles of fencing. Hand-planted conifer plantations and windrows are not natural and do intrude upon this sand-dune landscape.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Bessey Ranger District (Samuel R. McKelvie National Forest).

Recreation Opportunities: Typical recreation includes hiking, primitive camping, hunting, photography and horseback riding. Sight-seeing through the hand-planted forest and elsewhere is available.

Special Features

Unique Characteristics and Scenic Features: Some archeological sites may exist, especially representative of prehistoric occupation. The area provides a singular, scenic sand-dune landscape of swales and grassy hills. Hand-planted tree plantations on a grassland landscape are unique.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Bessey Ranger District (Samuel R. McKelvie National Forest).

Manageability

Size and Shape: The 60,790-acre Steer Creek East area is a contiguous block of National Forest System land with no inholdings. It is about 13 miles wide east to west and about eight miles long north to south.

Potential to Manage Boundaries: The vast size of the area makes monitoring of the boundaries difficult, especially on the northern and eastern boundaries to Steer Creek East, where adjacent private land abuts the area. The western and southern boundaries to Steer Creek East are easier to monitor since these boundaries are formed by paved travelways. Signing would be expensive and would have to be extensive. Maintenance of such signing would be difficult because of the sand dune terrain forming the boundaries is easily breached, and because the length of boundary would make monitoring illegal access difficult.

Steer Creek East: Availability Analyses

Resource Values and Potentials

Oil and Gas: Historically two wildcat wells were drilled on the Samuel R. McKelvie National Forest, but both proved dry. Warm-water resources are known to exist.

Coal: No coal resources exist on the Samuel R. McKelvie National Forest.

Livestock Grazing: Eleven permittees operate on 12 allotments for an average, annual, permitted AUM count of 20,450 in the Steer Creek East roadless area.

Locatable Minerals: No known deposits of locatable minerals exist in this area.

Common Minerals: Known sand and gravel resources exist in the northern portions of this area near the Snake River.

Timber: A hand-planted plantation forest of ponderosa pine, Scotch pine, Austrian pine, jack pine and Eastern red cedar is scattered over approximately 2,150 acres within Steer Creek East. Although some of the timber in the area may be of merchantable size, no sales have ever been conducted in the area. Finding a market for the timber remains the primary obstacle. Some post and pole products are available, consisting of Eastern red cedar and the thinning of conifer stands. Firewood for local use is available through permits.

Recreation: Nonmotorized hunting would be enhanced through a Wilderness designation. Off-road motorized recreation would be prohibited. Handicapped and elderly access may be reduced as a result of Wilderness designation.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Blowout penstemon: Effects from Wilderness designation would be beneficial due to the reduction in mortality caused by motorized or mechanized vehicles and equipment, restrictions that accompany Wilderness designations.
- Western prairie-fringed orchid: Effects from Wilderness designation would be beneficial due to the reduction in mortality caused by motorized or mechanized vehicles and equipment, restrictions that accompany Wilderness designations.

Plant and Animal Species, cont.

- Peregrine falcon; American burying beetle: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on the nesting success and wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Samuel R. McKelvie National Forest include: the greater prairie chicken and the plains sharp-tailed grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: No appreciable subsurface minerals exist in the area and no leased acres exist in the area.

Existing Contracts and Agreements: Eleven direct grazing permits are in force in this area. No livestock associations operate in the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Bessey Ranger District (Samuel R. McKelvie National Forest).

Effects on Adjacent Lands: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Bessey Ranger District (Samuel R. McKelvie National Forest).

Steer Creek East: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The closest designated Wilderness is the 4,635-acre Fort Niobrara Wilderness about 25 miles to the northeast in the Fort Niobrara National Wildlife Refuge. The next nearest designated Wilderness is the 7,794-acre Soldier Creek Wilderness about 175 miles to the west on the Pine Ridge Ranger District of the Nebraska National Forest.

The Fort Niobrara Wilderness represents a mixed-grass and tallgrass prairie ecosystem, while the Soldier Creek Wilderness represents a ponderosa pine ecosystem.

Representation of Landforms and Ecosystems: This area represents the Sand Hills prairie on the largest vegetated sand-dune region in the Western Hemisphere.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: This area is very sparsely populated. The nearest town of any size is Valentine, Nebraska, about 20 miles to the northeast. Valentine's population is about 2,800. Designating the area as Wilderness might attract people from urban areas farther east, including Lincoln and Omaha, Nebraska.

A considerable number of people and organizations have called on the Forest Service to designate a grassland Wilderness somewhere on the Northern Great Plains. Currently, the Forest Service provides for no grassland Wilderness areas anywhere within the National Forest System.

Steer Creek East: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 3.64	520 acres
	MA 5.12	2,170 acres
	MA 6.1	58,100 acres
Alternative 3:	MA 2.1	2,170 acres
	MA 2.2	2,500 acres
	MA 3.64	3,210 acres
	MA 6.1	52,910 acres
Alternative 4:	MA 1.2	58,290 acres
	MA 3.64	70 acres
	MA 3.66	2,170 acres
	MA 6.1	260 acres
Alternative 5:	MA 1.31	52,650 acres
	MA 2.1	2,170 acres
	MA 3.64	5,710 acres
	MA 6.1	260 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended for Wilderness

Alternatives: 4

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. The natural appearance is broken in portions by rectangular, hand planted, conifer forest blocks of trees. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the wilderness character of the area.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Mineral potential in the area is low and mineral development is unlikely under any management scenario. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be maintained.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 5

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. The natural appearance is broken in portions by rectangular, hand planted, conifer forest blocks of trees. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the primitive to semi-primitive character of the area.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Mineral potential in the area is low and mineral development is unlikely under any management scenario. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be maintained.

Designation: Non-wilderness

Prescription: MA 2.1, Special Interest Areas

Alternatives: 3 and 5

Environmental Consequences: Vegetation, terrestrial and aquatic habitats would usually but not always appear natural. There would be some evidence of vegetative manipulation. Past human use, such as fences, trails, water developments, and primitive roads, would be evident. The natural appearance is broken in portions by rectangular, hand planted, conifer forest blocks of trees. Opportunities for isolation and solitude in a motorized setting would be available. At various times wildlife would be disturbed by human activities. There would be an opportunity for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources. Livestock and livestock facilities would be apparent.

Mitigation Measures: Motorized travel would be restricted to designated routes to protect the special values of the area. Livestock grazing and recreation use would be restricted if it hinders achievement of the desired condition for the SIA. Roads not necessary for administrative, scientific, or valid private access would be closed or obliterated. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act

Economic and Social Effects: Opportunities for recreation, interpretation, and educational activities would be increased. The need to provide good public access for recreation, interpretation, and educational opportunities would increase. If better access were provided the challenge to protect the special features of the area would increase. Opportunities for those desiring solitude and isolation would still exist but would be less than in a nonmotorized designation. Those desiring motorized opportunities would be limited and off-road vehicle opportunities would be forgone. Those accustomed to accessing the area by vehicle would continue to have limited access. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be substantially retained.

Designation: Non-wilderness

Prescription: MA 2.2, Research Natural Areas

Alternatives: 3

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. The natural appearance is broken in portions by rectangular, hand planted, conifer forest blocks of trees. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative, law enforcement, emergency, and scientific purposes. Construction of roads and trails would not be allowed except to correct resource damage. Livestock grazing and recreation use would be restricted if it hinders achievement of the desired condition for the RNA. New developments including livestock fences and water developments would not be allowed to detract from the primitive to semi-primitive character of the area. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Mineral potential in the area is low and mineral development is unlikely under any management scenario. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be substantially retained.

Designation: Non-wilderness

Prescription: MA 3.64, Special Plant and Wildlife Habitat

Alternatives: 2, 3, 4, and 5

Environmental Consequences: Vegetation, terrestrial and aquatic habitats would usually but not always appear natural. There would be some evidence of vegetative manipulation to maintain high levels of habitat effectiveness. Past human use, such as fences, trails, water developments, and primitive roads, would be evident. The natural appearance is broken in portions by rectangular, hand planted, conifer forest blocks of trees. Opportunities for isolation and solitude in a motorized setting would be available. There would be an opportunity for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources. Livestock grazing would occur periodically to meet management objectives.

Mitigation Measures: The area would be managed for no decrease in pasture size and for no net gain of fences, water developments, and roads. Motorized access would be allowed but limited to roads and trails. Although grazing could occur to meet management objectives, the area would normally be considered unsuitable for grazing.

Economic and Social Effects: Both motorized and nonmotorized opportunities would be available. Opportunities for those desiring solitude and isolation would be about the same as present. Those accustomed to accessing the area by vehicle would have limited access. Opportunities for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources would be good. Livestock grazing would likely remain the primary economic benefit from the area but would be reduced from present levels.. The primitive to semi-primitive character of the area would be substantially retained.

Designation: Non-wilderness

Prescription: MA 3.66, Ecosystem Restoration

Alternatives: 4 and 5

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be evident. The area would be dominated by open meadows, grasslands, shrublands, and areas of hardwood vegetation along drainages. Vegetation treatments to restore the native prairie ecosystem would be apparent. Exotic plant species such as the non-native conifer tree stands would be removed. The vegetation would consist of native prairie and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available.

Mitigation Measures: The area would be managed for no decrease in pasture size and for no net gain of fences, water developments, and roads. Motorized access would be restricted to roads and trails. Livestock grazing would be allowed at levels commensurate with prairie restoration. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would temporarily lose its roadless character during ecosystem restoration activities.

Economic and Social Effects: Both motorized and nonmotorized opportunities would be available. Opportunities for those desiring solitude and isolation would be reduced temporarily while restoration activities were in progress. Once restoration was substantially completed, opportunities for isolation and solitude would be restored to approximately the present level. Those accustomed to accessing the area by vehicle would continue to have limited access. Livestock grazing would likely remain the primary economic benefit from the area but would be reduced during restoration activities. The primitive to semi-primitive character of the area would be temporarily altered but would be restored over time.

Designation: Non-wilderness

Prescription: MA 5.12

Alternatives: 2

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be evident. The area would be dominated by open meadows, grasslands, shrublands, and areas of woody vegetation. The natural appearance is broken in portions by rectangular, hand planted, conifer forest blocks of trees. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, and other features would be allowed. The area would be managed for a balance of sustainable physical, biological, and scenic values associated with woody vegetation and open grassland. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while, at the same time opportunities for nonmotorized activities would be reduced and perhaps forgone. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing would likely remain the primary economic benefit. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character would be altered through time and perhaps permanently altered, making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternative: 2, 3, 4, and 5

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be apparent. The area would be dominated by open meadows, grasslands, shrublands, and areas of woody vegetation. Vegetation treatments would be apparent. The natural appearance is broken in portions by rectangular, hand planted, conifer forest blocks of trees. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, and other features would be allowed. The area would be managed for a diversity of plants, animals, and ecological functions and processes, while providing livestock forage and other amenity values. Although, mitigation measures would be applied to meet

Grassland-wide Plan standards and guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while at the same time opportunities for nonmotorized activities would be reduced and perhaps forgone. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing would remain the primary economic benefit. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character could be altered through time and perhaps permanently altered, making future wilderness designation unlikely.

Steer Creek West (Public Proposed): An Overview of the Affected Environment

The 26,210-acre Steer Creek West area is located about 30 miles southwest of Valentine, Nebraska, and 10 miles south of Nenzel, Nebraska. Specifically, the Steer Creek West area is located, either partly or fully, in Township 32 North, Range 32 West, Sections 6-7, 18-19 and 30-31, and Township 32 North, Range 33 West, Section 1-2, 4-30 and 33-36, and Township 32 North Range 34 West, Sections 1-2, 11-14 and 23-24. Access is via U.S. Highway 20 to Nenzel, then south along State Highway 16F.

This area lies within the Great Plains Steppe Province ecoregion of the Temperate Steppe Division as identified by Robert G. Bailey (71). The Sand Hills of Nebraska, where the area is located, is the largest area of grass-covered sand dunes in the Western Hemisphere. This area was formed by blowing sand and reached its present size during the last 8,000 years. Elevation rises to about 3,200 feet above sea level and the topography consists of low rolling hills, ridges and grass-covered dunes.

This area is a unique mixture of plant communities known as Sand Hills prairie, with such species as sand bluestem, prairie sandreed, little bluestem, switchgrass, Indiangrass, needle-and-thread, western wheatgrass, and prairie junegrass. A variety of introduced grasses occur, including Kentucky bluegrass, timothy, redtop, and red clover. In part due to successful fire suppression, red cedar is encroaching upon the prairie, presenting some management challenges. As well, habitat for the endangered blow-out penstemon and the threatened Western prairie fringed orchid is found in Steer Creek West.

Wildlife include prairie chicken, sharp-tailed grouse, mule and white-tailed deer, coyote, grassland songbirds, waterfowl, raptors, amphibians, and reptiles, including the box turtle.

Typical recreation includes hunting and off-highway motorized use. Livestock grazing also occurs, generally from May 15 to November 1.

Current fire management requires immediate, initial-attack suppression due to the proximity of adjacent private land.

Steer Creek West: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are very high. There is little to no background noise, limited motorized activity, and very few people to be encountered in these areas. The rolling, vegetated sand-dune grassland offers isolation and a vast quiet environment.

Natural Appearance and Integrity: A natural appearance is evident, representative of the characteristic, sand-dune grassland pattern. Most of the ecological processes are intact, including frequent, rapidly moving wildfire, although suppression is conducted as quickly as possible. Signs of livestock grazing are evident. Some recreational use is also evident, including spring birdwatching and hunting in the fall. Livestock developments include 52 windmills and stock tanks and 62 miles of fencing.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Bessey Ranger District (Samuel R. McKelvie National Forest).

Recreation Opportunities: Typical recreation can include hiking, primitive camping, hunting, photography, and horseback riding. Sight-seeing, including through areas of hand-planted forests, is available.

Special Features

Unique Characteristics and Scenic Features: Some archeological sites may exist, especially representative of prehistoric occupation. The area provides a singular, scenic sand-dune landscape of swales and grassy hills.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Bessey Ranger District (Samuel R. McKelvie National Forest).

Manageability

Size and Shape: The 26,210-acre Steer Creek West area is a contiguous block of National Forest System land. No inholdings exist. It is about eight miles wide east to west and about six miles long north to south.

Potential to Manage Boundaries: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Bessey Ranger District (Samuel R. McKelvie National Forest).

Steer Creek West: Availability Analyses

Resource Values and Potentials

Oil and Gas: Historically two wildcat wells were drilled on the McKelvie National Forest, but both proved dry. Warm-water resources are known to exist.

Coal: No coal resources exist on the McKelvie National Forest.

Livestock Grazing: Eight permittees operate on eight allotments for an average, annual, permitted AUM count of 16,800 in the Steer Creek West area.

Locatable Minerals: No known locatable minerals exist in this area.

Common Minerals: No known minerals exist in this area.

Timber: No merchantable timber exists in Steer Creek West. Some post and pole products are available, consisting of Eastern red cedar and the thinning of conifer stands. Firewood for local use is available through permits.

Recreation: Nonmotorized hunting would be enhanced through a Wilderness designation. Off-road motorized recreation would be prohibited. Handicapped and elderly access may be reduced by Wilderness designation.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Blowout penstemon: Effects from Wilderness designation would be beneficial due to the reduction in mortality caused by motorized or mechanized vehicles and equipment, restrictions that accompany Wilderness designations.
- Western prairie-fringed orchid: Effects from Wilderness designation would be beneficial due to the reduction in mortality caused by motorized or mechanized vehicles and equipment, restrictions that accompany Wilderness designations.
- Peregrine falcon: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on the nesting success and wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Samuel R. McKelvie National Forest include: the greater prairie chicken and the plains sharp-tailed grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: No appreciable subsurface minerals exist in the area and no leased acres exist in the area.

Existing Contracts and Agreements: Eight direct grazing permits are in force in this area. No agreements exist with any livestock associations, since no livestock associations operate in the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Bessey Ranger District (Samuel R. McKelvie National Forest).

Effects on Adjacent Lands: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Bessey Ranger District (Samuel R. McKelvie National Forest).

Steer Creek West: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The following are the closest designated Wilderness areas:

- Fort Niobrara Wilderness (4,635 acres) about 40 miles to the northeast in the Fort Niobrara National Wildlife Refuge. Represents a mixed-grass and tallgrass prairie ecosystem.
- Soldier Creek Wilderness (7,794 acres) about 170 miles to the west on the Pine Ridge Ranger District of the Nebraska National Forest. Represents a ponderosa pine ecosystem.

Representation of Landforms and Ecosystems: This area represents the Sand Hills prairie on the largest vegetated sand-dune region in the Western Hemisphere.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: This area is very sparsely populated. The nearest town of any size is Valentine, Nebraska, about 25 miles to the northeast. Valentine's population is about 2,800. Designating the area as Wilderness might attract people from urban areas farther east, including Lincoln and Omaha, Nebraska.

A considerable number of people and organizations have called on the Forest Service to designate a grassland Wilderness somewhere on the Northern Great Plains. Currently, the Forest Service provides for no grassland Wilderness areas anywhere within the National Forest System.

Steer Creek West: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 3.64	270 acres
	MA 6.1	25,940 acres
Alternative 3:	MA 3.64	270 acres
	MA 6.1	25,940 acres
Alternative 4:	MA 1.2	26,120acres
	MA 6.1	90 acres
Alternative 5:	MA 1.31	25,850 acres
	MA 3.64	270 acres
	MA 6.1	90 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended for Wilderness

Alternatives: 4

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. The natural appearance is broken in portions by rectangular, hand planted, conifer forest blocks of trees. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the wilderness character of the area.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Mineral potential in the area is low and mineral development is unlikely under any management scenario. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be maintained.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 5

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. The natural appearance is broken in portions by rectangular, hand planted, conifer forest blocks of trees. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the primitive to semi-primitive character of the area.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Mineral potential in the area is low and mineral development is unlikely under any management scenario. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be maintained.

Designation: Non-wilderness

Prescription: MA 3.64, Special Plant and Wildlife Habitat

Alternatives: 2, 3, and 5

Environmental Consequences: Vegetation, terrestrial and aquatic habitats would usually but not always appear natural. There would be some evidence of vegetative manipulation to maintain high levels of habitat effectiveness. Past human use, such as fences, trails, water developments, and primitive roads, would be evident. The natural appearance is broken in portions by rectangular, hand planted, conifer forest blocks of trees**.** Opportunities for isolation and solitude in a motorized setting would be available. There would be an opportunity for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources. Livestock grazing would occur periodically to meet management objectives.

Mitigation Measures: The area would be managed for no decrease in pasture size and for no net gain of fences, water developments, and roads. Motorized access would be allowed but limited to roads and trails. Although grazing could occur to meet management objectives, the area would normally be considered unsuitable for grazing.

Economic and Social Effects: Both motorized and nonmotorized opportunities would be available. Opportunities for those desiring solitude and isolation would be about the same as present. Those accustomed to accessing the area by vehicle would have limited access. Opportunities for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources would be good. Livestock grazing would likely remain the primary economic benefit from the area but would be reduced from present levels. The primitive to semi-primitive character of the area would be substantially retained.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternative: 2, 3, 4, and 5

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be apparent. Open meadows, grasslands, shrublands, and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The natural appearance is broken in portions by rectangular, hand planted, conifer forest blocks of trees. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, and other features would be allowed. The area would be managed for a diversity of plants, animals, and ecological functions and processes, while providing livestock forage and other amenity values. Although, mitigation measures would be applied to meet Grassland-wide Plan standards and guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while at the same time opportunities for nonmotorized activities would be reduced and perhaps forgone. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing would remain the primary economic benefit. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character could be altered through time and perhaps permanently altered, making future wilderness designation unlikely.

Dismal River (Public Proposed): An Overview of the Affected Environment

The 12,980-acre Dismal River area is located about 15 miles southwest of Halsey, Nebraska. Specifically, Dismal River is located, either partly or fully in Township 31 North, Range 27 West, Sections 4-10 and 14-23. Access is by way of Nebraska Highway 2 to Halsey, then west to the forest entrance, west on State spur 86B and southwest on Forest Development Road 203.

This area lies within the Great Plains Steppe Province ecoregion of the Temperate Steppe Division as identified by Robert G. Bailey (71). The Sand Hills of Nebraska, where the area is located, is the largest area of grass-covered sand dunes in the Western Hemisphere. This area was formed by blowing sand and reached its present size during the last 8,000 years. Elevation rises to about 3,200 feet above sea level and the topography consists of low rolling hills, ridges, and grass-covered dunes.

This area is a unique mixture of plant communities known as Sand Hills prairie, with such species as sand bluestem, prairie sandreed, little bluestem, switchgrass, Indiangrass, needle-and-thread, western wheatgrass, and prairie junegrass. A variety of introduced grasses occur, including Kentucky bluegrass, timothy, redtop, and red clover. In part as a result of successful fire suppression, red cedar is encroaching upon the prairie, presenting some management challenges. Habitat for the endangered blow-out penstemon, including a proposed reintroduction site for the penstemon, is found in Dismal River.

Wildlife include prairie chicken, sharp-tailed grouse, mule and white-tailed deer, coyote and other furbearers, grassland songbirds, waterfowl, raptors, amphibians, and reptiles, including the box turtle.

Forest Development Road 228 provides access into the area. Although this road is identified as a forest development road, it is only minimally maintained and travelers are advised to operate only four-wheel-drive vehicles on it.

Typical recreation includes hunting and off-highway motorized use. Livestock grazing also occurs in the area, typically May 15 to October 1.

Current fire management requires immediate, initial-attack suppression due to the proximity of adjacent private land.

Dismal River: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are very high. There is little to no background noise, limited motorized activity, and very few people to be encountered in these areas. The rolling, vegetated sand-dune grassland offers isolation and a vast quiet environment.

Natural Appearance and Integrity: A natural appearance is evident, representative of the characteristic, sand-dune grassland pattern. Most of the ecological processes are intact, including frequent, rapidly moving wildfire, although suppression is conducted as quickly as possible. Signs of livestock grazing are evident. Some recreational use is also evident, including spring birdwatching and hunting in the fall and Off-highway vehicle use throughout the year. Livestock developments include 18windmills and stock tanks and 22 miles of fencing.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Bessey Ranger District (Nebraska National Forest).

Recreation Opportunities: Typical recreation includes hiking, primitive camping, hunting, photography and horseback riding. Sight-seeing through prairie is available.

Special Features

Unique Characteristics and Scenic Features: Some archeological sites may exist, especially representative of prehistoric occupation. The area provides a singular, scenic sand-dune landscape of swales and grassy hills

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Bessey Ranger District (Nebraska National Forest).

Manageability

Size and Shape: The 12,980-acre Dismal River area is a contiguous block of National Forest System land with no inholdings. It is about 5 miles wide east to west and about 4 miles long north to south on the west end tapering down to about 11/2 miles wide on the east end.

Potential to Manage Boundaries: Boundary management may prove difficult, in part because of a very small Forest Service staff in the area. The vast size of the area makes monitoring of the boundaries difficult, especially on the southern boundary to Dismal River, where adjacent private land abuts the area. Northern and eastern boundaries to Dismal River are easier to monitor since these boundaries are formed by paved travelways. Signing would be expensive and would have to be extensive. Maintenance of such signing would be quite time-consuming. The sand-dune terrain forming the boundaries is easily breached and the sheer length of the boundary and lack of staff would make monitoring of illegal access nearly impossible.

Dismal River: Availability Analyses

Resource Values and Potentials

Oil and Gas: Historically two wildcat wells were drilled on the Nebraska National Forest, but both proved dry. Warm-water resources are known to exist.

Coal: No coal resources exist on the Nebraska National Forest.

Livestock Grazing: Four permittees operate on four allotments, for an average, annual, permitted AUM count of 4,000 in the Dismal River roadless area.

Locatable Minerals: No known deposits of locatable minerals exist in this area.

Common Minerals: Known sand and gravel resources exist in the southern portions of this area near the Dismal River.

Timber: There is some natural occurring eastern red cedar in the area with denser stands appearing near the southern portion close to the Dismal River.

Recreation: Nonmotorized hunting would be enhanced through a Wilderness designation. Off-road motorized recreation would be prohibited. Handicapped and elderly access may be reduced by Wilderness designation.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Blowout penstemon: Effects from Wilderness designation would be beneficial due to the reduction in mortality caused by motorized or mechanized vehicles and equipment, restrictions that accompany Wilderness designations.
- Western prairie-fringed orchid: There would be no effects from Wilderness designation because there is no existing habitat within the area.
- Peregrine falcon; American burying beetle: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on the nesting success and wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Nebraska National Forest include: the greater prairie chicken and the plains sharp-tailed grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: No appreciable subsurface minerals exist in the area and no leased acres exist in the area.

Existing Contracts and Agreements: Four direct grazing permits are in force in this area. No agreements exist with any livestock associations, since no livestock associations operate in the area.

Biotic Control Measures and Fire Protection: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Bessey Ranger District (Nebraska National Forest).

Effects on Adjacent Lands: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Bessey Ranger District (Nebraska National Forest).

Dismal River: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The following are the closest designated Wilderness areas:

- Fort Niobrara Wilderness (4,635 acres) about 75 miles to the north in the Fort Niobrara National Wildlife Refuge. Represents a mixed-grass and tallgrass prairie ecosystem.
- Soldier Creek Wilderness (7,794 acres) about 215 miles to the west on the Pine Ridge Ranger District of the Nebraska National Forest. Represents a ponderosa pine ecosystem.

Representation of Landforms and Ecosystems: This area represents the Sand Hills prairie on the largest vegetated sand-dune region in the Western Hemisphere.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: This area is very sparsely populated. The nearest town of any size is Broken Bow, Nebraska, about 50 miles to the southeast. Broken Bow's population is about 4,000. Designating the area as Wilderness might attract people from urban areas farther east, including Lincoln and Omaha, Nebraska.

A considerable number of people and organizations have called on the Forest Service to designate a grassland Wilderness somewhere on the Northern Great Plains. Currently, the Forest Service provides for no grassland Wilderness areas anywhere within the National Forest System.

Dismal River: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 3.64	280 acres
	MA 6.1	12,700 acres
Alternative 3:	MA 3,64	280 acres
	MA 6.1	12,700 acres
Alternative 4:	MA 3.64	280 acres
	MA 6.1	12,700 acres
Alternative 5:	MA 3.64	280 acres
	MA 6.1	12,700 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended for Wilderness

Alternatives: Wilderness designation is not considered in any alternative because of the area's existing level of mineral development.

Designation: Non-wilderness

Prescription: MA 3.64, Special Plant and Wildlife Habitat

Alternatives: 2, 3, 4, and 5

Environmental Consequences: Vegetation, terrestrial and aquatic habitats would usually but not always appear natural. There would be some evidence of vegetative manipulation to maintain high levels of habitat effectiveness. Past human use, such as fences, trails, water developments, and primitive roads, would be evident. The natural appearance is broken in portions by rectangular, hand planted, conifer forest blocks of trees. Opportunities for isolation and solitude in a motorized setting would be available. There would be an opportunity for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources. Livestock grazing would occur periodically to meet management objectives.

Mitigation Measures: The area would be managed for no decrease in pasture size and for no net gain of fences, water developments, and roads. Motorized access would be allowed but limited to roads and trails. Although grazing could occur to meet management objectives, the area would normally be considered unsuitable for grazing.

Economic and Social Effects: Both motorized and nonmotorized opportunities would be available. Opportunities for those desiring solitude and isolation would be about the same as present. Those accustomed to accessing the area by vehicle would have limited access. Opportunities for discovery and interpretation of ecological, biological, cultural, historic and paleontological resources would be good. Livestock grazing would likely remain the primary economic benefit from the area but would be reduced from present levels. The primitive to semi-primitive character of the area would be substantially retained.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternative: 2, 3, 4, and 5

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be apparent. Open meadows, grasslands, shrublands, and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, and other features would be allowed. The area would be managed for a diversity of plants, animals, and ecological functions and processes, while providing livestock forage and other amenity values. Although, mitigation measures would be applied to meet Grassland-wide Plan standards and guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while at the same time opportunities for nonmotorized activities would be reduced and perhaps lost permanently. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing would remain the primary economic benefit. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character could be lost through time and perhaps permanently lost making future wilderness designation unlikely.

Criteria Common to All Roadless Areas on this Administrative Unit

Capability Criteria

Challenge: Challenges center around survival in a dry, vast, and open environment. Summer temperatures can exceed 100° Fahrenheit. Winter temperatures can drop to more than -30° Fahrenheit, with wind-chill factors well in excess of -85° Fahrenheit. The wide-open landscapes can be very deceptive and visitors can become altered very easily. No developed recreation trails exist, although some two-track roads exist. Wildfire is frequent, and moves very rapidly over a highly flammable landscape. It can easily overtake people on foot, horseback or in motorized vehicles.

Opportunities for Outdoor Education: A visitor should find plenty of features to stimulate curiosity: grassland ecosystems, grassland flora and fauna, shifting weather patterns and cloud types and clear night skies with unimpeded views of the stars. Skills in maneuvering a rugged terrain, using a compass, taking precautions for snake and spider bites, heat stroke, frostbite, setting up a primitive campsite and outdoor cooking may all test and develop a visitor's understanding of the outdoors. However, no interpretive resources, such as brochures or interpretive signing, exist in these areas.

Visitor-information services are limited. Still, a visitor should find plenty of features to stimulate curiosity and self-education: grassland ecosystems, grassland flora and fauna, sand-dune topography, shifting weather patterns and cloud types, and clear nights with unimpeded views of the stars. Skills in maneuvering through a repetitious sand-dune landscape, using a compass, taking precautions for heat stroke, frostbite or freezing, setting up a primitive campsite, securing water, and outdoor cooking may all test a visitor's understanding of the Sand Hills prairie.

Availability Criteria

Biotic Control Measures and Fire Protection: Chemical, biological and mechanical control methods may be used in these areas to stem the expansion of undesirable plant species. Wildfire suppression would be addressed in Wilderness management plans that would be developed if any of the roadless areas are designated by Congress as Wilderness.

Effects on Adjacent Lands: Some acres of Canada thistle and leafy spurge do occur in these areas and there is a possibility that it could spread to adjacent lands of other ownership. The potential exists that wildfire igniting in the area could spread to adjacent lands. It may be more likely that ignitions would begin outside these areas on adjacent lands of other ownership, which could spread onto National Forest System lands, especially along river corridors where recreation is concentrated.

Buffalo Gap National Grassland

Fall River Ranger District

Cheyenne River: An Overview of the Affected Environment

The 7,570-acre Cheyenne River area lies about 15 miles southeast of Hermosa, South Dakota, and about six miles southeast of Fairburn, South Dakota. Specifically, the Cheyenne River area is located, either partly or fully, in Township 4 South, Range 9 East, Sections 35 and 35, and Township 5 South, Range 9 East, Sections 1-4, 8-15, 17, and 23-24. Access is via Highway 79, east three miles along Custer County Road 18, through Fairburn, then 14 miles on Forest Development Road 7053, or southeast 21 miles from Hermosa via U.S. Highway 40 to Forest Development Road 7053 turning to the west.

The Cheyenne River area lies within the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division as identified by Robert G. Bailey (71). The topography of the area is varied, consisting of gently rolling grasslands or highly vegetated tabletop buttes with steep, dissected slopes exposing layers of color-banded clays of reds and shades of white and gray. Elsewhere, sparsely vegetated, mounded, clay badlands terrain and beds of agates exist. Natural seeps frequently occur along some of the hillsides. The elevation of the area ranges from between 2,750 to 3,300 feet above sea level. The dominant feature in the northern portion of the area is the Chalk Hills Ridge, exhibiting side slopes of white shale clays. This ridge runs in a northeasterly or southwesterly direction and is the most visible landmark in the northern portion of the area. The dominant feature in the southern portion is the Cheyenne River itself. Between the Chalk Hills and Cheyenne River are rolling grasslands dominated by western wheatgrass.

The dominant grasses include western wheatgrass, green needlegrass, buffalo grass, and blue gramma. Some crested wheatgrass, an exotic, can be found in isolated areas. The noxious weed Canada thistle also is found in the area. Woody shrub and browse species, mainly found in alluvial draws or dissected drainages, include skunkbrush sumac, chokecherry, snowberry, buffaloberry, and wild rose. North-facing exposures may be dominated by Rocky Mountain juniper. Draws in the area contain some green ash and chokecherry. A healthy, functioning, regenerating cottonwood community exists along the Cheyenne River. Sandbars provide special habitat conditions for some species.

Wildlife includes mule and white-tailed deer, pronghorn antelope, sharp-tailed grouse, high populations of raptors, such as red-tailed and Swainson's hawks, coyotes, porcupines, badgers, raccoons, prairie dogs, meadowlarks, loggerhead shrikes, belted kingfishers, northern flickers, long-billed curlews, upland sandpipers, prairie rattlesnakes, spiny softshell turtles, Woodhouse's toads, chorus frogs, and garter snakes. Bald eagles winter in the riverine cottonwoods. Fish species include channel catfish, stonecat and the flathead chub.

Recreational opportunities include rock hounding, hunting, horseback riding, canoeing, prairie dog shooting, and hiking. Livestock are grazed in the area.

Current fire management requires immediate, initial-attack suppression due to the proximity of adjacent private land.

Cheyenne River: Capability Analyses

Environment

Opportunity for Solitude and Serenity: This area provides a high opportunity for solitude and serenity. The remote badlands and rolling grassland terrain offers a visitor the chance to become isolated and removed from more developed areas on the Great Plains. Few range developments, except for fences, are located in the Cheyenne River area.

Natural Appearance and Integrity: This area retains a fairly high natural appearance. The landscape is only minimally altered from historic conditions. Generally, this area is scenic and provides the visitor a chance to experience the grassland as it appeared more than 100 years ago. Livestock may detract from the natural appearance. Livestock developments include a few stock dams, some fencing, and some two-track roads. Overall, the vegetative health is high, with most plant communities functioning properly. Most of the ecological processes, with the possible exception of fire, are intact.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Buffalo Gap National Grassland (Fall River Ranger District).

Recreation Opportunities: A number of recreational activities occur in the area, including rock hounding, prairie dog shooting and viewing, other hunting opportunities, horseback riding, nature study, birdwatching, limited off-road motorized recreation, some canoeing, and other associated activities.

Special Features

Unique Characteristics and Scenic Features: The Chalk Hills, which provide badlands features, including steep slopes, shale escarpments, and Rocky Mountain juniper, are a colorful portion of this area. The Cheyenne River marks the southern boundary to the area and provides scenic canoeing opportunities. A fair number of visitors come to the area to search for gemstones and agates. Fossils found in White River Group and Pierre Shale deposits represent the Eocene and Oligocene (45 to 26 million years ago) and the Late Cretaceous (90 to 65 million years ago) periods.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Buffalo Gap National Grassland (Fall River Ranger District).

Manageability

Size and Shape: The 7,570-acre Cheyenne River area has an irregular shape. It contains one inholding of about 320 acres. The Cheyenne area is about five miles wide east to west and five miles long north to south.

Potential to Manage Boundaries: All but about two miles of the area's boundaries is fenced, so posting and signing would be quite easy. Clear and visible signing should discourage illegal motorized trespass; however, enforcing motorized closures would prove difficult because the area is so remote.

Cheyenne River: Availability Analyses

Resource Values and Potentials

Oil and Gas: The development potential is low. Oil shale and geothermal resources exist in the area.

Coal: No coal resources exist on the Buffalo Gap National Grassland.

Livestock Grazing: Two permittees graze cattle on two allotments, producing about 1,520 AUMs per year from July through November.

Locatable Minerals: Known and potential deposits of gold occur in the area, especially along the Cheyenne River where placer mining opportunities exist. Potential uranium, molybdenum, selenium, and vanadium resources may occur in this area.

Common Minerals: Known sand and gravel deposits exist along the Cheyenne River. In addition, known deposits of gemstones, Chadron bentonite/clay resources, and Pierre shale exist in the area. Potential specialty sand and potential building stone also may occur in the area.

Timber: No merchantable timber exists in the area.

Recreation: This area would provide excellent backcountry recreational experiences, including horseback riding, dispersed camping, rock hounding, canoeing, nature study, hiking and associated nonmotorized activities. Opportunities for physically challenged and elderly access under a Wilderness designation would likely be reduced. Walk-in hunting opportunities would likely increase. Motorized recreation of all kinds, including ATV, snowmobile, and four-wheel-drive use, would be prohibited.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on the nesting success and wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

- Mountain plover: A Wilderness designation would likely reduce prairie dog shooting, thereby increasing the expansion of prairie dog towns which, in turn, enhances mountain plover habitat. Designation would reduce motorized activities that can disturb mountain plovers and destroy their nests.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions. Finally, the mountain plover, which favors areas affected by fire, may be adversely affected due to reduced motorized support in conducting prescribed fires.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Buffalo Gap National Grassland (Fall River Ranger District) include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: No current federal mineral leases exist in the area. Nearly the entire area has been leased in the past. About 1,586 acres of private, subsurface minerals ownership exist beneath National Forest System lands in the area. No private leases exist in the area.

Existing Contracts and Agreements: The two permittees in the area have direct permits issued by the U.S. Forest Service.

Biotic Control Measures and Fire Protection: Wildfire and noxious weed control would continue despite future management, including Wilderness designation.

Effects on Adjacent Lands: Vehicles would not be used for transportation or fire suppression when the fire danger is low. Vehicles would be used when fire conditions are high enough that firefighters walking and using hand tools would not be able to prevent a large fire.

Defensible fuel profile zones would be developed to permit options in managing restoration-designed prescribed fires.

Cheyenne River: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The following are the closest designated Wilderness areas:

- Sage Creek Wilderness (64,144 acres) about 20 miles to the east in Badlands National Park. Represents a mixed-grass prairie ecosystem.
- Black Elk Wilderness (9,824 acres) about 27 miles to the west in the Black Hills. Represents a ponderosa pine ecosystem.

The Cheyenne River Wilderness would represent a mixed-grass prairie in a badlands setting and would share many of the characteristics of the Sage Creek Wilderness.

Representation of Landforms and Ecosystems: This area is representative of rolling grasslands, limited badlands, riparian cottonwood floodplain, and green ash/chokecherry wooded draws.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: The general local concerns expressed about this area include maintaining range improvements with motorized vehicles and suppression of wildfires with motorized vehicles. Local environmental groups have expressed an interest in designating areas for backcountry experiences, which may include Wilderness designation. In addition, a newly proposed railroad line, sponsored by the Dakota, Minnesota, and Eastern Railroad Company could be routed through the area. Such an expansion of railway service into the area would severely reduce the opportunity for solitude and serenity.

Cheyenne River: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 6.1	7,570 acres
Alternative 3:	MA 6.1	7,570 acres
Alternative 3A:	MA 2.1	7,570 acres
Alternative 4:	MA 1.2	7,570 acres
Alternative 5:	MA 1.31	7,570 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended for Wilderness

Alternatives: 4

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish

through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, geologic, and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the wilderness character of the area. Oil and gas potential is low and oil and gas development is unlikely under any management scenario. Common variety mineral development would be prohibited. If the area was designated Wilderness, it would normally be withdrawn from mineral location and entry and mineral opportunities would be forgone.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Livestock grazing would likely remain the primary economic benefit from the area. Unless locatable mineral development occurred, the primitive to semi-primitive character of the area would be maintained.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 5

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, geologic, and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the primitive to semi-primitive character of the area. Oil and gas potential is low and oil and gas development is unlikely under any management scenario. Common variety mineral development opportunities would be prohibited. Locatable minerals could still be developed with appropriate mitigating measures.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Livestock grazing would likely remain the primary economic benefit from the area. Unless locatable mineral development occurred, the primitive to semi-primitive character of the area would be maintained.

Designation: Non-wilderness

Prescription: MA 2.1, Special Interest Areas

Alternatives: 3A

Environmental Consequences: Vegetation, terrestrial and aquatic habitats would usually but not always appear natural. There would be some evidence of vegetative manipulation. Past human use, such as fences, trails, water developments, and primitive roads, would be evident. Opportunities for isolation and solitude in a motorized setting would be available. At various times wildlife would be disturbed by human activities. There would be an opportunity for discovery and interpretation of ecological, biological, cultural, historic, geologic, and paleontological resources. Livestock and livestock facilities would be apparent.

Mitigation Measures: Motorized travel would be restricted to designated routes to protect the special values of the area. Livestock grazing and recreation use would be restricted if it hinders achievement of the desired condition for the SIA. Roads not necessary for administrative, scientific, or valid private access would be closed or obliterated. Mineral development, oil, gas, locatable and common variety, would be allowed with appropriate mitigation measures. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act.

Economic and Social Effects: Opportunities for recreation, interpretation, and educational activities would be increased. The need to provide good public access for recreation, interpretation, and educational opportunities would increase. If better access were provided, the challenge to protect the Special Features of the area would increase. Opportunities for those desiring solitude and isolation would still exist but would be less than in a nonmotorized designation. Those desiring motorized opportunities would be limited and off-road vehicle opportunities would be forgone. Those accustomed to accessing the area by vehicle would continue to have limited access. Livestock grazing would likely remain the primary economic benefit from the area. Unless mineral development occurred, the primitive to semi-primitive character of the area would be substantially retained.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternative: 2 and 3

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be apparent. Open meadows, grasslands, shrublands, and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of

successional stages. Opportunities for isolation and solitude in a motorized setting would be available.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, mineral developments and other features would be allowed. The area would be managed for a diversity of plants, animals, and ecological functions and processes, while providing livestock forage and other amenity values. Although, mitigation measures would be applied to meet Grassland-wide Plan standards and guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while at the same time opportunities for nonmotorized activities would be reduced and perhaps forgone. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing would remain the primary economic benefit. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character could be altered through time and perhaps permanently altered, making future wilderness designation unlikely.

First Black Canyon: An Overview of the Affected Environment

The 4,960-acre First Black Canyon area lies about 12 miles northeast of Smithwick, South Dakota. Specifically, the First Black Canyon area is located, either partly or fully, in Township 7 South, Range 9 East, Sections 3-4, 9-15, and 22-27. Access from Smithwick is via Fall River County Road Number 1 east for about eight miles, then north on Forest Development Road 7045 for about 10 miles, then northeast on Forest Development Road 7063 for about two miles. The Jim Wilson Canyon Public Proposed Roadless Area lies to the west of First Black Canyon.

The First Black Canyon area lies within the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division as identified by Robert G. Bailey (71). The topography of the area is varied, consisting of rolling to steep hilly grasslands, some of it fairly rugged and dissected with gullies, with a few patches of hard, flat clay pan. The elevation of the area ranges from between 2,900 to 3,240 feet above sea level.

The dominant grasses include western wheatgrass, green needlegrass, buffalo grass, and blue gramma. The noxious weed Canada thistle also is found in the area. No woody shrub components exist, although a few solitary cottonwoods may be found.

Wildlife includes mule and white-tailed deer, pronghorn antelope, sharp-tailed grouse, high populations of raptors, such as red-tailed and Swainson's hawks, coyotes, porcupines, badgers, prairie dogs, meadowlarks, loggerhead shrikes, northern flickers, long-billed curlews, upland sandpipers, prairie rattlesnakes, Woodhouse's toads, chorus frogs, and garter snakes.

Recreational opportunities include hunting, horseback riding, prairie dog shooting, and off-highway recreational motorized use. Livestock grazing occurs in the area.

Current fire management requires immediate, initial-attack suppression due to the explosive nature of the natural fuels.

First Black Canyon: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are available. The terrain offers an opportunity for isolation within the rolling hills. In addition, on open stretches, the nature of the mixed-grass prairie provides isolation; however, a fair number of developments do exist, such as stock dams, stock tanks, and two-track roads. The visitor might still experience the grassland much as early settlers and American Indians did more than a century ago.

Natural Appearance and Integrity: Overall, this area retains a natural appearance, representative of a healthy native grassland with rolling hills terrain. Most of the ecological processes, including seasonal flash flooding, remain intact. Closer examination reveals some signs of livestock activities. Cattle frequent the area from May through October. Livestock developments include some fencing, seven stock dams, and five stock tanks, which detract from the natural setting. About eight miles of buried pipeline are located in the area, but buried pipeline is not easily identifiable.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Buffalo Gap National Grassland (Fall River Ranger District).

Recreation Opportunities: The opportunities exist for hiking across an isolated hilly area. Currently, hunting pressure in this area is moderate to high. Should the area be designated as a Wilderness, all hunting would be on a walk-in basis only.

Special Features

Unique Characteristics and Scenic Features: Eight active prairie dog towns of about 115 acres provide unique grassland habitat to numerous grassland species. In conjunction with the adjacent Jim Wilson Canyon, this area provides one of the highest concentrations of prairie dog complexes on the Fall River District. First Black Canyon also offers open, native grassland landscapes, which might be an attractive feature to people looking for a grassland experience.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Buffalo Gap National Grassland (Fall River Ranger District).

Manageability

Size and Shape: The 4,960-acre First Black Canyon area is a contiguous block of National Forest System land with no inholdings under other ownership. It is about one to two miles wide east to west and about three to four miles long north to south. Existing developments pose only minor management challenges; however, the buried pipeline and fence lines do need to be maintained on an annual basis.

Potential to Manage Boundaries: The current boundaries consist of fencelines and Forest Development Roads. Fence lines offer the opportunity for clear and visible signing. They also prevent unauthorized motorized access. Since about three-quarters of the area's boundary are formed by Forest Development Roads, illegal motorized access may be difficult to prevent should the area be designated as a Wilderness.

First Black Canyon: Availability Analyses

Resource Values and Potentials

Oil and Gas: No oil and gas developments exist in the area. No interest has been expressed to develop any sites. The development potential is low, although oil shale and geothermal resources do exist in the area.

Coal: No coal resources exist on the Buffalo Gap National Grassland.

Livestock Grazing: Typically, livestock grazing occurs from May through October. This area is within the Gamet Allotment, with six permittees, for an average estimate of 1,800 permitted AUMs per year for this portion of the Gamet Allotment.

Locatable Minerals: No known locatable minerals exist in the area.

Common Minerals: Known sand, gravel and Pierre shale resources exist in the area.

Timber: No merchantable timber exists in the area.

Recreation: Wilderness designation might decrease hunting pressure, as well as restrict physically challenged and elderly access. Some increase in backcountry visitation might occur under Wilderness designation.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on the nesting success and wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.
- Black-footed ferret: Effects from Wilderness designation would be both beneficial and adverse. Beneficial effects result from the reduced human disturbances and reduced potential mortality due to motorized vehicles. In addition, ferrets would benefit from the significant reduction in prairie dog shooters, who would lose motorized access to prairie dog towns in a Wilderness area. Adverse effects result from restrictions on the motorized support to aid in ferret reintroduction projects. Ferrets may be targeted for reintroduction projects in the future in several areas on the Northern Great Plains, including this area.
- Mountain plover: A Wilderness designation would likely reduce prairie dog shooting, thereby increasing the expansion of prairie dog towns which, in turn, enhances mountain plover habitat. Designation would reduce motorized activities that can disturb mountain plovers and destroy their nests.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions. Finally, the mountain plover, which favors areas affected by fire, may be adversely affected due to reduced motorized support in conducting prescribed fires.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Buffalo National Grassland (Fall River Ranger District) include: the black-tailed prairie dog, and plains sharp-tailed grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: About 1,857 acres of private, subsurface minerals ownership exist beneath National Forest System lands in the area. No private leases exist in the area.

Existing Contracts and Agreements: The area is permitted under a grazing permit held by the Pioneer Grazing Association.

Biotic Control Measures and Fire Protection: Wildfire and noxious weed control would continue, despite future management, including Wilderness designation.

Effects on Adjacent Lands: Better strategies to identify public/private interface boundaries and to educate the public about landownership patterns may be needed. Some control of noxious or exotic plants is currently done in the area. Minor prairie dog control (usually less than 100 acres once every three to five years) is conducted and takes into account adjacent private lands.

The current boundaries consist of fence lines and Forest Development Roads. Fence lines offer the opportunity for clear and visible signing. They also prevent unauthorized motorized access. Unauthorized motorized access may be more difficult to prevent along Forest Development Roads.

Under Wilderness designation, vehicles would not be used for transportation or fire suppression when the fire danger is low. Vehicles will be used when fire conditions are high enough that firefighters walking and using hand tools would not be able to prevent a large fire.

Defensible fuel profile zones would be developed to permit options in managing restoration-designed prescribed fires.

First Black Canyon: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The following are the closest designate Wilderness areas:

- Black Elk Wilderness (9,824 acres) in the Black Hills lies about 33 miles to the northwest and is the closest designated Wilderness to First Black Canyon. Represents a ponderosa pine ecosystem.
- Sage Creek Wilderness (64,144 acres) is about 37 miles to the northeast in Badlands National Park. Represents a mixed-grass prairie ecosystem. It is the only designated Wilderness in the White River Badlands.

Representation of Landforms and Ecosystems: This area represents a mixed-grass prairie.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. A Wilderness designation may impede predator control and monitoring of any future reintroductions of the black-footed ferret to the area. Most other key species probably would benefit from a designation.

Public Interests and Concerns: The area is very sparsely populated. Rapid City, with a population of about 55,000 and about 40 miles to the northwest, is the closest area of significant population. It is likely that more people from Rapid City would visit the area under Wilderness designation.

A considerable number of people and organizations have called for the Forest Service to designate a grassland Wilderness somewhere on the Northern Great Plains. Currently, the Forest Service provides for no grassland Wilderness anywhere within the National Forest System.

First Black Canyon: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 6.1	4,960 acres
Alternative 3:	MA 3.63	4,960 acres
Alternative 3A:	MA 6.1	4,960 acres
Alternative 4:	MA 1.2	4,960 acres
Alternative 5:	MA 3.63	4,960 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended for Wilderness

Alternatives: 4

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the wilderness character of the area.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation, and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Mineral potential in the area is low and mineral development is unlikely under any management scenario. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be maintained.

Designation: Non-wilderness

Prescription: MA 3.63 Black-footed Ferret Reintroduction Habitat

Alternatives: 3 and 5

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Open meadows, grasslands, and shrub lands would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of a variety of successional stages. Black-tailed prairie dog and thus black-footed ferret habitat would increase and become an increasing part of the landscape. Opportunities for isolation and solitude in a motorized setting would be available. Livestock and livestock facilities would be apparent.

Mitigation Measures: Recreation, grazing, mineral leasing, road construction and other similar activities are allowed only it they contribute to the enhancement of black-footed ferret reintroduction habitat. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, and other features would be allowed if they meet reintroduction objectives. Motorized opportunities would be available but limited. The primitive to semi-primitive character of the area would be altered with prairie dog complexes.

Economic and Social Effects: Motorized activities would be limited to designated routes. Opportunities for solitude, lower human encounters, and nonmotorized settings would remain approximately the same as present. Livestock grazing would continue primarily as a tool to

help meet habitat objectives, and remain the primary economic benefit. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character would likely be reasonably maintained. However, there is a possibility, such as in the case of mineral development, that the character of the area would be altered so that future wilderness designation would be unlikely.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternative: 2 and 3A

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be apparent. Open meadows, grasslands, and shrub lands would dominate the area. Vegetation treatments would be apparent. The vegetation would consist a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, and other features would be allowed. The area would be managed for a diversity of plants, animals, and ecological functions and processes, while providing livestock forage and other amenity values. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while at the same time opportunities for nonmotorized activities would be reduced and perhaps forgone. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing would remain the primary economic benefit. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character could be altered through time and perhaps permanently altered, making future wilderness designation unlikely.

Indian Creek (Public Proposed):

The 3,760-acre portion of the Indian Creek area on the Fall River Ranger District shares a contiguous boundary with the Wall Ranger District. Since 25,100 acres of the Indian Creek area lie within the Wall Ranger District, the narrative for the Indian Creek area is found under the Wall Ranger District section.

Jim Wilson Canyon: An Overview of the Affected Environment

The 6,020-acre Jim Wilson Canyon area lies about 12 miles northeast of Smithwick, South Dakota. Specifically, the Jim Wilson area is located, either partly or fully, in Township 7 South, Range 9 East, Sections 4-5, 8-9, 15-18, 20-22, 27-29, and 32-34. Access from Smithwick is via Fall River County Road Number 1 east for about eight miles, then north on Forest Development Road 7045 for about 10 miles, then northeast on Forest Development Road 7063 for about a quarter mile. The First Black Canyon Public Proposed Roadless Area lies to the east of Jim Wilson Canyon.

The Jim Wilson Canyon area lies within the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division as identified by Robert G. Bailey (71). The topography of the area is varied, consisting of rolling to steep hilly grasslands, some of it fairly rugged and dissected with gullies, with a few patches of hard, flat clay pan. The elevation of the area ranges from between 2,900 to 3,350 feet above sea level.

The dominant grasses include western wheatgrass, green needlegrass, buffalo grass, and blue gramma. The noxious weed Canada thistle also is found in the area. No woody shrub components exist, although a few solitary cottonwoods may be found.

Wildlife includes mule and white-tailed deer, pronghorn antelope, sharp-tailed grouse, high populations of raptors, such as red-tailed and Swainson's hawks, coyotes, porcupines, badgers, prairie dogs, meadowlarks, loggerhead shrikes, northern flickers, long-billed curlews, upland sandpipers, prairie rattlesnakes, Woodhouse's toads, chorus frogs, and garter snakes.

Recreational opportunities include hunting, horseback riding, prairie dog shooting, and off-highway recreational motorized use. One bass fishery exists at Island Dam. Livestock grazing occurs in the area.

Current fire management requires immediate, initial-attack suppression due to the explosive nature of the natural fuels.

Jim Wilson Canyon: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are available. The terrain offers an opportunity for isolation within the rolling hills. In addition, on open stretches, the nature of the mixed-grass prairie provides isolation; however, a fair number of developments do exist, such as stock dams, stock tanks, and two-track roads. The visitor might still experience the grassland much as early settlers and American Indians did more than a century ago.

Natural Appearance and Integrity: Overall, this area retains a natural appearance, representative of a healthy native grassland with rolling hills terrain. Most of the ecological processes, including seasonal flash flooding, remain intact. Closer examination reveals some signs of livestock activities. Cattle frequent the area from May through October. Livestock developments include some fencing, 12 stock dams, and eight stock tanks, which detract from the natural setting. About ten and a half miles of buried pipeline are located in the area, but buried pipeline is not easily identifiable. Two artificial raptor nesting platforms exist in the area.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Buffalo Gap National Grassland (Fall River Ranger District).

Recreation Opportunities: The opportunities exist for hiking across an isolated hilly area. Currently, hunting pressure in this area is moderate to high. Should the area be designated as a Wilderness, all hunting would be on a walk-in basis only. The bass fishery at Island Dam would be on a walk-in basis only under Wilderness designation.

Special Features

Unique Characteristics and Scenic Features: In conjunction with the adjacent First Black Canyon, this area provides one of the highest concentrations of prairie dog complexes on the Fall River District. Jim Wilson Canyon also offers open, native grassland landscapes, which might be an attractive feature to people looking for a grassland experience

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Buffalo Gap National Grassland (Fall River Ranger District).

Manageability

Size and Shape: The 6,020-acre Jim Wilson Canyon area is a contiguous block of National Forest System land with no inholdings under other ownership. It is about three-quarters to two and one-half miles wide east to west and about five and a half miles long north to south. Existing developments pose only minor management challenges; however, the buried pipeline and fencelines do need to be maintained on an annual basis.

Potential to Manage Boundaries: The current boundaries consist of fence lines and Forest Development Roads. Fence lines offer the opportunity for clear and visible signing. They also prevent unauthorized motorized access. Since about three-quarters of the area's boundary is formed by Forest Development Roads, illegal motorized access may be difficult to prevent should the area be designated as a Wilderness.

Jim Wilson Canyon: Availability Analyses

Resource Values and Potentials

Oil and Gas: No oil and gas developments exist in the area. No interest has been expressed to develop any sites. The development potential is low, although oil shale and geothermal resources exist in the area.

Coal: No coal resources exist on the Buffalo Gap National Grassland.

Livestock Grazing: Typically, livestock grazing occurs from May through October. This area is within the Gamet Allotment, with six permittees, for an average estimate of 1,800 permitted AUMs per year for this portion of the Gamet Allotment.

Locatable Minerals: No known locatable minerals exist in the area.

Common Minerals: Known sand, gravel, and Pierre shale resources exist in the area.

Timber: No merchantable timber exists in the area.

Recreation: Wilderness designation might decrease hunting pressure, as well as restrict physically challenged and elderly access. Some increase in backcountry visitation might occur under Wilderness designation. Designation would support a walk-in fishery for bass at Island Dam.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on the nesting success and wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.
- Black-footed ferret: Effects from Wilderness designation would be both beneficial and adverse. Beneficial effects result from the reduced human disturbances and reduced potential mortality due to motorized vehicles. In addition, ferrets would benefit from the significant reduction in prairie dog shooters, who would lose motorized access to prairie dog towns in a Wilderness area. Adverse effects result from restrictions on the motorized support to aid in ferret reintroduction projects. Ferrets may be targeted for reintroduction projects in the future in several areas on the Northern Great Plains, including this area.
- Mountain plover: A Wilderness designation would likely reduce prairie dog shooting, thereby increasing the expansion of prairie dog towns which, in turn, enhances mountain plover habitat. Designation would reduce motorized activities that can disturb mountain plovers and destroy their nests.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning and shooting of prairie dogs, accomplished mainly with motorized support, would be greatly reduced. However, travel restrictions would also mean a reduction in predator control, which would be harmful to prairie dogs. Finally, the mountain plover, which favors areas affected by fire, may be adversely affected due to reduced motorized support in conducting prescribed fires.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Buffalo Gap National Grassland (Fall River Ranger District) include: the black-tailed prairie dog, plains sharp-tailed grouse and the sage grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: About 2,920 acres of private, subsurface minerals ownership exist beneath National Forest System lands in the area. No private leases exist in the area.

Existing Contracts and Agreements: The area is permitted under a grazing permit held by the Pioneer Grazing Association.

Biotic Control Measures and Fire Protection: Wildfire and noxious weed control would continue, despite future management, including Wilderness designation.

Effects on Adjacent Lands: Better strategies to identify public/private interface boundaries and to educate the public about landownership patterns may be needed. Some control of noxious or exotic plants is currently done in the area. Minor prairie dog control (usually less than 100 acres once every three to five years) is conducted, and takes into account adjacent private lands.

The current boundaries consist of fence lines and Forest Development Roads. Fence lines offer the opportunity for clear and visible signing. They also prevent unauthorized motorized access. Unauthorized motorized access may be more difficult to prevent along Forest Development Roads.

Under Wilderness designation, vehicles would not be used for transportation or fire suppression when the fire danger is low. Vehicles would be used when fire conditions are high enough that firefighters walking and using hand tools would not be able to prevent a large fire.

Defensible fuel profile zones would be developed to permit options in managing restoration-designed prescribed fires.

Jim Wilson Canyon: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The following are the closest Wilderness areas:

- Black Elk Wilderness (9,824 acres) in the Black Hills lies about 33 miles to the northwest and is the closest designated Wilderness to First Black Canyon. Represents a ponderosa pine ecosystem.
- Sage Creek Wilderness (64,144 acres) is about 37 miles to the northeast in Badlands National Park. Represents a mixed-grass prairie ecosystem. It is the only designated Wilderness in the White River Badlands.

Representation of Landforms and Ecosystems: This area represents a mixed-grass prairie.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. A Wilderness designation may impede any future reintroductions of the black-footed ferret to the area. Most other key species probably would benefit from a designation.

Public Interests and Concerns: The area is very sparsely populated. Rapid City, with a population of about 55,000 and about 40 miles to the northwest, is the closest area of significant population. It is likely that more people from Rapid City would visit the area under Wilderness designation.

A considerable number of people and organizations have called for the Forest Service to designate a grassland Wilderness somewhere on the Northern Great Plains. Currently, the Forest Service provides for no grassland Wilderness anywhere within the National Forest System.

Jim Wilson Canyon: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 6.1	6,020 acres
Alternative 3:	MA 3.63	6,020 acres
Alternative 3A:	MA 6.1	6,020 acres
Alternative 4:	MA 1.2	6,020 acres
Alternative 5:	MA 3.63	6,020 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended for Wilderness

Alternatives: 4

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration, noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the wilderness character of the area. Valid existing mineral rights would be honored.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Mineral potential in the area is low and mineral development is unlikely under any management scenario. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be unless valid outstanding minerals were developed. If outstanding mineral rights were developed, the primitive to semi-primitive character of the development area could be altered, making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 3.63

Alternatives: 3 and 5

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Open meadows, grasslands, and shrub lands would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of a variety of successional stages. Black-tailed prairie dog and thus black-footed ferret habitat would increase and become an increasing part of the landscape. Opportunities for isolation and solitude in a motorized setting would be available. Livestock and livestock facilities would be apparent.

Mitigation Measures: Recreation, grazing, mineral leasing, road construction and other similar activities are allowed only it they contribute to the enhancement of black-footed ferret reintroduction habitat. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, and other features would be allowed if they meet reintroduction objectives. Motorized opportunities would be available but limited. Valid existing mineral rights would be honored. The primitive to semi-primitive character of the area would be altered with prairie dog complexes.

Economic and Social Effects: Motorized activities would be limited to designated routes. Opportunities for solitude, lower human encounters, and nonmotorized settings would remain approximately the same as present. Livestock grazing would continue primarily as a tool to help meet habitat objectives, and remain the primary economic benefit. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character would likely be reasonably maintained. However, there is a possibility, such as in the case of mineral development, that the character of the area would be altered so that future wilderness designation would be unlikely.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternatives: 2 and 3A

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be apparent. Open meadows, grasslands, and shrub lands would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, and other features would be allowed. The area would be managed for a diversity of plants, animals, and ecological functions and processes, while providing livestock forage and other amenity values. Although, mitigation measures would be applied to meet Grassland-wide Plan standards and guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while at the same time opportunities for nonmotorized activities would be reduced and perhaps forgone. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing would remain the primary economic benefit. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character could be altered through time and perhaps permanently altered, making future wilderness designation unlikely.

Red Shirt: An Overview of the Affected Environment

The 7,130-acre Red Shirt area lies about 16 miles southeast of Hermosa, South Dakota, and about 13 miles east of Fairburn, South Dakota. Specifically, the Red Shirt area is located, either partly or fully, in Township 4 South, Range 9 East, Sections 1-3, 10-15, 24, and Township 4 South, Range 10 East, Sections 7-8, 17-22, and 27-30. Access is via Highway 79, east along Custer County Road 18, through Fairburn, to Forest Development Road 7053, or southeast from Hermosa via U.S. Highway 40 to Forest Development Road 7053 turning to the west. The Cheyenne roadless area lies directly to the south.

The Red Shirt area lies within the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division as identified by Robert G. Bailey (71). The topography of the Red Shirt area is varied, consisting of gently rolling grasslands or highly vegetated tabletop buttes with steep, dissected slopes exposing layers of color-banded clays of reds and shades of white and gray. Elsewhere, sparsely vegetated, mounded, clay badlands terrain and beds of agates exist. Natural seeps frequently occur along some of the hillsides. The elevation of the area ranges from between 2,700 to 3,200 feet above sea level. This area is the most western extension of the White River Badlands on the Buffalo Gap National Grassland. The Red Shirt area is locally often referred to as Shoemaker Canyon.

The dominant grasses include western wheatgrass, green needlegrass, buffalo grass, and blue gramma. Some crested wheatgrass, an exotic, can be found in isolated areas. The noxious weed Canada thistle also is found in the area. Woody shrub and browse species, mainly found in alluvial draws or dissected drainages, include skunkbrush sumac, chokecherry, snowberry, buffaloberry, and wild rose. North-facing exposures may be dominated by Rocky Mountain juniper. In the alluvial floodplains or in some of the sharp dissected cutbanks along Red Shirt Creek and Camp Creek, cottonwood is the dominant riparian community. Both creeks are intermittently vegetated with conspicuous stands of cordgrass.

Wildlife includes mule and white-tailed deer, pronghorn antelope, sharp-tailed grouse, high populations of raptors, such as red-tailed and Swainson's hawks, coyotes, porcupines, raccoons, prairie dogs, meadowlarks, loggerhead shrikes, lark sparrows, northern orioles, American goldfinches, long-billed curlews, upland sandpipers, prairie rattlesnakes, Woodhouse's toads, chorus frogs, and garter snakes.

Recreational opportunities include rock hounding, hunting, horseback riding, and hiking. Other uses include livestock grazing and the gathering of sacred and medicinal plants and herbs by American Indians. One permittee currently grazes bison.

Current fire management requires immediate, initial-attack suppression due to the proximity of adjacent private land.

Red Shirt: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are available. The rugged terrain offers an opportunity for isolation within Red Shirt (Shoemaker) Canyon, and within the rolling hills. In addition, on open stretches, the vast nature of the mixed-grass prairie and the lack of visible human developments allow the visitor to experience the grassland much as early settlers and American Indians did more than a century ago.

Natural Appearance and Integrity: Overall, this area retains a natural appearance, representative of a healthy native grassland with rolling hills and rough badlands terrain. Most of the ecological processes, including seasonal flash flooding, remain intact. Closer examination may reveal some signs of livestock activities. Cattle may frequent the area during the spring or fall grazing seasons. Livestock developments, including two developed springs, some fencing and four stock dams, detract from the natural setting. One buried pipeline is located in the area, but it is not easily identifiable.

Challenge: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Buffalo Gap National Grassland (Fall River Ranger District).

Recreation Opportunities: A number of recreational activities occur in the area, including rock hounding, prairie dog shooting and viewing, other hunting opportunities, horseback riding, nature study, birdwatching, limited off-road motorized recreation, some canoeing, and other associated activities.

Special Features

Unique Characteristics and Scenic Features: Active prairie dog towns provide unique grassland habitat to numerous grassland species. Bison graze at least a small portion of the area. The Red Shirt area is very scenic. It offers colorful badlands terrain and open, native grassland landscapes. Numerous agate beds (commonly called the Fairburn Agate Beds) are scattered throughout the area and rock hounds find such collectible gems as Fairburn, prairie, and black agates, banded jasper, chalcedony and rattle stones. Fossils found in White River Group and Pierre Shale deposits represent the Eocene and Oligocene (45 to 26 million years ago) and the Late Cretaceous (90 to 65 million years ago) periods.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Buffalo Gap National Grassland (Fall River Ranger District).

Manageability

Size and Shape: The 7,130-acre Red Shirt area is a contiguous, though irregularly shaped, block of National Forest System land. It has no inholdings under other ownership. The area is about eight miles wide east to west and about two to four miles long north to south. The few existing developments pose only minor management challenges; however, fencelines do need to be maintained on an annual basis.

Potential to Manage Boundaries: The current boundaries consist of fence lines and natural topographical features. Fence lines offer the opportunity for clear and visible signing. They also prevent unauthorized motorized access. Natural boundaries pose a larger management challenge. Clear boundary identification and signing may be more difficult than with fence lines and unauthorized motorized access may be more difficult to prevent.

Red Shirt: Availability Analyses

Resource Values and Potentials

Oil and Gas: The development potential is low. Oil shale and geothermal resources exist in the area.

Coal: No coal resources exist on the Buffalo Gap National Grassland.

Livestock Grazing: Five permittees graze livestock (and bison) on four allotments, numbering about 3,000 permitted AUMs per year.

Locatable Minerals: Known and potential deposits of gold occur in the area in Cheyenne River deposits where placer mining opportunities exist. Potential uranium, molybdenum, selenium, and vanadium resources may occur in this area.

Common Minerals: Known gemstones, Chadron bentonite / clay resources, and Pierre shale exist in the area. Potential sand and gravel resources and specialty sand resources may occur in the area.

Timber: No merchantable timber exists in this area.

Recreation: This area would provide excellent backcountry recreational experiences, including horseback riding, dispersed camping, rock hounding, nature study, hiking and associated nonmotorized activities. Opportunities for physically challenged and elderly access under a Wilderness designation would likely be reduced. Walk-in hunting opportunities would likely increase. Motorized recreation of all kinds, including ATV, snowmobile, and four-wheel-drive use, would be prohibited.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on the nesting success and wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.
- Mountain plover: A Wilderness designation would likely reduce prairie dog shooting, thereby increasing the expansion of prairie dog towns which, in turn, enhances mountain plover habitat. Designation would reduce motorized activities that can disturb mountain plovers and destroy their nests.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions. Finally, the mountain plover, which favors areas affected by fire, may be adversely affected due to reduced motorized support in conducting prescribed fires.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Buffalo Gap National Grassland (Fall River Ranger District) include: the black-tailed prairie dog, and plains sharp-tailed grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: No current federal mineral leases exist in this area. The majority of the entire area has been leased in the past. About 6,773 acres of private, subsurface minerals ownership exist beneath National Forest System lands in the area. No private leases exist in the area.

Existing Contracts and Agreements: The five permittees in the area are issued direct permits by the U.S. Forest Service.

Biotic Control Measures and Fire Protection: Wildfire, and noxious weed control would continue despite future management, including Wilderness designation.

Effects on Adjacent Lands: Vehicles would not be used for transportation or fire suppression when the fire danger is low. Vehicles would be used when fire conditions are high enough that firefighters walking and using hand tools would not be able to prevent a large fire.

Defensible fuel profile zones would be developed to permit options in managing restoration-designed prescribed fires.

Red Shirt: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The following are the closest Wilderness areas:

- Black Elk Wilderness (9,824 acres) in the Black Hills lies about 25 miles to the west. Represents a ponderosa pine ecosystem.
- Sage Creek Wilderness (64,144 acres) is about 20 miles to the east in Badlands National Park. Represents a mixed-grass prairie ecosystem. The Red Shirt Wilderness area would be a mixed-grass prairie in a badlands setting and would share some of the characteristics of the Sage Creek Wilderness

Representation of Landforms and Ecosystems: This area is representative of rolling grasslands, scenic badlands terrain, green ash / chokecherry wooded draws, and Rocky Mountain juniper breaks.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: The general local concerns expressed about this area include maintaining range improvements with motorized vehicles and suppression of wildfires with motorized vehicles. Local environmental groups have expressed an interest in designating areas for backcountry experiences, which may include Wilderness designation. The U.S. Forest Service is concerned about the environmental effects resulting from expanding off-road motorized recreation in the area. In addition, a newly proposed railroad line, sponsored by the Dakota, Minnesota and Eastern Railroad Company, could be routed through the area. Such an expansion of railway service into the area would severely reduce the opportunity for solitude and serenity.

Red Shirt: Environmental Consequences

Management Prescription Allocations by Alternative:

	Forest Service Inventoried Acres		RARE II Acres
Alternative 2:	MA 1.31		9,210 acres
	MA 2.2	1,560 acres	
	MA 6.1	5,570 acres	
Alternative 3:	MA 1.2	5,300 acres	8,450 acres
	MA 2.2	1,610 acres	
	MA 6.1	220 acres	760 acres
Alternative 3A:	MA 2.1	5,570 acres	9,210 acres
	MA 2.2	1,560 acres	
Alternative 4:	MA 1.2	5,840 acres	9,210 acres
	MA 3.4	210 acres	
	MA 6.1	1,080 acres	
Alternative 5:	MA 1.2		9,210 acres
	MA 1.31	5,300 acres	
	MA 2.2	1,560 acres	
	MA 4.4	200 acres	
	MA 6.1	70 acres	

Designation: Wilderness

Prescription: MA 1.2 Recommended for Wilderness

Alternatives: 3, 4, and 5

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the wilderness character of the area. Valid existing mineral rights would be honored.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Mineral potential in the area is low and mineral development is unlikely under any management scenario. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be maintained unless valid outstanding minerals were developed. If outstanding mineral rights were developed, the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 2 and 5

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the primitive to semi-primitive character of the area. Valid existing mineral rights would be honored.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Mineral potential in the area is low and mineral development is unlikely under any management scenario. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be maintained unless valid outstanding minerals were developed. If outstanding mineral rights were developed, the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 2.1, Special Interest Areas

Alternatives: 3A

Environmental Consequences: Vegetation, terrestrial and aquatic habitats would usually but not always appear natural. There would be some evidence of vegetative manipulation. Past human use, such as fences, trails, water developments, and primitive roads, would be evident. Opportunities for isolation and solitude in a motorized setting would be available. At various times wildlife would be disturbed by human activities. There would be an opportunity for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources. Livestock and livestock facilities would be apparent.

Mitigation Measures: Motorized travel would be restricted to designated routes to protect the special values of the area. Livestock grazing and recreation use would be restricted if it hinders achievement of the desired condition for the SIA. Roads not necessary for administrative, scientific, or valid private access would be closed or obliterated. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Valid existing mineral rights would be honored.

Economic and Social Effects: Opportunities for recreation, interpretation, and educational activities would be increased. The need to provide good public access for recreation, interpretation, and educational opportunities would increase. If better access were provided the challenge to protect the Special Features of the area would increase. Opportunities for those desiring solitude and isolation would still exist but would be less than in a nonmotorized designation. Those desiring motorized opportunities would be limited and off-road vehicle opportunities would be forgone. Those accustomed to accessing the area by vehicle would continue to have limited access. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be substantially retained unless valid outstanding minerals were developed. If outstanding mineral rights were developed, the primitive to semi-primitive character of the development

area could be altered making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 2.2, Research Natural Areas

Alternatives: 2, 3, and 3A

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative, law enforcement, emergency, and scientific purposes. Construction of roads and trails would not be allowed except to correct resource damage. Livestock grazing and recreation use would be restricted if it hinders achievement of the desired condition for the RNA. New developments including livestock fences and water developments would not be allowed to detract from the primitive to semi-primitive character of the area. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Valid existing mineral rights would be honored.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Mineral potential in the area is low and mineral development is unlikely under any management scenario. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would substantially retained unless valid outstanding minerals were developed. If outstanding mineral rights were developed, the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 3.4 National River System, Scenic Rivers Recommended

Alternatives: 4

Environmental Consequences: Opportunities for isolation and solitude in a free-flowing river setting would be available. Shorelines would be largely primitive and undeveloped, but accessible in places by roads. Vegetation, terrestrial and aquatic habitats would usually but not always appear natural. There would be some evidence of vegetative manipulation. Past human use, such as fences, trails, water developments, and primitive roads, would be evident. There would be an opportunity for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources. Livestock and livestock facilities would be apparent.

Mitigation Measures: Motorized travel is generally permitted on water or land within the Scenic River designation. Motorized travel would be restricted to designated routes to protect the special values of the area. Livestock grazing and recreation are also permitted activities but use may be use-restricted if it hinders achievement of the desired condition for the Scenic Rivers designation. Roads not necessary for administrative, scientific, or valid private access would be closed or obliterated. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Valid existing mineral rights would be honored.

Economic and Social Effects: Opportunities for recreation, interpretation, and educational activities would be increased. The need to provide good public access for recreation, interpretation, and educational opportunities would increase. If better access were provided the challenge to protect the Special Features of the area would increase. Opportunities for those desiring solitude and isolation would still exist but would be less than in a nonmotorized designation. Those desiring motorized opportunities would be limited and off-road vehicle opportunities would be forgone. Those accustomed to accessing the area by vehicle would continue to have limited access. Livestock grazing would likely remain the primary economic benefit from the area. The semi-primitive character of the area would be maintained unless valid outstanding minerals were developed. If outstanding mineral rights were developed, the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 4.4 National River System, Recreation Rivers Recommended

Alternatives: 5

Environmental Consequences: Recreation opportunities in a free-flowing natural riverine setting would be available. Roads or railroads would be in close proximity to one or both of the banks. Some development along the shoreline would be expected. Vegetation, terrestrial and aquatic habitats would usually but not always appear natural. There would be some evidence of vegetative manipulation. Past human use, such as fences, trails, water developments, and primitive roads, would be evident. There would be an opportunity for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources. Livestock and livestock facilities would be apparent.

Mitigation Measures: Motorized travel is generally permitted on water or land within the Scenic River designation. Motorized travel would be restricted to designated routes to protect the special values of the area. Livestock grazing and recreation are also permitted activities but use may be use restricted if it hinders achievement of the desired condition for the Scenic Rivers designation. Roads not necessary for administrative, scientific, or valid private access would be closed or obliterated. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Valid existing mineral rights would be honored.

Economic and Social Effects: Opportunities for recreation, interpretation, and educational activities would be increased. The need to provide good public access for recreation, interpretation, and educational opportunities would increase. If better access were provided the challenge to protect the Special Features of the area would increase. Opportunities for those desiring solitude and isolation would still exist but would be less than in a nonmotorized designation. Those desiring motorized opportunities would be limited and off-road vehicle opportunities would be forgone. Those accustomed to accessing the area by vehicle would continue to have limited access. Livestock grazing would likely remain the primary economic

benefit from the area. The primitive to semi-primitive character of the area would be maintained unless valid outstanding minerals were developed. If outstanding mineral rights were developed, the primitive to semi-primitive character of the development area could be altered making wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternative: 2, 3, 4, and 5

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be apparent. Open meadows, grasslands, shrublands, and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, and other features would be allowed. The area would be managed for a diversity of plants, animals, and ecological functions and processes, while providing livestock forage and other amenity values. Although, mitigation measures would be applied to meet Grassland-wide Plan standards and guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while at the same time opportunities for nonmotorized activities would be reduced and perhaps forgone. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing would remain the primary economic benefit. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character could be altered through time and perhaps permanently altered, making future wilderness designation unlikely.

Criteria Common to All Roadless Areas on this Administrative Unit

Capability Criteria

Challenge: Challenges center around survival in a harsh and dry environment. Any existing water developments used by livestock are not suitable for human consumption. Summer temperatures can exceed 100° Fahrenheit. Winter temperatures can drop to more than -30° Fahrenheit, with wind-chill factors well in excess of -85° Fahrenheit. Broken terrain and open landscapes can be deceptive and may disorient visitors' abilities to mark their directions. No developed trails exist, although some two-track roads exist. Prairie rattlesnakes may be encountered and can be dangerous. Seasonal flash flooding may test a visitor's skill in adapting to this natural phenomenon and creates water hazards and slick gumbo conditions.

Opportunities for Outdoor Education: A visitor should find plenty of features to stimulate curiosity: grassland ecosystems, grassland flora and fauna, shifting weather patterns and cloud types, and clear night skies with unimpeded views of the stars. Skills in maneuvering a rugged terrain, using a compass, taking precautions for snake and spider bites, heat stroke, frostbite, setting up a primitive campsite, and outdoor cooking may all test and develop a visitor's understanding of the outdoors. However, no interpretive resources, such as brochures or interpretive signing, exist in these areas.

Buffalo Gap National Grassland

Wall Ranger District

Indian Creek (RARE II) Area: An Overview of the Affected Environment

The 25,100-acre Indian Creek RARE II area is located about five miles west of Scenic, South Dakota, and 37 miles southeast of Rapid City, South Dakota. Specifically, the Indian Creek (RARE II) area is located, either partly or fully, in Township 4 South, Range 13 East, Sections 6-7 and 18-19, and Township 3 South, Range 13 East, Sections 29-32, and Township 3 South, Range 12 East, Sections 23-28 and 31-35, and Township 4 South, Range 12 East, Sections 1-15 and 17-24, and Township 4 South, Range 11 East, Sections 1-2, 9, 11-15 and 21-24, and Township 3 South, Range 11 East, Section 35. Access is via State Highway 44 to Scenic, then north on Pennington County Road 580 (locally known as Spring Draw Road).

The Indian Creek (RARE II) area lies within the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division as identified by Robert G. Bailey (71), in the White River Badlands. The area is by far the most remote, rugged and inaccessible on the entire Wall Ranger District. Topography consists of intermingled badlands and grassland table terrain, with drainages off of the tables deeply incised and eroded, exposing cliffs of multi-colored clays. Large flat floodplains lie below the tables. This area does not exhibit the sharp, serrated pinnacles of nearby Badlands National Park. Rather, badlands terrain is more rounded in shape and very sparsely vegetated. Three ridgelines, which create distinctive landmarks, cross the area north to south. Two of them exhibit tabletop characteristics--Heutmacher and Zebell Tables. The third isn't named and is not generally flat on top. The two main drainages are Indian Creek and Big Corral Draw, which flow north and west into the Cheyenne River. Elevation ranges from 3,000 feet above sea level along the ridgelines to 2,600 feet above sea level along the Cheyenne River, which intermittently forms the western boundary of the area. Agate beds can be found in the area, as can significant fossil deposits. A great deal of fossil theft is occurring in the area. The well-known Sheep Mountain Table lies outside of the area to the east.

Dominant vegetation includes mixed-grass uplands of western wheatgrass, blue gramma, and buffalo grass. In some side drainages, big and little bluestem can be found. Elsewhere, Rocky Mountain juniper is found in the draws and cutbanks and on hillside slopes, especially with a north-facing aspect. Juniper is the largest woody component in the area. The main floodplains, including the Cheyenne River, Indian Creek, and Big Corral Draw, provide cottonwood habitat. Cottonwood is generally in good health and is regenerating along the Cheyenne River. The cottonwood along Indian Creek and Big Corral Draw is in less vigorous health, although recent

changes in livestock stocking levels is improving the condition of cottonwoods in these drainages. Silver sagebrush can be found in the floodplains, while chokecherry and snowberry exist in some of the side draws and drainages. Some Canada thistle may be scattered around stock ponds, and crested wheatgrass and cheat grass can be found on some upland sites.

Wildlife includes mule and white-tailed deer, pronghorn antelope, sharp-tailed grouse, mourning dove, coyote, badger, skunk, golden eagles, great-horned owls, Swainson's and red-tailed hawks, meadowlarks, horned larks, eastern and western kingbirds, prairie rattlesnakes, bull snakes, and catfish.

One designated two-track road (Forest Development Road 7129) enters along Indian Creek Drainage, but it is not maintained. Currently, no motorized traffic or mechanized traffic (such as bicycles) is allowed into the area, except along FDR 7129. An excellent scenic vista is found at the end of FDR 7129. A minimum of fencing exists in the area. No buried pipelines exist, although about 30 stock dams and two windmills are within the Indian Creek RARE II area.

Recreational opportunities include hiking, primitive camping, horseback riding, hunting, limited canoeing, and rock hounding. No developed trails exist in the area. Other uses include livestock grazing, some authorized scientific study of fossils, and the collection of sacred and medicinal plants by American Indians.

Current fire management requires immediate, initial-attack suppression due to the proximity of adjacent private land.

Indian Creek (RARE II Area): Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are available. The rugged terrain offers an opportunity for isolation among the canyons. In addition, on open stretches of the tabletops, the unimpeded nature of the mixed-grass prairie and the relative lack of visible human developments allow the visitor to experience the grassland much as early settlers and American Indians did more than a century ago. However, on some stretches outside but adjacent to the area, farmsteads, cultivated fields, and power lines may be visible. Few fences occur in the area. In addition, the lazy meandering of the Cheyenne River adds a natural charm and sense of timelessness.

Natural Appearance and Integrity: This area retains a natural appearance, representative of rough and rolling badlands terrain. Most of the ecological processes, with the possible exception of frequent natural wildfire, remain intact. Closer examination reveals signs of livestock grazing and illegal fossil excavation. Cattle may be frequently encountered during the warmer grazing season on the flat tables or in the bottom lands. Livestock developments, including fences, primitive trails and stock dams, detract from the natural setting, although most range developments are constructed to blend with the natural surroundings as much as possible. Fossil extraction, which is mostly illegal, also detracts from the natural surroundings.

Challenge: Challenge in this area centers around survival in a dry, harsh environment. Summer temperatures can exceed 100° Fahrenheit in an area with few drinkable water sources. Winter temperatures can drop to in excess of -30° Fahrenheit, with wind-chill factors in excess of -85° Fahrenheit. Broken terrain and open landscapes are deceptive and may disorient the visitor's ability to mark his or her directions. Hiking may be much more difficult than anticipated with steep slopes and difficult terrain. Only cattle or abandoned trails exist in the area, and they may intermittently disappear or reappear along their course.

Recreation Opportunities: Recreation can include hiking, primitive camping, walk-in hunting, photography, wildlife and wildflower viewing, rock hounding, and limited canoeing during the peak flow season along the Cheyenne River. The Sage Creek Wilderness Campground is about 18 miles to the east in Badlands National Park.

Special Features

Unique Characteristics and Scenic Features: Some archeological sites may exist in the area, representing prehistoric and historic homestead occupation. A few, small prairie dog towns do exist in the area, but not in excess of 200 acres. This area is scenic. It provides colorful badlands terrain and open, native grassland sites on tabletops and bottomlands. The Cheyenne River provides a riverine environment. Fossils found in White River Group and Pierre Shale deposits represent the Eocene and Oligocene (45 to 26 million years ago) and the Late Cretaceous (90 to 65 million years ago) periods. Numerous agate resources add to the Special Features of the area.

Opportunities for Outdoor Education: A visitor should find plenty of features to stimulate curiosity: geology and fossil resources, grassland ecosystems, grassland flora and fauna, bared soil layers, shifting weather patterns and cloud types, incredibly clear night skies offering unimpeded views of the stars. Skills in maneuvering a rugged terrain, using a compass, taking precautions for snake and spider bites, heat stroke, frostbite and freezing, setting up a primitive campsite, and outdoor cooking may all test and develop a visitor's understanding of the outdoors.

Manageability

Size and Shape: The 25,100-acre Indian Creek RARE II area is mostly in contiguous acres in a rectangular shape extending about five and a half miles north to south and 10 miles east to west. Five inholdings of other ownership (about 2,500 acres) are in the area, including one section of state school land.

Potential to Manage Boundaries: Although this area is currently managed for nonmotorized access, it is very difficult to restrict motorized access. Two reasons predominate: the number of areas along the boundary for easy entry, and the distance personnel would have to travel to enforce motorized restrictions. It is likely that entry violations would still occur under Wilderness designation without the implementation of additional strategies to restrict access.

The signing of the area is not anticipated to be a large management concern. Maintenance of signing, due to vandalism, could become more problematic.

Indian Creek (RARE II Area): Availability Analyses

Resource Values and Potentials

Oil and Gas: No oil and gas developments exist in the area. The development potential is low. No interest has been expressed in the last 15 or more years concerning oil and gas development. Oil shale and geothermal resources do exist in the area.

Coal: No coal resources exist on the Buffalo Gap National Grassland.

Livestock Grazing: Typically, livestock grazing occurs from mid-May through October. There are four allotments, with nine permittees, for an average of 4,000 permitted AUMs per year in the Indian Creek RARE II area.

Locatable Minerals: Known gold and uranium resources exist in the area. Potential molybdenum, selenium and vanadium resources may exist in the area.

Common Minerals: Known gemstone, Chadron bentonite/clay resources, Pierre shale, and sand and gravel resources exist in the area. Potential specialty sand resources may exist in the area.

Timber: No merchantable timber exists in the area, except for some post-and-pole material that could be taken infrequently from some stands of Rocky Mountain juniper.

Recreation: Wilderness designation might increase the likelihood for a special-use outfitter permit to provide horseback riding in the area. Opportunities for physically challenged and elderly access under a Wilderness designation would likely be reduced. Walk-in hunting opportunities would likely increase. Motorized recreation of all kinds, including ATV, snowmobile, and four-wheel-drive use, would be prohibited.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on the nesting success and wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.
- Mountain plover: A Wilderness designation would likely reduce prairie dog shooting, thereby increasing the expansion of prairie dog towns which, in turn, enhances mountain plover habitat. Designation would reduce motorized activities that can disturb mountain plovers and destroy their nests.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions. Finally, the mountain plover, which favors areas affected by fire, may be adversely affected due to reduced motorized support in conducting prescribed fires.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Buffalo Gap National Grassland (Wall Ranger District) include: the black-tailed prairie dog and plains sharp-tailed grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: About 15,810 acres of private, subsurface minerals ownership exist beneath National Forest System lands in the area. No private leases exist in the area.

Existing Contracts and Agreements: There are nine direct grazing permits in effect in the area.

Biotic Control Measures and Fire Protection: Chemical, biological and mechanical control methods may be used in these areas to stem the expansion of undesirable plant species. Wildfire suppression would be addressed in Wilderness management plans that would be developed if any of the roadless areas are designated by Congress as Wilderness.

Effects on Adjacent Lands: Better strategies to identify public/private interface boundaries and to educate the public about landownership patterns may be needed. No control of noxious or exotic plants is currently done in the area. Minor prairie dog control (usually less than 100 acres once every three to five years) is conducted and takes into account adjacent private lands.

The current boundaries consist of fence lines and natural topographical features. Fence lines offer the opportunity for clear and visible signing. They also prevent unauthorized motorized access. Natural boundaries pose a larger management challenge. Clear boundary identification and signing may be more difficult than with fence lines and unauthorized motorized access may be more difficult to prevent.

Vehicles would be used for fire suppression.

Defensible fuel profile zones would be developed to permit options in managing restoration-designed prescribed fires.

Indian Creek (RARE II Area): Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The following are the closest Wilderness areas:

- Black Elk Wilderness (9,824 acres) in the Black Hills lies about 40 miles to the northwest and is the closest designated Wilderness to First Black Canyon. Represents a ponderosa pine ecosystem.
- Sage Creek Wilderness (64,144 acres) is about 10 miles to the east in Badlands National Park. Represents a mixed-grass prairie ecosystem with characteristics similar to those found in the Indian Creek RARE II area. It is the only designated Wilderness in the White River Badlands.

Representation of Landforms and Ecosystems: Mixed-grass prairies, cottonwood floodplains, juniper breaks, and White River Badlands are the predominant landforms and ecosystems in this area.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: The area is very sparsely populated. Rapid City, with a population of about 55,000 and about 40 miles to the northwest, is the closest area of significant population. Some increases in visitation may occur under a Wilderness designation, but it probably wouldn't be significant. Most of the visitors may already be visiting nearby Badlands National Park. More people from Rapid City may or may not visit the area under Wilderness designation.

A considerable number of people and organizations have called for the Forest Service to designate a grassland Wilderness somewhere on the Northern Great Plains. Currently, the Forest Service provides for no grassland Wilderness anywhere within the National Forest System.

Indian Creek (RARE II) Area: Environmental Consequences

Management Prescription Allocations by Alternative:

Wall Ranger District

Alternative 2:	MA 6.1	25,100 acres
Alternative 3:	MA 1.2	23, 890 acres
	MA 3.63	760acres
	MA 6.1	450 acres
Alternative 4:	MA 1.2	24,940acres
	MA 3.63	120 acres
	MA 6.1	40 acres
Alternative 5:	MA 2.1	24,340 acres
	MA 6.1	760 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended for Wilderness

Alternatives: 4

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the wilderness character of the area. Valid existing mineral rights would be honored.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Mineral potential in the area is low and mineral development is unlikely under any management scenario. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be maintained unless valid outstanding minerals were developed. If outstanding mineral rights were developed, the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 2.1, Special Interest Areas

Alternatives: 3 and 5

Environmental Consequences: Vegetation, terrestrial and aquatic habitats would usually but not always appear natural. There would be some evidence of vegetative manipulation. Past human use, such as fences, trails, water developments, and primitive roads, would be evident. Opportunities for isolation and solitude in a motorized setting would be available. At various times wildlife would be disturbed by human activities. There would be an opportunity for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources. Livestock and livestock facilities would be apparent.

Mitigation Measures: Motorized travel would be restricted to designated routes to protect the special values of the area. Livestock grazing and recreation use would be restricted if it hinders achievement of the desired condition for the SIA. Roads not necessary for administrative, scientific, or valid private access would be closed or obliterated. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Valid outstanding mineral rights would be honored.

Economic and Social Effects: Opportunities for recreation, interpretation, and educational activities would be increased. The need to provide good public access for recreation, interpretation, and educational opportunities would increase. If better access were provided the challenge to protect the Special Features of the area would increase. Opportunities for those desiring solitude and isolation would still exist but would be less than in a nonmotorized designation. Those desiring motorized opportunities would be limited and off-road vehicle opportunities would be forgone. Those accustomed to accessing the area by vehicle would continue to have limited access. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be substantially retained unless valid outstanding minerals were developed. If outstanding mineral rights were developed the primitive to semi-primitive character of the area would be altered so that future wilderness designation would be unlikely.

Designation: Non-wilderness

Prescription: MA 3.63

Alternatives: 3 and 4

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Open meadows, grasslands, and shrub lands would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of a variety of successional stages. Black-tailed prairie dog and thus black-footed ferret habitat would increase and become an increasing part of the landscape. Opportunities for isolation and solitude in a motorized setting would be available. Livestock and livestock facilities would be apparent.

Mitigation Measures: Recreation, grazing, mineral leasing, road construction and other similar activities are allowed only it they contribute to the enhancement of black-footed ferret reintroduction habitat. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, and other features would be allowed if they meet reintroduction objectives. Motorized opportunities would be available but limited. The primitive to semi-primitive character of the area would be altered with prairie dog complexes. Valid outstanding mineral rights would be honored.

Economic and Social Effects: Motorized activities would be limited to designated routes. Opportunities for solitude, lower human encounters, and nonmotorized settings would remain approximately the same as present. Livestock grazing would continue primarily as a tool to help meet habitat objectives, and remain the primary economic benefit. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character would likely be reasonably maintained. However, there is a possibility, such as in the case of mineral development, that the character of the area would be altered so that future wilderness designation would be unlikely.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternative: 2, 4, and 5

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be apparent. Open meadows, grasslands, shrublands, and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, mineral developments, and other features would be allowed. The area would be managed for a diversity of plants, animals, and ecological functions and processes, while providing livestock forage and other amenity values. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while at the same time opportunities for nonmotorized activities would be reduced and perhaps forgone. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing would remain the primary economic benefit. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character could be altered through time and perhaps permanently altered, making future wilderness designation unlikely.

Indian Creek (Public Proposed) Area: An Overview of the Affected Environment

The 6980-acre Indian Creek Public Proposed area lies just north and southwest of the Indian Creek RARE II area. Specifically, this area is located, either partly or fully, in Township 3 South, Range 12 East, Sections 4-5, 8-9, 17, 19-23 and 29-30, Township 2 South, Range 12 East, Section 33, and Township 4 South, range 11 East, Sections 17, 19-21, 28-32. In a practical sense, this area is mainly an extension of the Indian Creek RARE II area. It shares nearly all of the attributes of the RARE II area, except that it is smaller. For purposes of this evaluation, the narrative for the Indian Creek RARE II area would be nearly identical for the Indian Creek Public Proposed area. Please see that narrative.

Indian Creek (Public Proposed Area): Capability Analyses

Environment

Opportunity for Solitude and Serenity: Please, refer to the same section as provided in the Indian Creek RARE II area.

Natural Appearance and Integrity: Please, refer to the same section as provided in the Indian Creek RARE II area.

Challenge: Please, refer to the same section as provided in the Indian Creek RARE II area.

Recreation Opportunities: Please, refer to the same section as provided in the Indian Creek RARE II area.

Special Features

Unique Characteristics and Scenic Features: Please, refer to the same section as provided in the Indian Creek RARE II area.

Opportunities for Outdoor Education: Please, refer to the same section as provided in the Indian Creek RARE II area.

Manageability

Size and Shape: The 3,770-acre Indian Creek (Public Proposed) area to the north of the RARE II area resembles a stove pipe, which sits to the north atop the 25,100 acre Indian Creek RARE II area. Three separate segments make up the area, the smallest about 80 acres in size, the next largest about 400 acres in size and the largest about 2,730 acres in size. This area is rather narrow and is about three miles wide east to west and three miles long north to south. The area contains two inholdings of about 1,200 acres. The 3,760-acre area to the southwest is across the Cheyenne River from the RARE II and is one continuous block

Potential to Manage Boundaries: Please, refer to the same section as provided in the Indian Creek RARE II area.

Indian Creek (Public Proposed Area): Availability Analyses

Resource Values and Potentials

Oil and Gas: Please, refer to the same section as provided in the Indian Creek RARE II area.

Coal: Please, refer to the same section as provided in the Indian Creek RARE II area.

Livestock Grazing: Two allotments with two permittees for an annual average of 560 permitted AUMs exist in this area. The allotments are typically grazed during the winter from November 1 to January 1.

Locatable Minerals: Please, refer to the same section as provided in the Indian Creek RARE II area.

Common Minerals: Please, refer to the same section as provided in the Indian Creek RARE II area.

Timber: Please, refer to the same section as provided in the Indian Creek RARE II area.

Recreation: Please, refer to the same section as provided in the Indian Creek RARE II area.

Unique Plant and Animal Species: Please, refer to the same section as provided in the Indian Creek RARE II area.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: Please, refer to the same section as provided in the Indian Creek RARE II area.

Existing Contracts and Agreements: There are two direct livestock grazing permits.

Biotic Control Measures and Fire Protection: Chemical, biological and mechanical control methods may be used in these areas to stem the expansion of undesirable plant species. Wildfire suppression would be addressed in Wilderness management plans that would be developed if any of the roadless areas are designated by Congress as Wilderness.

Effects on Adjacent Lands: Please, refer to the same section as provided in the Indian Creek RARE II area.

Indian Creek (Public Proposed Area): Evidence of Need for Wilderness

Contributions to Wilderness Distribution: Please, refer to the same section as provided in the Indian Creek RARE II area.

Representation of Landforms and Ecosystems: Please, refer to the same section as provided in the Indian Creek RARE II area.

Survival of Biotic Species: Please, refer to the same section as provided in the Indian Creek RARE II area.

Public Interests and Concerns: Please, refer to the same section as provided in the Indian Creek RARE II area.

Indian Creek (Public Proposed Area): Environmental Consequences

Management Prescription Allocations by Alternative:

	Wall Ranger District		Fall River Ranger District
Alternative 2:	MA 6.1	3,210 acres	3, 770 acres
Alternative 3:	MA 1.2	1,070 acres	
	MA 6.1	2,140 acres	3,770 acres
Alternative 3A:	MA 2.1	3,770 acres	
Alternative 4:	MA 1.2	3,190 acres	2,090 acres
	MA 3.4		1,060 acres
	MA 6.1	20 acres	620 acres
Alternative 5:	MA 1.2	2,700 acres	
	MA 2.1	3,190 acres	
	MA 4.4		1,070 acres
	MA 6.1	20 acres	

Designation: Wilderness

Prescription: MA 1.2 Recommended for Wilderness

Alternatives: 4

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of

ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the wilderness character of the area. Valid outstanding mineral rights would be honored.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Mineral potential in the area is low and mineral development is unlikely under any management scenario. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be maintained unless valid outstanding minerals were developed. If outstanding mineral rights were developed, the primitive to semi-primitive character of the development area could be altered, making wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 2.1, Special Interest Areas

Alternatives: 3, 3A, and 5

Environmental Consequences: Vegetation, terrestrial and aquatic habitats would usually but not always appear natural. There would be some evidence of vegetative manipulation. Past human use, such as fences, trails, water developments, and primitive roads, would be evident. Opportunities for isolation and solitude in a motorized setting would be available. At various times wildlife would be disturbed by human activities. There would be an opportunity for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources. Livestock and livestock facilities would be apparent.

Mitigation Measures: Motorized travel would be restricted to designated routes to protect the special values of the area. Livestock grazing and recreation use would be restricted if it hinders achievement of the desired condition for the SIA. Roads not necessary for administrative, scientific, or valid private access would be closed or obliterated. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Valid outstanding mineral rights would be honored.

Economic and Social Effects: Opportunities for recreation, interpretation, and educational activities would be increased. The need to provide good public access for recreation, interpretation, and educational opportunities would increase. If better access were provided the challenge to protect the special features of the area would increase. Opportunities for those desiring solitude and isolation would still exist but would be less than in a nonmotorized designation. Those desiring motorized opportunities would be limited and off-road vehicle opportunities would be forgone. Those accustomed to accessing the area by vehicle would continue to have limited access. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be

substantially retained unless valid outstanding minerals were developed. If outstanding mineral rights were developed the primitive to semi-primitive character of the area would be altered so that future wilderness designation would be unlikely.

Designation: Non-wilderness

Prescription: MA 3.4 National River System, Scenic Rivers Recommended

Alternatives: 4

Environmental Consequences: Opportunities for isolation and solitude in a free-flowing river setting would be available. Shorelines would be largely primitive and undeveloped, but accessible in places by roads. Vegetation, terrestrial and aquatic habitats would usually but not always appear natural. There would be some evidence of vegetative manipulation. Past human use, such as fences, trails, water developments, and primitive roads, would be evident. There would be an opportunity for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources. Livestock and livestock facilities would be apparent.

Mitigation Measures: Motorized travel is generally permitted on water or land within the Scenic River designation. Motorized travel would be restricted to designated routes to protect the special values of the area. Livestock grazing and recreation are also permitted activities but use may be use restricted if it hinders achievement of the desired condition for the Scenic Rivers designation. Roads not necessary for administrative, scientific, or valid private access would be closed or obliterated. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Valid outstanding mineral rights would be honored.

Economic and Social Effects: Opportunities for recreation, interpretation, and educational activities would be increased. The need to provide good public access for recreation, interpretation, and educational opportunities would increase. If better access were provided the challenge to protect the special features of the area would increase. Opportunities for those desiring solitude and isolation would still exist but would be less than in a nonmotorized designation. Those desiring motorized opportunities would be limited and off-road vehicle opportunities would be forgone. Those accustomed to accessing the area by vehicle would continue to have limited access. Livestock grazing would likely remain the primary economic benefit from the area. The semi-primitive character of the area would be retained unless valid outstanding minerals were developed. If outstanding mineral rights were developed the semi-primitive character of the area would be altered so that future wilderness designation would be unlikely.

Designation: Non-wilderness

Prescription: MA 4.4, National River System, Recreation Rivers Recommended

Alternatives: 5

Environmental Consequences: Recreation opportunities in a free-flowing natural riverine setting would be available. Roads or railroads would be in close proximity to one or both of the banks. Some development along the shoreline would be expected. Vegetation, terrestrial and aquatic habitats would usually but not always appear natural. There would be some evidence of vegetative manipulation. Past human use, such as fences, trails, water developments, and primitive roads, would be evident. There would be an opportunity for discovery and interpretation of ecological, biological, cultural, historic, and paleontological resources.

Livestock and livestock facilities would be apparent.

Mitigation Measures: Motorized travel is generally permitted on water or land within the Scenic River designation. Motorized travel would be restricted to designated routes to protect the special values of the area. Livestock grazing and recreation are also permitted activities but use may be use-restricted if it hinders achievement of the desired condition for the Scenic Rivers designation. Roads not necessary for administrative, scientific, or valid private access would be closed or obliterated. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. Valid outstanding mineral rights would be honored.

Economic and Social Effects: Opportunities for recreation, interpretation, and educational activities would be increased. The need to provide good public access for recreation, interpretation, and educational opportunities would increase. If better access were provided the challenge to protect the Special Features of the area would increase. Opportunities for those desiring solitude and isolation would still exist but would be less than in a nonmotorized designation. Those desiring motorized opportunities would be limited and off-road vehicle opportunities would be forgone. Those accustomed to accessing the area by vehicle would continue to have limited access. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be retained unless valid outstanding minerals were developed. If outstanding mineral rights were developed the semi-primitive character of the area would be altered so that future wilderness designation would be unlikely.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternative: 2, 3, 4, and 5

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be apparent. Open meadows, grasslands, shrublands, and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, mineral developments, and other features would be allowed. The area would be managed for a diversity of plants, animals, and ecological functions and processes, while providing livestock forage and other amenity values. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while at the same time opportunities for nonmotorized activities would be reduced and perhaps forgone. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing would remain the primary economic benefit. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character could be altered through time and perhaps permanently altered, making future wilderness designation unlikely.

Rake Creek Badlands (Public Proposed): An Overview of the Affected Environment

The 12,300-acre Rake Creek Badlands area is located about 10 miles east of Interior, South Dakota, and about three miles south of Cactus Flats, South Dakota. Specifically, the Rake Creek area is located, either partly or fully, in Township 3 South, Range 20 East, Section 30, and Township 3 South, Range 19 East, Sections 1-2, 7-9 and 11-30. Access from Interior is east for eight miles on Jackson County Road 6, then two miles north on Jackson County 6, and another mile north on Forest Development Road 7156. Access from Cactus Flats, which sits on Interstate 90, is south two miles on State Highway 240. Rake Creek is immediately east of the highway. The area is located in Township 3 South, Range 19 East.

The Rake Creek Badlands area lies within the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division as identified by Robert G. Bailey (71). The topography of the area includes open rolling grasslands and intermingled grasslands within a broken, badlands wash terrain. The area is divided in two by a distinctive landscape feature called the "Wall." The Wall extends across the White River Badlands and is one of its most remarkable features. Most of the Rake Creek Badlands roadless area lies below the Wall, where open grasslands are dissected by cutbanks and incisions and some vertical badlands formations, creating a ruptured badlands landscape. Above the Wall, flat open grasslands predominate. The Wall itself is a steep, highly eroded cliff that suddenly and dramatically drops about 200 feet. Elevation in the area ranges from about 2,400 feet above sea level to 2,650 feet above sea level. The area below the Wall is drained to the south by Rake Creek and Cut Creek, which empty into the White River. The area above the Wall contains no major creeks or drainages, but generally flows to the north, eventually draining into the Bad River.

Vegetation on the uplands includes Western wheatgrass, green needlegrass, blue gramma, and buffalo grass. Little bluestem and big bluestem can be found in the drainages and draws. Woody species include snowberry and silver sage. A few solitary cottonwoods exist. No juniper breaks exist in this area. Very little riparian vegetation is found in the area. Wildflowers bloom in season, especially on flat areas, and include gumbo lily.

Representative wildlife includes pronghorn antelope, a low number of mule deer, prairie dogs, raptors, reptiles, such as the prairie rattlesnake and bull snake, grassland songbirds and coyotes.

Several two-track roads curl into the area. A couple of buried pipelines exist, about 17 miles in total length. Fourteen stock tanks connect to these pipelines. Thirty-eight stock dams are located within the area. Fencing divides the land into pastures for livestock.

Recreational opportunities include hiking, primitive camping, picnicking, off-road motorized use, and horseback riding. Livestock grazing is the predominate use.

Current fire management requires immediate, initial-attack suppression due to the proximity of adjacent private land.

Rake Creek Badlands: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are available. The Wall provides a visual barrier, isolating the lower portion from the more developed upper portion. Overall, the area is not overly developed and the visitor should be able to experience the grassland much as early settlers and American Indians did more than a century ago.

Natural Appearance and Integrity: This area does retain a natural appearance, representative of badlands terrain. Most of the ecological processes, with the possible exception of natural wildfire, remain intact. Closer examination reveals signs of livestock activities. Cattle may be encountered during the warmer grazing season. Color-banded clays are exposed, especially along the Wall, and are quite scenic. This area is a true example of badlands topography, with open stark grasslands in an eroded, highly dissected terrain. Livestock developments, including fencing, primitive trails, stock tanks and stock ponds, detract from the natural setting, although most of the range developments have been constructed to blend with the natural surroundings.

Challenge: in this area centers around survival in a dry, harsh environment. Summer temperatures can exceed 100° Fahrenheit in an area with few drinkable water sources. Winter temperatures can drop to in excess of -30° Fahrenheit, with wind-chill factors in excess of -85° Fahrenheit. The open landscape and badlands terrain are deceptive, although the Wall does help orientate the visitor. No marked trails exist in the area, although a few two-track roads do exist. Prairie rattlesnakes may be encountered and can be dangerous. Seasonal flash flooding and seasonal thunderstorms with hail may test a visitor's outdoor skills. Wet weather creates slick, gumbo conditions, making travel, including hiking, difficult.

Recreation Opportunities: Recreational opportunities include hiking, primitive camping, picnicking, off-road motorized use, and horseback riding. Currently, along State Highway 240 in Badlands National Park, a scenic overlook provides a very scenic view into the Rake Creek area.

Special Features

Unique Characteristics and Scenic Features: The Wall is the major scenic landmark in the area. Several archeological sites may exist, representing prehistoric and historic homestead occupation. A couple of small prairie dog towns of no more than 150 total acres are found in the area. Overall, the area is colorful and rugged, with areas of flat grasslands. Fossil resources from the Late Cretaceous (90 to 65 million years ago) found in the area's Pierre Shale Formation deposits exist and include marine fossils.

Opportunities for Outdoor Education: A visitor should find features to stimulate curiosity: geology and fossil resources, grassland ecosystems, grassland flora and fauna, shifting weather patterns and cloud types, clear night skies offering unimpeded views of the stars. Skills in maneuvering an open grassland and badlands terrain, using a compass, taking precautions for snake and spider bites, heat stroke, frostbite and freezing, setting up a primitive campsite, and outdoor cooking may all test and develop a visitor's understanding of the outdoors. No interpretive signing, brochures or staff are available on or near the site to help describe the characteristics of the area. Grassland and badlands interpretation is available in nearby Badlands National Park at Cedar Pass (about five miles away) or at the National Grassland Visitor's Center in Wall, about 25 miles away.

Manageability

Size and Shape: The 12,300-acre Rake Creek Badlands area is generally a contiguous block of National Forest System land with no inholdings of other ownership. It is about five mile long north to south and five and a half miles wide east to west.

Potential to Manage Boundaries: The current boundaries consist of fence lines that may require annual maintenance. However, the potential to manage these fence lines is high. These fence lines do offer the opportunity for clear and visible signing. Opportunities for access below the Wall, where the greatest share of this area exists, are limited. Opportunities for access above the Wall are high, although less than 2,000 acres of this area exists above the Wall. The area shares about three miles of boundary on its west side in common with Badlands National Park.

Rake Creek Badlands: Availability Analyses

Resource Values and Potentials

Oil and Gas: No known oil and gas resources exist in the area. No interest has been expressed in the last 15 or more years concerning oil and gas development. The development potential is low. Geothermal resources do exist in the area.

Coal: No coal resources exist on the Buffalo Gap National Grassland.

Livestock Grazing: Four permittees run cattle on four allotments for an average of about 4,000 annual permitted AUMs. Livestock are typically run from June 1 through October.

Locatable Minerals: No known locatable minerals exist in the area.

Common Minerals: Known deposits of Chadron bentonite/clay resources and Pierre shale resources exist in the area.

Timber: No merchantable timber exists in the area.

Recreation: Wilderness designation would prohibit off-road motorized recreation and other motorized access. Walk-in hunting opportunities would increase. Handicapped and elderly access may be reduced, though not eliminated under a Wilderness designation.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon; whooping crane: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on the nesting success and wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.
- Mountain plover: A Wilderness designation would likely reduce prairie dog shooting, thereby increasing the expansion of prairie dog towns which, in turn, enhances mountain plover habitat. Designation would reduce motorized activities that can disturb mountain plovers and destroy their nests.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions. Finally, the mountain plover, which favors areas affected by fire, may be adversely affected due to reduced motorized support in conducting prescribed fires.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Buffalo Gap National Grassland (Wall Ranger District) include the black-tailed prairie dog and plains sharp-tailed grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: About 8,490 acres of private, subsurface minerals ownership exist in the area. No private leases exist in the area.

Existing Contracts and Agreements: The White River Grazing Association holds a 10-year permit in the area. That agreement was last renewed in 1996.

Biotic Control Measures and Fire Protection: Chemical, biological and mechanical control methods may be used to stem the expansion of undesirable plant species. Wildfire suppression would be addressed in Wilderness management plans that would be developed if any of the roadless areas are designated by Congress as Wilderness.

Effects on Adjacent Lands: Wilderness designation would increase the need for visible signing. Scattered patches of Canadian thistle can be found around stock ponds. Some limited prairie dog control is conducted every three to five years on no more than 50 acres. Adjacent Badlands National Park land periodically undergoes prescribed fire to promote vegetative diversity. Currently, fire in the Rake Creek Badlands is suppressed as quickly as possible.

Vehicles would be used for fire suppression.

Defensible fuel profile zones would be developed to permit options in managing restoration-designed prescribed fires.

Rake Creek Badlands: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The following are the closest designated Wilderness areas:

- Sage Creek Wilderness (64,144 acres) about eight miles to the west in Badlands National Park. Represents a mixed-grass prairie ecosystem, not unlike the Rake Creek roadless area.
- Black Elk Wilderness (9,824 acres) in the Black Hills lies about 80 miles to the west. Represents a ponderosa pine ecosystem.

Representation of Landforms and Ecosystems: This area is representative of the White River Badlands and of a mixed-grass prairie.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: The area is sparsely populated. The nearest urban area is Rapid City, with a population in excess of 55,000, which is just more than 50 miles to the west. Pierre, with a population in excess of 13,000, is about 90 miles to the northeast. Some increases in visitation may occur under a Wilderness designation, but may not be significant. Most of the visitors may already be visiting nearby Badlands National Park, so a Wilderness designation may simply disperse those visitors into the Rake Creek Badlands area.

A considerable number of people and organizations have called on the Forest Service to designate a grassland Wilderness somewhere on the Northern Great Plains. Currently, the Forest Service provides for no grassland Wilderness areas anywhere within the National Forest System.

Rake Creek Badlands: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 6.1	12,300 acres
Alternative 3:	MA 1.31	12,030 acres
	MA 6.1	270 acres
Alternative 4:	MA 1.2	12,030 acres
	MA 6.1	270 acres
Alternative 5:	MA 1.31	12,030 acres
	MA 6.1	270 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended for Wilderness

Alternatives: 4

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the wilderness character of the area. Valid outstanding mineral rights would be honored.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Mineral potential in the area is low and mineral development is unlikely under any management scenario. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be retained unless outstanding minerals were developed. If outstanding mineral rights were developed, the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 3 and 5

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration and noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the primitive to semi-primitive character of the area. Valid outstanding mineral rights would be honored.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Mineral potential in the area is low and mineral development is unlikely under any management scenario. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be retained unless outstanding minerals were developed. If outstanding mineral rights were developed, the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternative: 2, 3, 4, and 5

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be apparent. Open meadows, grasslands, shrublands, and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, mineral developments, and other features would be allowed. The area would be managed for a diversity of plants, animals, and ecological functions and processes, while

providing livestock forage and other amenity values. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while at the same time opportunities for nonmotorized activities would be reduced and perhaps forgone. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing would remain the primary economic benefit. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character could be altered through time and perhaps permanently altered, making future wilderness designation unlikely.

Criteria Common to All Roadless Areas on this Administrative Unit

There are no criteria common to all roadless areas on the Wall Ranger District of the Buffalo Gap National Grassland.

Fort Pierre National Grassland

Fort Pierre Ranger District

Cedar Creek (Public Proposed): An Overview of the Affected Environment

The 8,730-acre Cedar Creek area lies about 15 miles south-southeast of Pierre, South Dakota. It is located, either partly or fully, in Township 108 North, Range 78 West, Sections 10, 15, 19-24, 26-33 and Township 107 North, Range 78 West, Sections 4 and 5. The area can be accessed from the north by driving south from the town of Fort Pierre, South Dakota, for 12 miles on U. S. Highway 83, then seven miles east and south on gravel roads. The area can be accessed from Interstate 90 by driving about 11 miles north on U. S. Highway 83, then east and north on gravel roads for about eight miles.

The Cedar Creek area lies within the Pierre Hills Physiographic Division, as identified by T. Van Bruggen in *The Vascular Plants of South Dakota*, 1976. Robert G. Bailey further identifies the area as a part of the Great Plains Steppe Province ecoregion of the Temperate Steppe Division. This gently rolling landscape west of the Missouri River historically supported mostly mixed-grass vegetation typical of central South Dakota. Today, much of the area surrounding the Fort Pierre National Grassland has been plowed into crop production. Elevation in the Cedar Creek area varies from about 1,720 feet to 2,050 feet above sea level.

Cedar Creek drains to the area to the east toward the Missouri River. Cedar Creek forks upstream, a mile west of the eastern boundary to the area. Above the fork, the South Branch of Cedar Creek is more prominent in terms of vegetative diversity and varied topography than the branch, which is simply referred to as Cedar Creek. Scattered plains cottonwood and peachleaf or sandbar willows grow along the floodplain of the eastern part of the main creek and the South Branch. Prairie cordgrass crowds the creek channel. Western snowberry covers floodplain segments and dense patches of wild plum and chokecherry grow in favored sites.

Along the South Branch, elevation varies about 100 feet from the creek to ridgetops. The topography becomes gently rolling away from the creek forks. Vegetation on the uplands is almost entirely grass. Western wheatgrass and green needlegrass cover flats and ridges. Big and little bluestem, sideoats grama, and porcupine grass join western wheatgrass on the slopes.

Mule deer inhabit floodplains and creek breaks and occasional white-tailed deer can be seen anywhere in the area. Small herds of pronghorn are also present. Sharp-tailed grouse and the greater prairie chicken are common. The Fort Pierre National Grassland has one of the most stable populations of the greater prairie chicken in the nation. The Cedar Creek area has productive habitat for the greater prairie chicken, but is not unique in this way. There are a few scattered ring-necked pheasants. Coyotes, raccoons, and badgers are common predators. Swainson's hawks and occasional ferruginous hawks nest in the area.

Several two-track roads cross the area, as do about seven miles of buried pipeline used for livestock. Eleven metal tanks water cattle. About 22 miles of interior fence have been strung through the area, which amounts to 1.6 miles of interior fence per section. Nineteen small reservoirs (fish ponds and stock dams) have been constructed across drainages. The largest is Mallard Dam, on the main fork of Cedar Creek. Mallard Dam was reconstructed with assistance from Ducks Unlimited. Mallard Dam supports a marsh of almost 25 acres. Thirteen water dugouts for cattle have also been excavated.

Recreational opportunities include hunting, hiking, horseback riding, camping, and fishing for bass and panfish. Livestock grazing is a common use.

Cedar Creek: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are available on a limited basis, but such opportunities are not consistent throughout the area. The valleys along the creek forks offer some isolation among a broken landscape. This allows a visitor to experience semi-primitive grassland. When a visitor climbs the valley slopes, however, ranches can be spotted in several directions and a radio tower can be seen seven miles to the south. No upland trees are present to block sight distances or to absorb sound. About a third of the boundary in the Cedar Creek area is against private cropland, although some of this cropland has been planted to grass through the Conservation Reserve Program.

Natural Appearance and Integrity: Overall, along the valley of the South Branch, this roadless area retains a natural appearance representative of a rolling grassland. Cropland and private buildings are visible, however, from the ridgelines. Most of the ecological processes, including flash flooding--but with the exception of frequent natural wildfire--remain intact. The portion of the area in which adjacent farmland and ranch-base properties are not obvious exists along the South Branch and a drainage flowing into the South Branch from the south. This portion accounts for less than 20 percent of the entire roadless area.

Signs of livestock activities are common. Cattle may be frequently encountered during the warmer grazing season. About seven miles of buried range-water pipeline exist in the area. Livestock developments, including fences, primitive trails, stock tanks, dugouts, and small ponds detract from the natural setting, although the ponds provide wildlife habitat and recreational opportunities.

Challenge: Challenge in this area centers around survival in a moderately dry, harsh environment. Summer temperatures can exceed 100° Fahrenheit in an area with few drinkable water sources. Winter temperatures can drop to in excess of -30° Fahrenheit, with wind-chill factors in excess of -85° Fahrenheit. The open landscape can be deceptive. Prairie rattlesnakes may be encountered and can be dangerous. Seasonal flash flooding and seasonal thunderstorms with hail may test a visitor's outdoor skills. Wet weather creates slick conditions, making travel difficult.

Hillsides are often steep but short. The area affords pleasant hiking opportunities, but the activity is not especially challenging in this area.

Recreation Opportunities: The most frequent recreation is hunting for sharp-tailed grouse, prairie chicken, deer, and pronghorn. Hunting in this area is all by walk-in only, since vehicle travel on the Fort Pierre National Grassland during September, October, and November is confined to designated routes and none of these routes go through the area. During other times, vehicle travel is permitted, and the gentle topography and lack of woody vegetation on uplands allow vehicles to access a very high percent of the area. Fishing, hiking, horseback riding, nature study, photography and other associated activities may also take place, although non-consumptive recreation in not currently high. Parts of the area, especially along the South Branch, have a semi-primitive, low-development setting. In other places, private cropland and ranches are visible.

Special Features

Unique Characteristics and Scenic Features: Several homestead sites exist, as do two, old, inoperable windmills. Two very small prairie dog towns lie in the area. The South Branch is scenic, especially in the autumn when the cottonwood leaves turn and bluestem on the slopes become red.

Opportunities for Outdoor Education: The south unit of the Mallard Allotment has been proposed as a Research Natural Area. This allotment features the diverse creek bottom of the South Branch, along with varied vegetation on surrounding hills. This allotment probably has as much vegetation as any similarly sized area on the Fort Pierre National Grassland.

Manageability

Size and Shape: This 8,730-acre Cedar Creek area is irregular in shape, about five and one-half miles east to west. Blocks of land jut out to the north and south from the main rectangular configuration of the area. North to south the area ranges from between two miles to four miles. The area has one inholding, scheduled to be traded to the U.S. Forest Service. Another 160-acre parcel on the northwestern portion of the area is scheduled to be traded into private ownership.

Potential to Manage Boundaries: Fence lines compose the boundary on all sides of this area. They hold the potential to offer clear and visible signing should the area be designated as a Wilderness area. A major challenge under a Wilderness designation may be restricting vehicle trespass, since two-thirds of the boundary is shared with private land, most of which has easy vehicle access.

Cedar Creek: Availability Analyses

Resource Values and Potentials

Oil and Gas: The minerals potential for oil and gas is low, and no oil and gas developments currently exist within the area.

Coal: No known coal resources exist in the area.

Livestock Grazing: Five livestock permittees operate on all or part of five allotments within the area, grazing about 7,604 animal-unit-months per year.

Locatable Minerals: No known locatable minerals exist in the area.

Common Minerals: No known common minerals exist in the area.

Timber: No commercial timber is present in the area.

Recreation: Motorized recreation would be prohibited under a Wilderness designation. Current nonmotorized recreation, such as dispersed camping, hunting, hiking, horseback riding and nature study, would be allowed. Wilderness designation would preclude off-highway motorized recreation, such as ATV and snowmobile use. A few ponds with fisheries potential exist in the area and anglers now use vehicles to reach them. Walk-in hunting opportunities would not increase, since no vehicles are currently allowed off of designated routes during the hunting season, except when driven by physically challenged hunters. Backcountry experiences would be enhanced with the exclusion of motorized activities. Opportunities for physically challenged and elderly access may be reduced or eliminated in the area under a Wilderness designation.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Whooping crane; American burying beetle: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have beneficial effect on the nesting success and wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions. Finally, the mountain plover, which favors areas affected by fire, may be adversely affected due to reduced motorized support in conducting prescribed fires.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially due to reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Fort Pierre National Grassland include: the greater prairie chicken, black-tailed prairie dog, and the plains sharp-tailed grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the tables at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: There are no outstanding mineral leases.

Existing Contracts and Agreements: The Central South Dakota Cooperative Grazing District holds the 10-year livestock grazing agreement in the area.

Biotic Control Measures and Fire Protection: Chemical, biological and mechanical control methods may be used to stem the expansion of undesirable plant species. Wildfire suppression would be addressed in Wilderness management plans that would be developed if any of the roadless areas are designated by Congress as Wilderness. Currently, motor vehicles are used to spray noxious weeds and to control occasional wildfires.

Effects on Adjacent Lands: The most significant effect to adjacent land under a Wilderness designation may be trespass from the Wilderness area onto adjacent lands, especially if boundary signing is inadequate.

Cedar Creek: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The following are the nearest designated Wilderness areas:

- Fort Niobrara Wilderness (4,635 acres) located about 90 miles to the south on the Fort Niobrara National Wildlife Refuge in north central Nebraska. Represents a mixed-grass prairie ecosystem.
- Sage Creek Wilderness (64,144 acres) in Badlands National Park lies about 115 miles west of the Cedar Creek area. Represents a mixed-grass prairie ecosystem.
- Soldier Creek Wilderness (7,794 acres) is located about 165 miles to the west on the Black Hills National Forest. Represents a ponderosa pine ecosystem.

Representation of Landforms and Ecosystems: This area represents a mixed-grass prairie with a hardwood draw/cottonwood floodplain component.

Biota: No species are dependent upon a Wilderness designation to remain viable in this area. Most key species would benefit, however, from a designation.

Public Interests and Concerns: There are no large cities in central South Dakota. Rapid City and Sioux Falls, both in South Dakota, are 155 miles and 180 miles away respectively. Rapid City has a population of about 50,000, while Sioux Falls has a population of more than 80,000. Pierre, the state capital, is 15 miles to the north. It supports about 12,000 residents, with another 1,800 people living in nearby Fort Pierre.

A considerable number of people and organizations have called on the Forest Service to designate a grassland Wilderness somewhere on the Northern Great Plains. Currently, the Forest Service provides for no grassland Wilderness areas anywhere within the National Forest System.

Cedar Creek: Environmental Consequences

Management Prescription Allocations by Alternative: In the Final EIS (Record of Decision), the area will be allocated to MA 1.2 Recommended for Wilderness in one or more alternatives.

Alternative 2:	MA 6.1	8,730 acres
Alternative 3:	MA 2.2	1,050 acres
	MA 6.1	7,680 acres
Alternative 4:	MA 2.2	1,050 acres
	MA 6.1	7,680 acres
Alternative 5:	MA 2.2	1,050 acres
	MA 6.1	7,680 acres

Designation: Non-wilderness

Prescription: MA 2.2, Research Natural Areas

Alternatives: 3, 4, and 5

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic, and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative, law enforcement, emergency, and scientific purposes. Construction of roads and trails would not be allowed except to correct resource damage. Livestock grazing and recreation use would be restricted if it hinders achievement of the desired condition for the RNA. New developments including livestock fences and water developments would not be allowed to detract from the primitive to semi-primitive character of the area. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Mineral

potential in the area is low and mineral development is unlikely under any management scenario. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would substantially retained.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternative: 2, 3, 4, and 5

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be apparent. Open meadows, grasslands, shrublands, and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, and other features would be allowed. The area would be managed for a diversity of plants, animals, and ecological functions and processes, while providing livestock forage and other amenity values. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while at the same time opportunities for nonmotorized activities would be reduced and perhaps forgone. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing would remain the primary economic benefit. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character could be altered through time and perhaps permanently altered, making future wilderness designation unlikely.

Oglala National Grassland

Pine Ridge Ranger District

Sugarloaf (Public Proposed): An Overview of the Affected Environment

The 9,090-acre Sugarloaf area is located in extreme northwestern Nebraska, about 23 miles west of Chadron, Nebraska, and six miles north of Crawford, Nebraska. Specifically, the Sugarloaf area is located, either partly or fully, in Township 35 North, Range 5 East, Section 36, and Township 34 North, Range 5 East, Sections 1-3, 9-15, and 21-24 and Township 34 North, Range 6 East, Sections 6-8 and 13-14. Access is via U.S. Highway 20 to Crawford, then north on State Highways 2 and 71.

The Sugarloaf area lies within the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division as identified by Robert G. Bailey (71). Its topography consists of rolling hills of mixed grasses. In some areas, steep hillside slopes expose agate beds or bare clay. Some areas rise like humps, with exposed bands of red and green clay deposits. Elevation ranges from between 3,700 to 3,800 feet above sea level.

The dominant grasses include western wheatgrass, green needlegrass, buffalograss, and blue grama. The noxious weed Canada thistle is found in isolated areas and recent control efforts include both biological and chemical applications. Woody shrub and browse species include sagebrush, cottonwood, green ash, willow, and boxelder. Some woody vegetation is found along the Long Branch Creek Drainage, which generally flows northwest into Hat Creek.

Representative wildlife includes pronghorn antelope, mule deer, wild turkey, raptors, such as the red-tailed and Swainson's hawks, coyotes, meadowlarks, loggerhead shrikes, upland sandpipers, long-billed curlews, and prairie rattlesnakes.

Recreational opportunities include rock hounding, hunting, horseback riding, hiking, off-highway vehicle recreation, and primitive camping. A small bass fishery can be found at Sioux Reservoir. The other primary use in the area is livestock grazing.

Current fire management requires immediate, initial-attack suppression due to the proximity of adjacent private land.

Sugarloaf: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are available. The rolling grassland terrain provides an opportunity for isolation. The open nature of the landscape offers some opportunities to experience the grassland in a semi-primitive condition. Nearby developments, including a well-traveled highway (State Highway 71) and a high-traffic Burlington Northern Railroad corridor, do create background noise. In addition, sporadic fly-overs from a military base near Rapid City, South Dakota, (Ellsworth Air Force Base), reduce the area's potential to provide serenity.

Natural Appearance and Integrity: Overall, this area retains a natural appearance, representative of a healthy native grassland of rolling hills and exposed agate beds. Most of the ecological processes, including seasonal flash flooding, especially along Long Branch Creek, remain intact. Frequent wildfire starts may occur. Closer examination reveals signs of livestock activities. Power lines and a railroad corridor, outside of the area's boundaries, are visible. Livestock developments do detract from the natural setting, and include: fencing, 16 stock tanks, eight stock ponds, one small reservoir, one wildlife guzzler, three wildlife exclosures, and about 15 miles of buried pipeline.

Challenge: Challenge in this area centers around survival in a dry, harsh environment. Summer temperatures can exceed 100° Fahrenheit in an area with few drinkable water sources. Winter temperatures can drop to in excess of -30° Fahrenheit, with wind-chill factors in excess of -85° Fahrenheit. The open landscape is deceptive, although enough landmarks, including the nearby Pine Ridge, or human-made constructions, including the nearby railway corridor, provide visitors with visual markers to direct their movements. No marked trails exist in the area, although a number of two-track roads do exist. Prairie rattlesnakes may be encountered and can be dangerous. Seasonal flash flooding and seasonal thunderstorms with hail may test a

visitor's outdoor skills. Wet weather creates slick, gumbo conditions, making travel difficult.

Recreation Opportunities: Recreational opportunities include rock hounding, hunting, horseback riding, hiking, motorized sight-seeing, off-highway vehicle recreation and primitive camping. A small bass fishery can be found at Sioux Reservoir.

Special Features

Unique Characteristics and Scenic Features: The area is scenic, with a swelling, sea-like grassland terrain. Significant quantities of agates and other collectible semi-precious gems and stones occur in this area. They are found in exposed beds, often along hillside slopes. Rock hounds visit these sites to search for prairie and Fairburn agates, jasper and other interesting gem materials. Numerous archeological sites have been identified, including prehistoric sites. Fossils found in White River Group and Pierre Shale deposits represent the Eocene and Oligocene (45 to 26 million years ago) and the Late Cretaceous (90 to 65 million years ago) periods. Long Branch Creek provides one of only a few extensive riparian sites on the Oglala National Grassland.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Pine Ridge Ranger District (Oglala National Grassland).

Manageability

Size and Shape: This 9,090-acre Sugarloaf area is a contiguous block of National Forest System land with no inholdings of other ownership within it. The area is about six miles wide east to west and about five miles long north to south.

Potential to Manage Boundaries: The current boundaries consist of fencelines and would require annual maintenance. These fence lines do offer the opportunity for clear and visible signing. The numerous developments inside the area may require annual maintenance. Because of the area's location to nearby travel routes, especially State Highway 71, preventing illegal motorized entry under a Wilderness designation may prove challenging.

Sugarloaf: Availability Analyses

Resource Values and Potentials

Oil and Gas: Oil shale exists in the area. The oil and gas potential for this area is rated as moderate.

Coal: No coal resources exist in the area.

Livestock Grazing: Four members of the Sugarloaf Grazing Association run cattle on four allotments with an average of about 4,465 annual permitted AUMs.

Locatable Minerals: The potential for uranium deposits may exist in the Sugarloaf area.

Common Minerals: Known gemstone, Chadron bentonite/clay resources, and Pierre shale resources exist in the area.

Timber: No merchantable sawlog timber or significant quantities of post and pole timber exist in the area.

Recreation: Under Wilderness designation, mechanized recreation, including off-highway vehicle use, would be prohibited. Nonmotorized hunting would likely increase. Handicapped and elderly access would probably be reduced, though not eliminated. A small, walk-in bass fishery at Sioux Reservoir would be available.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on the nesting success and wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.
- Mountain plover: A Wilderness designation would likely reduce prairie dog shooting, thereby increasing the expansion of prairie dog towns which, in turn, enhances mountain plover habitat. Designation would reduce motorized activities that can disturb mountain plovers and destroy their nests.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Oglala National Grassland include: the black-tailed prairie dog and plains sharp-tailed grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: All 9,090 acres of the Sugarloaf area were acquired, mostly during the 1930s and early 1940s under the authority of such laws and the 1937 Bankhead-Jones Farm Tenant Act. No acres of private, subsurface minerals ownership exist in the area. No leases exist in the area.

Existing Contracts and Agreements: A 10-year grazing permit with the Sugarloaf Grazing Association is in force in the area, with an effective expiration date of February 2001. Special-use permits are in force for paleontological resources for educational purposes. Water pipelines are under permit in this area.

Biotic Control Measures and Fire Protection: Chemical, biological and mechanical control methods may be used to stem the expansion of undesirable plant species. Wildfire suppression would be addressed in Wilderness management plans that would be developed if any of the roadless areas are designated by Congress as Wilderness.

Effects on Adjacent Lands: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Pine Ridge Ranger District (Oglala National Grassland).

Sugarloaf: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest designated Wilderness are as follows:

- Soldier Creek Wilderness (7,794 acres) about 15 miles to the south on the Pine Ridge of Nebraska. Represents a ponderosa pine ecosystem.
- Black Elk Wilderness (9,824 acres) in the Black Hills is about 60 miles to the north. Represents a ponderosa pine ecosystem.

Representation of Landforms and Ecosystems: This area is representative of a mixed-grass prairie over an open and rolling grassland terrain.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: This area is sparsely populated. The nearest towns of any size include Crawford and Chadron, Nebraska, with a combined population of about 7,000. Designating the area as Wilderness might attract some people from urban areas in eastern Nebraska, Rapid City, South Dakota, and Cheyenne, Wyoming.

A considerable number of people and organizations have called on the Forest Service to designate a grassland Wilderness somewhere on the Northern Great Plains. Currently, the Forest Service provides for no grassland Wilderness areas anywhere within the National Forest System.

Sugarloaf: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 6.1	9,090 acres
Alternative 3:	MA 6.1	9,090 acres
Alternative 4:	MA 1.2	8,360 acres
	MA 6.1	730 acres
Alternative 5:	MA 1.31	8,360 acres
	MA 6.1	730 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended for Wilderness

Alternatives: 4

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration, noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the wilderness character of the area. The area has a moderate oil and gas potential for development but no existing leases.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Mineral potential in the area is low and mineral development is unlikely under any management scenario. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be retained unless outstanding minerals were developed. If outstanding mineral rights were developed the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 5

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration, noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act.

New developments including livestock fences and water developments would not be allowed to detract from the primitive to semi-primitive character of the area. The area has a moderate oil and gas potential for development but no existing leases.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Mineral potential in the area is low and mineral development is unlikely under any management scenario. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be retained unless outstanding minerals were developed. If outstanding mineral rights were developed the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternative: 2, 3, 4, and 5

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be apparent. Open meadows, grasslands, shrub lands and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, mineral developments, and other features would be allowed. The area would be managed for a diversity of plants, animals, and ecological functions and processes, while providing livestock forage and other amenity values. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while at the same time opportunities for nonmotorized activities would be reduced and perhaps forgone. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing would remain the primary economic benefit. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character could be altered through time and perhaps permanently altered making future wilderness designation unlikely.

Toadstool (Public Proposed): An Overview of the Affected Environment

The 5,280-acre Toadstool area is located in extreme northwestern Nebraska, about 29 miles west of Chadron, Nebraska, and 10 miles northwest of Crawford, Nebraska. Specifically, the Toadstool area is located, either partly or fully, in Township 33 North, Range 5 East, Sections 4-8, 17 and 18, and Township 33 North, Range 4 East, Sections 1, 2 and 12, and Township 34 North, Range 5 East, Section 31, and Township 34 North, Range 4 East, Section 35.

The Toadstool area lies within the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division as identified by Robert G. Bailey (71). Its topography consists of rolling hills of mixed grasses. In some areas, steep hillside slopes expose bare clay in badlands landscapes. Some areas rise like humps, with exposed bands of red and green clay deposits. Elevation ranges between about 3,780 and 4,300 feet above sea level.

The dominant grasses include western wheatgrass, green needlegrass, buffalograss, and blue grama. The noxious weed Canada thistle is found in isolated areas and recent control efforts include both biological and chemical applications. Woody shrub and browse species include sagebrush, cottonwood, green ash, willow, and boxelder. Ponderosa pine and Rocky Mountain juniper are also found in the area.

Representative wildlife includes pronghorn antelope, mule deer, wild turkey, raptors, such as the red-tailed and Swainson's hawks, coyotes, meadowlarks, loggerhead shrikes, upland sandpipers, long-billed curlews, and prairie rattlesnakes.

Recreational opportunities include hunting, horseback riding, hiking, off-highway vehicle recreation, and primitive camping. The other primary use is livestock grazing.

Toadstool Campground borders this area on the eastern flank. This developed campground includes six sites, a picnic area, an interpretive kiosk, vault toilets and a reproduction "soddie" that represents the era of homesteading in the area.

The Hudson-Meng Bison Bonebed Site borders the southern portion of this area. This site is producing the remains of an extinct species of 10,000-year-old bison that died en masse. An interpretive visitor center is available.

Current fire management requires immediate, initial-attack suppression due to the proximity of adjacent private land.

Toadstool: Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are available. The rolling grassland and badlands terrain provides an opportunity for isolation. The generally open nature of the landscape offers some opportunities to experience the grassland in a semi-primitive condition. Nearby developments, including a high-traffic Burlington Northern Railroad corridor, do create background noise. In addition, sporadic fly-overs from a military base near Rapid City, South Dakota, (Ellsworth Air Force Base), reduce the area's potential to provide serenity.

Natural Appearance and Integrity: Overall, this area retains a natural appearance, representative of a healthy native grassland of rolling hills and badlands terrain. Most of the ecological processes, including seasonal flash flooding, remain intact. Frequent wildfire starts may occur. Closer examination reveals signs of livestock activities. Power lines and a railroad corridor, outside of the area's boundaries, are visible. Livestock developments do detract from the natural setting, and include: fencing, nine stock tanks, four water impoundments and one windmill.

Challenge: Challenge in this area centers around survival in a dry, harsh environment. Summer temperatures can exceed 100° Fahrenheit in an area with few drinkable water sources. Winter temperatures can drop to in excess of -30° Fahrenheit, with wind-chill factors in excess of -85° Fahrenheit. The open landscape is deceptive, although enough landmarks, including the nearby Pine Ridge, or human-made constructions, including the nearby railway corridor, provide visitors with visual markers to direct their movements. About one mile of interpretive trail, originating from Toadstool Campground, exists in the area. About one-quarter mile of this trail is physically challenged accessible. A number of two-track roads exist in the area. Prairie rattlesnakes may be encountered and can be dangerous. Seasonal flash flooding and seasonal thunderstorms with hail may test a visitor's outdoor skills. Wet weather creates slick, gumbo conditions, making travel difficult.

Recreation Opportunities: Recreational opportunities include hunting, horseback riding, hiking, motorized sight-seeing, off-highway vehicle recreation, and primitive camping. The Toadstool Campground and the Hudson-Meng Bison Bonebed Site are adjacent to this area. About one mile of interpretive hiking trail, originating from the Toadstool Campground, exists in the area. The area is very scenic, with badlands topography, and attracts many visitors each year.

Special Features

Unique Characteristics and Scenic Features: The area is scenic, with a swelling, sea-like grassland terrain and eroded badlands landscapes elsewhere. Numerous archeological sites have been identified, including prehistoric sites. Fossils found in White River Group and Pierre Shale deposits represent the Eocene and Oligocene (45 to 26 million years ago) and the Late Cretaceous (90 to 65 million years ago) periods. Fossils from the Oligocene are world-renowned. Whitehead Creek provides an intermittent stream and riparian vegetation. A scenic canyon-like experience can be had along this creek. Abundant Eastern red cedar grows along this drainage.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Pine Ridge Ranger District (Oglala National Grassland).

Manageability

Size and Shape: This 5,280-acre Toadstool area is a contiguous block of National Forest System land with no inholding of other ownership within it. The area is about four miles wide east to west and about three miles long north to south. The area's shape is similar to a heavy "t."

Potential to Manage Boundaries: The current boundaries consist of fence lines and would require annual maintenance. These fence lines do offer the opportunity for clear and visible signing. The numerous developments inside the area may require annual maintenance. Because of the area's location to nearby travel routes, preventing illegal motorized entry under a Wilderness designation may prove challenging.

Toadstool: Availability Analyses

Resource Values and Potentials

Oil and Gas: Oil shale exists in the area. The oil and gas potential for the area is rated as moderate to high.

Coal: No coal resources exist in the area.

Livestock Grazing: Three members of the Sugarloaf Grazing Association run cattle on three allotments with an average of about 1,450 annual permitted AUMs.

Locatable Minerals: The potential for uranium deposits may exist in the Toadstool area.

Common Minerals: Chadron bentonite/clay resources and Pierre shale resources exist in the area.

Timber: No merchantable sawlog timber or significant quantities of post and pole timber exist in the area.

Recreation: Under Wilderness designation, mechanized recreation, including off-highway vehicle use, would be prohibited. Nonmotorized hunting would likely increase. Handicapped and elderly access would probably be reduced, though not eliminated.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on the nesting success and wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.
- Mountain plover: A Wilderness designation would likely reduce prairie dog shooting, thereby increasing the expansion of prairie dog towns which, in turn, enhances mountain plover habitat. Designation would reduce motorized activities that can disturb mountain plovers and destroy their nests.

Bighorn Sheep: Wilderness designation would have beneficial effects on bighorn sheep due to the lack of human disturbances and reductions in motorized activities a designation would bring, especially during the birthing season.

Rare Plants: Rare plants would largely benefit from Wilderness designation due to the reductions in motorized activities, which can destroy individual plants and their habitats. In addition, theft of rare plants by collectors might be reduced due to restrictions placed on motorized access within Wilderness areas.

Black-tailed prairie dogs and species closely associated with prairie dog towns and colonies: Prairie dogs and prairie dog-associated species would largely benefit from Wilderness designations, primarily because the poisoning of prairie dog towns, accomplished mainly with motorized support, would be greatly reduced. In addition, fewer prairie dog shooters would frequent prairie dog towns in Wilderness areas due to restrictions on motorized access. However, prairie dogs and associated species may be adversely affected by a Wilderness designation due to the reduction anticipated in predator control, which would result from motorized restrictions. Finally, the mountain plover, which favors areas affected by fire, may be adversely affected due to reduced motorized support in conducting prescribed fires.

Non-listed raptors: Non-listed raptors would benefit from designated Wilderness due to a reduction in human disturbances, including reductions in motorized use, especially in and around both aerial- and ground-nesting raptor sites.

Management Indicator Species: Wilderness designation would largely have beneficial effects on management indicator species, especially reductions in human disturbances, including restrictions on motorized use. Management indicator species on the Oglala National Grassland include: the black-tailed prairie dog and plains sharp-tailed grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: About 180 acres of private, subsurface minerals ownership exist in the area. No private leases exist in the area.

Existing Contracts and Agreements: A 10-year grazing permit with the Sugarloaf Grazing Association is in force in the area, with an effective expiration date of February 2001. Special-use permits are in force for paleontological resources for educational purposes. Water pipelines are under permit in this area.

Biotic Control Measures and Fire Protection: Chemical, biological and mechanical control methods may be used in these areas to stem the expansion of undesirable plant species. Wildfire suppression would be addressed in Wilderness management plans that would be developed if any of the roadless areas are designated by Congress as Wilderness.

Effects on Adjacent Lands: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Pine Ridge Ranger District (Oglala National Grassland).

Toadstool: Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest designated Wilderness is the 7,794-acre Soldier Creek Wilderness, about seven miles to the south on the Pine Ridge of Nebraska. The 9,824-acre Black Elk Wilderness in the Black Hills is about 57 miles to the north. Both of these Wilderness areas are representative of ponderosa pine ecosystems.

Representation of Landforms and Ecosystems: This area is representative of a mixed-grass prairie on a badlands and rolling plains terrain.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species probably would benefit, however, from a designation.

Public Interests and Concerns: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Pine Ridge Ranger District (Oglala National Grassland).

Toadstool: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 2.1	910 acres
	MA 6.1	4,370 acres
Alternative 3:	MA 2.1	910 acres
	MA 6.1	4,370 acres
Alternative 4:	MA 1.2	5,270 acres
	MA 6.1	10 acres
Alternative 5:	MA 1.31	4,360 acres
	MA 2.1	910 acres
	MA 6.1	10 acres

Designation: Wilderness

Prescription: MA 1.2 Recommended for Wilderness

Alternatives: 4

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration, noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the wilderness character of the area. The area has a moderate to high oil and gas potential for development.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Mineral potential in the area is low and mineral development is unlikely under any management scenario. Livestock grazing would likely remain the primary economic benefit from the area.

The primitive to semi-primitive character of the area would be retained unless outstanding minerals were developed. If outstanding mineral rights were developed the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 5

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration, noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the primitive to semi-primitive character of the area. The area has a moderate to high oil and gas potential for development. Valid outstanding mineral rights would be honored.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Mineral potential in the area is low and mineral development is unlikely under any management scenario. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be retained unless outstanding minerals were developed. If outstanding mineral rights were developed the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 2.1, Special Interest Areas

Alternatives: 2, 3, and 5

Environmental Consequences: Vegetation, terrestrial and aquatic habitats would usually but not always appear natural. There would be some evidence of vegetative manipulation. Past human use, such as fences, trails, water developments, and primitive roads, would be evident. Opportunities for isolation and solitude in a motorized setting would be available. At various times wildlife would be disturbed by human activities. There would be an opportunity for discovery and interpretation of ecological, biological, cultural, historic and paleontological resources. Livestock and livestock facilities would be apparent. The area has a moderate to high oil and gas potential for development.

Mitigation Measures: Motorized travel would be restricted to designated routes to protect the special values of the area. Livestock grazing and recreation use would be restricted if it hinders achievement of the desired condition for the SIA. Roads not necessary for administrative, scientific, or valid private access would be closed or obliterated. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. The area has a moderate to high oil and gas potential for development. Valid outstanding mineral rights would be honored.

Economic and Social Effects: Opportunities for recreation, interpretation and educational activities would be increased. The need to provide good public access for recreation, interpretation and educational opportunities would increase. If better access were provided the challenge to protect the Special Features of the area would increase. Opportunities for those desiring solitude and isolation would still exist but would be less than in a nonmotorized designation. Those desiring motorized opportunities would be limited and off-road vehicle opportunities would be forgone. Those accustomed to accessing the area by vehicle would continue to have limited access. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be substantially retained unless outstanding minerals were developed. If outstanding mineral rights were developed the primitive to semi-primitive character of the development area could be altered making future wilderness designation unlikely.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternative: 2 and 3

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be apparent. Open meadows, grasslands, shrub lands and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, mineral developments, and other features would be allowed. The area would be managed for a diversity of plants, animals, and ecological functions and processes, while providing livestock forage and other amenity values. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while at the same time opportunities for nonmotorized activities would be reduced and perhaps forgone. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing would remain the primary economic benefit. The area would continue to provide the existing mix of economic benefits while roadless primitive to semi-primitive character could be altered through time and perhaps permanently altered making future wilderness designation unlikely.

Soldier Creek (Public Proposed), North East Pasture: An Overview of the Affected Environment

The 1,830-acre Management Area is located in extreme northwestern Nebraska, about 39 miles west of Chadron, Nebraska, and nine miles west of Crawford, Nebraska. Specifically, the Soldier Creek Management Area is located partly in Sections 29, 30, 31, and 32, Township 32 North, Range 53 West; Sections 5, and 6, 7, Township 31, Range 53 West. Access is via US Highway 20 to Fort Robinson State Park then west via James Road for 5 ½ miles.

The Soldier Creek Management Area lies within the Great Plains-Palouse Dry Steppe Province ecoregion of the Temperate Steppe Division as identified by Robert G. Bailey (71).

Its topography consists of rolling hills of mixed grasses, steeper slopes with sandstone buttes and ponderosa pine covered hills. Elevation ranges from between 4,200 to 4,600 feet above sea level.

The dominant grasses include big bluestem, little bluestem, green needle grass, sandberg bluegrass, western wheatgrass, and bluegrama. Forbs species include spiderwort, yarrow, prairie coneflower, scarlet globe mallow, and scarlet gaura.

This area contains the North Fork and portions of Middle Fork of Soldier Creek, which support a variety of hardwood tree species including cottonwood, green ash, hackberry, and boxelder. Understory shrub species include chokecherry, plum, snowberry, and willow.

Canada thistle and leafy spurge, state designated noxious weeds, can be found along the drainages. Canada thistle infestations are less then 3 total acres. Leafy spurge exists along the Middle Fork in less than a 0.2-acre area. Long-term control efforts include herbicide applications.

Representative wildlife includes white tail deer, mule deer, elk, bighorn sheep, wild turkey, raptors, such as the red-tailed and Swainson's hawks, coyotes, meadowlarks, and rattlesnakes.

Recreational opportunities include hunting, horseback riding, hiking, fishing, and primitive camping. The other primary use in the area is permitted livestock grazing management.

Current fire management requires immediate, initial-attack suppression due to the proximity of adjacent private land.

Soldier Creek (Public Proposed): Capability Analyses

Environment

Opportunity for Solitude and Serenity: Opportunities for solitude and serenity are available. The rugged terrain provides an opportunity for isolation. The diverse nature of the landscape offers some opportunities to experience the open parklands, steep slopes, and hardwood drainages in a semi-primitive condition.

Natural Appearance and Integrity: Overall, this area retains a natural appearance, representative of a healthy native ponderosa pine – grassland mix. Most of the ecological processes, including fires, and seasonal flash flooding, especially along Soldier Creek, remain intact. This entire management unit was burned during the July 8, 1989 Fort Robinson wild land Fire. Frequent wildfire starts still occur. Power lines and county roads, outside of the area's boundaries, are visible from some locations. Many developments used in recreation management and livestock management exist in the area. Nearby recreation management developments exist including a graveled parking area, hand water pump, fully accessible vault toilet, fire grates, and picnic tables at the Trailhead. Approximately four miles of the "Boots and Saddle Trail" and 1 ¾ miles of the "Trooper Trail." Livestock management structures include one windmill and associated stock tanks. Approximately four miles of fence exist along the north and eastern boundaries of this area and also include the fence that surrounds the trailhead complex. These developments to some degree detract from the natural setting.

Challenge: Challenge in this area centers around survival in a rugged environment. Summer temperatures can exceed 100° Fahrenheit. Winter temperatures can drop to in excess of -30° Fahrenheit, with wind-chill factors in excess of -85° Fahrenheit. The rugged landscape is deceptive, although there are enough human-made landmarks, including the nearby two-track road to the fish ponds and James Road to Fort Robinson State Park. Marked trails exist in the area. Prairie rattlesnakes may be encountered and can be dangerous. Seasonal flash flooding and seasonal thunderstorms with hail may test a visitor's outdoor skills.

Recreation Opportunities: Recreational opportunities include, hunting, horseback riding, hiking, nonmotorized sight-seeing, and primitive camping. Fishing is available in the Middle Fork of Soldier Creek as well as at the three ponds along the Middle Fork.

Special Features

Unique Characteristics and Scenic Features: The area is scenic, with a diverse view of sandstone buttes, grass covered uplands, and hardwood drainages. Numerous archeological sites have been identified in the area that recall the historical use of the area starting in 1874 when it was part of the Fort Robinson Military Reservation up through World War II. Use of the area by the military was terminated in June 1948. The Department of Agriculture Research Service (ARS) used the area in conjunction with the University of Nebraska as an experimental beef breeding station immediately following relinquishment by the military. The area was officially transferred from the ARS to the Forest Service for purpose of administration on October 25, 1966. However, the beef research being conducted by the ARS was not completely phased out at Fort Robinson until January 1972.

This entire management unit was burned during the July 8, 1989 Fort Robinson wild land Fire, which burned a total of 48,000 acres. The fire consumed most of the ponderosa pine forest while less damage was done to the hardwood species along the drainages. The grass and shrub vegetation responded very favorably to the fire.

Resting the area from livestock grazing for two years after the fire as well as implementing a 4-pasture rotation grazing system has significantly improved rangeland vegetation condition. Along the Middle Fork of Soldier Creek exists historical fish rearing ponds that were managed by the Nebraska Game and Parks prior to the Fort Robinson Fire. After the Fort Robinson Fire the area received considerable rainfall resulting in loss of topsoil and flooding. This silted in the ponds making them unsuitable for fish rearing and the management was changed to a "put and take" fisheries.

Opportunities for Outdoor Education: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Pine Ridge Ranger District.

Manageability

Size and Shape: This 1,8,30-acre Soldier Creek Management area is a contiguous block of National Forest System land with no inholdings of other ownership within it. The area is about 1 1/2 miles wide east to west and about two miles long north to south. It adjoins the Soldier Creek Wilderness Area on its west and south borders.

Potential to Manage Boundaries: The current boundaries consist of fence lines and would require annual maintenance. These fence lines do offer the opportunity for clear and visible signing. The numerous developments inside the area will require annual maintenance.

Because of the existing Soldier Creek Wilderness, and the current nonmotorized use designation of the non-wilderness area, preventing illegal motorized entry under an additional Wilderness designation may not be challenging.

Soldier Creek (Public Proposed): Availability Analyses

Resource Values and Potentials

Oil and Gas: The oil and gas potential for this area is rated as low

Coal: No coal resources exist in the area.

Livestock Grazing: Three members of the Soldier Creek Grazing Association manage livestock within this area under a Term Grazing Permit. The Soldier Creek Allotment is made up of four pastures, of which three exist within the Wilderness area and one exists within the adjoining non-wilderness area being considered. A total of 1,560 animal unit months (AUMs) are permitted.

Locatable Minerals: The potential for uranium deposits is low.

Common Minerals: No common minerals exist.

Timber: No merchantable sawlog timber or significant quantities of post and pole timber exist in the area.

Recreation: Under Wilderness designation, mechanized recreation, including off-highway vehicle use, would be prohibited. The area is currently managed as backcountry recreation, nonmotorized. Nonmotorized vehicles are allowed such as mountain bikes. Nonmotorized hunting would likely remain the same as well as existing use by the handicapped and elderly.

Plant and Animal Species: Depending on the federally listed threatened and endangered species present in the area, Wilderness designation would have a beneficial, neutral or adverse effect on the federally listed species as shown below:

- Peregrine falcon: Scientific literature does not imply any significant benefit or lack of benefit based on the management of designated Wilderness areas.
- Bald eagle: Effects from Wilderness designation would have a beneficial effect on the nesting success and wintering survival of bald eagles, largely due to the lack of human disturbances, including a reduction in motorized activities, which result from Wilderness designations.

Rare Plants: This area is currently closed to motorized vehicles. Wilderness designation would make noxious weed control more difficult by restricting motorized travel and could result in a small to rare plants.

Non-listed raptors: This area is currently closed to motorized vehicles, therefore there may not be a significant change in existing benefit to non-listed raptor species.

Management Indicator Species: This area is currently closed to motorized vehicles, therefore there may not be a significant change in existing benefit to management indicator species. Management indicator species on the Pine Ridge Unit include: the pygmy nuthatch and plains sharp-tailed grouse.

Other species not yet mentioned, including Candidate Species for the Threatened and Endangered Species List, Species at Risk and Species of Concern: In general, Wilderness designations would likely produce an overall mix of effects on these species, due to the vast number of species covered falling under this category.

For a complete list of key species associated with each administrative unit covered by this revision process, please see the table at the very end of this document.

This area is currently closed to motorized vehicles, therefore there may not be a significant change in existing benefit to plant and animal species based upon the effects discussion above.

Management Obligations, Constraints, or Encumbrances

Mineral Leases and Subsurface Rights: The mineral rights in the Soldier Creek Management Area and the existing Soldier Creek Wilderness were claimed in 1980. Two companies drilled 45 prospect holes in search of uranium.

Existing Contracts and Agreements: A 10-year grazing permit with the Soldier Creek Grazing Association is in effect in the area, with an effective expiration date of December 31, 2000. This permit is in good standing and will likely be reissued.

Biotic Control Measures and Fire Protection: Chemical, biological and mechanical control methods may be used to stem the expansion of undesirable plant species. Wildfire suppression would be addressed in Wilderness management plans that would be developed if any of the roadless areas are designated by Congress as Wilderness.

Effects on Adjacent Lands: Please, refer to "Criteria Common to All Roadless Areas on this Administrative Unit" at the end of the roadless report for the Pine Ridge Ranger District (Pine Ridge Unit).

Soldier Creek (Public Proposed): Evidence of Need for Wilderness

Contributions to Wilderness Distribution: The nearest designated Wilderness is the 7,794-acre Soldier Creek Wilderness that adjoins this area. The 9,824-acre Black Elk Wilderness in the Black Hills is about 60 miles to the north. Both of these Wilderness area's are representative of ponderosa pine ecosystems.

Representation of Landforms and Ecosystems: This is representative of mixed-grass uplands interspersed with steep slopes with isolated patches of ponderosa pine (those that did not get destroyed in the Fort Robinson Fire of 1989) covered hills dissected by hardwood drainages.

Biota: No species are dependent upon a Wilderness designation to remain viable in the area. Most key species may benefit, however, the current management does not allow motorized-vehicle use which is the key disturbance.

Public Interests and Concerns: This area is sparsely populated. The nearest towns of any size include Crawford and Chadron, Nebraska, with a combined population of about 7,000. Designating the area as Wilderness likely will not attract any more people than are currently visiting the existing Soldier Creek Wilderness, which currently receives a many visitors. People from Iowa, Eastern Nebraska, Colorado, and other states visit the area.

A considerable number of people and organizations have called on the Forest Service to designate a grassland Wilderness somewhere on the Northern Great Plains.

Soldier Creek Management Area: Environmental Consequences

Management Prescription Allocations by Alternative:

Alternative 2:	MA 6.1	1,830 acres
Alternative 3:	MA 1.31	1,830 acres
Alternative 4:	MA 1.31	1,830 acres
Alternative 5:	MA 1.31	1,830 acres

Designation: Wilderness

Prescription: MA 1.2A Suitable Wilderness

Alternatives: Wilderness designation is not considered in any alternative because of the area's existing level of development.

Designation: Non-wilderness

Prescription: MA 1.31 Backcountry Recreation Nonmotorized

Alternatives: 3, 4, and 5

Environmental Consequences: Vegetation composition and structure are controlled by natural processes, such as fire, insects, disease, and grazing. There is some evidence of past human use, such as fences, trails, water developments, and primitive roads, but these would diminish through time. Isolation and solitude would characterize the area. Recreation activities would be those not requiring motorized equipment in a primitive setting such as hiking, walking, horseback riding, and nonmotorized hunting. There would be an opportunity for discovery of ecological, biological, cultural, historic and paleontological resources. Disturbance to wildlife by human activity would be minimized.

Mitigation Measures: Motorized access would be restricted except for authorized administrative use, such as grazing administration, noxious weed and fire control. Motorized wheelchair access would be permitted in accordance with the Americans with Disabilities Act. New developments including livestock fences and water developments would not be allowed to detract from the primitive to semi-primitive character of the area. The area has a low oil and gas potential for development.

Economic and Social Effects: Opportunities for solitude, lower human encounters, and nonmotorized settings will be maintained or increased while at the same time opportunities for motorized recreation would be forgone. Those presently using the area for motorized activities, recreation and hunting would no longer be able to do so. Opportunities for those desiring walk in hunting would increase. Some interpretive opportunities would be forgone. Mineral potential in the area is low and mineral development is unlikely under any management scenario. Livestock grazing would likely remain the primary economic benefit from the area. The primitive to semi-primitive character of the area would be retained.

Designation: Non-wilderness

Prescription: MA 6.1 Rangeland with Broad Resource Emphasis

Alternative: 2

Environmental Consequences: The evidence of motorized roads and trails would continue to be present. Livestock and livestock facilities would be apparent. Open meadows, grasslands, shrub lands and areas of woody vegetation would dominate the area. Vegetation treatments would be apparent. The vegetation would consist of open, park-like stands and a variety of successional stages. Opportunities for isolation and solitude in a motorized setting would be available.

Mitigation Measures: A full spectrum of motorized opportunities would be allowed unless specific areas are designated as closed or travel restricted to designated roads and trails. Construction of livestock and recreation facilities, roads, power lines, fences, water developments, mineral developments, and other features would be allowed. The area would be managed for a diversity of plants, animals, and ecological functions and processes, while providing livestock forage and other amenity values. Although, mitigation measures would be applied to meet Grassland-wide Plan Standards and Guidelines, there is possibility the area would lose its roadless character due to increased development and human presence.

Economic and Social Effects: Opportunities for motorized activities would be increased gradually while at the same time opportunities for nonmotorized activities would be reduced and perhaps forgone. Opportunities for solitude, lower human encounters, and nonmotorized settings would gradually be reduced. All users would be permitted motorized access. Livestock grazing would remain the primary economic benefit. The area would continue to

provide the existing mix of economic benefits while roadless primitive to semi-primitive character could be altered through time and perhaps permanently altered making future wilderness designation unlikely.

Criteria Common to All Roadless Areas on this Administrative Unit

Capability Criteria

Opportunities for Outdoor Education: A visitor should find features to stimulate curiosity: geology and fossil resources, grassland ecosystems, grassland flora and fauna, colorful agate beds, shifting weather patterns and cloud types, clear night skies offering unimpeded views of the stars. Skills in maneuvering in an open grassland terrain, using a compass, taking precautions for snake and spider bites, heat stroke, frostbite and freezing, setting up a primitive campsite and outdoor cooking may all test and develop a visitor's understanding of the outdoors.

Availability Criteria

Effects on Adjacent Lands: Wilderness designation would increase the need for clear and extensive signing. Wilderness designation may increase the potential for trespass over adjacent lands into these areas.

Vehicles would not be used for transportation or fire suppression when the fire danger is low. Vehicles would be used when fire conditions are high enough that firefighters walking and using hand tools would not be able to prevent a large fire.

Defensible fuel-profile zones would be developed to permit options in managing restoration-designed prescribed fires.

Evidence of Need for Wilderness

Public Interests and Concerns: These areas are sparsely populated. The nearest towns of any size include Crawford and Chadron, Nebraska, with a combined population of about 7,000. Designating these areas as Wilderness might attract some people from urban areas in eastern Nebraska, Rapid City, South Dakota, and Cheyenne, Wyoming.

Roadless Area Ratings

This section rates each of the 45 roadless areas based on the roadless area narratives provided earlier in this report. The first three matrices shown below provide the evaluative criteria used to determine ratings for each roadless area. These criteria initially were taken from *Forest Service Handbook* 1909.12,7, then further defined in an interdisciplinary manner.

Table C-5: Capability Ratings Matrix

Ratings		
High	**Moderate**	**Low**
Opportunities for Solitude and Serenity		
Terrain vast and / or rugged Lack of unnatural sounds Limited chance to encounter others	Surrounding landscape moderately developed Infrequent unnatural sounds Some encounters with others likely	Surrounding landscape highly developed Frequent unnatural sounds Encounters with others likely
Natural Appearance and Integrity		
Ecological processes intact Natural characteristics retained Relatively low number of structures and water points when compared to adjacent lands	Ecological processes somewhat reduced Natural characteristics appear mostly high Relatively moderate number of structures and water points when compared to adjacent lands	Ecological processes significantly reduced Clear and frequent evidence of human modifications Relatively high number of structures and water points when compared to adjacent lands
Challenge		
Offers many opportunities for challenge and adventure	Offers some opportunities for challenge and adventure	Offers few opportunities for challenge and adventure
Recreational Opportunities		
Offers many opportunities for primitive, unconfined recreation	Offers some opportunities for primitive, unconfined recreation	Offers few opportunities for primitive, unconfined recreation
Unique Characteristics and Scenic Features		
Offers many special characteristics and features	Offers some special characteristics and features	Offers few special characteristics and features
Opportunities for Outdoor Education		
Offers many opportunities for outdoor education	Offers some opportunities for outdoor education	Offers few opportunities for outdoor education
Size and Shape		
No inholdings of other ownership present Size and shape lend themselves to limited external influences	Inholdings of other ownership less than 5 % of total acres Size and shape lend themselves to some external influences	Inholdings of other ownership greater than 5 % of total acres Size and shape lend themselves to significant external influences
Potential to Manage Boundaries		
Boundary identification easily accomplished	Boundary identification poses some considerable challenges	Boundary identification poses major challenges

Table C-6: Availability Matrix (Rating the Potential for Conflicting Values)

Wilderness Availability Rates As:			
	High	**Moderate**	**Low**
Oil, Gas and Coal	Potential for conflicting values is low	Potential for conflicting values is moderate	Potential for conflicting values is high
Livestock Grazing	Potential to intensify livestock management in the area is low	Potential to intensify livestock management in the area is moderate	Potential to intensify livestock management in the area is high
Locatable Minerals	Potential for conflicting values is low	Potential for conflicting values is moderate	Potential for conflicting values is high
Common Minerals	Potential for conflicting values is low	Potential for conflicting values is moderate	Potential for conflicting values is high
Timber	Potential for conflicting values is low	Potential for conflicting values is moderate	Potential for conflicting values is high
Recreation	Potential for conflicting values is low	Potential for conflicting values is moderate	Potential for conflicting values is high
Plant and Animal Species	Designation results in mainly positive benefits to key species	Designation results in a mix of effects on key species	Designation results in mainly negative effects on key species
Mineral Leases and Subsurface Rights (includes Federal leasing)	Potential for conflicting values is low. Less than 10 percent of private, subsurface minerals ownership. Less than 10 percent is leased for oil and gas development.	Potential for conflicting values is moderate. Between 10 to 20 percent of private, subsurface minerals ownership. Between 10 to 20 percent is leased for oil and gas development.	Potential for conflicting values is high. More than 20 percent of private, subsurface minerals ownership. Greater than 30 percent is leased for oil and gas development.
Existing Contracts and Agreements	Potential for conflicting values is low.	Potential for conflicting values is moderate	Potential for conflicting values is high
Biotic Control Measures and Fire Protection	Potential for conflicting values is low	Potential for conflicting values is moderate	Potential for conflicting values is high
Effects on Adjacent Lands	Potential for conflicting values is low	Potential for conflicting values is moderate	Potential for conflicting values is high

Table C-7: Evidence of Need for Wilderness Ratings Matrix

High	Moderate	Low
Contributions to Wilderness Distribution		
Area is contiguous to an existing Wilderness Nearest existing Wilderness is more than 100 miles away	Nearest existing Wilderness is between 50 to 100 miles away	Nearest existing Wilderness is less than 50 miles away
Representation of Landforms and Ecosystems		
Area is not represented as defined by *Bailey's ecosystem subsection list Landform not represented in the existing National Wilderness System	Area is represented at less than 10,000 acres as defined by *Bailey's subsection list Landform infrequently represented in the existing National Wilderness System	Area is represented at more than 10,000 acres as defined by *Bailey's subsection list Landform is commonly represented in the existing National Wilderness System
Biota		
The viability of key species is dependent upon Wilderness designation	The viability of key species is generally assisted by Wilderness designation	The viability of key species is may benefit from a Wilderness designation; however, a federally listed threatened or endangered species is negatively affected
Public Interests and Concerns		
Low potential to cause extreme, conflicting polarization that leads to legal action if an area is recommended for Wilderness.	Moderate potential to cause extreme, conflicting polarization that leads to legal action if an area is recommended for Wilderness.	High potential to cause extreme, conflicting polarization that leads to legal action if an area is recommended for Wilderness.

The matrix shown below provides the overall ratings for capability, availability and evidence of need for Wilderness for each of the 45 roadless areas. More specific ratings for each area is provided immediately after the matrix shown below.

Table C-8: Summary Ratings for Northern Great Plains Roadless Areas

Roadless Area	Capability	Availability	Need for Wilderness
DAKOTA PRAIRIE GRASSLANDS			
Little Missouri Grassland/Medora			
Grand River	Moderate	Low	Low
South Fork	Moderate	Low	Low
Twin Buttes Creek	Moderate	Low	Low
Bell Lake	Moderate	Low	Low
Blacktail	Moderate	Low	Low
Bullion Butte	Moderate	High	Moderate
Dawson's Waterhole	Moderate	Low	Low
Easy Hill	Moderate	Low	Low
Kinley Plateau	Moderate	High	Low
Magpie	Moderate	Low	Moderate
Ponderosa Pine	Moderate	High	Moderate
Scairt Woman	Moderate	Low	Low

Roadless Area	Capability	Availability	Need for Wilderness
Strom Hanson	Moderate	Moderate	Low
Tracy Mountain	Moderate	Low	Low
Twin Buttes	Moderate	High	Moderate
Wannagan	Moderate	High	Moderate
Little Missouri Grassland/McKenzie			
Collar / Bennett-Cottonwood	Moderate	Moderate	Moderate
Johns Town / Horse Creek	Moderate	Moderate	Low
Lone Butte	Moderate	Moderate	Low
Long X Divide	Moderate	High	Moderate
Sheyenne National Grassland			
Delamere	High	High	High
Durler	High	High	High
McLeod	High	High	High
Sheyenne	High	High	High
Venlo	Moderate	High	High
MEDICINE BOW-ROUTT NATIONAL FOREST UNIT			
Thunder Basin National Grassland			
Cow Creek	High	High	High
Downs	High	High	Moderate
Duck Creek	High	Moderate	High
H A Divide	Moderate	Moderate	Moderate
Miller Hills	Moderate	Moderate	Moderate
Red Hills	High	Moderate	High
NEBRASKA NATIONAL FOREST UNITS			
Samuel R. McKelvie National Forest			
Dismal River	High	High	Low
Steer Creek East	High	High	Moderate
Steer Creek West	High	High	Moderate
Buffalo Gap National Grassland/Fall River			
Cheyenne River	Moderate	Moderate	Moderate
First Black Canyon	Moderate	Moderate	Low
Jim Wilson Canyon	Moderate	Moderate	Low
Red Shirt	High	Moderate	Moderate
Buffalo Gap National Grassland/Wall			
Indian Creek (RARE II)	High	Moderate	Low
Indian Creek (Public Proposed)	High	Moderate	Low
Rake Creek	High	Moderate	Low
Ft. Pierre National Grassland			
Cedar Creek	Moderate	High	Moderate

Roadless Area	Capability	Availability	Need for Wilderness
Oglala National Grassland/Pine Ridge			
Soldier Creek	Moderate	High	Moderate
Sugarloaf	Moderate	High	Low
Toadstool	Moderate	Moderate	Low

Inventoried roadless areas that received a "low" availability rating were not considered for Wilderness (on the Little Missouri National Grassland) because of existing oil and gas leases within those areas' boundaries. Each roadless area was analyzed to determine whether or not oil and gas leases existed, whether or not those leases carry no-surface-occupancy (NSO) stipulations, and whether or not the non-NSO lease distribution would degrade the areas for Wilderness consideration. Those areas that carry a "low" availability rating either have the majority of their acreage leased without NSO stipulations or have non-NSO leases scattered across the roadless area. In some roadless areas, private mineral ownership exists under federal land surface. The Forest Service cannot deny the mineral owner reasonable access for mineral development.

Table C-9: Dakota Prairie Grasslands (Medora RD) by Roadless Area

DAKOTA PRAIRIE GRASSLANDS Little Missouri Grasslands/Medora	Grand River Badlands	South Fork	Twin Butte Creek	Bell Lake	Blacktail	Bullion Butte	Dawson's Waterhole	Easy Hill	Kinley Plateau	Magpie	Ponderosa Pine	Scairt Woman	Strom Hanson	Tracy Mountain	Twin Buttes	Wannagan
Capability Ratings																
Opportunities for Solitude and Serenity	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	High	Mod	High	Mod	Mod	Mod	Mod	Mod
Natural Appearance and Integrity	Mod	Mod	Mod	Mod	Mod	High	Mod	Mod	High	Mod	Mod	Mod	Mod	Mod	Mod	Mod
Challenge	Mod	Mod	Mod	Mod	Mod	Mod	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod
Recreational Opportunities	Low	Mod	Low	Mod	Mod	Mod	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod
Unique Characteristics and Scenic Features	Mod	Mod	Mod	Mod	Mod	Mod	Low	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod
Opportunities for Outdoor Education	Mod	Mod	Mod	Mod	Mod	Mod	Low	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod
Size and Shape	Low	Low	Mod	High	Mod	Mod	High	High	High	Mod	Mod	High	Low	High	Low	High
Potential to Manage Boundaries	Low	Low	Mod	High	Mod	Mod	High	High	High	High	High	High	Mod	High	High	High
Availability Ratings																
Oil, Gas and Coal	High	High	High	Low	Low	High	Low	Low	High	Low	High	Low	Mod	Low	High	Low
Livestock Grazing	Low	Low	Mod	Mod	High	High	High	High	High	High	High	High	High	High	High	High
Locatable Minerals	High	High	High	High	High	High	High	High	High	High	High	High	High	High	High	High
Common Minerals	High	High	High	High	Mod	High	High	High	High	High	High	High	High	High	High	High

DAKOTA PRAIRIE GRASSLANDS Little Missouri Grasslands/Medora	**Grand River Badlands**	**South Fork**	**Twin Butte Creek**	**Bell Lake**	**Blacktail**	**Bullion Butte**	**Dawson's Waterhole**	**Easy Hill**	**Kinley Plateau**	**Magpie**	**Ponderosa Pine**	**Scairt Woman**	**Strom Hanson**	**Tracy Mountain**	**Twin Buttes**	**Wannagan**
Timber	High	High	High	High	High	High	High	High	High	High	Mod	High	High	High	High	High
Recreation	Low	Low	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod
Plant and Animal Species	High	High	High	High	High	High	High	High	High	High	High	High	High	High	High	High
Mineral Leasing and Subsurface Rights	Mod	High	Mod	Low[1]	Low[1]	High	Low[1]	Low[1]	High	Low[1]	Low	Low[1]	Low[1]	Low[1]	High	High[2]
Existing Contracts and Agreements	Mod	High	High	Low	Low	High	Low	Low	High	High	High	Low	Low	Low	High	Low
Biotic Control Measures and Fire Protection	Mod	Mod	Mod	Mod	High	High	Mod	Mod	Mod	High	Mod	Mod	Mod	Mod	Mod	Mod
Effects on Adjacent Lands	Low	Low	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod
Need For Wilderness Ratings																
Contributions to Wilderness Distribution	High	High	High	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	High
Representation of Land-forms and Ecosystems	High	High	High	Low	Low	Mod	Mod	Low	Mod	Mod	Mod	Low	Low	Low	Mod	Mod
Biota	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod
Public Interests and Concerns	Low	Low	Low	Mod	Mod	Mod	Mod	Mod	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod

[1] Most of this area is leased for oil and gas development, has a high oil and gas occurrence and, therefore, is considered unavailable for Wilderness.

[2] The portion of this roadless area this is leased as NSO is rated as "high"; the rest of the area is rated as "low" due to oil and gas leasing.

Table C-10: Dakota Prairie Grasslands (McKenzie RD and Sheyenne NF) Ratings by Roadless Area

DAKOTA PRAIRIE GRASSLANDS **Little Missouri Grasslands/McKenzie**	**Collar/Bennett -Cottonwood**	**Johns Town / Horse Creek**	**Lone Butte**	**Long X Divide**	**DAKOTA PRAIRIE GRASSLANDS** **Sheyenne National Grassland**	**Delamere**	**Durler**	**McLeod**	**Sheyenne**	**Venlo**
Capability Ratings										
Opportunities for Solitude and Serenity	Mod	Mod	Mod	Mod		High	High	High	High	Low
Natural Appearance and Integrity	High	Mod	High	Mod		High	High	High	High	Mod
Challenge	Mod	Low	Mod	Mod		High	High	High	High	High
Recreational Opportunities	Mod	Low	Mod	Mod		Mod	Mod	High	High	High
Unique Characteristics and Scenic Features	High	High	High	High		High	High	High	High	Mod
Opportunities for Outdoor Education	Mod	Mod	Mod	Mod		High	High	High	High	High
Size and Shape	Mod	Mod	Mod	High		High	Mod	High	Mod	Mod
Potential to Manage Boundaries	High	High	High	High		High	High	High	High	High
Availability Ratings										
Oil, Gas and Coal	Mod	Low	Low	High		High	High	High	High	High
Livestock Grazing	High	High	High	High		High	High	High	High	High
Locatable Minerals	High	High	High	High		High	High	High	High	High
Common Minerals	High	High	High	High		High	High	High	High	High
Timber	High	High	High	High		High	High	High	High	High

DAKOTA PRAIRIE GRASSLANDS **Little Missouri Grasslands/McKenzie**	**Collar/Bennett -Cottonwood**	**Johns Town / Horse Creek**	**Lone Butte**	**Long X Divide**	**DAKOTA PRAIRIE GRASSLANDS** **Sheyenne National Grassland**	**Delamere**	**Durler**	**McLeod**	**Sheyenne**	**Venlo**
Recreation	Mod	Mod	Mod	Mod		High	High	High	High	High
Plant and Animal Species	High	Mod	High	High		Mod	Mod	Mod	Mod	Mod
Mineral Leasing and Subsurface Rights	Mod[3]	Low[4]	Low[5]	High		High	High	High	High	High
Existing Contracts and Agreements	Mod	Low	Low	Mod		High	High	High	High	High
Biotic Control Measures and Fire Protection	High	High	High	High		High	High	High	High	High
Effects on Adjacent Lands	Mod	Mod	Mod	Mod		High	High	High	High	High
Need For Wilderness Ratings										
Contributions to Wilderness Distribution	High	Low	Low	High		High	High	High	High	High
Representation of Landforms and Ecosystems	Mod	Mod	Mod	Mod		High	High	High	High	High
Biota	High	Low	Mod	Mod		Mod	Mod	Mod	Mod	Mod
Public Interests and Concerns	Low	Low	Low	Low		Mod	Mod	Mod	Mod	Mod

[3] Greater than 30% of the area is leased for oil and gas development. The northern portion of the area (Bennett Creek valley) allows surface occupancy of oil and gas development facilities; however, the remainder of the area's existing leases does not allow surface occupancy.

[4] The northern two-thirds of the area is leased for oil and gas development. The southern one-third of the area is not leased.

[5] Over 30% of the area is leased for oil and gas development. The existing leases still allow oil and gas exploration / development to occur.

Table C-11: Medicine Bow - Routt Ratings by Roadless Area

MEDICINE BOW-ROUTT NATIONAL FOREST UNIT **Thunder Basin National Grassland**	**Cow Creek**	**Downs**	**Duck Creek**	**H A Divide**	**Miller Hills**	**Red Hills**
Capability Ratings						
Opportunities for Solitude and Serenity	High	Mod	High	Mod	High	Mod
Natural Appearance and Integrity	High	High	High	Mod	Mod	High
Challenge	High	High	Mod	Mod	High	High
Recreational Opportunities	High	Mod	Mod	Mod	High	High
Unique Characteristics and Scenic Features	High	High	High	Mod	Mod	High
Opportunities for Outdoor Education	High	High	High	Mod	Mod	High
Size and Shape	Mod	Mod	Mod	Mod	Mod	Mod
Potential to Manage Boundaries	High	Mod	Mod	Low	Mod	High
Availability Ratings						
Oil, Gas and Coal	Mod	Mod	Mod	Mod	Mod	Mod
Livestock Grazing	High	High	High	High	High	High
Locatable Minerals	High	High	High	High	High	Mod

MEDICINE BOW-ROUTT NATIONAL FOREST UNIT **Thunder Basin National Grassland**	**Cow Creek**	**Downs**	**Duck Creek**	**H A Divide**	**Miller Hills**	**Red Hills**
Common Minerals	High	High	High	High	High	Mod
Timber	High	High	Mod	Mod	High	Mod
Recreation	Mod	High	Mod	Mod	High	Mod
Plant and Animal Species	High	High	High	High	Mod	Mod
Mineral Leasing and Subsurface Rights	Mod	Mod	Low	Mod	Mod	Mod
Existing Contracts and Agreements	High	Mod	Mod	Mod	Mod	Mod
Biotic Control Measures and Fire Protection	Mod	Mod	Mod	Mod	Mod	Mod
Effects on Adjacent Lands	Mod	Mod	Mod	Mod	Mod	Mod
Need For Wilderness Ratings						
Contributions to Wilderness Distribution	High	High	High	Mod	High	High
Representation of Landforms and Ecosystems	High	Mod	High	High	Mod	High
Biota	Mod	Mod	Mod	Mod	Low	Low
Public Interests and Concerns	High	Mod	Mod	Mod	Mod	Mod

Table C-12: Nebraska National Forest Ratings by Roadless Area

NEBRASKA NATIONAL FOREST UNITS	Samuel R. McKelvie National Forest			Buffalo Gap National Grassland							Ft. Pierre NG	Oglala National Grassland/Pine Ridge		
				Fall River			Wall							
	Dismal River	Steer Creek East	Steer Creek West	Cheyenne River	First Black Canyon	Jim Wilson Canyon	Red Shirt	Indian Creek (RARE II)	Indian Creek	Rake Creek	Cedar Creek	Soldier Creek	Sugarloaf	Toadstool
Capability Ratings														
Opportunities for Solitude and Serenity	High	High	High	Mod	Mod	Mod	High	High	High	High	Mod	Mod	Mod	Mod
Natural Appearance and Integrity	Mod	Mod	Mod	High	High	High	High	High	High	High	Mod	Mod	Mod	Mod
Challenge	High	High	High	Mod	Low	Low	High	High	High	High	Mod	High	Low	Mod
Recreational Opportunities	Mod	High	High	High	Mod	Mod	High	High	High	High	Mod	High	Mod	High
Unique Characteristics and Scenic Features	High	High	High	High	Low	Low	High	High	High	High	Mod	Mod	Mod	High
Opportunities for Outdoor Education	High	High	High	High	High	High	High	High	High	High	Mod	Mod	Mod	High
Size and Shape	High	High	High	Mod	High	High	High	Low	Low	High	Low	Mod	High	High
Potential to Manage Boundaries	Mod	Mod	Mod	High	Mod	Mod	Mod	Mod	Mod	High	Mod	High	High	Mod
Availability Ratings														
Oil, Gas and Coal	High	High	High	High	High	High	High	High	High	High	High	High	High	Mod
Livestock Grazing	High	Mod	Mod	High	Mod	Mod	High	High	High	High	Mod	High	High	Mod
Locatable Minerals	High	High	High	High	High	High	High	High	High	High	High	High	High	Mod

NEBRASKA NATIONAL FOREST UNITS	Samuel R. McKelvie National Forest			Buffalo Gap National Grassland							Ft. Pierre NG	Oglala National Grassland/Pine Ridge		
				Fall River			Wall							
	Dismal River	Steer Creek East	Steer Creek West	Cheyenne River	First Black Canyon	Jim Wilson Canyon	Red Shirt	Indian Creek (RARE II)	Indian Creek	Rake Creek	Cedar Creek	Soldier Creek	Sugarloaf	Toadstool
Common Minerals	High	High	High	High	High	High	High	High	High	High	High	High	High	High
Timber	Mod	Mod	High	High	High	High	High	High	High	High	High	High	High	High
Recreation	Mod	Mod	Mod	High	Mod	Mod	Mod	High	High	High	Mod	Mod	Mod	Mod
Plant and Animal Species	High	High	High	High	Mod	Mod	High	High	High	High	High	Mod	High	High
Mineral Leasing and Subsurface Rights	High	High	High	Low	Low	Low	Low	Low	Low	Low	High	Low	High	High
Existing Contracts and Agreements	High	High	High	High	High	High	High	High	High	High	High	High	Mod	Mod
Biotic Control Measures and Fire Protection	High	High	High	High	High	High	High	High	High	High	Mod	Mod	Low	Low
Effects on Adjacent Lands	High	High	High	High	High	High	High	Mod	Mod	High	Mod	High	High	Mod
Need For Wilderness Ratings														
Contributions to Wilderness Distribution	Mod	Low	Low	Low	Low	Low	Low	Low	Low	Low	Mod	High	Low	Low
Representation of Landforms and Ecosystems	High	High	High	Mod	Mod	Mod	Mod	Low	Low	Low	Mod	Mod	Mod	Mod
Biota	Low	Mod	Mod	Mod	Low	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod
Public Interests and Concerns	Low	Mod	Mod	Mod	Low	Low	High	Mod	Mod	Mod	Low	Low	Low	Low

Work Cited

Bailey, Robert G. *Description of the Ecoregions of the United States*. USDA-Forest Service, Miscellaneous Publication 1391, 2nd ed. Washington, DC: 1995.

The table below cross-walks to the section "Plant and Animal Species" in the "availability" section of this report for each roadless area.

LMNG - Little Missouri National Grassland

FPNG - Fort Pierre National Grassland

GR/CR - Grand River / Cedar River National Grassland

ONG - Oglala National Grassland / Pine Ridge Ranger District

SNG - Sheyenne National Grassland

NNF - Nebraska National Forest

TBNG - Thunder Basin National Grassland

SRM - Samuel R. McKelvie National Grassland

BGNG - Buffalo Gap National Grassland

BRD - Bessey Ranger District

Table C-13. Species Protected Under the Endangered Species Act and at Risk of Range-wide Imperilment.

	National Grassland or Forest									
Species	**LMNG**	**GR/CR**	**SNG**	**TBNG**	**BGNG**	**FPNG**	**ONG**	**NNF PRRD**	**NNF BRD**	**SRM**
Blowout penstemon									K	PSH
Western prairie fringed orchid			K						PSH	PSH
Ute ladies-tresses				PSH	PSH					
American burying Beetle						PSH			K	P
Whooping crane	K	P			K	K	PSH	PSH	PSH / OS	PSH / OS
Bald eagle	K	K	K	K	K	K	K	K	K	K
Peregrine falcon	PSH	PSH		PSH	K	PSH	PSH		PSH	PSH
Black-footed ferret				K	PSH		PSH			
Mountain plover									PSH / OS	PSH / OS
Topeka shiner									K	PSH

K = Known occurrence in vicinity; date of last observation suggests that species still occurs in area,

P = Possible but unconfirmed occurrence,

PSH = Species occurrence is unlikely or questionable; within species range and potential or suitable habitat may occur,

OS = Possible off-site occurrence (downstream, etc.)

Table C-14. Species that are Globally Imperiled or Vulnerable and/or Candidates for Protection Under ESA.

Species	National Grassland or Forest									
	LMNG	GRCRNG	SNG	TBNG	BGNG	FPNG	ONG	NNFPRRD	NNFBRD	SRMNF
Dakota buckwheat	K	K			K		P			
Smooth goosefoot	K	K			P				P	K
Barr's milkvetch				K	K		P			
Dakota skipper	K	P	K							
Powesheik skipper			K							
Ottoe skipper	K	K		UQ	P	P	P	P	P	P
Regal fritillary	K	K	K	UQ	P	K	P	P	K	P
Sturgeon chub	UQ	UQ		UQ	K/OS					
Swift fox	UQ	UQ		K	K	UQ	K	UQ		
Black-tailed prairie dog	K	K		K	K	K	K		K	UQ

K = Known occurrence in vicinity; date of last observation indicates that species still occurs in area,

P = Possible but unconfirmed occurrence,

UQ = Species occurrence is unlikely or questionable; within species range and potential or suitable habitat may occur,

OS = Possible off-site occurrence (downstream, etc.).

Table C-15. Species at Risk Regionally or at State Levels.

Species	National Grassland or Forest										
	Classification	LMNG	GRCRNG	SNG	TBNG	BGNG	FPNG	ONG	NNF PRRD	NNF BRD	SRMNF
Labrador bedstraw	FS – Sensitive (R1)			K							
Marsh bellflower	FS – Sensitive (R1)			K						P	K
Buckbean	FS – Sensitive (R1) IA - Threatened			K							
Nodding buckwheat	FS – Sensitive (R1)	K			P	P		P			
Slender cottongrass	FS – Sensitive (R1)			K						P	P
Lanceleaf cottonwood	FS – Sensitive (R1)	K			P	P					
Torrey's cryptantha	FS – Sensitive (R1)	K			P						
Dogberry	FS – Sensitive (R1)			K							
Crested shield fern	FS – Sensitive (R1)			K						P	P
Marsh fern	FS – Sensitive (R1)			K						P	K
Oak fern	FS –Sensitive (R1) IA - Threatened			K	UQ						
Sensitive fern	FS – Sensitive (R1)			K						P	K
Leathery grape-fern	FS – Sensitive (R1)			K							
Little grape-fern	FS – Sensitive (R1)			K							
Spinulose woodfern	FS – Sensitive (R1)			K						P	K
Northern lady-fern	FS – Sensitive (R1)			K							
Shining flatsedge	FS – Sensitive (R1)			K	UQ					P	P
Umbrella flatsedge	FS – Sensitive (R1)			K						P	P
Frostweed	FS – Sensitive (R1)			K	UQ					P	P
Broad-leaved goldenrod	FS – Sensitive (R1)			K							
Beach heather	FS – Sensitive (R1)			K							
Marsh horsetail	FS – Sensitive (R1)			K							
Meadow horsetail	FS – Sensitive (R1)			K							
Sand lily	FS – Sensitive (R1)	K	P		P	P		P	P	P	P
Blue lips	FS – Sensitive (R1)	K			P	P		P			
Alyssum-leaf phlox	FS – Sensitive (R1)	K	P		P	P		P	P		
Limber pine	FS – Sensitive (R1)	K									
Upright pinweed	FS – Sensitive (R1)	P		K						P	P
Alkali sacaton	FS – Sensitive (R1)	K	P		P	P		P			

Species	National Grassland or Forest										
	Classification	**LMNG**	**GRCRNG**	**SNG**	**TBNG**	**BGNG**	**FPNG**	**ONG**	**NNF PRRD**	**NNF BRD**	**SRMNF**
Purple sandgrass	FS – Sensitive (R1) MN - Spp Concern			K						P	P
Delicate sedge	FS – Sensitive (R1) IA - Spp Concern			K							
Foxtail sedge	FS – Sensitive (R1)			K							
Handsome sedge	FS – Sensitive (R1)			K							
Showy lady's slipper	FS – Sensitive (R1) IA - Threatened			K							
Small white lady's slipper	FS – Sensitive (R1) IA, MN - Spp Concern COSEWIC - E			K						P	P
Wahoo spindle-tree	FS – Sensitive (R1)			K							
Golden stickleaf	FS – Sensitive (R1)	K									
Adder's tongue	FS – Sensitive (R1) IA - Spp Concern			K						P	K
Hooker's townsendia	FS – Sensitive (R1)	K			P	K		P			
Loesel's twayblade	FS – Sensitive (R1)			K						P	K
Bog willow	FS – Sensitive (R1) IA - Threatened			K							
Belfragii's bug	FS – Sensitive (R1)	K	P	K							
Tawny crescent butterfly	FS – Sensitive (R1 & 2)	K	P		P			P	K		
Arogos skipper	FS – Sensitive (R1)		P	P	P	P	P	P			
Flathead chub	FS – Sensitive (R2)	K/OS	K/OS		K/OS	K/OS		K/OS		K/OS	K/OS
Longnose sucker	SD - Threatened	K/OS									
Plains topminnow	FS – Sensitive (R2)				K/OS	K/OS				K/OS	K/OS
Northern leopard frog	FS – Sensitive (R1 & 2) MT - Spp Concern COSEWIC - V	K	K	K	K	K	K	K	K	K	K
Tiger salamander	FS – Sensitive (R2)	K	K	K	K	K	K	K	K	K	K
Pale milk snake	FS – Sensitive (R2) MT - Spp Concern	P	P		P	P	P	P	K	K	P
Blanding's turtle	IUCN - Lower Risk SD - Endangered									P	K

Species	National Grassland or Forest									
	Classification	**LMNG**	**GRCRNG**	**SNG**	**TBNG**	**BGNG**	**FPNG**	**ONG**	**NNF PRRD**	**NNF BRD**	**SRMNF**
American bittern	FS – Sensitive (R2) PIF - Moderate Priority WY - Spp Concern Priority	K	K	K		K	K	K		P	K
Greater prairie chicken	FS – Sensitive (R1 & 2) MN - Spp Concern COSEWIC - XT			K			K			K	K
Yellow-billed cuckoo	FS – Sensitive (R2) PIF - Moderate Priority MT, WY - Spp Concern	UQ	K	K	K	K	UQ	K	K	K	K
Long-billed curlew	FS – Sensitive (R2) BLM - Sensitive COSEWIC - V WY - Spp Concern PIF - High Priority WY-PIF - Level 1	K	P		K	K	K	K		K	K
American peregrine falcon	FS – Sensitive (R1 & 2) TNC / NHP – G4T4, N3 MT,NE,SD–Endangered WY – Spp Concern	K	P	P	K	K	K	K	K	P	P
Northern goshawk	FS – Sensitive (R1 & 2) BLM - Sensitive MT, WY - Spp Concern	P	P	P	K	P	P	P	P	P	P
Sage grouse	FS – Sensitive (R1) WY-PIF - Level 1 COSEWIC - E	K			K	K					
Ferruginous hawk	FS – Sensitive (R2) BLM - Sensitive COSEWIC - V MT, WY - Spp Concern WY-PIF - Level 1	K	K		K	K	K	K	K	K	K
White-faced ibis	FS – Sensitive (R2) BLM - Sensitive MT, WY - Spp Concern			P	P	UQ	UQ	UQ			UQ

Species	National Grassland or Forest									
	Classification	**LMNG**	**GRCRNG**	**SNG**	**TBNG**	**BGNG**	**FPNG**	**ONG**	**NNF PRRD**	**NNF BRD**	**SRMNF**
Common loon	FS – Sensitive (R2) BLM - Sensitive				UQ	UQ	UQ	UQ		UQ	UQ
Merlin	FS – Sensitive (R2) WY - Spp Concern	K	P	P	K	K	K	K	K	K	K
Pygmy nuthatch	FS – Sensitive (R2)				P			P	K		
Western burrowing owl	FS – Sensitive (R1 & 2) BLM - Sensitive COSEWIC - E MT - Spp Concern MN - Endangered WY-PIF - Level 1	K	K	P	K	K	K	K	K	K	K
Sprague's pipit	FS – Sensitive (R1)	K	K	P	K	K	P			P	P
Upland sandpiper	FS – Sensitive (R2)	K	K	K	K	K	K	K	K	K	K
Loggerhead shrike	FS – Sensitive (R1 & 2) BLM - Sensitive COSEWIC - T MT - Spp Concern PIF - Moderate Priority MN - Threatened WY-PIF - Level 1	K	K	K	K	K	K	K	K	K	K
Baird's sparrow	FS – Sensitive (R1 & 2) BLM - Sensitive MT - Spp Concern PIF - High Priority MN - Endangered WY-PIF - Level 1	K	K	P	K	UQ	P	UQ			
Fox sparrow	FS – Sensitive (R2)	P	P	P	K	P	K	P	P	K	K
Trumpeter swan	IUCN - Lower Risk FS – Sensitive (R2) BLM - Sensitive MT,WY - Spp Concern WY-PIF - Level 1					K					UQ

Species	National Grassland or Forest									
	Classification	**LMNG**	**GRCRNG**	**SNG**	**TBNG**	**BGNG**	**FPNG**	**ONG**	**NNF PRRD**	**NNF BRD**	**SRMNF**
Black tern	FS – Sensitive (R2) BLM - Sensitive PIF - Moderate Priority IA - Spp Concern WY-PIF - Level 1	K	K	K	K	K	K	P		P	P
Black-backed woodpecker	FS – Sensitive (R1 & 2) BLM – Sensitive WY – Spp Concern				P						
Lewis' woodpecker	FS – Sensitive (R2)				K	P		K	K		
Townsend's big-eared bat	IUCN - Vulnerable FS – Sensitive (R1 & 2) BLM - Sensitive MT,WY - Spp Concern	P			K	K		P	P		
Mountain lion	SD - Threatened	P			K	P		P	K		
Fringe-tailed myotis	WY - Spp Concern FS – Sensitive (R2)				K	K		K	K		
River otter	NE - Endangered SD - Threatened	K		K						P	P
California bighorn sheep	FS – Sensitive (R1)	K									
Dwarf shrew	FS – Sensitive (R2) MT, WY - Spp Concern				UQ	UQ					

K = Known occurrence in vicinity; date of last observation indicates that species still occurs in area,

P = Possible but unconfirmed occurrence,

UQ = Species occurrence is unlikely or questionable; within species range and potential habitat may occur,

OS = Possible off-site occurrence (downstream, etc.).

Chapter 3 Differences Among Alternatives

Introduction

This appendix contains management direction that differs among the alternatives. Most direction contained in the proposed Revised Management Plans applies to all action alternatives. In most cases, differences between the no action and the action alternatives are described here. Also, differences among the action alternatives where the direction in the proposed Revised Management Plan does not fit the theme of an alternative are described here.

Direction for Alternative 1 (No Action)

Carry forward all unit-wide direction in the existing land and resource management plans, as amended. In particular, standards and guidelines will differ in Alternative 1 from Alternatives 2 through 5 in the areas of paleontology, wildlife, prairie dogs, livestock grazing, and travel management.

Infrastructure

Direction for Alternatives 1 and 2

Goal 4 – Effective Public Service

An effective organization is needed to achieve the agency's mission. Objectives relate to generating scientific information, protecting and maintaining resources and facilities for agency and public use, and fulfilling basic land-stewardship responsibilities to help ensure sustainable ecosystems and provide multiple benefits to people.

The agency is also committed to a customer-service ethic focused on serving the needs of customers, including low-income, minority, and historically under-served communities. This commitment includes having an innovative workforce that is representative of the American society as a whole.

Goal 4.a - Improve the capability of the Nation's forests and grasslands to provide diverse, high-quality outdoor recreation opportunities

Objectives

1. Within 15 years, annually maintain at least 20 percent of the Forest Development transportation system roads.
2. Within 15 years, complete at least 10 percent of high-priority facility reconstruction projects.

Goal 4a Objectives, cont.

3. Within 5 years, manage to standard at least 20 percent of buildings, bridges, and other facilities.

Standards

1. Allow motorized use on new or existing travelways (See Appendix G, Glossary), or as designated on the travel map, unless a documented decision shows:

- Motorized use conflicts with Management Plan objectives;
- Motorized use is incompatible with the recreation opportunity spectrum class;
- Travelways are located in areas closed to motorized use and are not ``designated routes;''
- Motorized use creates user conflicts that result in unsafe conditions related to weather conditions;
- Physical characteristics of travelway(s) preclude any form of motorized use;
- Travelways do not serve an existing or identified future public need; or
- Financing is not available for maintenance necessary to protect resources.

2. Allow motorized wheelchair use in a non-motorized area so long as that wheelchair meets the legal definition of being "designed solely for use by a mobility impaired person for locomotion that is suitable for use in an indoor pedestrian area". (Title V, Section 507(c) (2) of the Americans with Disabilities Act).
3. Keep drinking water safe for human consumption at Forest Service facilities or at facilities under special-use permit by the Forest Service.

Guidelines

1. Do not invest in new facilities on lands meeting the criteria for disposal.
2. Newly acquired facilities will not be retained unless sufficient maintenance funding is available or cooperative maintenance can be secured, and a substantial government benefit can be demonstrated.
3. Require a special-use permit for motorized access to private land where access for the general public is not available.
4. Install gates along all existing range allotment and pasture fences at intervals to provide reasonable access (not exceed 1 mile), as funding allows. Install gates along all new fences at intervals not to exceed 1 mile and at fence corners.
5. Provide a minimum of 12-foot openings for gates to allow access for firefighting equipment, as funding allows.
6. Install user-friendly gate closures, as funding allows (See Appendix E for details).
7. Use cattle guards or hinged metal gates on popular and designated travel routes, as funding allows. Place a gate adjacent to each cattle guard.
8. Build new and reconstructed fences to the specifications listed in Appendix B to provide for big game (adults and young) movement during all seasons, where desired.

9. Do not construct any woven wire fences.
10. Prioritize for reconstruction those fences that do not meet big game specifications. Prioritize removal of existing woven wire fences. Mitigate existing fences that do not meet big game specifications.
11. Leave interior gates that are not along transportation corridors open when not needed to control livestock.
12. See the following publications for fence construction for livestock, including bison: Facilities for Handling, Sheltering and Trailing Livestock, September 1987, Society For Range Management; Fences, July 1988, Society For Range Management; and Facilities for Watering Livestock and Wildlife, January 1989, MTDC 89-1.
13. Restrict capital investments on lands with non-federal mineral estate ownership in areas of moderate to high mineral development potential if purpose of capital investment would conflict with mineral development.
14. Perform site-specific mineral evaluations prior to making substantial capital investments, such as recreation developments, on Federal mineral estate in areas of moderate to high potential for valuable mineral deposits. Depending on conclusions from mineral evaluation and potential for mineral development, consider alternate location for capital investment, withdrawal of locatable minerals, or restrictions on surface occupancy for leasable minerals.

Direction for Alternative 5

Dakota Prairie Grasslands only

Standards

1. Restrict motorized travel to existing roads and trails; prohibit motorized use in designated non-motorized areas and the Maah Daah Hey and North Country Trails (except for authorized administrative use, such as grazing administration, noxious weed control, or fire control).
2. Allow motorized wheelchair use in a non-motorized area so long as that wheelchair meets the legal definition of being "designed solely for use by a mobility impaired person for locomotion that is suitable for use in an indoor pedestrian area". (Title V, Section 507(c) (2) of the Americans with Disabilities Act).
3. Keep drinking water safe for human consumption at Forest Service facilities or at facilities under special-use permit by the Forest Service.

Guidelines

1. Do not invest in new facilities on lands meeting the criteria for disposal.
2. Newly acquired facilities will not be retained unless sufficient maintenance funding is available or cooperative maintenance can be secured, and a substantial government benefit can be demonstrated.
3. Require a special-use permit for motorized access to private land where access for the general public is not available.

Guidelines, cont.

4. Install gates along all existing range allotment and pasture fences at intervals to provide reasonable access (not exceed 1 mile), as funding allows. Install gates along all new fences at intervals not to exceed 1 mile and at fence corners.
5. Provide a minimum of 12-foot openings for gates to allow access for firefighting equipment, as funding allows.
6. Install user-friendly gate closures, as funding allows (See Appendix E for details).
7. Use cattle guards or hinged metal gates on popular and designated travel routes, as funding allows. Place a gate adjacent to each cattle guard.
8. Build new and reconstructed fences to the specifications listed in Appendix B to provide for big game (adults and young) movement during all seasons, where desired.
9. Do not construct any woven wire fences.
10. Prioritize for reconstruction those fences that do not meet big game specifications. Prioritize removal of existing woven wire fences. Mitigate existing fences that do not meet big game specifications.
11. Leave interior gates that are not along transportation corridors open when not needed to control livestock.
12. See the following publications for fence construction for livestock, including bison: Facilities for Handling, Sheltering and Trailing Livestock, September 1987, Society For Range Management; Fences, July 1988, Society For Range Management; and Facilities for Watering Livestock and Wildlife, January 1989, MTDC 89-1.
13. Restrict capital investments on lands with non-federal mineral estate ownership in areas of moderate to high mineral development potential if purpose of capital investment would conflict with mineral development.
14. Perform site-specific mineral evaluations prior to making substantial capital investments, such as recreation developments, on Federal mineral estate in areas of moderate to high potential for valuable mineral deposits. Depending on conclusions from mineral evaluation and potential for mineral development, consider alternate location for capital investment, withdrawal of locatable minerals, or restrictions on surface occupancy for leasable minerals.

Livestock Grazing Direction by Alternative

Alternative 1

No adjustments are made for animal equivalents to account for variations in livestock weight.

No limits on average pasture size and density of water developments.

Alternative 2

No limits on average pasture size and density of water developments.

Alternative 3

Maintain or increase average pasture size, and structural improvements may be constructed to achieve desired condition objectives.

Alternative 4

Maintain or increase average pasture size, and allow no net gain in water developments.

Within 15 years, establish at least 5 percent of rangelands on national grasslands as bison- only grazing areas. Priority for designating areas for bison grazing are areas with primitive or semi-primitive recreation settings, low amounts of structural improvements and high amounts of secondary range, and areas that may be of important to restore bison in the landscape to Native American Indian tribes.

Alternative 5

Maintain or increase average pasture size, and allow no net gain in water developments.

Non-Native and Invasive Species, Noxious Weeds, and Insect Management Direction by Alternative

Alternatives 2, 3, 4, and 5

Standard

1. Once appropriate consultation with state agencies has taken place, allow only certified noxious weed-free products for recreational animal feed or revegetation projects. This includes use of certified hay or straw, and heat-treated, or other appropriately processed products.

Guideline

1. Where technically and economically feasible, use genetically local (at the ecological sub-section level) native plant species in revegetation efforts. To prevent soil erosion, non-native annuals or sterile perennial species may be used while native perennials are becoming established.

Paleontological Resource Direction by Alternative

Alternative 1

Standards

1. Continue with current policy direction, which allows on-top-the-surface collection of invertebrates without a permit for personal, non-commercial use.

Standards, cont.

2. Allow collection of on-top-the-surface petrified wood for personal, non-commercial use, without charge but with a free-use permit, or without a permit in designated areas, according to the following stipulations (See 36 CFR 228.62[e]):
    - No known heritage values, scientific values, or other prohibitive restrictions occur at the site.
    - The maximum amount of collected petrified wood per person per day does not exceed 25 pounds, and that the total maximum weight in one calendar year per person does not exceed 250 pounds. Permits may be issued, however, to museums, educational institutions, and similar groups for larger amounts.
3. Allow vertebrate fossil collection with authorization, only to qualified individuals or institutions.
4. Prohibit the commercial collection of fossils.
5. Conduct paleontologic surveys prior to ground-disturbing activities according to the process outlined in Appendix J.

Guideline

1. Survey and post land boundaries where paleontological sites have Fossil Potential Classification sensitivity ranking of 3, 4, or 5, as funding allows (See Paleontological Appendix for details).

Alternatives 2, 3, and 4

Standards

1. Allow non-commercial collection of paleontological resources with authorization (permit or area designation).
2. Allow collection of on-top-the-surface petrified wood for personal, non-commercial use, without charge but with a free-use permit, or without a permit in designated areas, according to the following stipulations (See 36 CFR 228.62[e]):
    - No known heritage values, scientific values, or other prohibitive restrictions occur at the site.
    - The maximum amount of collected petrified wood per person per day does not exceed 25 pounds, and that the total maximum weight in one calendar year per person does not exceed 250 pounds. Permits may be issued, however, to museums, educational institutions and similar groups for larger amounts.
3. Protect key paleontological resources (Classes 3, 4 and 5 of the Fossil Potential Classification) from disturbance, or mitigate the effects of disturbance, to conserve scientific, interpretive and legacy values. (See Paleontological Appendix for details).
4. Prior to ground-disturbing activities, conduct paleontologic surveys in any area where there is a high potential to encounter these resources according to the process outlined in Appendix J.

Guideline

1. Survey and post land boundaries where paleontological sites have Fossil Potential Classification sensitivity ranking of 3, 4, or 5, as funding allows (See Paleontological Appendix for details).

Alternative 5

Standards

1. Allow on-top-the-surface collection of invertebrates without a permit for personal, non-commercial use.
2. Allow collection of on-top-the-surface petrified wood for personal, non-commercial use, according to the following stipulations (See 36 CFR 228.62[e]):
    - No known heritage values, scientific values, or other prohibitive restrictions occur at the site.
    - The maximum amount of collected petrified wood per person per day does not exceed 25 pounds, and that the total maximum weight in one calendar year per person does not exceed 250 pounds. Permits may be issued, however, to museums, educational institutions and similar groups for larger amounts.
3. Prohibit the commercial collection of fossils.
4. Protect from disturbance or mitigate from disturbance key paleontological resources (Classes 3, 4 and 5 of the Fossil Potential Classification) to conserve scientific, educational, interpretive and legacy values. (See Paleontological Appendix for details).
5. Conduct paleontologic surveys prior to ground-disturbing activities according to the process outlined in Appendix J.

Guidelines

1. Designate areas to allow for on-top-the-surface collection of vertebrate fossils, as funding allows. (See Paleontological Appendix for details).
2. Survey and post land boundaries where paleontological sites have Fossil Potential Classification sensitivity ranking of 3, 4 or 5, as funding allows (See Paleontological Appendix for details).

Prairie Dog Direction by Alternative

Alternative 1

Unit-wide direction in the existing land and resource management plans and prairie dog management plans would continue. Direction varies between national grasslands and forests.

Alternative 2

Guidelines

1. Limit the use of rodenticides outside of 3.63 Management Areas to one or more of the following situations:
    - Human health and safety risks occur in the immediate area.
    - To achieve desired vegetation conditions. (See vegetation matrix in Geographic Area direction for details)
    - Prairie dog colonies occur on isolated National Forest System tracts less than 3,000 acres.
    - Unwanted colonization on adjoining lands is occurring and the most likely source of prairie dogs appears to be colonies located along the property boundary on National Forest System lands.
    - To maintain forage to support permitted livestock.
2. Reevaluate prairie dog management if the total acreage of fully active prairie dog colonies grows to the following levels:

Table 3-1. Maximum Acreage of Fully Active Prairie Dog Colonies (Alternative 2)

Great Plains Dry Steppe Province Unit	
Buffalo Gap / Oglala National Grasslands	2 percent of potential suitable
Cedar River / Grand River National Grasslands	2 percent of potential suitable
Little Missouri National Grassland	2 percent of potential suitable
Thunder Basin National Grassland	2 percent of potential suitable
Nebraska National Forest (Pine Ridge unit)	Not applicable
Great Plains Steppe Province Unit	
Fort Pierre National Grassland	1 percent of potential suitable
Nebraska National Forest (Bessey Ranger District)	Not applicable
Samuel R. McKelvie National Forest	Not applicable
Prairie Parkland Province Unit	
Sheyenne National Grassland	Not applicable

Alternative 3

Standards

1. Prohibit use of rodenticides (above-ground grain baits) for reducing prairie dog populations outside the period October 1 to December 31 to reduce risks to migratory birds. To reduce risk to other wildlife, do not use burrow fumigants in prairie dog colonies.
2. Limit the use of rodenticides (grain-baits) for reducing prairie dog populations to the following situations:
    - Public health and safety risks occur in the immediate area
    - Damage to private and public facilities, such as cemeteries and residences

Guidelines

1. Consult U.S. Fish and Wildlife Service-approved, state-wide prairie dog conservation strategies for additional guidance on the appropriate response to complaints of unwanted prairie dog colonization on adjoining agricultural lands (private, state, and tribal lands).
2. Prohibit prairie dog shooting where significant risks have been identified for other wildlife species or where shooting is preventing or slowing a desired prairie dog population expansion. Restrictions shall be year-long or seasonal, and dates of seasonal restrictions shall vary depending on the species at risk Coordinate and consult with appropriate wildlife agencies prior to implementation of restrictions.

Alternative 4

Standards

1. Limit the use of rodenticides outside of 3.63 Management Area to address health and safety risks.
2. Prohibit recreational shooting of prairie dogs by area closure.

Guidelines

1. Emphasize the use of vegetation management and other nonchemical methods in managing colony growth and establishment.
2. Reintroduce prairie dogs into suitable habitat, where desired and as funding allows.
3. Reevaluate prairie dog management if the total acreage of fully active prairie dog colonies grows to the following levels:

Table D-2: Maximum Acreage of Fully Active Prairie Dog Colonies (Alternative 4)

Great Plains Dry Steppe Province Units	
Buffalo Gap / Oglala National Grasslands	20 percent of potential suitable
Cedar River / Grand River National Grassland	20 percent of potential suitable
Little Missouri National Grassland	20 percent of potential suitable
Thunder Basin National Grassland	20 percent of potential suitable
Nebraska National Forest (Pine Ridge unit)	Not applicable
Great Plains Steppe Province Unit	
Fort Pierre National Grassland	5 percent of potential suitable
Nebraska National Forest (Bessey Ranger District)	Not applicable
Samuel R. McKelvie National Forest	Not applicable
Prairie Parkland Province Unit	
Sheyenne National Grassland	Not applicable

Alternative 5

Standards

1. Limit rodenticide use to October 1 and December 31 to reduce risks to migratory birds and species of concern.
2. Prohibit the use of burrow fumigants.

Guidelines

1. Limit the use of rodenticides outside of 3.63 Management Areas to one or more of the following situations:
   - Human health and safety risks occur in the immediate area.
   - Prairie dog colonies occur on isolated National Forest System tracts less than 3,000 acres.
   - Unwanted colonization on adjoining lands is occurring and the most likely source of prairie dogs appears to be located along the property boundary on National Forest System lands.
   - To achieve desired vegetation conditions (see vegetation matrix in Geographic Area direction for details).
2. Emphasize the use of vegetation management and other nonchemical methods in managing colony growth and establishment.
3. Reevaluate prairie dog management if the total acreage of fully active prairie dog colonies grows to the following levels:

Table D-3: Maximum Acreage of Fully Active Prairie Dog Colonies (Alternative 5)

Great Plains Dry Steppe Province Units	
Buffalo Gap / Oglala National Grasslands	10 percent of potential suitable
Cedar River / Grand River National Grasslands	10 percent of potential suitable
Little Missouri National Grassland	10 percent of potential suitable
Thunder Basin National Grassland	10 percent of potential suitable
Nebraska National Forest (Pine Ridge unit)	Not applicable
Great Plains Steppe Province Unit	
Fort Pierre National Grassland	3 percent of potential suitable
Nebraska National Forest (Bessey Ranger District)	Not applicable
Samuel R. McKelvie National Forest	Not applicable
Prairie Parkland Province Unit	
Sheyenne National Grassland	Not applicable

Rangeland and Forest Health by Alternative

There is no difference in direction pertaining to Goals and Objectives, however, desired vegetation composition and structure do differ between alternatives.

Goals and Objectives

Goal 1.c – Increase the amount of forests and grasslands restored to or maintained in a healthy condition with reduced risk and damage from fires, insects and disease, and invasive species.

Objective

1. Within 10 years, implement management practices, including prescribe fire, that will move all affected landscapes toward desired vegetation composition and structure as described in Geographic Area direction.

(Reference Chapter 2, Summary tables for differences in desired vegetation composition and structure)

Recreation Direction by Alternative

Alternative 5

Guidelines

1. Where prairie grouse and upland bird hunting is a priority, retain high cover levels through the upland bird-hunting season.
2. Do not allow livestock grazing in woody draws and riparian areas during the deer rifle hunting season.

Goals and Objectives for Alternative 3

Goal 2 – Multiple Benefits to People

Within the limitations of maintaining ecosystem health and conserving biological diversity, forests and rangelands are managed to meet people's needs for uses, values, products and services.

Goal 2.a – Improve the capability of the Nation's forests and grasslands to provide diverse, high-quality outdoor recreation opportunities

Objectives

1. Annually maintain or reconstruct 20% of the National Grassland and Forest trails to regional standards.
2. Over the next 15 years, provide readily available information concerning recreation opportunities for developed, historic, and appropriate cultural sites.

Objectives, cont.

3. Within 5 years, provide appropriate directional signing to key recreation sites and inform people about the public access routes to national grasslands and national forest.
4. Within 10 years, complete site and recreation plans, including rehabilitation and re-vegetation strategies. As demand warrants, increase recreational opportunities where compatible with resource objectives. These opportunities may include trails, campgrounds, and interpretation.

Goals and Objectives for Alternative 5

Goal 2 – Multiple Benefits to People

Within the limitations of maintaining ecosystem health and conserving biological diversity, forests and rangelands are managed to meet people's needs for uses, values, products, and services.

Goal 2.a - Improve the capability of the Nation's forests and grasslands to provide diverse, high-quality outdoor recreation opportunities

Objectives

1. Within 15 years, maintain or reconstruct to standard at least 80 percent of the trails rated poor or critical.
2. Provide readily available off and on-site information on recreation opportunities for developed and historic sites.
3. Within 5 years, provide appropriate directional signing to key recreation sites.
4. Within 10 years, develop or update and implement site plans, as funding allows, for all developed recreation sites. Site plans should address reconstruction or improvement of existing facilities, development of new facilities, and vegetation management (including noxious weeds).

Dakota Prairie Grasslands only

1. Within 10 years,
    - Construct 2 to 3 new campgrounds on the Little Missouri National Grassland, and add 1 to 2 new campgrounds on the Sheyenne National Grassland;
    - Construct 1 to 2 boat launch and take-out sites on the Little Missouri River;
    - Construct 2 to 3 new ponds at least 50 acres in size on the Little Missouri National Grassland or the Grand River National Grassland;
    - Construct 1 new picnic area on Grand River National Grassland.
2. Within 3 years, inventory conditions at high use dispersed recreation site. Within 10 years, implement rehabilitation or revegetation practices as necessary.
3. Provide interpretive information in response to customer surveys.

Nebraska National Forest only

1. Within 10 years,
    - Construct 1 additional primitive campground on the Buffalo Gap National Grassland
    - Construct at least one new pond at least 50 acres in size.
    - Construct at least 50 miles of trail and one interpretive trail.
    - Construct Prehistoric Prairie Discovery Center and associated trails.
2. Within 3 years, inventory conditions at high use dispersed recreation site. Within 10 years, implement rehabilitation or revegetation practices as necessary.
3. Provide interpretive information in response to customer surveys.

Thunder Basin National Grassland only

1. Within 10 years,
    - Construct at least one new campground.
    - Construct at least 2 water oriented recreation opportunity sites.
    - Construct at least 4 areas that are hardened dispersed recreation sites.
    - Develop one motorized route for ATV's and bikes at least 100 miles long.
    - Develop opportunities to enhance or create systems of trailheads and travel routes, as opportunities and funding become available. Emphasize these developments in the Upton, Cow Creek Buttes, Weston, and Red Hills areas.
    - Develop a complex of opportunities in the Upton - Osage area combining motorized and nonmotorized trails and hardened dispersed recreation sites.
2. Within 3 years, inventory conditions at high use dispersed recreation site. Within 10 years, implement rehabilitation or revegetation practices as necessary.
3. Provide interpretive information in response to customer surveys.

Appendix E Research Natural Areas

Introduction

One of the key principles of ecosystem management is called "adaptive management." Adaptive management recognizes that land and resource management decisions need to be made, even though the knowledge needed for making these decisions and the consequences are incomplete or uncertain. Under adaptive management, managers decide the best course with the available information, but monitor to ensure that the original decision has the desired effect. Research Natural Areas (RNAs) are key components of adaptive management, because they represent ecosystems in a natural condition. RNAs serve as reference areas to allow managers to assess the consequences of management on other similar areas. Scientists use RNAs to understand how ecosystems function. RNAs are also important for conserving biological diversity.

The first Forest Service RNA was established in 1927 on the Coronado National Forest in Arizona. Since then, the RNA system has grown to about 420 established RNAs nationwide. Forest plans will propose additions to the RNA network, because of the essential role of RNAs in ecosystem management to provide reference areas, research opportunities and protection for biological diversity. Currently, there are only four RNAs in the Northern Great Plains.

What RNAs Represent

The goal of the RNA program is to represent the ecological diversity that occurs on National Forests and National Grassland units so that we can assess the impacts of management and conserve biological diversity. An ecosystem can roughly be defined as the plants, animals, and environment of a given area. Some of the major ecosystem types that help define this ecological diversity on the Northern Great Plains include ponderosa pine, oak savanna, shrublands, grasslands, and aquatic and riparian (streamside) ecosystems. At a finer scale, ecosystem types can be defined by several of their dominate plant species, such as eastern ponderosa pine, limber pine, cottonwood, oak, sagebrush, western wheatgrass, green needlegrass, and carex. At this level, ecosystem types are referred to as plant associations or community types. More than 300 plant associations and community types have been identified on National Forest and Grassland units in the Northern Great Plains, and few of these are represented by RNAs.

Broad geographical differences in ecosystems are also recognized by performing RNA targeting of different ecosystem types within each Ecoregion Section (see Hierarchy of Ecological Units). Variations in geology, soils, landforms, and climate influence the kinds of plants and animals that live in different regions and can also be used as features for establishing a representative RNA system. The climatic differences that occur between the north and south areas along with differences in the east and west areas of the Northern Great Plains affect ecosystems and are typical of the kind of significant ecological differences that the RNA system tries to represent.

Function of RNAs

RNAs serve at least three important functions for the Forest Service:

1. Reference Areas: RNAs serve as benchmarks or reference areas for monitoring and evaluating the sustainability and impacts of land management practices on lands with similar ecosystem types. To determine the impact of management on an area, it is desirable to have a similar area maintained in natural condition for comparison. RNAs make one of their most important contributions to ecosystem management serving as a representative system of controls for land managers.
2. Biological diversity: RNAs provide protection for biological diversity. A representative RNA system provides some degree of assurance that a wide array of plant and animal species are being given a high degree of protection for the future. This protection may be most important for the forms of biological diversity that ecosystems often depend upon the most and about which we know the least, such as soil micro-organisms, fungi, and insects. RNAs can also be selected to provide a high degree of protection for specific populations of threatened, endangered, and/or sensitive species.
3. Research: RNAs provide sites for research into how ecosystems function. This research is often best accomplished in areas where ecological and evolutionary processes are functioning as naturally as possible. RNAs serve as sites for monitoring long-term change in ecosystems, such as global climate change and shifting patterns in the landscape resulting from natural disturbances by fire, floods, and insect epidemics. When scientists perform a variety of research projects in an identified RNA, the cumulative results of such work can greatly increase our understanding of particular ecosystems. One of the results of ecosystem management is that lands will be managed with the best information available. Over the years, scientific research in RNAs has helped provide that information. RNAs also serve an important educational function by providing excellent examples of ecosystems in relatively natural conditions with functioning ecological processes.

RNAs help the Forest Service maintain the long-term health, productivity, and diversity of lands entrusted to its management by the public.

Identifying RNAs

Units and resource specialists were asked to identify potential RNAs based on what potential community types could exist on their units. This was done using the descriptions in Ecological Subregions of the United States: Section Descriptions by Bob Bailey and Johnston 1987. On the Dakota Prairie Grasslands units, Forest Service personnel worked with the North Dakota Natural Heritage Program in conducting ecological field evaluations of potential RNAs chosen. On the Nebraska National Forest units along with the Thunder Basin National Grassland, district personnel identified potential RNAs and then worked with The Nature Conservancy in the development of ecological field evaluations of potential RNAs.

The following steps were used in determining potential RNAs:

1. The *Rare Plant Communities of the Northern Great Plains* assessment and *Northern Great Plains Steppe Assessment Map*, both prepared by The Nature Conservancy, provided ecological information that aided in the determination of potential RNAs.

2. Districts determined potential RNAs based on what vegetation community types exist on both their units and the Northern Great Plains and their potential to provide vegetation community types for representation. Region 2 units did this by using a matrix of community types derived from Johnston, 1987. In Region 1, target assignments were made as to what vegetation community types need to be represented and located on various units.
3. Work with The Nature Conservancy and state Natural Heritage programs to accomplish field evaluations of potential RNAs.
4. Preliminary evaluation by personnel at district offices and supervisor offices to either add or eliminate from consideration RNAs based on knowledge and judgement from the information from the field evaluations and using the identifiers as criteria that are listed below. In some cases this also involved the evaluation of various sizes in order to capture vegetation conditions, maintain ecological processes and meet management concerns. Other areas can be proposed based on the public scoping process; however, evaluations of these areas may not be completed by the time the final environmental impact statement is released as a result of many factors, including limits on time and budgets and may have to wait for future planning efforts.
5. Proposed RNAs are then submitted as RNAs to be carried forward in the draft environmental impact statement.

Proposed RNAs were reviewed by the RNA coordinators from each unit in context to the Northern Great Plains within the overall planning area. All RNAs were nominated regardless of any current management practices occurring in the area; that is, current management did not diminish conditions to a point that the areas could not meet the established RNA criteria, including quality, condition, viability and defensibility.

Criteria

The following criteria were used in evaluating potential RNAs:

1. Quality: How well a site represents the targeted ecosystem type or protected biodiversity elements.
2. Condition: How much the site has been degraded or altered from natural or optimal conditions.
3. Viability: The likelihood of long-term survival for the ecosystem and its protected biodiversity.
4. Defensibility: Extent to which the ecosystem and biodiversity elements can be protected from extrinsic human factors.

Identifiers

Identifiers help define criteria to a finer scale. They are used as tools for evaluating sites that represent ecosystem types:

- Ecosystem types, plant series and plant association level that are under-represented in the planning unit.
- Impact from human disturbance since settlement.
- Existence of maintained or of primitive roads.
- Status of grazing allotments that are vacant, closed, or degree of current use.
- Recreation impacts are small.

Condition of RNAs

Because RNAs represent ecosystems in their natural condition, they should be located in areas with a minimal amount of impact from human use. RNAs should also contain good examples of the ecosystem types they represent. For some ecosystem types, areas without significant human impact could not be found. In these cases, RNAs were selected from sites in the best available condition. On the Northern Great Plains, a concentrated effort was made to select sites that would have minimal conflicts with existing public uses. Therefore, potential RNAs were primarily selected from lands that are presently roadless, and in vacant or closed grazing allotments, or where grazing levels appear compatible with RNA designation and where areas provide representation of ecosystem types.

Size of RNAs

To serve as benchmarks, to conserve biological diversity, and to serve as research areas, RNAs must be large enough to maintain the natural processes that sustain ecosystems. For example, many of our forest, grassland, and shrubland ecosystems evolved from fire and other natural disturbances producing a landscape that is a mosaic of patches of various sizes and ages. These patches can vary from tens to thousands of acres in size. To maintain ecological processes in many of our fire-dependent ecosystems, land areas of a thousand or more acres in size often work best to incorporate a mosaic of successional stages or to allow for their development in the future. Current ideas in conservation biology also recognize the potentially harmful influence of some outside land uses on the ecological integrity of small natural areas. Small natural areas can degrade easily and suffer species loss.

Larger natural areas provide greater representation for the range of natural variability which occurs in most ecosystem types and makes RNAs potentially more valuable as benchmarks for ecosystem management. Some RNAs that represent these patterns and processes are desirable. Where possible, complete watersheds have been selected for potential RNAs, partially in order to maintain intact and naturally functioning aquatic and riparian ecosystems.

Management of RNAs

Management area prescriptions provide an outline for how RNAs will be managed. The intent of RNA management is to minimize human impacts that will affect the ecosystem and to maintain biological diversity and natural processes. Therefore, most potential RNAs were selected from areas that are roadless, in vacant or closed grazing allotments, or where grazing levels appear compatible with RNA designation, in areas that have not experienced timber harvesting, and in areas that do not experience heavy recreation use. Road building and timber harvesting are not compatible uses in RNAs. Some degree of livestock grazing can be used to maintain grassland ecosystems found on National Grassland units.

Recreational Management

Most of the potential RNAs on the Northern Great Plains planning area were selected in areas that do not receive heavy recreational use. However, it is inevitable that varying degrees of recreational use will occur in all these areas, and recreational use will likely increase. Because RNAs serve as benchmarks and heavy recreational use can alter species populations and affect ecosystem function, recreational use is not encouraged, but not prohibited, in RNAs. For example, use of existing trails in RNAs is permitted, but no new trails will be constructed unless necessary to correct resource damage from existing trails. Existing recreational trails often provide desirable access to RNAs for research, administrative, and educational purposes.

Fire Management

Natural fire frequencies are desirable in RNAs. However, excessive build up of fuels from decades of fire suppression, valuable resources outside RNA boundaries, and special values inside some RNAs, may preclude allowing prescribed natural fires to occur. Site-specific fire management plans may need to be developed for some RNAs in order to identify circumstances during which natural fires can be allowed to burn freely and to design specific management-ignited, prescribed fires to mimic natural fires.

Exotic Species Management

Exotic (non-native) species are not desirable in RNAs. Some particularly invasive and unpalatable plant species, such as knapweed and Canada thistle, could be targets for control in RNAs and elsewhere on public and private lands. Decisions on the threats of exotic plant species to RNA values and possible control techniques, including the use of herbicides, will need to be made on a site-specific basis.

Descriptions of Nominated and Established Research Natural Areas

Short summaries for each of the nominated RNAs are presented below. They are organized alphabetically by administrative units. Complete descriptions of each area were written in 1996, 1997 and 1998, based on "ecological evaluations" developed by the Natural Heritage Programs of North Dakota, South Dakota, Wyoming and Nebraska, and validated by employees familiar with on-the-ground conditions on the Custer National Forest, Nebraska National Forest and Thunder Basin National Grassland. These complete descriptions are part of the "administrative record" on file and available for review at the Supervisor's Office for the Nebraska National Forest in Chadron, Nebraska.

Dakota Prairie Grasslands

Little Missouri National Grassland (McKenzie Ranger District)

Bear Den-Bur Oak

The 2,840-acre Bear Den-Bur Oak area is located about 27 miles north of Killdeer, North Dakota. Bear Den-Bur Oak lies within the Missouri Plateau physiographic region, which includes badlands and unglaciated areas. Two major landform features characterize the area: an intermittent creek and its tributary ephemeral drainages that drain the steep badlands terrain, and rugged badlands. Elevation ranges between 2,000 and 2,535 feet above sea level.

Bear Den-Bur Oak contains representative bur oak habitat intermixed with salt desert shrub and mixed-grass prairie. The area provides excellent representation of the bur oak / chokecherry habitat type. The bur oak communities generally exhibit high-quality condition. Some of the most dense and extensive bur oak communities on the Little Missouri National Grassland are found in Bear Den-Bur Oak. Other vegetation includes paper birch (uncommon in the Little Missouri Badlands), aspen, Rocky Mountain juniper, green ash, silver sage and western wheatgrass. Elk and bighorn sheep utilize the area, as do raptors and reptiles, such as the Northern leopard frog.

This area lies within the Williston Basin, a large sedimentary and structural basin known for its petroleum resources. The area has a high potential for oil and gas, and has a history of oil and gas production. Additional oil development is unlikely due to restrictions and stipulations associated with development within this rugged area. Livestock grazing occurs. Recreational use is limited to some hunting and very infrequent hiking.

Cottonwood Creek Badlands

The 5,880-acre Cottonwood Creek Badlands is located about 22 miles south and 8 miles west of Watford City, North Dakota. The area consists of a rugged and deeply dissected landscape formed within an actively eroding drainage, Cottonwood Creek, which empties into the Little Missouri River. The Cottonwood Creek Badlands lie within the Missouri Plateau section of the Great Plains Province, and is just south of the limit of glaciation. Elevation ranges between 2,020 to 2,520 feet above sea level.

This area contains one of the largest contiguous areas of high-quality habitats on the Little Missouri National Grassland. Habitats are considered to be in excellent health. This area

captures at least 11 plant communities, providing a mosaic of shrublands, woodlands and grasslands intermingled across a rugged badlands terrain. Habitat types include: green ash / chokecherry woody draw, shadscale saltbrush / big sagebrush badlands, big sagebrush / western wheatgrass, aspen woody draw, plains cottonwood riparian woodland, Rocky Mountain juniper / little ricegrass woodland and silver sagebrush / western wheatgrass riparian. Bighorn sheep and the tawny crescent butterfly, two sensitive species, likely utilize the area.

No oil and gas facilities are found within the boundary of the area, although a good deal of oil and gas activity has occurred historically around the area. Livestock grazing occurs. The Cottonwood Creek Badlands have important recreational value. The Maah-Daah-Hey Trail swings through a portion of the area, but does not permit motorized traffic. Hiking, hunting and horseback riding occurs in the area.

Little Missouri National Grassland (Medora Ranger District)

Bullion Butte

The 3,160-acre Bullion Butte is located about 25 miles south of Medora, North Dakota. Bullion Butte is one of the largest buttes on the Little Missouri National Grassland and sits imposingly against the rolling badlands terrain. It lies within the Missouri River Plateau physiographic region, which includes badlands and unglaciated areas. The butte is capped by bright claystones underlain by sandstone. Bullion Butte rises to 3,358 feet above sea level, dropping about 700 feet to the surrounding plains.

Bullion Butte is highly scenic, and includes wooded deciduous forest communities intermixed with mixed-grass prairie. The massive rock-capped butte supports a variety of high quality grassland and woodland communities, which are common for the Little Missouri Grassland as well as several uncommon plant communities and numerous rare species. The top of the butte provides excellent panoramic views of the surrounding grasslands. Prairie dog towns occur on the toeslopes of the butte. Black-footed ferrets were sighted in these towns up until 1974. Bighorn sheep utilize the area. Habitat probably exists for the western big-eared bat and the spotted bat. Golden eagles, prairie falcons, Baird's sparrow, long-billed curlew and Sprague's pipets have been documented in the area. Bullion Butte provides habitat for three Forest Service plant species and numerous other rare plant species for North Dakota. Bullion Butte and the region of the grasslands around the Bullion Butte escarpment provide one of the last remaining roadless areas in the Little Missouri Grassland.

Historically, American Indians used Bullion Butte for religious practices, including vision quests. Eagle catchment sites are located atop the butte. Current use includes livestock grazing. Oil and gas leasing will occur under No Surface Occupancy stipulations in the near future. Recreational use is limited, but includes hunting, hiking and camping.

Little Missouri River

The 1,190-acre Little Missouri River area is located about 20 miles south of Medora, North Dakota. Unique landforms created by the meandering Little Missouri River as found in the area include: alluvial floodplains, river terraces, steep river bluffs and riverine badlands. Active ecological river processes are visible and include side-cutting, depositional and erosional processes. Elevation ranges from 2,387 to 2,400 feet above sea level.

This area provides excellent representation of the Little Missouri River corridor. The health of vegetative communities is rated between good and excellent. High-quality vegetative types include plains cottonwood / Rocky Mountain juniper, green ash / snowberry, green ash / chokecherry, and silver sagebrush / western wheatgrass. The healthy gallery cottonwood bottoms are significant, especially since cottonwood bottoms seem to be trending downward elsewhere across the Northern Great Plains. A number of wildlife species associated with cottonwood bottoms are found in the area, including the black-billed cuckoo and the gray catbird. Neotropical migrant passerines are also abundant.

Oil and gas exploration has occurred in the area. Some private leases exist. Livestock grazing is allowed. The Little Missouri River corridor is locally a popular hunting area. Some camping and hiking occurs.

Mike's Creek:

The 4,489-acre Mike's Creek area is located about 35 miles northwest of Belfield, North Dakota. It lies within the Missouri Plateau physiographic region and includes badlands and unglaciated areas. Two major landform features characterize Mike's Creek: an intermittent creek with ephemeral drainages and steep badlands spine landforms. Elevation ranges between 2,200 to 2,700 feet above sea level.

Landforms in Mike's Creek contribute to a mosaic of habitats, including some of the most dense and extensive Rocky Mountain juniper woodlands on the Little Missouri National Grassland. These juniper woodlands occur on north-facing slopes created by rugged badlands. Other vegetation includes big sagebrush, shadscale saltbrush, greasewood, silver sage and western wheatgrass. Ecologically, vegetative health in Mike's Creek is considered good to excellent. In addition, the RNA captures nearly an entire watershed and its associated drainages as the system begins high in a steep badlands divide and flows down to the Little Missouri River. Few management activities have affected the quality of watershed processes or vegetative habitats associated with this drainage.

Historical use of the area has been low, due to its remote and rugged characteristics. Livestock grazing occurs, but is generally light. Oil development is limited and is currently declining in the area due to past development and extraction. Recreational use is limited, but does including hunting and hiking.

Ponderosa Pines

The 3,560-acre Ponderosa Pines is located about 30 miles south of Medora, North Dakota. The Ponderosa Pines site lies within the Missouri Plateau physiographic region, including badlands and unglaciated areas. The area is generally characterized by gently rolling uplands interrupted by scattered buttes, knolls and ridges capped by resistant rocks. Dendritic drainage patterns are well developed. Elevation ranges between 2,471 to 2,620 feet.

The ponderosa pine stands contained in this RNA are disjunct from the main range for this species and represent the most northeasterly colonies of native ponderosa pine in North America. The ponderosa pines in this area provide excellent representations of ponderosa pine forests mixed with good quality western wheatgrass / green needlegrass communities. In addition, the upland rolling grasslands contain notable examples of buffaloberry communities, representing a distinctive northern Great Plains shrub species. The bluebunch wheatgrass communities in this area represent the easternmost extent of this species in the United States.

Four wildlife species identified as candidates to the threatened and endangered species list are found in the area: the black tern, ferruginous hawk, Baird's sparrow, and loggerhead shrike.

The unique ponderosa pine stands led to the only national forest ever conceived in North Dakota, the Dakota National Forest (1908-1917). Prior to its establishment, the stands on this now-decommissioned national forest were harvested. No appreciable volume of timber has been harvested since. Livestock are currently grazed in the area. Hunting is popular, especially for wild turkey. A privately owned ranch provides nearby lodging, outfitting and guiding into the area. Any future oil and gas leasing will carry no-surface-occupancy stipulations.

Two Top/Big Top RNA (Existing)

The 100-acre Two Top / Big Top buttes are located about 37 miles north of Belfield, in Billings County, North Dakota. Also called the "Twin Buttes", these flat-topped buttes lie within the Missouri Plateau physiographic region of the Great Plains Province, which includes badlands and unglaciated uplands. The RNA consists of two steep-sided buttes rising almost 400 feet above the surrounding landscape and covered with mixed grass prairie vegetation typical for the Little Missouri National Grassland. The steep side slopes of these badland buttes have restricted access over the years and have protected the natural features of the butte tops and sides. Livestock grazing has not affected the native vegetation, and fire disturbances have occurred sporadically.

Two Top / Big Top contains representative wheatgrass / needlegrass and little bluestem / juniper vegetation communities considered in relict condition. Processes and conditions occur that would be typical of a grassland that has received limited use by wildlife, no use by domesticated livestock, and has experienced a sporadic fire regime. The area is noted for its dense grass canopy cover, high abundance of butterflies and skippers, rodent activity, plentiful snakes, and grassland communities trending towards a high seral stage. In addition, the butte sides contain undisturbed communities of big sagebrush, longleaf sagebrush, rabbitbrush, and shadscale saltbush.

Established in 1972, Two Top / Big Top was the first natural area proposed and established on the Little Missouri National Grassland. In addition, the area has been registered in the national Registry of Natural Landmarks, as administered by the National Park Service. Research interest in the area has been steady, beginning with the study published in the Ecology Journal by Quinnild and Cosby entitled "Relicts of climax vegetation on two mesas in western North Dakota" in 1958. Researchers, naturalists, and an occasional hiker are the primary users of the area. No oil and gas exploration or livestock grazing occurs on the buttes.

Limber Pines RNA (Existing)

The 681-acre Limber Pines area is located about 12 miles north of Marmarth, in Slope County, North Dakota. The Limber Pines area contains the only native population of limber pines to occur in North Dakota and one of only two sites to occur in eastern Montana. This naturally occurring pine community is highly disjunct from the natural distribution range for this species. Consequently, the population and site have been of interest to researchers for studies involving genetics, historical evolution, and physiologic adaptation of the species. The pines area is located within the Missouri Plateau physiographic region characterized by badlands and unglaciated uplands. The boundaries of the site are located along the southern reach of the Little Missouri River after it enters the badlands of the Little Missouri National Grasslands. Elevation ranges from 2,620 feet to 2,940 feet, which is considerably lower than the 5,000 to 9,000 foot elevation zone usually preferred by limber pine within its range of the western U.S.

The limber pine community occurs in conjunction with the needlegrass / wheatgrass and salt desert shrub habitat types more commonly found in the Little Missouri National Grasslands. The pines were first identified as a unique community in 1949 and have been the source of considerable research interest since. The site was proposed for an RNA in 1986 and established in 1991. The RNA contains several Forest Service sensitive plant and animal species, as well as numerous state rare plant and animal species. In addition, the area receives considerable use by wildlife, such as deer, eagles, sage grouse, snakes, Clark's nutcracker, and rodents. Culturally, many pre-historic sites are documented in the area.

Although oil and gas development occurs on the adjacent grasslands, no oil and gas activities occur in or immediately adjacent to the Limber Pines area. Livestock grazing occurs within the RNA at low to moderate utilization levels. Although there is high interest from the public in the limber pines, recreational use is affected by the isolated nature of the area. Local schools conduct educational trips to the site for school children. Hiking and hunting occur in the area.

Sheyenne National Grassland

Bluestem Meadow

The 80-acre Bluestem Meadow is located about 10.5 miles east and 3.5 miles south of Lisbon, North Dakota. Bluestem Meadow is found on the flat deltaic sand plain, which formed when the ancient glacial Lake Agassiz existed more than 10,000 years ago. The relief varies less than 10 feet on this landscape and creates a slightly undulating expanse of tallgrass prairie and wetland communities. Elevation ranges between 1,070 to 1,075 feet above sea level.

This site is characterized by a very good condition wet-mesic tallgrass community, with shallow depressions and swales. Tallgrass prairie has undergone vast alteration and estimates of decline in the United States are as high as 98 percent. Ecologically, the site is healthy, although a few undesirable plant species occur, including Kentucky bluegrass, white sweet clover and leafy spurge.

Bluestem Meadow is home to one sensitive plant species, the small white lady's slipper, one state rare plant, the nodding lady's tresses, one sensitive butterfly, the regal fritillary, and one sensitive bird, the greater prairie chicken.

Historically, this area has been hayed. No livestock grazing has occurred for many years. Limited recreational use exists.

Fritillary Prairie

The 240-acre Fritillary Prairie is located about 11 miles east and two miles north of Lisbon, North Dakota. Fritillary Prairie is found on the Sheyenne Delta, an area of fine sand and silt deposited at the mouth of the Sheyenne River where it flowed into the ancient glacial Lake Agassiz late in the Wisconsin glaciation. Some areas are nearly level, while other areas display low dunes and shallow blow-outs, providing a hummocky appearance to the landscape. The Sheyenne River drains the area. Elevation ranges between 1,060 and 1,070 feet above sea level.

Fritillary Prairie contains very good to excellent examples of the tallgrass prairie types. These types include sedge meadow wetlands, wet-mesic prairie types with tall, warm-season grasses, and dry-mesic types with a variety of mid- to tall, warm- and cool-season grasses. Nationally, up to 98 percent of the tallgrass prairie has given way to agricultural or other land conversions. In North Dakota, up to 49 percent of wetlands have been converted to other uses. Rare species found in the area include: the western prairie-fringed orchid, regal fritillary and Dakota skipper butterflies, silky aster and greater prairie chicken. Overall, the area remains in very good ecological condition, although encroachment by Kentucky bluegrass and leafy spurge is a concern.

Livestock grazing occurs, as does haying. Limited recreation, mostly in the form of hiking, also occurs. Two-track trails are found in the area.

Oak Hills

The 385-acre Oak Hills area is located about 23 miles east and six miles north of Lisbon, North Dakota. Oak Hills is found on the Sheyenne Delta, an area of fine sand and silt deposited at the mouth of the Sheyenne River where it flowed into the ancient glacial Lake Agassiz late in the Wisconsin glaciation. This delta is characterized by rough and choppy dune topography with relief ranging from five to fifty feet, although variation is usually ten to twenty feet. The Sheyenne River drains this area. Elevation ranges between 1,040 to 1,105 feet above sea level.

Vegetation is strongly influenced by the sandy substrate and variability in soil moisture. Vegetation includes a complex of grassland openings intermixed with bur oak woodland and sand savanna, along with scattered thickets of smooth sumac, plum and chokecherry. Common grasses include needle-and-thread, prairie sand reed, blue grama, sand bluestem, sideoats grama and sand dropseed. The oak savanna is considered critically endangered, estimated to have declined 98 percent over its historic occurrence in the Midwest. Oak Hills is vegetatively one of the best remaining sites within the Choppy Sandhills on the Sheyenne National Grassland. Leafy spurge, an exotic noxious weed, may pose serious management concerns without effective treatment.

Livestock grazing occurs in the area, as do hiking, horseback riding, and unsanctioned dirt bike and all-terrain-vehicle use. Two-track trails used by the livestock permittee occur in the area.

Platanthera Prairie

The 400-acre Platanthera Prairie is located about 18 miles east of Lisbon, North Dakota. The site is found within the Hummocky Sandhills habitat association of the Sheyenne Delta, a geologic landform with vegetation strongly influenced by a sandy substrate and a high water table. The water table is generally about 10 feet below the surface. The site is characterized by rolling and undulating hummocks with variation in relief from five to ten feet. Elevation ranges between 1,065 to 1,070 feet above sea level.

The site is in good ecological condition. The wetland swales and depressions are in excellent condition, with no evidence of draining or filling. The primary vegetation types include: sandhills mixed-grass prairie, wet-mesic tallgrass prairie and sedge meadow wetlands. Two undesirable species, Kentucky bluegrass and leafy spurge, are found in the area. A significant and thriving population of the threatened western prairie-fringed orchid occurs on the site. Platanthera Prairie also is home to the greater prairie chicken and the regal fritillary butterfly.

Historically, the area has provided for uneven livestock utilization, which contributes to lower ecological condition on the hummocks. Cattle tend to over-utilize hummocks while only lightly utilizing swales. Only limited recreational use is made of the area.

Sheyenne Springs RNA (Existing)

The 57-acre Sheyenne Springs area is located about 16 miles west and 8 miles north of Lisbon, North Dakota. The site, consisting of a peatland stream complex interrupted by beaver dams and surrounded by woodlands, lies in a small valley above the Sheyenne River. Sheyenne Springs lies in the physiographic setting of the Sheyenne Sandhills, part of the enormous deltaic plain created by glacial meltwater carried by the Sheyenne River into ancient glacial Lake Agassiz. This glacial deposit is the largest on the continent and is characterized by multiple layers of sand deposited as the glacial lake advanced and retreated. In the RNA, elevations range from 984 feet at the stream on the lower end of the site to 1,099 feet at the highest sandhill.

The spring-fed wetland complex has been protected from livestock grazing since 1974 and is noted for its abundant wildlife and rare species. The wetland complex is characterized by a number of undisturbed, highly restricted, specialized aquatic habitats and their characteristic flora and fauna, including calcium carbonate peat wetland, or fen. Sheyenne Springs hosts the highest known number of state rare plant species in North Dakota--including 18 rare species that are considered relicts with a boreal affinity more closely resembling the paleoflora immediately after the lowering of glacial Lake Agassiz. Beaver are very active in the RNA and significantly shape the ecosystem with ponds and dams.

The area was fenced in 1974 to protect it from livestock grazing. No trails exist within the RNA. The area has received high interest from naturalists, including those interested in birds, butterflies, and plants, as well as researchers.

Medicine Bow-Routt National Forest

Thunder Basin National Grassland

Antelope Creek

The Antelope Creek area is located about 16 miles northwest of Bill, Wyoming. The area encompasses 1,090 acres and lies within the ecoregion classified as the Great Plains-Palouse Dry Steppe Province, Powder River Basin Section, Southern Powder River Basin-Scoria Hills Subsection. Bedrock in the area is claystone and concretionary sandstone of the Paleocene-aged Lebo Member of the Fort Union Formation. The substrate is Quarternary alluvium derived from the surrounding uplands, including outcrops of porcellanite (scoria) west of the area. Elevation in the smaller potential area ranges between 4,310 to 4,390 feet above sea level, while in the larger area between 4,310 to 4,420 feet.

Antelope Creek includes segments of two perennial streams, Antelope Creek and Dry Fork of the Cheyenne River. Vegetation includes plains cottonwood woodlands, shrub vegetation of plains silver sagebrush and black greasewood, grasslands of prairie sandreed and needle-and-thread, and wet meadows of leafy bulrush and alkali cordgrass. One threatened species is known to occur in the area, the bald eagle. Beaver and prairie dogs are also present in the area. The area, in reasonably good ecological condition, contains a high-quality example of a plains stream ecosystem.

Livestock grazing does occur. Several abandoned oil wells and drill holes can be found in the area, but no major conflicts with mineral exploration or production are expected should the area be designated as a Research Natural Area. The cottonwood woodlands do offer attractive primitive camping opportunities to recreationists.

Prairie Creek

The 560-acre Prairie Creek area is located about 12 miles northwest of Clareton, Wyoming. It is located on the eastern side of the broad, shallow valley of the southward-flowing Prairie Creek. The area contains gentle slopes with westward-flowing draws less than 50 feet deep. Slopes in the area face mainly west and southwest. Bedrock in the area is shale of the Tullock Member of the Paleocene-aged Fort Union Formation. Elevation ranges between 4,480 to 4,853 feet above sea level.

Riparian and upland vegetation includes grama / needlegrass / wheatgrass, wheatgrass / needlegrass shrub-steppe, blue grama / western wheatgrass, big sagebrush / western wheatgrass, and nuttall saltbrush / western wheatgrass. Three undesirable plant species are present in low numbers: cheatgrass, meadow brome and yellow alyssum. Ferruginous hawks may utilize the area. Habitat suitable to the black-tailed prairie dog is also present. Prairie Creek provides good representation of the blue grama / western wheatgrass plant association.

Livestock grazing occurs. No major impacts associated with mineral exploration or production is expected should the area become a designated Research Natural Area. Recreational use is mostly limited to autumn hunting opportunities.

Rock Creek

The 592-acre Rock Creek area is located about 8 miles northwest of Clareton, Wyoming. It lies within the ecoregion classified as the Great Plains-Palouse Dry Steppe Province, Powder River Basin Section, Southern Powder River Basin-Scoria Hills Subsection. The area contains segments of two intermittent branches of Rock Creek flowing south in valleys about 100 feet deep. Slopes face mainly east or west and are gentle. The bedrock is soft sandstone with small amounts of shale, both of the Tullock Member of the Paleocene-aged Fort Union Formation. The substratum in the intermittent stream valleys is alluvium derived from the surrounding uplands. Elevation ranges between 4,450 to 4,640 feet above sea level.

The principal distinguishing features include rolling hills with vegetation of the big sagebrush / needle-and-thread plant association and the needle-and-thread / blue grama plant association, and draws supporting the silver sagebrush / western wheatgrass plant association. Barr's milkvetch, a plant species of conservation interest but with no federal status, is found in the area. Three undesirable plants occur in the area: cheatgrass, meadow brome and yellow alyssum. Elk may utilize the area. Pronghorn antelope are common.

Only recently did this area become part of the Thunder Basin National Grassland. Livestock grazing has become an allowable use of the area. No major impacts from mineral exploration or production are expected should the area become a designated Research Natural Area. Recreational use is mostly limited to autumn hunting.

Wildlife Draw

The 630-acre Wildlife Draw area is located about 32 miles west of Newcastle, Wyoming. It lies within the ecoregion classified as the Great Plains-Palouse Dry Steppe Province, Powder River Basin-Scoria Hills Subsection. The area contains rolling hills with several draws. Orientation of the area is north to south across a valley with a generally eastward, intermittent drainage. Elevation ranges from about 4,440 feet to 4,630 feet above sea level.

Wildlife Draw is vegetated entirely with grasslands and sagebrush shrub-steppe. Vegetation includes needle-and-thread, blue grama, western wheatgrass and threadleaf sedge. Wyoming big sagebrush is widespread. Three draws contain ephemeral streams and support a silver sagebrush / western wheatgrass association. Four exotic plant species are present: cheatgrass, meadow brome, yellow alyssum and salsify. This area represents the mosaic of the following associations reasonably well: needle-and-thread / blue grama and big sagebrush / needle-and-thread.

No federally listed threatened or endangered plant or animal species are known to be present in the area. Judging by the gentle roll of the grasslands in the area, prairie dogs probably used the are at least intermittently before settlement. The narrow shape and small acreage of the area is too small to support populations of pronghorn antelope, elk and mule deer. Establishment of this area as an RNA might require a change in the current livestock grazing management.

Nebraska National Forest Units

Samuel R. McKelvie National Forest

Steer Creek

The 2,500-acre Steer Creek area is located about 13 miles northeast of the Niobrara Ranger Station on the Samuel R. McKelvie National Forest. The site is within in the Sandhills ecosystem of central Nebraska. The area is represented by dune prairies, dry valleys and wetland communities. Elevation ranges from 2,863 to 2,993 feet above sea level.

The dunes are formed from eolian material. Established hummocks typically give way to sparsely vegetated and shifting depressions of unstable sandy soils, commonly called blow-outs. These blow-outs serve as colonization sites for many specially adapted plant species. Between the sandy dunes lie broad valleys dominated by short grasses and sedges. Blow-outs may occur in these valleys, too. Wetland communities in the area exhibit diverse species associated with wet meadows, freshwater marshes, and aquatic associations of submerged pondweed.

An attractive feature of Steer Creek is that surrounding lands are completely managed by the U.S. Forest Service, which reduces the possibility of conflicts with adjacent landowners. The area is not, however, in pristine condition. Two-track roads do enter the area. In addition, during the grazing period, large reductions in plant leaves and shoots are observed, as well as trampling of creek banks and substantial presence of manure in waterways. Substantial recovery of riparian areas has been observed after the grazing period. Less observable negative and positive effects from grazing likely occur in the area.

Signal Hill RNA (Existing)

The 700 acre Signal Hill RNA is located about 12 miles south and west of Halsey, Nebraska in section 3 and 4, T. 21N., R. 27W. and was established in May of 1950. This tract represents vegetative community types of the Nebraska Sandhills, which is about 20,000 square miles, which makes up about one fourth of the land area of Nebraska. The terrain is that of choppy hills, or sand dunes now supporting a good vegetative cover. The soil is practically pure silica, and contains less than one per cent of organic matter. The dunes in the vicinity of the RNA are described by geologists as being the youngest of the hills and still are affected by the wind, although it is generally agreed that they have become a good deal more stable. Elevation varies from 2,820 to 2,900 feet. There are no lakes, or streams on the area, being an intermingled composition of dunes and small valleys without drainage. The rainfall varies from 15 inches to 26 inches per annum. It is well distributed throughout the season, although heavier in May, June and July. September, October and November are regarded as the "dry months". The mean annual temperature is 49 degrees Celsius. The mean annual humidity averages about 67 per cent.

Sandhill lovegrass is characteristic of the north slopes and in some swales. Sandhill bluestem is a common pioneer in blowouts and on steep south slopes. Sand reedgrass is abundant over a wide range. Other community types include Indian grass, switchgrass, sandhill muhly, needle-and-thread and sedge. Important mixed grass species include western wheatgrass, blue grama, hairy grama, green needlegrass, and red three-awn.

Buffalo Gap National Grassland (Fall River Ranger District)

Hay Canyon Pasture

The 1,010-acre Hay Canyon Pasture is located about 7 miles northeast of Smithwick, South Dakota. It is situated in the Tertiary Table Lands and the Pierre Hills Divisions of the Great Plains. The Pierre Hills area is characterized by nearly level to rolling hills. The Tertiary Table Lands are characterized by very steep badlands formations and gently sloping alluvial fans. The Cheyenne River and its tributaries drain most of the area. The clayey soils of the area allow for rapid run-off but slow permeability. Elevation ranges from 3,050 feet to 3,214 feet above sea level.

In the drier uplands, short- and mixed-grass communities are prevalent. The lower drainages typically exhibit more vegetative growth with some taller grasses and a few isolated cottonwood trees. The predominate species include western wheatgrass, buffalograss, green needlegrass, and blue grama. Three exotic species are present: cheatgrass, Japanese brome, and sweetclover.

Healthy prairie dog colonies are scattered within the area. Burrowing owls and other species associated with prairie dogs are present. The prairie dog colonies of the area are in very good shape due to the amount of native vegetation and the utilization of the burrows by other wildlife. Two stock ponds are present, one of which (Bochert Dam) is fenced off to enhance wetland habitat and encourage waterfowl production. The wetlands present appear to be in a reasonable condition. Prospects for the area's long-term ability to support functioning ecosystems with a minimum of manipulation are good. This site is large and secluded with adequate protection from outside disturbances.

South Pasture (777 Allotment)

The 1,570-acre South Pasture is located about 18 miles west of Fairburn, South Dakota. It is situated in the Tertiary Table Lands and the Pierre Hills Divisions of the Great Plains. The area is characterized by nearly level to rolling hills to very steep badlands formations and gently sloping alluvial fans. Drainages flow into French Creek, which drains into the Cheyenne River. Elevation ranges from 2,950 to 3,250 feet above sea level.

South Pasture contains a wide variety of habitats. In the badlands portions, natural erosion has sculpted mounds, pinnacles, escarpments, overflows and steep drainage banks. Dominant vegetation includes western wheatgrass and needle-and-thread. Nonvegetated badlands outcrops also occur, as do juniper breaks, shrub patches and about one-quarter-mile of deciduous riparian woodland along French Creek. Plant and animal health and diversity are considered quite high, although some exotic grass species, including smooth and Japanese brome, cheatgrass, and Kentucky bluegrass, can be found in isolated patches.

Current use includes holistic grazing management with a herd of more than 1,000 bison. This herd remains in the area for between six and eleven days per year. This grazing system is an attempt to mimic historic, natural grazing patterns of bison on short- and mixed-grass prairies. Some hunting and hiking also occur in the area.

Buffalo Gap National Grassland (Wall Ranger District)

Steer Pasture

The 4,636-acre Steer Pasture area is located about 3.5 miles south of Wall, South Dakota. Steer Pasture is situated in the Tertiary Table Lands and the Pierre Hills Divisions of the Great Plains. The Tertiary Table Lands consist of the Brule and Chadron Formations, distinguished by very steep badland formations and gently sloping alluvial fans. The Pierre Hills region is characterized by nearly level to rolling hills. Steer Pasture lies on the Bloom Basin east of a large, rugged, near-vertical badland wall.

The dominant vegetative species include western wheatgrass, a sod-forming grass, and needle-and-thread, a bunch grass. Dakota buckwheat, a sensitive species, occurs infrequently in the area, as do such exotic species as Japanese brome, cheatgrass and sweet clover. The overall quality of vegetative diversity is low to moderate, due in part to cattle grazing; however, the condition of the land is fair to good. Prospects for the area's long-term ability to support functioning ecosystems and communities with a minimum of manipulation are good. Fire should be reintroduced to remove litter and exotics and to further encourage the growth of native plant species.

Steer Pasture is mainly utilized for livestock grazing and to a lesser extent wildlife production and recreation. The primary recreational activities include hunting and fishing, with bird watching, horseback riding and mountain biking becoming increasingly popular throughout the entire Buffalo Gap National Grassland.

West Wall

The 1,040-acre area is located about 9 miles southwest of Wall, South Dakota. The Cheyenne River drains most of the area. The area is situated in the Tertiary Table Lands and the Pierre Hills Divisions of the Great Plains. Topography varies considerably, from gently rolling uplands to rugged valleys and ravines to the flat Sage Creek floodplain and its terraces. Elevation ranges from 2,456 to 2,963 feet above sea level.

The West Wall area is divided into three pastures containing a wide variety of plant communities. Mixed-grass prairie species dominate, including thick stands of sod-forming grasses and taller native bunch grasses. Woody vegetation is limited to more mesic sites, including the largest area of juniper break habitat on the Buffalo Gap National Grassland. Woody vegetation is common in flat lowlands surrounding Sage Creek and in shallow depressions.

Impacts from past and present livestock grazing are evident. Currently, the stocking level of livestock in the area is considered moderate. Plant community health ranges from fair to good. Some encroachment by exotic grasses can be observed. Hiking and hunting do occur.

Fort Pierre National Grassland

Mallard South:

The 1,030-acre Mallard South area is located about 19 miles south-southeast of Pierre, South Dakota. The landscape is characterized by level to rolling grasslands rising from unglaciated, Cretaceous-aged clay soils, dissected by entrenched intermittent streams. The southern branch of Cedar Creek, an intermittent tributary of the Missouri River, drains the area. Elevation ranges from 1,800 to 2,020 feet above sea level.

Three general types of vegetation dominate the site: mixed-grass prairie hillsides with such grasses as big and little bluestem and porcupine grass, uplands and footslopes of western wheatgrass, and riparian zones supporting a mosaic of grassland, shrub thickets, temporary wetland habitat, and a stringer of widely scattered deciduous trees. Unlike the surrounding landscape, Mallard South contains a relatively diverse, well-vegetated riparian zone. The abundance and vitality of plum, chokecherry and buffaloberry thickets in the area is also a rare feature within the Fort Pierre National Grassland. At least four Forest Service sensitive species occur in the area: regal fritillary butterflies, Northern leopard frogs, greater prairie chickens and upland sandpipers.

The relatively good condition of the riparian zones and high condition of several grassland types suggest that livestock stocking rates have not been excessive in the past few decades. Two exotic plant species, if not actively managed, may pose serious impacts: yellow sweet clover and smooth brome. A lack of natural firebreaks may impede using prescribed fire as an effective management tool.

Oglala National Grassland

Prairie Dog (Pasture 45)

The 940-acre Prairie Dog area is located within Pasture 45 of the Oglala National Grassland about 20 miles north-northeast of Harrison, Nebraska and 6 miles south of Ardmore, South Dakota. The area consists of rolling upland grasslands and riparian communities somewhat representative of the Hat Creek watershed ecosystem as found in northern Sioux County, Nebraska. Mixed-grass prairie occupies most of the upland slopes and hilltops, with shallow-soiled rocky prairie and rock outcrops localized on hilltops and eroded slopes. The topography is fairly mild with elevations ranging from 3,620 to 3,780 feet above sea level.

Whitehead Creek runs northward through the western fifth of the area, draining the uplands through a series of small tributaries. Riparian grasslands and meadows occur on terraces of the creek and its larger tributaries, and floodplain meadow, wet meadow, and small ephemeral wetland communities occur in the streambed of the tributaries. Eroded badlands slopes and clay pan communities are found to a limited extent along the margins of the valley of the main drainage channel. A large active prairie dog town occupies the western third of the upland area east of Whitehead Creek.

Although this area has been mostly ungrazed for the past 10 years, the area still shows signs of past anthropomorphic disturbances, including two impoundments on tributaries of Whitehead Creek. Two-track roads cross the length of the area. Aerial photography seems to indicate past cultivation in the vicinity of the prairie dog town. Exotic plant species are common, including Canada thistle. Controlled burning or short-term, early-season, high-intensity grazing should be explored for thatch removal and control of cheatgrass and sweetclover. Removal of prairie dogs (by shooters or eradication, such as poisoning) could have a negative impact, opening large areas of the prairie dog town to invasion by exotic species.

Pine Ridge Ranger District

West Ash Creek (Pastures 6, 7 and 11)

The 640-acre West Ash Creek area is located within Pasture 6, 7 and 11 of the Pine Ridge unit on the Nebraska National Forest about 18 miles southwest of Chadron, Nebraska. The area consists of mostly successional ponderosa pine forests burned in a 1985 wildfire. In addition, some unburned pine forests, some grasslands and some riparian canyon bottoms exist. The area is within the Pine Ridge ecosystem of the White River watershed of northwestern Nebraska. Topography in the area consists mostly of steep, dissected canyons covered by pine forests and woodlands typical of the Pine Ridge ecosystem. Elevation ranges from 3,880 to 4,440 feet above sea level. Ridgetops are fairly rocky and contain rock outcrops interspersed with mixed-grass prairie. In some places, nearly vertical rock cliffs are present. The area has been nearly continuously ungrazed since 1986, but still shows signs of past overgrazing in the canyon bottoms, which are commonly dominated by exotic species.

The main channel of West Ash Creek, a permanent, spring-fed stream, runs north-northwest along the east boundary, and portions of several tributary canyons are contained within the site. The canyon bottoms contain grassland with scattered patches of deciduous trees, such as boxelder, green ash, hackberry, and cottonwood, and wet-meadow communities.

Although cattle grazing doesn't presently occur in the area, the dominance of exotics in the canyon bottoms due to past overgrazing will continue to impede natural succession. The same is true of the burned slopes seeded to intermediate wheatgrass. Controlled burns would be very difficult to manage due to the rugged nature of the terrain. Management of wheatgrass through grazing may also prove difficult on the uplands and would likely be harmful to the canyon bottoms. Leafy spurge and Canada thistle control measures along West Ash Creek should be planned to avoid accidental spraying of the orchid (such as *Platanthera hyperborea*, commonly called northern green orchid) in the area.

Inventory Summary

The results of the inventory are shown in the following table. Values are rounded to the nearest 10 acres:

Table E-1: Nominated Research Natural Areas

	RNA Name	Type	Acres
Dakota Prairies			
Little Missouri National Grassland McKenzie	Cottonwood Creek-Badlands	botanical / zoological	5,880
	Bear Den-Bur Oak	botanical	2,840
Little Missouri National Grassland Medora	Bullion Butte	botanical / geological	3,160
	Ponderosa Pines	botanical / zoological	3,560
	Mike's Creek	botanical / zoological	4,490
	Little Missouri River	botanical / geological	1,190
Sheyenne National Grassland	Oak Hills	botanical	390
	Fritillary Prairie	botanical / zoological	240
	Bluestem Meadow	botanical	80
	Platanthera Prairie	botanical	370
Medicine Bow-Routt National Forest Unit			
Thunder Basin National Grassland	Rock Creek	botanical	590
	Prairie Creek	botanical	560
	Antelope Creek	botanical	1,090
	Wildlife Draw	Botanical	630
Nebraska National Forest Units			
Samuel R. McKelvie National Forest	Steer Creek	botanical	2,500
Buffalo Gap National Grassland Fall River	South Pasture, 777 Allotment	botanical	1,560
Buffalo Gap National Grassland Wall	West Wall	botanical	1,030
Fort Pierre National Grassland	Mallard	botanical	1,030
Oglala National Grassland	Prairie Dog, Pasture 45	botanical / zoological	940
Pine Ridge Ranger District	West Ash, Pastures 6,7, 11	botanical	640

Demand Assessment

Plan revision alternatives should provide for a range of RNA management by displaying different numbers and sizes of RNA designations. Management direction will be developed for any designated RNA.

Current RNAs do not adequately represent the potential vegetation or geologic types that exist on the national grassland areas.

The decision to be made is which areas, if any, should be designated as RNAs, and how should they be managed?

The following table indicates potential vegetation types (Kuchler types - 1985) in relation to occurrence on the units in the planning area.

Table E-2: Potential Vegetation Types, Kuchler Vegetation Type Occurrence.

Potential Natural Vegetation (Kuchler Types, 1985)									
National Grassland/ Forest	**Section (Bailey, 1994)**	**E. Ponderosa Forest**	**Wheatgrass-Needlegrass**	**Grama-Needlegrass-Wheatgrass**	**Wheatgrass-Grama-Buffalograss**	**N. Floodplain Forest**	**Sandhills prairie**	**Sagebrush Steppe**	**Bluestem Prairie**
Region 1									
Little Missouri NG	NW Great Plains 331F								
Grand River NG	NW Great Plains 331F								
Cedar River NG	NW Great Plains 331F								
Sheyenne NG	Red River Valley 251A								
Region 2									
Nebraska (Pine Ridge)	NW Great Plains 331F								
Nebraska (Bessey)	Nebraska Sandhills 332C								
Nebraska (McKelvie)	Nebraska Sandhills 332C								
Oglala NG	NW Great Plains 331F								
Buffalo Gap NG	NW Great Plains 331F								
Ft. Pierre NG	N Central Great Plains 332D								
Thunder Basin NG	NW Great Plains 331F								
	Powder River Basin 331G								

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Appendix F Special Interest Areas

Introduction

This report describes the potential Special Interest Areas (SIAs) considered in development of the alternatives in the EIS. SIA descriptions are presented by respective units for the Dakota Prairie Grasslands, Thunder Basin National Grassland (Medicine Bow / Routt National Forest), and Nebraska National Forest. This report is organized in alphabetical order.

Inventory Process

Units and resource specialists were asked to identify potential SIAs from their knowledge of the resource. Potential SIAs could be any area having special scenic, historical, geological, botanical, zoological and / or paleontological characteristics. Between 1993 and 1996, Forest Service personnel on the Little Missouri National Grassland worked in partnership with the North Dakota Natural Heritage Program to develop awareness and recognition for candidate SIAs. On the Thunder Basin National Grassland and Nebraska National Forest, additional potential SIAs were developed from potential Research Natural Areas (RNAs) reviewed by The Nature Conservancy in 1996 and deemed unsuitable for RNA classification.

Dakota Prairie Grasslands

Grand River/Cedar River National Grasslands

Aspen Stand SIA

This 10-acre site lies within the Humphrey Draw Wildlife Area and is the only aspen stand known to occur on the Grand River / Cedar River National Grasslands. The stand is located near the head of a green ash wooded draw and, while small, is healthy and is reproducing. The largest trees are between eight and ten inches in diameter at breast height.

The Bog SIA

This 30-acre site consists of several bog-like patches within a grassland matrix. Plants from the Carex genus dominate the patches. Wet, mucky areas are interspersed with dry ground, providing a patchwork of vegetation. The wet areas feature bentonite-like suspended clays that have a paste-like texture. Livestock have fallen in and have disappeared; the depth of the bog has not been determined.

Grand River Sand Dunes SIA

Two areas make up this 70-acre potential SIA. The sites contain unique sandy blowouts, areas where a complete grass vegetative cover is absent and wind action creates a constantly shifting landscape. The west blowout is the larger of the two and supports a prairie sandreed / Indian ricegrass community.

White Butte SIA

This 130-acre site is of archaeological interest and of potential significance to the Lakota tribes. Two potential sensitive species as listed by the U.S. Forest Service are found in the area: *Astragaius* and *Oxytropis* spp. Geologic interest is high in the area given its landform and the petrified rock found in the area. White Butte is the highest point in the area and provides excellent vista views of the surrounding plains.

Little Missouri National Grassland (Medora Ranger District)

Battle of the Badlands SIA

This 1,220-acre site has high value for its archeological, paleontological, wildlife, and geologic resources. The SIA includes a portion of General Sully's 1864 Battle of Badlands with the Sioux Indians, portions of the 1864 and 1876 military trails, and the 1876 Snow Camp of the Custer Expedition to the Little Bighorn battle. It is contiguous with the Square Buttes SIA. The area also contains several uncommon plant species.

Black Butte SIA

This 720-acre site may be one of the Earthnaming Buttes of the Hidatsa and is in the general vicinity of other heritage sites. The butte top contains eagle-catching pits and offers a scenic view of the badlands, rolling prairie, and adjacent buttes. Several uncommon or sensitive plant species (as listed by the Forest Service and the State of North Dakota) are found in the area, including blue lips, paper birch, mountain brome, squaw currant, and Douglas knotweed. The area also contains several nesting sites for raptors.

Black Cottonwood SIA

This 290-acre site contains the only known population of black cottonwood on the Little Missouri National Grassland. The site contains other unique plant species, including several listed as species of concern by the State of North Dakota. The area provides important habitat for Neotropical migratory birds and raptors. Several archeological sites are also found in the area.

Bullion Creek Type Formation SIA

This 550-acre site is the type section of the Bullion Creek Geologic Formation Type. As a type section, this site would be the standard of this formation for geological research and analysis. This formation contains large numbers of fossils of considerable scientific value.

Burning Coal Vein/Columnar Junipers SIA

This 210-acre site contains an inactive burning coal vein seam, considered to be a significant geologic feature. The junipers in the area have grown in an atypical "columnar" shape, which some attribute to gaseous vapors escaping from the earth when the burning coal vein was active. Several other uncommon plant species are found in the area. The only known North Dakota population of *Belfragi's chlorochroan* bug occurs at this site. This bug is a U.S. Fish and Wildlife Service candidate for the federal Threatened and Endangered Species list. This site also contains fossilized leaves and shells.

Cannonball/Slope Contact SIA

This 60-acre site contains geologic outcropping features from the Paleocene epoch Fort Union Group. The site uniquely illustrates the westernmost extension of marine Paleocene seas. The Cannonball Formation occurs at this site as tongues within the surrounding Slope Formation, the only known location in the Williston Basin where this relationship occurs.

Custer Trail/Davis Creek SIA

This 700-acre site recognizes the historic significance of General Alfred Terry and Lt. Colonel George Custer's 1876 expedition across the badlands to the Battle of the Little Bighorn. It includes segments of trail ruts, the May 28, 1876 campsite, and Initial Rock, which is inscribed with the names of two Seventh Calvary soldiers. The site also contains a golden eagle nest site, pronghorn antelope winter range, and the only known population of the sand lily on the Little Missouri National Grassland.

Ice Caves SIA

This 240-acre site is one of only two known natural cave systems in North Dakota. A number of uncommon or unusual plant communities are found in the jumble of rocks associated with the caves. Sandstone caprock and large blocks of sandstone have broken loose from the ridge cap and have tumbled down the steep slope to create this unusual geological site. This site was historically used by settlers to store perishable foods. A prairie falcon and golden eagle nests have been found at the site. Excellent scenery, vistas, and botanical features make this a popular day-trip destination for visitors.

Pretty Butte SIA

This 320-acre site features listed Forest Service sensitive species and rare species as identified by the State of North Dakota, including blue lips. The site may also provide habitat for sensitive bat populations. The top of the butte provides scenic vista points to view the surrounding badlands and rolling plains. The SIA also features numerous prehistoric sites and may be one of the Baby Hills or Baby Buttes held sacred by the Hidatsa, Mandan, and Sioux tribes.

Riparian Pools SIA

This 50-acre site features a high-quality riparian zone with unusual plant communities, high botanical diversity, waterfowl nesting sites, and occurrences of the rare Baird's sparrow, listed as a Forest Service sensitive species. Several prehistoric sites have also been discovered on the site.

Roundtop Butte SIA

This 10-acre site features a crumbling sandstone formation which provides habitat conditions for several uncommon plant species, including listed Forest Service sensitive plants, as well as plants of concern as identified by the State of North Dakota. Such species include Dakota buckwheat and nodding buckwheat.

Slope Type Formation SIA

This 190-acre site is the type section for the Slope Geologic Formation. As a type section, this site would be the standard of this formation for geologic research and analysis.

Square Buttes SIA

This 1,600-acre SIA contains the 1864 Sully expedition "waterhole" campsite and a major battle site from the early stages of the Battle of the Badlands with the Sioux Indians. It also includes trail ruts from this expedition and the later Custer 1876 military expedition. It is contiguous with the Battle of the Badlands SIA. Several plant species uncommon to the Little Missouri National Grassland are found in this SIA. In addition, numerous raptor nests occur on the steep cliff faces of the butte.

Sheyenne National Grassland

No potential Special Interest Areas were identified on the Sheyenne National Grassland.

Medicine Bow/Routt National Forest

Thunder Basin National Grassland

Alkali Divide SIA

This 5,140-acre site features a high concentration of fossil remains from the Late Cretaceous Period ending about 65 million years ago. The site is within the Lance Formation, which is composed of 2,600 feet of dull gray, sandy shales alternating with lenticular, light-colored sandstones, and thin lignite beds. The Lance Formation has a very good potential to produce a large variety of fossils of excellent research value. This is the most productive fossil-bearing site on the Thunder Basin National Grassland.

Buffalo Divide SIA

This 490-acre site features a series of prehistoric camps that run along a grassy ridge the separates the watersheds of the Belle Fourche and Cheyenne Rivers. Excavations conducted in the early 1990s indicated a protohistoric (period of time after initial European contact but before good written record) occupation as a hunting camp during the summer and fall. The good preservation of the site and the presence of many associated artifacts make this site a good candidate for further research. It is eligible for the National Register of Historic Places.

Cellars SIA

This 960-acre site is characterized by a series of prehistoric camps atop a continuous ridge overlooking the surrounding terrain. This complex of more than 120 stone circles was a major prehistoric campsite for early American Indians. Management emphasizes protecting the archeological features and increasing our understanding of the site by working in concert with contemporary American Indian tribes.

Cheyenne River Zoological SIA

This 5,980-acre site, previously named East Pasture, provides a prairie dog complex of approximately 3,000 acres, occupied mountain plover habitat, and potential black-footed ferret habitat. About six and three-quarter miles of the Cheyenne River winds through the area, offering habitat for fish, beaver, and raptors, which nest in the area. Also found along this river corridor are potential habitats for the Ute ladies-tresses and bald eagle winter roost sites.

Cow Creek Historic Rangeland SIA

This 14,170-acre site features naturally appearing rangelands that function in a self-sustaining ecological manner. The area provides a glimpse into what rangelands were like in the pre homestead era, prior to the 1880s. Native vegetation and ecological processes function and are basically unaffected by man, except for the introduction of domestic livestock and the basic facilities needed to maintain them.

Lance Geologic SIA

This 40 acre site is characterized by a wash approximately 10 acres in size containing numerous mushroom like geologic features, three-dimensional views of ancient sedimentary structures. Additionally, the area offers opportunity for study of certain unique geologic features, ancient depositional environments, and paleontologic and paleoecologic resources.

Nebraska National Forest Units

Bessey Unit (Including the Samuel R. McKelvie National Forest)

Bessey/McKelvie Tree Plantations SIA

The 21,710 acres of these accumulated sites are scattered between the Bessey unit and Samuel R. McKelvie unit, both of which are located in the Sandhills of Nebraska. These areas contain tree plantations of ponderosa pine, jack pine, and Eastern red cedar. These plantations were established between the early 1900s and 1946. Some of these stands were planted by Civilian Conservation Corps crews during the Great Depression as demonstration projects for area residents. These plantations form the largest hand-planted forests in North America.

Mallard Exclosure

This 680-acre exclosure site features a Sandhills wetland complex with green ash, cottonwood, and several willow species. Management emphasis is on protecting this unique botanical community.

Buffalo Gap National Grassland (Fall River Ranger District)

Edgemont Shark Locality SIA

This 940-acre site features a former picnic area that is continually impacted by fossil collectors. An enormous number of shark and fish teeth, as well as ammonites, are found at the site. The shark teeth are so numerous that they are exposed as shark-tooth rock conglomerate. A plesiosaur and early mosasaurs have been found at the site. Rock in the area is identified as Late Cretaceous Carlile Shale.

Indian Creek SIA

Most of this potential SIA is located on the Wall Ranger District of the Buffalo Gap National Grassland. Only 840 acres are located on the Fall River Ranger District. Please refer to the description of this SIA in the narrative for the Wall Ranger District.

Marietta South SIA

This 260-acre paleontologic site features the Belle Fourche, Greenhorn Limestone, and Mowry Shale Units of the Late Cretaceous Marine Sequence. This site has produced a wide variety of vertebrates, including plesiosaurs and pterosaurs, both rare in the fossil record for South Dakota. Other fossils located at this site include fishes, sharks, turtles, and invertebrates, such as ammonites and clams.

One-Mile Hill SIA

This 630-acre site features Late Cretaceous Belle Fourche Shale and Greenhorn Limestone. The site contains a wide variety of fossils, including fish, turtles, sharks, ammonites, and clams. It is fairly scenic, with a good deal of big sagebrush and highly erodible soils and exposed shales clearly visible.

Red Shirt Scenic

In the draft plan and analysis Red Shirt was considered for SIA designation. In FEIS Alternative 3, Red Shirt is Recommended for Wilderness, MA 1.2. This 33,470-acre site includes the scenic White River Badlands and the braided Cheyenne River. It features color-banded buttes rising to flat plateaus. The area provides nonmotorized, backcountry, recreational experiences in a primitive, undeveloped setting.

Swift Fox

In the draft plan and analysis Swift Fox was considered for SIA designation. In FEIS Alternative 3, Swift Fox is to be managed as Special Plant and Wildlife Habitat, MA 3.64. This 10,070-acre site provides suitable habitat for the swift fox. This small fox is federally listed as "warranted but precluded" on the threatened and endangered species list. Concern for the viability of the swift fox has also been expressed by the State of South Dakota. A stable population of swift fox has been observed in the rolling grasslands of this potential SIA.

Wallace Ranch Localities SIA

This 420-acre paleontological site is representative of the Late Cretaceous Pierre Shale Marine Unit and has produced such fossils as fish, sharks, pterosaurs, mosasaurs, turtles, baculites, and other ammonites. A shark specimen found on the site is scientifically significant because it displays preserved cranial elements that in life were of cartilage material, not bone.

Buffalo Gap National Grassland (Wall Ranger District)

Indian Creek

In the draft plan and analysis Indian Creek was considered for SIA designation. In FEIS Alternative 3, Indian Creek is Recommended for Wilderness, MA 1.2. This 27,600-acre site offers the largest block of scenic, Cheyenne River badlands breaks and the largest roadless area on the Buffalo Gap National Grassland. The rugged, remote terrain contains an abundance of scientifically significant fossil resources.

Kadoka Lake

In the draft plan and analysis Kadoka Lake was considered for SIA designation. In FEIS Alternative 3, Kadoka Lake is to be managed as Special Plant and Wildlife Habitat, MA 3.64. This 1,210-acre site is the largest wetland area on any national grassland in the Northern Great Plains. The area features Ducks Unlimited projects, with an emphasis on waterfowl habitat.

Scenic Type Section

In the draft plan and analysis Scenic Type Section was considered for SIA designation. In FEIS Alternative 3, Scenic Type Section will be managed as part of Black-Footed Ferret Reintroduction Habitat, MA 1.2. This 350-acre site is significant to paleontologists and geologists because it is the type section for the Scenic Member of the Brule Formation, White River Group, Oligocene Epoch, Tertiary Period. As a type section, this site would be the standard of this formation for research and analysis.

Weta Dam

In the draft plan and analysis Weta Dam was considered for SIA designation. In FEIS Alternative 3, Weta Dam is to be managed as Special Plant and Wildlife Habitat, MA 3.64. This 570-acre site provides significant habitat for the trumpeter swan. The site features Ducks Unlimited projects emphasizing waterfowl habitat.

Pine Ridge Unit (Including the Oglala National Grassland)

Bur Oak Enclosure SIA

This three-acre site contains a large stand of bur oak that is thought to be native to the area. It is the only known population of bur oak on the Pine Ridge unit.

Hudson Meng Bison Bonebed SIA

This 40-acre site contains 600 to 1,000 skeletons of an extinct, prehistoric bison species. The skeletons are approximately 10,000 years old. The site is undergoing intense scientific study, and a modern, interpretive visitor center has been built alongside a climate-controlled bonebed enclosure.

Mountain Mahogany Stand SIA

This 90-acre site features a mature stand of mountain mahogany, which extends onto adjacent private land. The stand is thought to have originated after a fire in the 1950s reduced competition from ponderosa pine.

Quaking Aspen Stand SIA

This eight-acre site, located on the Oglala National Grassland, features a stand of quaking aspen and three beaver ponds. The site provides for the only known quaking aspen on the Oglala National Grassland. Smaller aspen stands are found along the Pine Ridge of the Nebraska National Forest.

Toadstool Park SIA

This 2,000-acre site, located on the Oglala National Grassland, features badlands terrain of the White River Group. The site contains the longest known fossil animal trackway in the world from the Oligocene epoch. The site has produced mammalian fossils representing the rise of modern mammalian families in North America. A developed campground and replica sod shanty are located nearby.

Warbonnet/Yellowhand SIA

This 30-acre site features the location of a skirmish between the Fifth Cavalry, led by Colonel Wesley Merritt, and a band of Cheyenne Indians, led by Chief Yellowhand. The band was attempting to join the northern camps during the summer of the great Sioux War in 1876. During this skirmish, Buffalo Bill Cody is reputed to have killed Chief Yellowhand, the only casualty from the battle.

Demand Assessment

Assessing the demand for SIAs is accomplished mainly in two ways: 1) recognition of significant public interest and use of an area, often for recreation or aesthetic purposes, and 2) recognition of scientific or historic values associated with an area; for instance, sites with rare plant and animal occurrences or with unusually high historic or paleontological values.

Dozens of sites have been analyzed for their suitability as SIAs. During this analysis and inventory process, a number of sites have been advanced as potentially appropriate SIA sites.

To illustrate demand rationale, a few examples of potential SIA sites follow:

Bessey/McKelvie Tree Plantations: These sites are truly tree plantation areas, the first plantings done in the early 1900s on Sandhills grassland areas. Located on the Bessey Ranger District of the Nebraska National Forest, these plantations have historic significance in that they represent a grand experiment in transforming grasslands into forested lands. Ponderosa pine, jack pine, and Eastern red cedar are the more commonly found tree species in the area.

Edgemont Shark Locality: A paleontological site located on the Fall River Ranger District of the Buffalo Gap National Grassland, this site is well known for the numerous shark and fish teeth fossils occurring in the area. Other discoveries include a plesiosaur and early mosasaurs.

Hudson-Meng Bison Bonebed: This site, located on the Pine Ridge Ranger District of the Nebraska National Forest (Oglala National Grassland), contains between 600 and 1,000 bison skeletons dating back about 10,000 years. The bonebed site has been placed on the National Register of Historic Places. The site houses a bonebed enclosure and a visitor information center. This site is becoming an increasingly popular tourist destination.

Ice Caves: Located on the Medora Ranger District of the Little Missouri National Grassland, the Ice Caves site is one of very few caves found in North Dakota. Many unusual plant communities are found in the jumble of rocks associated with the cave site. The Ice Caves site is a popular day-trip destination and hiking area.

Weta Dam: Weta Dam is located on the Wall Ranger District of the Buffalo Gap National Grassland. The site provides primary habitat for the trumpeter swan, a rare bird once hunted to the brink of extinction. The Weta Dam site is a Ducks Unlimited project area, with an emphasis on waterfowl production and habitat.

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Appendix G Wild and Scenic Rivers Evaluation

Introduction

The National Wild and Scenic Rivers Act of 1968 (P.L. 90-542; 16 U.S.C. 1271-1287, as amended) is designed to preserve certain rivers and streams with outstanding natural, heritage, or recreational features in a free-flowing condition for the enjoyment of current and future generations. At the end of 1997, the National Wild and Scenic Rivers System (NWSRS) included 154 streams totaling 10,759 miles. There are no designated rivers or streams within or bordering the Northern Great Plains planning units.

The term "river," as used in this appendix, is based on language in the 1968 act. "River" does not confer any meaning about water quality or quantity. On the Northern Great Plains, "river" applies to rivers, creeks, or intermittent streams that are free-flowing (without impoundments).

Free-flowing rivers and streams may be designated by the U.S. Congress (usually following a study by a federal agency, such as the USDA-Forest Service) or by the Secretary of the Interior upon application of the governor of a state or states through which the river flows.

Each stream is administered by either a federal or state agency. Designation may include all or part of a river and may include tributaries. A corridor about one-half-mile wide (one-quarter mile either side of a stream) is usually included within the designation boundary to protect related natural, heritage, and recreational values.

Designated rivers and streams are classified as wild, scenic, or recreational. The Wild and Scenic Rivers Act defines these terms as follows:

- **Wild Rivers**: Rivers or sections of rivers free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.
- **Scenic Rivers**: Rivers or sections of rivers free of impoundments, with shorelines or watersheds still largely undeveloped, but accessible in places by roads.
- **Recreational Rivers**: Rivers or sections of rivers readily accessible by road or railroad, that may have some development along their shoreline and that may have undergone some impoundments or diversions in the past.

Landownership within designated boundaries can be, and often is, a combination of federal, state, and private. If designation of any rivers were to occur, and if private land lies within the corridors, the Forest Service would consider acquisition of these lands only when the owner is willing to sell or exchange land for the appraised value. The federal government is limited to acquiring no more than 100 acres per mile of stream of private lands within a designated stream corridor. In fact, agencies are not required, in any case, to acquire any private land. In addition, recreational, agricultural, and residential uses may continue. Recreational users are cautioned to be aware of and respect private property rights. Existing water rights and existing jurisdiction

of states and the United States over waters as determined by established principles of law are not affected by designation.

Designation neither implies nor gives the government control of private lands within the river corridor. Although Congress could include private lands within the boundaries of the designated river area, management restrictions would apply only to public lands.

The Federal Energy Regulatory Commission is prohibited from licensing projects on or directly affecting designated rivers. Other federal agencies cannot assist by loan, grant, license, or any other manner the construction of any water-resource project (such as a dam, water diversion, channel, or rip-rap) that would have a direct and adverse effect on river values.

A four-step process is required before a river can be included in the NWSRS. The first step is an evaluation of a river's "eligibility." This evaluation must consider the area within one-quarter mile of the high water mark on both sides of a river and other features outside the corridor, if their inclusion is essential for the protection of the river's outstandingly remarkable values.

The second step is to classify eligible segments of the river as potential wild, scenic, or recreational segments based on specific criteria that help determine the appropriate potential classification.

The third step is to evaluate the eligible river for "suitability." This evaluation considers possible Congressional inclusion of the river in the NWSRS in terms of social and economic values, effects on other resources and effects on private lands and other uses of the area.

Finally, an evaluation is made as to whether or not a recommendation for inclusion of segments of the river should be made to Congress. When Congress does designate a river for inclusion, a final boundary for the corridor is established, and a management plan is developed.

Beginning in 1996, all free-flowing rivers and streams within or immediately bordering National Forest Service System lands connected to the Northern Great Plains Plans Revision process were screened to determine which should be evaluated for possible eligibility to the NWSRS. Five rivers and streams (a total of 155.35 miles) within or bordering National Forest System lands were determined to be potentially eligible and were, therefore, evaluated further. In addition, the National Park Service determined that 27.7 miles of the Little Missouri River within Theodore Roosevelt National Park were eligible for possible inclusion in the NWSRS.

Purpose and Need for Action

The Wild and Scenic Rivers Act, at Section 5(d), states:

> In all planning for the use and development of water and related land resources, consideration shall be given for all federal agencies involved to potential national wild, scenic and recreational river areas. All river basin and project plan reports submitted to Congress shall consider and discuss any such potentials. The Secretary of the Interior and the Secretary of Agriculture shall make specific studies and investigations to determine which additional wild, scenic and recreational river areas within the United States shall be evaluated in planning reports by all federal agencies as potential alternative uses of the water and related land resources involved.

The *Forest Service Land and Resource Management Planning Handbook* (FSH 1909.12) found at Section 8.01--"Authority," states:

> The purpose and authority for study of wild and scenic rivers are in the Wild and Scenic Rivers Act of October 1, 1968, as amended. Revised USDA-USDI Guidelines for Eligibility, Classification, and Management of River Areas dated September 7, 1982, supplements the act. The text of the act and guidelines are set forth in Chapter 9 ... Treatment may vary but, except as noted in this section, the planning teams should evaluate each river to verify that it meets the eligibility criteria specified in sections 1(b) and 2(b) of the Wild and Scenic Rivers Act. Document the finding of eligibility or non-eligibility and the river's potential classification in the forest plan.
>
> Beyond this point, there is some latitude in treatment of eligible rivers. The preferred process is to proceed with determining suitability by completing a river study in the draft forest plan. An alternative is to delay the suitability determination on eligible rivers until a subsequent separate study is carried out. If this latter alternative is used, the forest plan must provide for protection of the river area until a decision is made as to the future use of the river and adjacent lands. Unless the study process would be unduly delayed, subsequent study of eligible rivers may be coordinated with a general revision of the forest plan.

Historical Summary

The Custer National Forest identified the Little Missouri River as meeting the eligibility criteria for possible inclusion into the Wild and Scenic Rivers System during development of the first management plan in 1987. No suitability study was completed.

The Medicine Bow National Forest did not identify any rivers as being eligible on the Thunder Basin National Grassland during their first planning effort completed in 1985.

The 1984 Nebraska National Forest Land and Resource Management Plan did not identify any rivers as being eligible for possible inclusion into the Wild and Scenic River System. The review of river eligibility focused primarily on the lack of scenic quality and shortness of river length flowing through the lands administered by the Nebraska National Forest. The rivers reviewed were:

- Niobrara: approximately one-half mile.
- Snake: approximately one mile.
- Dismal: approximately three miles.
- Middle Loup: approximately 2 miles.
- Cheyenne: approximately 14 miles.
- White: approximately 4 miles.

In 1992, the Theodore Roosevelt National Park (TRNP) determined that the entire segment of the Little Missouri River (27.2 miles) within the boundaries of the three TRNP units were eligible for possible designation. The identified outstanding remarkable values of the Little Missouri River within the three units include scenic, recreational, geological, fisheries, historic, cultural, and ecological features that are exemplary of these resource values in the Northern Great Plains region. The three units and corresponding miles of river are listed below:

- South Unit: 11.5 miles.
- Elkhorn Unit: 1 mile.
- North Unit: 14.7 miles.

Current Conditions

The Little Missouri River in North Dakota is currently the only river in the planning area specifically being managed to preserve its characteristics as a potential Wild and Scenic River. There are no designated Wild and Scenic Rivers within the administrative boundaries of any of the units involved in the Northern Great Plains Plans Revision. Within the Northern Great Plains, segments of two rivers have been included in the Wild and Scenic River System: the Missouri and the Niobrara. Several segments of the Missouri River have been designated, including a segment in Montana and other segments in Nebraska and South Dakota. A segment of the Niobrara River, southeast of Valentine, Nebraska, has also been designated.

Benchmark Analysis Summary

Inventory and Evaluation Process

The Nebraska National Forest and Thunder Basin National Grassland conducted a systematic review of all sixth-level watersheds using Geographic Information Systems (GIS). The GIS computer program mapped all the sixth-level watersheds for these units on a scale of 1:126,720. An interdisciplinary team on each district then reviewed the major stream within each sixth-level watershed for free-flowing characteristics and evaluated the free-flowing segments using Forest Service Region 2 criteria to determine if segments had any outstandingly remarkable characteristics. Eligibility-determination criteria indicating an outstanding rating could include scenic, recreation, geology, fisheries, wildlife, prehistoric, historic, and ecological / vegetative.

The Custer National Forest reviewed all intermittent and perennial streams. The evaluation of these streams then followed the same process as the other units. The process for assessing outstandingly remarkable values for every criteria for each stream evaluated is on file at the Forest Supervisor's Office in Chadron, Nebraska. Values were judged “outstandingly remarkable” compared to other streams on a regional, state, or national level. For streams found eligible, an estimate of potential classification (wild, scenic, or recreational) was made.

Results of Inventory and Evaluation

The table below displays the results of the inventory of streams for Wild and Scenic River eligibility.

Table G-1. Wild and Scenic River Inventory.

Planning Unit	River	Potential Classification	Miles	Outstandingly Remarkable Features
Dakota Prairie Grasslands				
Little Missouri National Grassland	Little Missouri	Wild	3.3	Scenery, fisheries and wildlife
		Scenic	88.9	
		Recreational	13.7	
Sheyenne National Grassland	Sheyenne	Recreational	10.2	Plant species, fisheries, and ecological, archeological and hydrologic features
Nebraska National Forest Units				
Bessey Ranger District	Middle Loup	Recreational	.5	Bessey Nursery and Bessey Recreation Complex
Buffalo Gap National Grassland / Fall River	Cheyenne	Scenic	8.6	Fisheries, wildlife, scenery, and recreation
	Rapid Creek	Scenic	1.7	Fisheries and wildlife

Table G-2. Wild and Scenic River Inventory for the Theodore Roosevelt National Park.

Planning Unit	River	Potential Classification	Miles	Values
South Unit	Little Missouri	Recreational	1.5	Scenic, recreational, geological, fisheries, historic, cultural, and ecological
		Scenic	5.8	
		Wild	4.2	
Elkhorn Unit	Little Missouri	Scenic	1.0	Scenic, recreational, geological, fisheries, historic, cultural, and ecological
North Unit	Little Missouri	Scenic	4.0	Scenic, recreational, geological, fisheries, historic, cultural, and ecological
		Wild	10.7	

Demand Assessment

Public comments received during the formal public scoping period range from support for designating rivers as part of the National Wild and Scenic River System to opposition for any designations. The major concern expressed by those opposing designation is that additional controls and restrictions may be placed on private landowners along a designated river. There were several comments in favor of the existing North Dakota state designation of the Little Missouri as a state scenic river.

During the formal public scoping period, Theodore Roosevelt National Park received 522 pre-printed postcards and 26 letters asking for wild or scenic status with the TRNP boundaries. Of the 522 pre-printed postcards, 274 contained additional comments written by the sender. The TRNP did not receive any correspondence asking that the agency not pursue designation of wild or scenic river status.

During the time the DEIS was available for public comments both Theodore Roosevelt National and the USFS Northern Great Plains planning office at Chadron, Nebraska received comments that specifically addressed the wild and scenic designation for the Little Missouri River within the park boundaries. Theodore Roosevelt National Park received 144 comments during the public input period. Of these, 142 comments were in favor of designation and 2 were opposed. The Chadron USFS office received 218 comments that specifically addressed wild and scenic designation within the park boundaries. Of these 218 comments, 169 expressed support for the preferred alternative and designation and 49 expressed comments against pursuing designation within the park boundaries. A total of 362 comments was received by both agencies with 86% in favor of designation within the park and 14% opposed.

No comments were received that specifically supported designating the Middle Loup River in Nebraska, although there were many comments opposing a national designation.

Comprehensive River Management Plans

Any river or river segment designated as wild, scenic, or recreational under the Wild and Scenic River Act will require a comprehensive river management plan. These plans will be written within three years of the river's or river segment's designation in accordance with the Wild and Scenic River Act, Section 3 (D) (1) and Public Law 90-542, as amended.

Organization of this Report

Each stream evaluation is divided into the following sections: description, eligibility, potential classification, alternatives, and suitability.

Cheyenne River (Nebraska National Forest)

Description: Located on both the Fall River and Wall Ranger Districts of the Buffalo Gap National Grassland, about eight miles of the Cheyenne River have been determined as eligible under the scenic classification. The Cheyenne River rises on the eastern plains of Wyoming and empties into the Missouri River in central South Dakota. Generally, the Cheyenne River is a braided, meandering prairie river, with one main channel and numerous side channels which

form sandbars and narrow, vegetated islands. It is characterized by frequent oxbows and high levels of suspended solids. A number of benches rise from the main stream and provide an array of vegetative communities. Some of the major communities include aquatic vegetation along the sandbars, a riparian cottonwood woodland, and grasses, such as prairie sandreed, switchgrass, and western wheatgrass along the river benches.

Eligibility: The eligible section of this river is located from Section 27, Township 4 South, Range 10 East to Section 21, Township 4 South, Range 11 East. The Cheyenne River (206 miles) is identified on the Nationwide River Inventory as having outstanding wild, scenic, or recreation potential. Except for the portion of the river flowing through the Buffalo Gap National Grassland, the river has not been studied for eligibility. Some areas along this river may be eligible under other authority or ownership; however, it is outside the scope of the U.S. Forest Service to analyze such river sections for inclusion.

Potential Classification: Approximately eight miles of the Cheyenne River that either borders or flows fully within lands administered by the U.S. Forest Service were inventoried. These river sections hold the potential for classification as scenic. Outstandingly remarkable features include significant fisheries and wildlife resources, scenic qualities, and recreational values.

Alternatives

- Alternative 1: Not recommended for designation.
- Alternative 2: Not recommended for designation.
- DEIS Alternative 3: Not recommended for designation.
- FEIS Alternative 3: Not recommended for designation.
- Alternative 4: Recommended for a designation with a scenic classification.
- Alternative 5: Recommended for a designation with a recreational classification.

Suitability

Suitability Factor Number 1: Characteristics that do or do not make the area a worthy addition to the National Wild and Scenic River System.

This river is highly scenic. A number of visually appealing habitats are visible from the river, including juniper breaks, cottonwood floodplains, and badlands topography. There is opportunity for increased recreational use of the river, including canoeing in a relatively pristine setting. The stream flow is somewhat controlled, since Angostura Reservoir lies upstream. Some fences do cross the river corridor, as does State Highway 44 at Section 26, Township 4 South, Range 10 East. The old Highway 44 bridge also crosses the river corridor and, although it no longer transports traffic, it does have some historic and scenic value. Some utility lines and the village of Red Shirt may be visible from some locations along the river.

Suitability Factor Number 2: Current status of landownership and use in the area including the amount of private land and the uses of such land.

The north side of this stretch of river is administered by the USDA-Forest Service. The south side of this stretch of river is administered by the Bureau of Indian Affairs (BIA). Management of this stretch of river would require some coordination between the two agencies. The primary use along this stretch of river is livestock grazing. Recreation along the river includes canoeing, hunting, hiking, nature study, and other associated outdoors activities.

Suitability Factor Number 3: Foreseeable potential uses of the land and water that would be enhanced, foreclosed, or curtailed by designation and values that would be foreclosed or diminished if the area is not protected as part of the National Wild and Scenic River System.

Transportation

Transportation either along or across this section of the Cheyenne River would not be altered based on designation. Furthermore, nondesignation probably would not lead to any change in transportation along or across this section of the Cheyenne River.

Water

The State of South Dakota has determined that the Cheyenne River does not support its assigned beneficial uses due to high conductivity and salinity / total dissolved solids / chlorides. Designation would not alter this basic condition of the river's water quality.

Minerals

Sand, specialty sand, gravel, Pierre shale, and gemstone resources are known to exist in this area. Placer gold mining has occurred along the Cheyenne river. The area has potential for uranium, molybdenum, selenium, and vanadium. Leasable minerals potential is low. The federal government owns most of the subsurface mineral rights along this stretch of the river. Approximately one mile of the river's subsurface minerals are controlled by other interests. No Within the scenic corridor segment, surface occupancy for extracting federal leasable minerals would require meeting a High Scenic Integrity Objective.

Timber

No commercial timber cutting or firewood collection has been or would be allowed along this stretch of river.

Fisheries and Wildlife

Three fish species, the flathead chub, plains top minnow, and the sturgeon chub, occur in the river. In addition, the spiny softshell turtle also occurs within the river corridor. These are considered species of concern by the Forest Service. Designation likely would not have any effect on these or other fish and wildlife species.

Recreation, Scenic, and Subsistence

The continued scenic qualities of the river would be maintained by designation. Designation would bring a higher public profile to the river, which might increase recreational use. If use were to increase markedly, the Forest Service would examine the possibility of providing a canoe launch, as well as a primitive campground.

Effects of Nondesignation

A new railway line has been proposed by the Dakota, Minnesota, and Eastern Railroad (DM&E). The DM&E Powder River Basin Expansion Project DEIS considers 3 alternatives and variations on each alternative including one alternative alignment along this segment of the Cheyenne river. In the event of nondesignation there is a possibility the scenic and recreational backcountry characteristics of this stretch of the river could be degraded should the proposed railway go through this National Forest Service river corridor.

Suitability Factor Number 4: Public, state, and local government interests.

This stretch of river provides access to sacred American Indian ceremonial sites. The Sierra Club publicly supports designation of this stretch of river. State and local government agencies have not supported or opposed designation.

Suitability Factor Number 5: Estimated costs of land acquisition and management as a Wild and Scenic River.

Signs would be installed to identify this stretch of river as part of the Wild and Scenic River System. In addition, a river management plan would be prepared. Estimated costs for installing interpretive signs on the north side of this section of river are $3,000. Estimated costs for preparing a river management plan are $10,000. No land acquisitions along or near this stretch of the river are planned.

Little Missouri (Dakota Prairie Grasslands)

Description: More than 10,000 years ago, as the last major glacier retreated to the north, the Little Missouri River region underwent significant alteration, directing the flow of the Little Missouri River into the larger Missouri River. The Little Missouri River's general flow is north; it arises in Wyoming and eventually empties into Lake Sakakawea northwest of Killdeer, North Dakota. The river's level fluctuates seasonally, with highest runoffs occurring in spring and lowest flows occurring during the typically hot summers of western North Dakota.

The Little Missouri River enters the administrative boundary of the Little Missouri National Grassland on the southern edge of Section 36, Township 133 South, Range 105 West and leaves the national grassland on the south side of Section 32, Township 149 North, Range 96 West. About 240 miles of the river meanders through the administrative boundary of the Little Missouri National Grassland, with about 134 miles within or forming a border with lands actually administered by the Little Missouri National Grassland of the Dakota Prairie Grasslands. The river also runs through both the North and South Units of the Theodore Roosevelt National Park, as well as through a number of parcels of land owned by the State of North Dakota.

The Little Missouri is one of the longest, unimpeded, free-flowing rivers remaining in the lower 48 states. It is outstandingly remarkable in many significant ways and certainly unique in others. Its channelization has helped sculpt the picturesque Little Missouri Badlands, with vertical erosion exposing up to 300 feet of soils and rock formations. The river runs through eight different rock formations: the Cretaceous Pierre, Fox Hills, and Hell Creek Formations and the Tertiary Ludlow, Cannonball, Slope, Bullion Creek, and Sentinel Butte Formations. These formations become progressively younger to the north and the east. The highly dissected valley landscape has high relief along much of its length.

The Little Missouri River drains the Little Missouri Badlands, an area of sometimes stark, eroded and dissected topography. The badlands are sparsely settled and significant native cover remains.

Zoological resources are also significant. The area is of very high value to upland game and nongame wildlife. The stream and adjacent riparian zone provides habitat for beaver, wild turkey, deer, great blue herons, and turkey vultures.

Less than half the Little Missouri River's floodplain is hayed or plowed, with potential habitat remaining for lowland forest, pioneer riparian communities, and sagebrush shrubland.

Campsites, lithic chipping stations, cultural material scatters, and eagle catchment pits point to many centuries of historic or prehistoric use by American Indians and their ancestors. During the 1880s, cattlemen ran large herds of cattle along the river. The Little Missouri Badlands were quickly divided into ranches. Several historic figures resided in the area, at least for a time, including Theodore Roosevelt and French nobleman, Marquis de Mores.

Many fossil sites have been recorded along the river, and many more will likely be discovered. Invertebrate, vertebrate, and plant fossils have been found in the Cretaceous and Paleocene formations along the waterway.

Some sport fishing occurs along the Little Missouri River, especially for channel catfish. The river is a critical spawning area for the channel catfish population found in Lake Sakakawea. The pallid sturgeon, a federally listed endangered species, and the sturgeon chub, a candidate species for the federal threatened and endangered species list, likely are present in the Little Missouri River. Six state rare species have been collected, in limited numbers, from the river.

The river is considered recreationally significant to the state. Recreation includes sight-seeing, canoeing, camping, and fishing. The river offers solitude and remote, rugged scenery. The State of North Dakota has designated the entire length of the river in North Dakota as a State Scenic River.

During most years the Little Missouri River becomes intermittent during the summer months. It has remained in a predominately natural state, is highly turbid, and carries a large sediment load. It provides a unique ecosystem for various forms of indigenous aquatic life, which are dependent on these seemingly adverse water-quality conditions.

The forest resource along the river is important as a feeding and wintering area for wildlife, as well as livestock. The lack of cottonwood regeneration is a concern along the entire length of the river corridor.

Eligibility: The Little Missouri River enters the administrative boundary of the Little Missouri National Grassland on the southern edge of Section 36, Township 133 South, Range 105 West and leaves the national grassland on the south side of Section 32, Township 149 North, Range 96 West. About 240 miles of the river meanders through the administrative boundary of the Little Missouri National Grassland, with about 134 miles within or forming a border with lands actually administered by the Little Missouri National Grassland of the Dakota Prairie Grasslands (lands within the administrative boundary of the Little Missouri National Grassland include intermingled state and private lands, as well as public lands under federal management).

The river also runs through both the North and South Units of the Theodore Roosevelt National Park, as well as through a number of parcels of land owned by the State of North Dakota.

Although the entire river, as it flows through the boundaries of the Little Missouri National Grassland, was determined eligible, not all the river was classified and included in alternatives. Based on strong public and local government input against designating any portions of the river flowing totally through private land, those portions of the river were declared unsuitable for inclusion into the National Wild and Scenic River System, at this time.

Locations of and potential classifications for eligible segments are shown by ranger district below:

McKenzie Ranger District

Wild	T149N, R96W, Section 31
Recreational	T147N, R98W, Sections 1-4, 6, 8-10
Scenic	T147N, R99W, Sections 3 and 4
Scenic	T147N, R100W, Section 30 T147N, R101W, Sections 22, 24-26, 28,32 T147N, R102W, Section 25
Scenic	T146N, R102W, Sections 1, 12-14
Recreational	T146N, R102W, Sections 22, 24, 26
Scenic	T145N, R102W, Section 26

Medora Ranger District

Scenic	T144N, R102W, Sections 4-6, 8 and 9
Scenic	T144N, R102W, Sections 21, 28
Scenic	T143N, R102W, Sections 4, 8 and 9
Scenic	T143N, R102W, Section 27
Scenic	T143N, R102W, Section 35
Scenic	T142N, R102W, Section 1
Scenic	T142N, R102W, Sections 11-14 and 23
Recreational	T141N, R102W, Section 1
Scenic	T140N, R102W, Section 33
Scenic	T139N, R102W, Sections 4 and 10
Scenic	T139N, R102W, Sections 22 and 23
Scenic	T138N, R102W, Sections 7 and 8
Scenic	T138N, R102W, Section 18
Scenic	T138N, R102W, Sections 24 and 31; T137N, R102W, Sections 4-6, 8-11, 13-15, 24-25
Scenic	T137N, R101W, Sections 31 and 32; T136N, R102W, Sections 3, 9-10
Scenic	T137N, R102W, Section 33: T136N, R102W, Section 6-8; T136N, R103W, Section 3
Scenic	T136N, R103W, Section 6
Scenic	T137N, R103W, Sections 31-32
Scenic	T136N, R104W, Sections 17 and 20
Recreational	T135N, R105W, Sections 1, 10-12
Scenic	T135N, R105W, Sections 14-15
Scenic	T135N, R105W, Sections 21-22, 27-29, 32-33
Scenic	T134N, R105W, Section 8

Medora Ranger District, cont.	
Scenic	T134N, R105W, Section 19; T134N, R106W, Sections 24-25
Wild	T134N, R105W, Section 31
Scenic	T133N, R105W, Sections 6 and 8
Scenic	T133N, R105W, Section 18, 20 and 30; T133N, R106W, Section 13

Potential Classifications: A total of 134.33 miles of the Little Missouri River that either borders or flows fully within lands administered by the U.S. Forest Service were inventoried and determined as eligible for potential inclusion in the National Wild and Scenic River System.

The miles of river segments and their classifications are listed below, by district:

McKenzie Ranger District	Recreational	7.15 miles
	Scenic	16.25 miles
	Wild	1.61 miles
Medora Ranger District	Recreational	6.51 miles
	Scenic	74.58 miles
	Wild	1.69 miles

According to the State of North Dakota, outstandingly remarkable features include significant fisheries and wildlife resources and high-quality scenic values.

Alternatives

Alternatives 4 and 5 make recommendations for inclusion in the NWSRS; however, recommendations do not always follow potential classifications. Wild classifications generally changes to scenic in both alternatives, although 3.3 miles of wild classification remains in Alternative 4.

- Alternative 1: Not recommended for designation; however, the Little Missouri River would be managed under its current state classification as a State Scenic River.
- Alternative 2: Not recommended for designation; however, the Little Missouri River would be managed under its current state classification as a State Scenic River, with the appropriate state laws applied.
- DEIS Alternative 3: Not recommended for designation; however, the Little Missouri River would be managed as a scenic corridor under Management Area Prescription 4.22.
- FEIS Alternative 3: Not recommended for designation; however, the Little Missouri River would be managed as a scenic corridor under Management Area Prescription 4.22.
- Alternative 4: Recommended for designation. A total of 105.9 miles is recommended, with 3.3 miles as wild, 88.9 miles as scenic, miles and 13.7 miles as recreational.
- Alternative 5: Recommended for designation. A total of 105.9 miles is recommended, with 92.2 miles as scenic and 13.7 miles as recreational.

Suitability

All wild segments are analyzed together in one section, regardless of their location along the river. The same process was used for all scenic and recreational segments. This approach was used in order to minimize redundancy and repetition, making this section shorter and easier to read.

Wild Segments

Suitability Factor Number 1: Characteristics that do or do not make the area a worthy addition to the National Wild and Scenic River System.

These river segments are highly scenic. They are remote and generally inaccessible, except by trail. A number of visually appealing habitats are visible from the river, including ecosystems representing upland grasslands, river breaks, river bottoms, and terraces. Stream flow is unimpeded. No river impoundments occur anywhere along the entire stretch of the Little Missouri River.

No developed roads or developed road crossings over the river corridor exist. No railroad corridors exist in the area. No fence lines cross the river in these segments. Infrequent traffic may be visible in the distance.

The primary uses in these river corridor segments are livestock grazing, the infrequent cutting of hay, and recreation. Recreation includes hunting, hiking, canoeing, horseback riding, and nature study.

Suitability Factor Number 2: Current status of landownership and use in the area including the amount of private land and the uses of such land.

Land in the eligible corridor segments is owned by USDA-Forest Service, State of North Dakota, and Bureau of Land Management. The primary uses within these corridors are livestock grazing, occasional haying, and recreation.

Suitability Factor Number 3: Foreseeable potential uses of the land and water that would be enhanced, foreclosed, or curtailed by designation and values that would be foreclosed or diminished if the area is not protected as part of the National Wild and Scenic River System.

Transportation

No change in use or trend is anticipated under designation or under nondesignation.

Water

No change in use or trend is anticipated under designation or under nondesignation.

Minerals

No locatable or common variety minerals are known to exist in these segments. In areas with a Wild River designation, no ground-disturbing activities would be allowed on lands with federal minerals.

Timber

No commercial timber cutting or firewood collection has been or would be allowed within these segments under any designation.

Fisheries and Wildlife

Fisheries and wildlife would not be affected by designation or nondesignation of these segments.

Recreation, Scenic, and Subsistence

The high scenic qualities of the river would be maintained under designation. Designation may increase recreational use. Any occasional trapping within the corridor would continue under designation.

Effects of Nondesignation

Nondesignation probably would not change current or predicted uses of recreation, minerals development, livestock grazing, or other activities in the eligible corridor segments.

Suitability Factor Number 4: Public, state, and local government interests.

The consortium of groups that published *Badlands on the Brink* has recommended that these segments be federally designated as scenic river corridors. Billings County and the Golden Valley County Commissioners are opposed to federal designation. Currently, the State of North Dakota manages the Little Missouri River as a State Scenic River from the South Dakota border to the State Highway 22 bridge crossing at Little Missouri Bay on Lake Sakakawea. Residents in the vicinity of the river generally seem to favor the state's current management of the river.

Suitability Factor Number 5: Estimated costs of land acquisition and management as a Wild and Scenic River.

Designation would require no land acquisition and, as a result, no costs for land purchase. Should Congress federally designate any segments of the river, a river management plan would be developed. The estimated cost for developing such a plan is $100,000. No land acquisitions are planned.

Scenic Segments

Suitability Factor Number 1: Characteristics that do or do not make the area a worthy addition to the National Wild and Scenic River System.

These river segments are scenic. Some segments are remote; others are quite accessible. A number of visually appealing habitats are visible from the river, including ecosystems representative of river bottoms, river breaks, terraces, toe slopes, upland grasslands and hardwood draws. Stream flow is unimpeded. No river impoundments occur anywhere along the Little Missouri River.

Developed roads may be present in some segments. In other segments, developed roads are not present. No developed road crossings exist in any of the eligible scenic segments. Features or conditions that resulted in the scenic classification are present, including water quality, conspicuous and/or inconspicuous roads, buildings and foundations, oil wells, power lines, diversion ditches, cable-car river crossings, power line river crossings, undeveloped-road river

crossings, pipeline river crossings, corrals and extensive hay fields. Traffic and ranches may be visible from the river in these segments.

Suitability Factor Number 2: Current status of landownership and use in the area including the amount of private land and the uses of such land.

Land in these segments is owned by USDA-Forest Service, State of North Dakota, National Park Service, and individuals. Some coordination between agencies may be necessary, especially where different agencies control opposite sides of any river segment. The primary uses in these river segments are livestock grazing, occasional haying, and recreation, including sight-seeing.

Suitability Factor Number 3: Foreseeable potential uses of the land and water that would be enhanced, foreclosed, or curtailed by designation and values that would be foreclosed or diminished if the area is not protected as part of the National Wild and Scenic River System.

Transportation

No change is anticipated under designation or nondesignation.

Minerals

Minerals activity would be allowed in eligible scenic corridor segments. Within the scenic corridor segment, surface occupancy for extracting federal leasable minerals would require meeting a Moderate Scenic Integrity Objective. No locatable or common variety minerals are known to exist in any of the eligible segments.

Timber

No commercial timber cutting or firewood cutting has been or would be allowed in any of the eligible scenic river corridor segments under any designation.

Fisheries and Wildlife

Fisheries and wildlife would not be affected under designation or nondesignation.

Recreation, Scenic, and Subsistence

The continued scenic qualities of the river would be maintained by designation. Designation might increase recreational use. Any occasional trapping within the eligible corridor segments would continue under designation.

Effects of Nondesignation

Nondesignation of these river segments probably would not change current or predicted uses of recreation, minerals development, livestock grazing, or other activities or uses.

Suitability Factor Number 4: Public, state, and local government interests.

The consortium of groups that published *Badlands on the Brink* has recommended that these segments be federally designated as scenic river corridors. Billings County and the Golden Valley County Commissioners are opposed to federal designation. Currently, the State of North Dakota manages the Little Missouri River as a State Scenic River from the South Dakota border to the State Highway 22 bridge crossing at Little Missouri Bay on Lake Sakakawea. Residents in the vicinity of the river generally seem to favor the state's current management of the river.

Suitability Factor Number 5: Estimated costs of land acquisition and management as a Wild and Scenic River.

Designation would require no land acquisition and, as a result, no costs for land purchase. Should Congress federally designate any segments of the river, a river management plan would be developed. The estimated cost for developing such a plan is $100,000. No land acquisitions are planned.

Recreational Segments

Suitability Factor Number 1: Characteristics that do or do not make the area a worthy addition to the National Wild and Scenic River System.

These river segments are scenic and may be readily accessible. A number of visually appealing habitats are visible from the river, including ecosystems representative of river bottoms, river breaks, terraces, toe slopes, upland grasslands, and hardwood draws. Stream flow is unimpeded. No river impoundments occur anywhere along the Little Missouri River.

Developed roads may be present. Features or conditions that resulted in the recreational classification are present, including long stretches of conspicuous roads, inconspicuous roads, pivot irrigation, and oil wells. Traffic and ranches may be visible from the river in these segments.

Suitability Factor Number 2: Current status of landownership and use in the area including the amount of private land and the uses of such land.

Land ownership in these segments is a mix of both USDA-Forest Service, State of North Dakota, and private. Some coordination between the Forest Service and the State of North Dakota may be needed under designation, especially where the state and the Forest Service control opposite sides of the river. Livestock grazing, occasional haying, some transport of freight (such as oil, gas, and cattle), and recreation, such as sight-seeing, occur in these river segments.

Suitability Factor Number 3: Foreseeable potential uses of the land and water that would be enhanced, foreclosed, or curtailed by designation and values that would be foreclosed or diminished if the area is not protected as part of the National Wild and Scenic River System.

Transportation

No change in use or trend is anticipated under designation or nondesignation.

Water

No change in use or trend is anticipated under designation or nondesignation.

Minerals

Minerals activity would be allowed in eligible recreational corridor segments. Within the recreational corridor segment, surface occupancy for extracting federal leasable minerals would require meeting a Moderate Scenic Integrity Objective. No locatable or common variety minerals are known to exist in any of the eligible segments.

Timber

No commercial timber cutting or firewood cutting has been or would be allowed in any of the eligible recreational river corridor segments under any designation.

Fisheries and Wildlife

Fisheries and wildlife would not be affected under designation or nondesignation.

Recreation, Scenic, and Subsistence

The continued scenic qualities of the river would be maintained by designation. Designation might increase recreational use. Any occasional trapping within the eligible corridor segments would continue under designation.

Effects of Nondesignation

Nondesignation of these river segments probably would not change current or predicted uses of recreation, minerals development, livestock grazing, or other activities or uses.

Suitability Factor Number 4: Public, state, and local government interests.

The consortium of groups that published *Badlands on the Brink* has recommended that these segments be federally designated as scenic river corridors. Billings County and the Golden Valley County Commissioners are opposed to federal designation. Currently, the State of North Dakota manages the Little Missouri River as a State Scenic River from the South Dakota border to the State Highway 22 bridge crossing at Little Missouri Bay on Lake Sakakawea. Residents in the vicinity of the river generally seem to favor the state's current management of the river.

Suitability Factor Number 5: Estimated costs of land acquisition and management as a Wild and Scenic River.

Designation would require no land acquisition and, as a result, no costs for land purchase. Should Congress federally designate any segments of the river, a river management plan would be developed. The estimated cost for developing such a plan is $100,000. No land acquisitions are planned.

Little Missouri (Theodore Roosevelt National Park)

Reviewers wishing to comment on the National Park's recommendations for wild and scenic designations should send their written comments to the Superintendent, Theodore Roosevelt National Park, P.O. Box 7, Medora, North Dakota 58645. Comments must be received by the closing date of the USFS Management Plans Revisions.

Description: Please refer to the description of the Little Missouri River under the preceding section for the Dakota Prairie Grasslands.

Eligibility: Theodore Roosevelt National Park consists of three distinct units: the South Unit, the Elkhorn Unit and the North Unit. There are 11.5 miles of the Little Missouri River within the South Unit, 1.0 miles in the Elkhorn Unit and 14.7 miles in the North Unit. A total of 27.2 miles of the Little Missouri River that either borders or flows fully within lands administered by the National Park Service were inventoried in 1992 and determined to be eligible for possible inclusion in the National Wild and Scenic River System.

Potential Classifications: The total river miles in each classification for each unit are listed below:

South Unit	Recreational	1.5 miles
	Scenic	5.8 miles
	Wild	4.2 miles
Elkhorn Unit	Scenic	1.0 miles
North Unit	Scenic	4.0 miles
	Wild	10.7 miles

Potential classifications and locations for eligible segments within each park unit are listed below:

South Unit

Recreational	T140N, R102W, Sections 22 and 21
Scenic	T140N, R102 W, Sections 16, 15, 10, 11 and 1
Scenic	T141N, R101W, Sections 33 (to confluence with Beef Corral Wash)
Wild	T141N, R101W, Sections 33, 32, 29, 30 and 19

Elkhorn Unit

Scenic:	T143N, R102W, Section 4
Scenic:	T144N, R102W, Section 33

North Unit

Wild:	T147N, R100W, Sections 8, 9 and 4
Wild:	T148N, R100W, Sections 33, 34, 35 and 36
Wild:	T148N, R99W, Sections 31, 32 and 33
Scenic:	T147N, R99W, Sections 4 and 3
Scenic:	T148N, R99W, Sections 34 and 35

Alternatives

The Theodore Roosevelt National Park identified 4 alternatives, while the U. S. Forest Service developed 5 alternatives in the DEIS and evaluated a modified DEIS Alternative 3 which is called FEIS Alternative 3. The four Park Service developed alternatives were merged and used in FEIS alternatives as follows:

Alternative 1 and 2: These alternatives makes no recommendation to Congress for Wild or Scenic River System designation. Current management of portions of the river within the park's boundary would continue; the policies and regulations for the park's undeveloped zone and the state's Scenic River guidelines would be applied.

DEIS Alternative 3: This alternative include a recommendation for designation according to the potential classification for each segment of river where the park manages both sides of the river within the South and North Units. This alternative also includes the one mile of the west shoreline within the Elkhorn Unit.

FEIS Alternative 3: This alternative includes a recommendation for designation according to the potential classification for each segment of river where the park manages both sides of the river within the South and North Units. This recommendation includes:

- 5.8 miles of Scenic River and 4.2 miles of Wild River in the South Unit, and
- 10.7 miles of Wild River in the North Unit.

Alternative 4: This alternative would recommend designation with a potential classification of recreational, scenic, or wild for all the river miles within the park's boundary, including along the segment where the park manages only one side of the river.

Alternative 5: This alternative would recommend scenic status for all of the river miles classified as wild or scenic to more closely comply with the State of North Dakota's designation of the Little Missouri River as a State Scenic River. This recommendation would only apply to the river where the park manages both sides of the river and the Elkhorn Unit.

FEIS Alternative 3 above is the preferred alternative for the National Park Service. This alternative recommends 4.2 miles of scenic river designation in the South Unit and a total of 14.9 miles of wild river designation in the South and North Units.

Suitability

All wild segments are analyzed together in one section, regardless of their location along the river. The same can be said for all scenic and all recreational segments. These segments have been combined to reduce the redundancy and repetition of this report.

Wild Segments

Suitability Factor Number 1: Characteristics that do or do not make the area a worthy addition to the National Wild and Scenic River System.

These river segments are highly scenic within the North Dakota badlands. They are remote and generally inaccessible, except by trail. Visually appealing habitats are visible from the river, including ecosystems representing upland grasslands, river breaks, river bottoms, and terraces. Native ungulates are often seen with the park's boundaries, including bison, whitetail deer, mule deer, and pronghorn antelope. In the South Unit, one may also see elk and wild horses. In the North Unit, in addition to the species listed above, bighorn sheep can be seen in the breaks above the river. There are numerous other wildlife species to be seen, including beaver, muskrat, coyotes, bobcats, raptors, and other birds.

Stream flow is unimpeded. No river impoundments occur anywhere along the entire stretch of the river, which is approximately 550 miles long. In North Dakota, there are only five highway bridges that cross the 275 miles of the Little Missouri River in the state.

In the proposed wild segments within the park, there is one short (one-half mile) shoreline development in the North Unit. This development consists of a campground on the north shore adjacent to the river in Section 31, T148N, R99W. The campground and access road are well-screened by vegetation. The noise from and visibility of this development are minimal and insignificant.

There are no roads crossing the river or immediately adjacent to the river in these two wild segments. In the North Unit, where the park road is within one-quarter mile of the river (portions of Sections 31, 32, and 33), the road is either well-screened by vegetation or is behind topography (Sections 32 and 33). If any traffic noise is heard, it is insignificant and infrequent.

No fence lines cross the river within the classified wild segments. There is a fence across the river at the north boundary of the South Unit, the terminus of the wild segment. At the North Unit, there is a fence line in Section 8, T147N, R100W at the park's boundary where the proposed wild segment begins and a fence line where the river leaves the park's boundary at Section 33, T148N, R99W. Because these three fence lines are at the boundaries of the wild segments, they do not distract from the feeling of experiencing a wild river.

No railway corridors exist in the vicinity of the wild segments.

The primary uses in the proposed wild river segments relate to naturally occurring processes, such as wildlife grazing, and also relate to recreational use, such as hiking, horseback riding, and canoeing. There are no agricultural, commercial, or industrial practices within the park's boundaries.

Suitability Factor Number 2: Current status of land ownership and use in the area including the amount of private land and the uses of such land.

The National Park Service manages all lands within the proposed wild segments of the river. There are no private surface or mineral in-holdings within these segments. National Parks were created to conserve the natural and cultural resources for the public's enjoyment.

Suitability Factor Number 3: Foreseeable potential uses of the land and water that would be enhanced, foreclosed, or curtailed by designation and values that would be foreclosed or diminished if the area is not protected as part of the National Wild and Scenic River System.

Transportation

No change in use or trend under designation or nondesignation.

Water

There are no known water improvement or impoundment projects proposed on the Little Missouri River. Designation would ensure that should such projects be proposed, natural flow would continue to meet the minimum needs of the remarkable values identified within the wild segments. If these segments are not designated, it would be more difficult for the park to ensure that activities or projects planned outside the park's boundaries would not impact the resources or natural processes occurring within the park.

The current water quality within the wild segments meets the minimum standards for designation under the Wild and Scenic Rivers Act. Designation would help the Park Service protect water resources in the park from impacts originating outside park boundaries. If future activities occurring outside the park's boundaries degrade the water quality or have the potential to degrade water quality within the wild segments, the park would be in a better position to work with the responsible entity and the State of North Dakota to mitigate the degradation. Without designation, it may be impossible for the park to mitigate water quality impacts originating outside park boundaries.

Minerals

There are no mineral withholdings within the wild segments. Since the wild segments are within the park's boundaries, no mineral extraction activities would be permitted.

Timber

No commercial timber cutting or firewood collection is permitted within the park's boundaries. Any hazard fuel removal would be completed under an approved plan that would consider and mitigate potential effects to wild river values.

Fisheries and Wildlife

Designation would ensure that natural flows meet the needs of fisheries and wildlife and that the water quality does not significantly degrade. Nondesignation of these segments would make it more difficult for the park to provide timely input on projects (outside park boundaries) that might regulate flows and impact fisheries and wildlife.

Recreation, Scenic, and Subsistence

Designation as a wild river would probably increase the recreational use. With an increase in recreational use, there may be sufficient demand to support commercial canoeing outfitter businesses. The extent of increased use is unknown since the magnitude of water flow to support canoeing use usually occurs only in the spring and early summer. Since the wild segments of the river can be seen from viewpoints and hiking trails, a designated wild river within the State of North Dakota is likely to attract more park visitors and tourism to the area. If this occurs, it would help the growing tourism industry in western North Dakota. Increased use may result in more trespass onto private land by recreationists. This might be mitigated by maps, education, and more signs indicating public versus private ownership.

Without designation, the amount of the river use would probably continue at the same levels the park is currently experiencing.

Suitability Factor Number 4: Public, state, and local government interests.

The consortium of groups that published *Badlands on the Brink* has recommended that segments within the park be federally designated as either wild or scenic. After information was published in the Sierra Club magazine about the Wild and Scenic River Study, the park received more than 550 postcards or letters encouraging the designation of the river within the park's boundaries during the formal public scoping process. The park has not received any correspondence opposing wild and scenic designation during the formal public scoping process.

Residents who attended scoping meetings in North Dakota were opposed to federal designation, although a few did publicly state that they didn't care whether the river was designated within the park's boundaries. These residents indicated they were opposed because of the impacts that designation might have on their use of private land within the river corridor. Most expressed support for the current management of the river under the State Scenic River designation, even though this law provides for no enforcement authority of the guidelines developed by the Little Missouri Scenic River Commission. Billings County and McKenzie County commissioners oppose federal designation within or outside of the park's boundaries. Neither the State of North Dakota nor the state's Congressional delegation took a public position on designation under the Wild and Scenic Rivers Act during the scoping process.

During the time the DEIS was available for public comments, both Theodore Roosevelt National Park and the USFS Northern Great Plains planning office at Chadron, Nebraska received comments that specifically addressed the wild and scenic designation for the Little Missouri River within the park boundaries. T.R. National Park received 144 comments during the public input period. Of these, 142 comments were in favor of designation and 2 were opposed. The Chadron USFS office received 218 comments that specifically addressed wild and scenic designation within the park boundaries. Of these 218 comments, 169 expressed support for the preferred alternative and designation and 49 expressed comments against pursuing designation within the park boundaries. There was a combined total of 362 comments with 86% in favor of designation within the park and 14% opposed.

Suitability Factor Number 5: Estimated costs of land acquisition and management as a Wild and Scenic River.

All of the wild segments are within the park's boundaries. Consequently, there would be no land acquisition costs involved. Management costs for developing a river management plan and for monitoring resource and visitor activities along all the river segments would come from the park's base budget and are expected to be approximately $30,000 per year. No land acquisitions are necessary.

Scenic Segments

Suitability Factor Number 1: Characteristics that do or do not make the area a worthy addition to the National Wild and Scenic River System.

The three river segments classified as scenic are truly scenic in nature within the North Dakota badlands. The scenic segment within the South Unit is adjacent to the main park road and is visible from numerous viewpoints or road sections. The proposed scenic segments are accessible, but require short hikes either cross-country or on a trail from parking lots. There are no parking lots on the shore of the river.

Visually appealing habitats are visible from the river, including ecosystems representing upland grasslands, river breaks, river bottoms, and terraces. Native ungulates are often seen with the park's boundaries including bison, whitetail deer, mule deer, and pronghorn antelope. In the South Unit, one may also see elk and wild horses. In the North Unit, in addition to the species listed above, bighorn sheep can be seen in the breaks above the river. There are numerous other wildlife species to be seen, including beaver, muskrat, coyotes, bobcats, raptors, and other birds.

Stream flow is unimpeded. No river impoundments occur anywhere along the entire stretch of the river, which is approximately 550 miles long. In North Dakota, there are only five highway bridges that cross the 275 miles of the Little Missouri River in the state.

In the scenic segments within the park, there are short stretches of shoreline with limited recreational developments. In the South Unit (Section 10, T140N, R102W), approximately one-half mile of shore adjacent to the river is occupied by a campground. The campground and access road are lightly screened by vegetation. The noise and visibility of the road traffic and campground are moderate. In the North Unit, a 115-kilovolt power line crosses the scenic section of the river, and the housing and maintenance area is adjacent to the river.

There are no roads crossing the river. However, in places in the South Unit, the park road is within one-quarter mile of the river, and traffic noise may be heard on occasion. There are two-track roads in the vicinity of the Elkhorn Unit, and vehicle noise can be heard by recreational users on the proposed scenic river segment. The intrusion is only light because of the low volume of vehicular traffic.

No fence lines cross the river within the scenic river segments. No railway corridors exist in or along the scenic segments. However, train whistle noise from the railroad line south of Interstate 94 can be heard, on occasion, in the scenic segment of the South Unit.

The primary uses in these proposed scenic river segments relate to naturally occurring processes, such as wildlife grazing, and recreation, such as camping, hiking, horseback riding, and canoeing. There are no agricultural, commercial, or industrial practices within the scenic segments, except for the small horse outfitter concession at the historic Peaceful Valley Ranch. The ranch house, barns, and corrals are screened by vegetation.

Suitability Factor Number 2: Current status of land ownership and use in the area including the amount of private land and the uses of such land.

The National Park Service manages all lands within the proposed scenic segment of the South Unit with the uses being for conservation of the natural and cultural resources and the public's enjoyment of these resources.

The Elkhorn Unit is nationally significant because it is the site of one of Theodore Roosevelt's two ranches and the location where he further developed his conservation ethic that became so important in later years when he was president. At the Elkhorn Unit, the National Park Service manages the west shoreline; the east shoreline of the river is in private ownership. The State Historical Society of North Dakota owns undeveloped tracts to the north and south of the Elkhorn Unit. The U.S. Forest Service also manages land in the immediate vicinity. The private land uses on the east side of the river include ranching, hunting, and commercial lodging operations. The uses on National Park Service and state land include visiting a historically significant site, hiking, sight-seeing, and wildlife viewing.

There is one potential scenic segment in the North Unit. In this segment, the National Park Service manages the north shoreline, and the south shoreline is in either private ownership or managed by the U.S. Forest Service. The uses of the parkland are the conservation of the natural and cultural resources for the public's enjoyment of these resources. Similar uses occur on the U.S. Forest Service, with additional uses including livestock grazing and hunting. Grazing is the dominant use on the private land.

Suitability Factor Number 3: Foreseeable potential uses of the land and water that would be enhanced, foreclosed, or curtailed by designation and values that would be foreclosed or diminished if the area is not protected as part of the National Wild and Scenic River System.

Transportation

No change in use or trend under designation or nondesignation.

Water

There are no known water improvement or impoundment projects proposed on the Little Missouri River. Designation would ensure that should such projects be proposed, natural water

flows would continue to meet the minimum needs of the remarkable values identified with the scenic segments. If these segments are not designated, it would be more difficult for the park to ensure that activities or projects planned outside the park's boundaries would not impact the resources or natural processes occurring with the park.

The current water quality within the scenic segments meets the minimum standards for designation under the Wild and Scenic Rivers Act, although meeting Federal or State standards is not a prerequisite for scenic classification. Designation would help the Park Service protect water resources in the park from impacts originating outside park boundaries. If future activities occurring outside the park's boundaries degrade the water quality or have the potential to degrade water quality within the wild segments, the park would be in a better position to work with the responsible entity and the State of North Dakota to mitigate the degradation. Without designation, it may be impossible for the park to mitigate water quality impacts originating outside park boundaries.

Minerals

There are no mineral in-holdings within the classified scenic segments within the North or South Units. In the South Unit, minerals would not be impacted by designation or by nondesignation.

In the North Unit, only one shoreline is within the park. The land that the U.S. Forest Service administers in Sections 3 and 4 of T147N, R99W also qualifies for a scenic classification. With this classification, mineral activity would be permitted on U.S. Forest Service land, but surface occupancy within the scenic corridor would generally be prohibited. Thus, designation would protect the scenic and recreational values along the river, while nondesignation may allow these values to degrade if the mineral resources are developed. The designation or nondesignation would probably have little impact on the development of the private minerals.

In the Elkhorn Unit, all minerals are federal except for a 44.72-acre parcel of private minerals. Approximately one-quarter mile of this acreage borders the Little Missouri River. Surface occupancy would generally be prohibited within the National Park. The river in the Elkhorn Unit is not being recommended for scenic status.

Timber

No commercial timber cutting or firewood collection is permitted within the park's boundaries. Any hazard fuel removal would be completed under an approved plan that would consider and mitigate potential effects to scenic river values.

Fisheries and Wildlife

Designation would ensure that natural flows meet the needs of fisheries and wildlife, and water quality does not significantly degrade. Nondesignation of these segments would make it more difficult for the park to provide timely input on projects outside the park's boundaries that might regulate flows and impact fisheries and wildlife.

Recreation, Scenic, and Subsistence

Designation as a scenic river would probably increase the recreational use. With an increase in recreational use, there may be sufficient demand to support commercial canoeing outfitter businesses. The extent of increased use is not known because the magnitude of water flow to support canoeing use usually occurs only in the spring and early summer. Since the scenic segments of the river can be seen from viewpoints and hiking trails, a designated scenic river within the State of North Dakota is likely to attract more park visitors and tourism to the area. If this occurs, it would help the growing tourism industry in western North Dakota. Increased use may result in more trespass onto private land by recreationists. This might be mitigated by maps, education, and more signs indicating public versus private ownership.

Without designation, the amount of the river use would probably continue at the same levels the park is currently experiencing.

Suitability Factor Number 4: Public, state, and local government interests.

The consortium of groups that published *Badlands on the Brink* has recommended that segments within the park be federally designated as either wild or scenic. After information was published in the Sierra Club magazine about the Wild and Scenic River Study, the park received more than 550 postcards or letters encouraging the designation of the river within the park's boundaries The park did not receive any correspondence opposing wild and scenic designation during the initial scoping process.

Residents who attended scoping meetings in North Dakota were opposed to federal designation, although a few did publicly state that they didn't care whether the river was designated within the park's boundaries. These residents indicated they were opposed because of the impacts that designation might have on their use of private land within the river corridor. Most expressed support for the current management of the river under the State Scenic River designation, even though this law provides for no enforcement authority of the guidelines developed by the Little Missouri Scenic River Commission. Billings County and McKenzie County commissioners are opposed to federal designation within or outside of the park's boundaries. Neither the State of North Dakota nor the state's Congressional delegation took a public position on designation under the Wild and Scenic Rivers Act during the scoping process.

During the time the DEIS was available for public comments, both Theodore Roosevelt National Park and the USFS Northern Great Plains planning office at Chadron, Nebraska received comments that specifically addressed the wild and scenic designation for the Little Missouri River within the park boundaries. T.R. National Park received 144 comments during the public input period. Of these 142 comments were in favor of designation and 2 were opposed. The Chadron USFS office received 218 comments that specifically addressed wild and scenic designation within the park boundaries. Of these 218 comments, 169 expressed support for the preferred alternative and designation and 49 expressed comments against pursuing designation within the park boundaries. There was a combined total of 362 comments with 86% in favor of designation within the park and 14% opposed.

Suitability Factor Number 5: Estimated costs of land acquisition and management as a Wild and Scenic River.

All of the scenic segments are within the park's boundaries. Consequently, there would be no land acquisition costs involved. Management costs for developing a river management plan and for monitoring resource and visitor activities along all the river segments would come from the park's base budget and are expected to be approximately 1/2 a full time position and approximately $30,000 per year. No land acquisitions are necessary.

Recreational Segments

In the FEIS Alternative 3, there are no recreational segments being recommended for designation

Suitability Factor Number 1: Characteristics that do or do not make the area a worthy addition to the National Wild and Scenic River System.

The one river segment potentially classified as recreational occurs in the South Unit and is 1.5 miles long. The National Park Service only manages the east shoreline of the river. The other shoreline and half of the river bed is in private ownership. Thus, designating this segment as a recreational river would cause awkward and potentially conflicting management of the river.

This segment is adjacent to the Interstate 94 Business Loop and flows under Interstate 94 with its two highway bridges. After launching in Medora, Chimney Park State Historic Site or Sully Creek State Park, this segment would be used by canoeists to access the scenic and wild segments of the river in the South Unit.

Besides the Interstate 94 Business Loop adjacent to the river and the interstate bridges over the river, there is also a busy railroad adjacent to the river. In addition, there is a major private campground with year-long residential trailer units and a sewage lagoon system. Other developments that would involve considerable vehicle traffic are planned within the river corridor adjacent to this segment.

Suitability Factor Number 2: Current status of land ownership and use in the area including the amount of private land and the uses of such land.

The east shoreline is managed by the National Park Service, and the west shoreline is in private ownership. The primary uses in this proposed recreational river segment relate to camping, sight-seeing, and canoeing. Private land uses include livestock grazing and a recreational campground. In the future, it is likely that more of this private land will be developed.

Suitability Factor Number 3: Foreseeable potential uses of the land and water that would be enhanced, foreclosed, or curtailed by designation and values that would be foreclosed or diminished if the area is not protected as part of the National Wild and Scenic River System.

Transportation

No change in use or trend under designation or nondesignation.

Water

There are no known water improvement or impoundment projects proposed on the Little Missouri River. Designation would ensure that should such project be proposed, natural water

flows would continue to meet the minimum needs of the remarkable values identified with the recreational segment. If the segment is not designated, it would be more difficult for the park to ensure that activities or projects planned outside the park's boundaries would not impact the resources or natural processes occurring with the park.

The current water quality within the recreational segment meets the minimum standards for designation under the Wild and Scenic Rivers Act, although meeting Federal or State standards is not a prerequisite for recreational classification. Designation would help the Park Service protect water resources in the park from impacts originating outside park boundaries. If future activities occurring outside the park's boundaries degrade the water quality or have the potential to degrade water quality within the wild segments, the park would be in a better position to work with the responsible entity and the State of North Dakota to mitigate the degradation. Without designation, it may be impossible for the park to mitigate water quality impacts originating outside park boundaries.

Minerals

Mineral development would not be affected under designation or nondesignation.

Timber

No commercial timber cutting or firewood collection is permitted within the park's boundaries. Any hazard fuel removal would be completed under an approved plan that would consider and mitigate potential effects to recreational river values.

Fisheries and Wildlife

Designation would ensure that natural flows meet the needs of fisheries and wildlife and water quality does not significantly degrade. Nondesignation of this segment would make it more difficult for the park to provide timely input on projects outside the park's boundaries that might regulate flows and impact fisheries and wildlife.

Recreation, Scenic, and Subsistence

Designation as a recreational river would probably increase the recreational use, particularly when combined with segments of scenic and wild river. With an increase in recreational use, there may be sufficient demand to support a commercial canoeing outfitter business. The extent of increased use is not known because the magnitude of water flow to support canoeing use usually occurs only in the spring and early summer. It is unlikely that the designation or nondesignation of this recreational river segment would have much impact on the recreational values or tourism industry. It would only have a positive impact on recreation and tourism if recreational designation were combined with scenic and wild designation.

Suitability Factor Number 4: Public, state, and local government interests.

The consortium of groups that published *Badlands on the Brink* has recommended that segments within the park be federally designated as either wild or "scenic." After information was published in the Sierra Club magazine about the Wild and Scenic River Study, the park received more than 550 postcards or letters encouraging the designation of the river within the park's boundaries. The park has not received any correspondence opposing wild and scenic designation.

Residents who attended scoping meetings in North Dakota were opposed to federal designation, although a few did publicly state that they didn't care whether the river was designated within the park's boundaries. These residents indicated they were opposed because of the impacts that designation might have on their use of private land within the river corridor. Most expressed support for the current management of the river under the State Scenic River designation, even though this law provides for no enforcement authority of the guidelines developed by the Little Missouri Scenic River Commission. Billings County and McKenzie County commissioners are opposed to federal designation within or outside of the park's boundaries. Neither the State of North Dakota nor the state's Congressional delegation took a public position on designation under the Wild and Scenic Rivers Act during the scoping process.

Suitability Factor Number 5: Estimated costs of land acquisition and management as a Wild and Scenic River.

The recreational segment is within the park's boundaries. Consequently, there would be no land acquisition costs involved. Management costs for developing a river management plan and for monitoring resource and visitor activities along all the river segments would come from the park's base budget and are expected to be approximately $30,000 per year. No land acquisitions are planned.

Middle Loup (Nebraska National Forest)

Description: The Middle Loup River rises in the Nebraska Sandhills about 50 miles northwest of Mullen. It flows to the southeast and drains into the Platte River at Columbus, about 250 miles downstream. Along with the North Loup and South Loup Rivers, the Middle Loup drains the majority of the Sandhills region of Nebraska, about 15,200 square miles. The Middle Loup is characterized by low flow fluctuations. It is shallow year-round, carries a heavy sediment load, and is a naturally braided river, with sandy channels shifting across a broad floodplain. Historically, this floodplain consisted mainly of both wet and dry meadows; however, water diversions, the elimination of bison, and fire suppression have allowed woodlands to encroach upon the river's banks and upon many of the sandbars. A great many meadows have been converted to cropland, hay meadows, or pastures for grazing.

On the half-mile section of the river being examined, sandbars and aquatic vegetation are evident and the floodplain is relatively small, perhaps a mile across. Only a portion of that floodplain is administered by the Bessey Ranger District. On this section, the river gives way to essentially one river terrace. On the south side, the bank is lined with a diversity of trees and woody species, including green ash, locust, cottonwood, Boston ivy, wild plum, cedar, ponderosa pine, and juniper. The north side of the river also includes woody species, but retains a greater share of meadow components, including grasses and sedges. The stream-flow regime on this stretch is less restricted than on downstream stretches of the Middle Loup, where major water diversions pull water from the river for municipal and agricultural uses.

Eligibility: The eligible portion of the river is found in Section 2, Range 26 West, Township 22 North.

Potential Classifications: Approximately one-half mile of the Middle Loup River that flows fully within lands administered by the U.S. Forest Service was inventoried for the Wild and Scenic River System. This one-half-mile river section holds a potential classification as

recreational. Outstandingly remarkable features include the Bessey Tree Nursery and the ranger district office building, both of which are listed on the National Register of Historic Places. In addition, the Bessey Recreational Complex is considered by U.S. Forest Service Region 2 to be significant for its recreational features.

Alternatives

- Alternative 1: Not recommended for designation.
- Alternative 2: Not recommended for designation.
- Alternative 3: Not recommended for designation.
- FEIS Alternative 3: Not recommended for designation.
- Alternative 4: Recommended for a designation with a recreational classification.
- Alternative 5: Not recommended for designation.

Suitability

Suitability Factor Number 1: Characteristics that do or do not make the area a worthy addition to the National Wild and Scenic River System.

The predominate values of this section of river are the historical significance of the Bessey Tree Nursery and ranger district office building and the recreational features of the Bessey Recreational Complex. The Middle Loup River, including this segment of it, has been traditionally used for recreational tubing, canoeing, and swimming. Bank stabilization structures are present on this stretch and do detract from the natural setting. Tree plantings around the recreational complex and nursery have a somewhat artificial appearance. A highway bridge, along State Highway 86B, also crosses the river. Another bridge, to be used as a trail bridge connecting the recreational complex with the town of Halsey, is planned and will likely be placed over this stretch of river. The bridge is being moved from a former site and is of historic value. Both highway and railroad traffic can be heard and sometimes seen from portions of the river. The short length of this section of eligible river may also argue against its recommendation for the National Wild and Scenic River System.

Suitability Factor Number 2: Current status of landownership and use in the area, including the amount of private land and the uses of such land.

This section of river is under federal management, administered by the USDA-Forest Service. Adjacent land is owned by private interests. Some private access points to the river, mostly for recreational purposes (such as launching canoes), are found in the area. However, there is only limited, legal public access to the river from private lands. A private gravel pit lies nearby. Livestock grazing is a land use on private lands in the area. Recreation and tree production are the dominant current uses on National Forest System lands in the area.

Suitability Factor Number 3: Foreseeable potential uses of the land and water that would be enhanced, foreclosed, or curtailed by designation and values that would be foreclosed or diminished if the area is not protected as part of the National Wild and Scenic River System.

Transportation

Little would change in terms of transportation under designation. The planned trail bridge would still be constructed over the river. Few modifications to the planned construction are anticipated.

Water

The fairly unaltered stream-flow regime along this river section would not change under designation. The high turbidity and sediment loads affecting water quality would not change either.

Minerals

Some coarse sand (locally called gravel) is mined on adjacent private lands. Alluvium deposits provide sand and gravel resources in this area. However, ample supplies of coarse sand and gravel deposits are found on adjacent private lands. Although the Wild and Scenic Rivers Act does not prohibit mining within recreational segments, no mining is likely to occur under designation on this stretch of the river. The potential for leasable minerals in the area is low. Subsurface minerals are reserved by the federal government.

Timber

Timber along this section of the river is managed for forest health and public safety. Such management would continue under designation.

Fisheries and Wildlife

Opportunities for sports fisheries is low along this stretch of the river. Such opportunities would not increase under designation. Such fish species as the fathead minnow, red shiner, sand shiner, and channel catfish may be present in the river. Species considered rare in Nebraska (the Iowa darter, pearl dace, and finscale dace) are more commonly found in small Sandhills streams and may or may not be found in this stretch of the river.

Common wildlife species include white-tailed deer, mule deer, wild turkey, beaver, and raccoons. Many neotropical migratory birds can be found along the river. A good number of eastern bird species are found along the river, in large part because of the wooded banks. Such species include the blue jay, cardinal, summer tanager, and the ruby-throated hummingbird. Native grassland birds, like the grasshopper sparrow and upland sandpiper, may be declining as the nearby meadows are encroached upon by woody vegetation. Shorebirds may also be declining on this stretch of river, as sandbar habitat is lost to woody encroachment.

Recreation, Scenic, and Subsistence

Some trapping occurs along the river. Designation would not alter that. An outfitter permit is in force under a special-use permit to the Nebraska State 4-H Camp. Designation would not alter that. Designation would not likely increase recreation along this stretch of the river, simply because the section under evaluation is negligible in length (one half-mile).

Effects of Nondesignation

Nondesignation would not affect current management of this section of the river.

Suitability Factor Number 4: Public, state, and local government interests.

Local public opposition to designation of this stretch of the Middle Loup River is strong. The State of Nebraska has not offered a position on designation.

Suitability Factor Number 5: Estimated costs of land acquisition and management as a Wild and Scenic River.

Designation would require the writing of a river management plan. Additional signs identifying the area as a Wild and Scenic River would likely be required. Construction of a canoe launch site would be considered. The estimated cost of designation is approximately $10,000. No land acquisitions are planned.

Rapid Creek (Nebraska National Forest)

Description: Located on the Fall River Ranger District of the Buffalo Gap National Grassland, a segment of about a mile and a half of Rapid Creek has been determined as eligible under the scenic classification. Rapid Creek rises in the central Black Hills about eight miles west of Rochford, South Dakota and flows for roughly 80 miles in a generally southwesterly direction, emptying into the Cheyenne River approximately 12 miles west of Farmingdale in southwestern South Dakota. The upper reaches of the creek drain semi-arid timberland, while the lower reaches drain arid, rolling prairie. The eligible segment of Rapid Creek lies on the plains. Rapid Creek is generally a fast-moving mountain stream that takes on the characteristics of a meandering prairie river east of Rapid City. Rapid Creek has a well-defined channel ranging between about 12 and 16 feet in width. Its floodplain exceeds a quarter-mile wide in some places. Rapid Creek is a cold-water fishery in the Black Hills, but becomes primarily a warm-water fishery out on the plains. Such fish species as channel catfish, longnose dace, shorthead redhorse, and the sand shiner occur along the eligible stretch of the Cheyenne River. Woody habitat components along this stretch of Rapid Creek help make this area attractive to such representative species as the red-tailed hawk, wood duck, Bullock's oriole, belted kingfisher, loggerhead shrike, sharp-tailed grouse, and the great-horned owl. Other wildlife species may include the pale milk snake, spiny softshell turtle, Northern leopard frog, mule deer, beaver, mink, red fox, and the white-footed mouse.

Along the eligible segment, cottonwood, green ash, willows, and chokecherry line the banks, typically intermixed with western wheatgrass, snowberry, and prairie sandreed. Some wetland vegetation is associated with this creek. Canada thistle exists along the entire stretch of the eligible segment.

Eligibility: The eligible segment of this river is located Section 35, Township 1 South, Range 11 East.

Potential Classifications: Approximately one and one-half mile of Rapid Creek, flowing entirely within lands administered by the U.S. Forest Service, was inventoried for the Wild and Scenic River System. This river section holds a potential classification as scenic. Outstandingly remarkable features include significant fisheries and wildlife resources.

Alternatives

- Alternative 1: Not recommended for designation.
- Alternative 2: Not recommended for designation.
- Alternative 3: Not recommended for designation.
- FEIS Alternative 3: Not recommended for designation.
- Alternative 4: Recommended for a designation with a scenic classification.
- Alternative 5: Recommended for a designation with a recreational classification.

Suitability

Suitability Factor Number 1: Characteristics that do or do not make the area a worthy addition to the National Wild and Scenic River System.

The fisheries and wildlife features are unique because no other public land adjacent to Rapid Creek on the plains is available. The habitat along this stretch of river is considered quite healthy.

The relatively short length of this segment may argue against its potential value as part of the Wild and Scenic River System.

Suitability Factor Number 2: Current status of landownership and use in the area including the amount of private land and the uses of such land.

The mile and a half segment is entirely administered by the U.S. Forest Service on both sides of the creek. Adjacent land uses include livestock grazing, crop production, and haying. All adjacent lands are in private ownership. National Forest System lands in the area are used predominantly for livestock grazing and recreation, including hiking, hunting, bird watching, nature study, and other associated outdoors activities.

Suitability Factor Number 3: Foreseeable potential uses of the land and water that would be enhanced, foreclosed, or curtailed by designation and values that would be foreclosed or diminished if the area is not protected as part of the National Wild and Scenic River System.

Transportation

Transportation either along or across this segment of Rapid Creek would not be altered based on designation.

Water

The creek bed contains rubble, gravel, and sand. A layer of silt covers much of the substrate, probably from upstream cattle traffic and farming. Monitoring of lower Rapid Creek, near Farmingdale, indicated that the stream partially supported its assigned uses from October 1993 to September 1995. The sole cause of moderate impairment was excessive total suspended solids. No change in water quality is likely to result from designation.

Minerals

Known deposits of sand, gravel, Pierre shale, and gemstone resources are found along Rapid Creek. The leasable minerals potential is low. The federal government does not own the subsurface minerals rights along the eligible segment of the creek. Since the mineral ownership is the dominant estate, the Forest Service would be limited in applying restrictions on mineral development where the mineral ownership is non-federal.

Timber

No commercial timber cutting or firewood collection has been or would be allowed along this stretch of Rapid Creek.

Fisheries and Wildlife

Fish species known to occur in this stretch of Rapid Creek include the longnose dace, channel catfish, fathead minnow, sand shiner, flathead chub, and shorthead redhorse. Wildlife species include many species of birds, reptiles, amphibians, and mammals. Designation likely would have no effect on fish or wildlife species.

Recreation, Scenic, and Subsistence

The scenic qualities of Rapid Creek along this stretch would be maintained under designation. Designation would increase public awareness, which may increase recreational use. Trapping would not be prohibited under designation.

Effects of Nondesignation

Nondesignation would not affect management or the unique features of this segment of Rapid Creek.

Suitability Factor Number 4: Public, state, and local government interests.

The Sierra Club publicly supports designation of this segment of Rapid Creek. State and local government agencies have neither publicly supported nor opposed designation.

Suitability Factor Number 5: Estimated costs of land acquisition and management as a Wild and Scenic River.

Installation of signs would be necessary to identify this stretch of Rapid Creek as part of the Wild and Scenic River System. In addition, a river management plan would be written. Estimated cost for sign installation on both sides of this segment of Rapid Creek is $500. Estimated costs for preparing a river management plan are $2,000. No land acquisition along or near this stretch of Rapid Creek is planned.

Sheyenne (Dakota Prairie Grasslands)

Description: The Sheyenne River flows entirely in North Dakota, arising in central North Dakota and emptying into the Red River near Fargo. The river has helped carve a spectacular valley 100 to 150 feet deep and a quarter-mile to a mile wide. While much of the land bordering the river is plowed, other sections, especially near the Sheyenne Sandhills (including the Sheyenne National Grassland) are amply wooded, with oak, green ash, and other deciduous species.

Extensive botanical surveys have been conducted in the Sandhills segment of the Sheyenne River, revealing numerous natural areas and many rare species occurrences. The area contains valuable zoological resources. Wildlife include Canadian geese, kingfishers, beaver, mink, wild turkey, and deer. The adjacent Sheyenne National Grassland contains the vast majority of the rare animal and plant occurrences found in the Sheyenne River Valley, including biotically rich lowland forests, fens, wetland thickets, low prairie, and oxbow wetlands. The area along the Sheyenne River has one of the most westerly occurrences of eastern hardwood forest species in the nation.

According to physical evidence, the Sheyenne River Valley has been occupied by people since the retreat of the last great glacier more than 10,000 years ago. Many prehistoric artifacts have been recovered and are among the oldest recovered in the state. Some sites may hold the key to understanding the transition of prehistoric people into the modern American Indian tribes of today. The general area is considered an historic transition region between Woodland and Plains cultures.

Euro-Americans occupied parts of the area during the fur trade era, especially during the first several decades of the nineteenth century. Homesteaders arrived with the advance of the Northern Pacific Railroad in the 1870s and 1880s. Settlement in the area continued through World War I.

Several state historic sites and National Register listings are associated with the river.

Invertebrate and vertebrate fossils have been found along the river, including bison remains in river deposits.

The Sheyenne River supports a considerable sports fishery, including channel catfish, northern pike, sauger, walleye, black bullheads, and smallmouth bass. It also provides a great deal of forage production and moderate reproduction for several sports species. No federally threatened or endangered fish species occur in the river, although eight, state-listed rare species do live in the Sheyenne River and its tributaries.

The Sheyenne River receives a substantial level of recreational use, including sight-seeing, fishing, and canoeing.

The river is generally eutrophic and seasonally poor in water quality, except during high release periods from the upstream dam on Lake Ashtabula.

The river contains a wide bottomland hardwood forest and wooded ravines. Such species as boxelder, green ash, basswood, hackberry, burr oak, ironwood, willow, and aspen are found in the area. The Sheyenne River Valley also supports one of the last forests in the nation to contain a large percentage of American elm.

The density of breeding waterfowl exceeds that of similar streams in the watershed and compares favorably with all streams statewide. The forested riparian zone also provides valuable habitat for wood ducks.

Eligibility: The eligible segment of the Sheyenne River is located in Township 135 North, Range 52 West, Sections 4 and 6, and Township 135 North, Range 53 West, Sections 1-2, 11 and 14-15.

Potential Classifications: Approximately two miles of the Sheyenne River that either border or flow fully within lands administered by the USDA-Forest Service were inventoried for the Wild and Scenic River System. These river sections hold a potential classification as recreational. Outstandingly remarkable features include the occurrence of threatened, endangered, or

sensitive plant species; archeological, hydrologic and ecological values; and a significant fisheries resource.

Alternatives

- Alternative 1: Not recommended for designation.
- Alternative 2: Not recommended for designation.
- Alternative 3: Not recommended for designation.
- FEIS Alternative 3: Not recommended for designation.
- Alternative 4: Recommended for a designation with a recreational classification.
- Alternative 5: Not recommended for designation.

Suitability

Suitability Factor Number 1: Characteristics that do or do not make the area a worthy addition to the National Wild and Scenic River System.

Ecologically, this area is quite unique. A significant American elm component in a generous, hardwood bottoms woodland exists on this stretch of the Sheyenne River. A high density of rare and sensitive plants and wildlife occur, including daces, ferns, and the lady slipper. The setting is quite unique for the Great Plains, with a number of special plant communities not often found on most other areas in the Great Plains. Fens, oxbows, and seeps create habitat for rare plants along the river. Overall, there is a high degree of natural diversity. A high scenic quality characterizes the area, with an abundance of color, especially in the autumn. The opportunity for nature study is very high.

The small length of public ownership along the river may argue for its exclusion from the Wild and Scenic River System. In adjacent stretches of the river in private ownership, a great deal of woodlands clearing has occurred, fragmenting the riverine forest. The water quality of the Sheyenne River is very low, mainly as a result of agricultural practices. Turbidity is high, and the water contains high levels of farm chemicals. A number of feed lots drain into the Sheyenne River Basin. The river's stream flow regime is highly regulated, primarily due to the upstream impoundment at Lake Ashtabula. There is no natural stream-flow regime on this stretch of the river.

Suitability Factor Number 2: Current status of landownership and use in the area including the amount of private land and the uses of such land.

Landownership in the area is intermingled, with federal (U.S. Forest Service), state, and private landowners sharing river front. Public ownership on both sides of a river stretch is uncommon. The state owns the Sheyenne River corridor from high water mark to high water mark.

Suitability Factor Number 3: Foreseeable potential uses of the land and water that would be enhanced, foreclosed, or curtailed by designation and values that would be foreclosed or diminished if the area is not protected as part of the National Wild and Scenic River System.

Transportation

No change in transportation along the river is anticipated should the stretch be designated. Recreational canoeing would still occur on a fairly frequent basis.

Water

Designation of this stretch of river may affect management of other watersheds along the Sheyenne River, especially upstream. Designation could affect upstream water usage, like storage, irrigation, and drainage.

Minerals

No change in minerals use is anticipated. No mining (including gravel) currently occurs within this stretch of the river. Although the Wild and Scenic Rivers Act does not prohibit mining within recreational river segments, no mining is expected under designation.

Timber

No change in management of the hardwood forest would be anticipated under designation.

Fisheries and Wildlife

Designation could enhance habitat for fisheries, mainly resulting from necessary adjustments to grazing systems along nearby tributaries (Iron Springs Creek and Berg Creek).

Recreation, Scenic, and Subsistence

No change in management for recreational, scenic, or subsistence purposes would be anticipated under designation. No campgrounds are found on this stretch of the river, and none would likely be planned. Trapping would not be prohibited under designation.

Effects of Nondesignation

Continued degradation of river banks from upstream uses would be anticipated without designation. Without designation, continued degradation along tributaries (Iron Springs Creek and Berg Creek) would also be anticipated.

Suitability Factor Number 4: Public, state, and local government interests.

The U.S. Corps of Engineers is developing an outlet for Devils Lake, a closed basin in northeastern North Dakota. The outlet would drain into the Sheyenne River. When completed, probably in the next few years, continued high flows along the Sheyenne River are anticipated. This increase in stream flow will likely increase degradation of the river's banks. Designation might affect how any future bridges built over this stretch of the Sheyenne River would be designed. Although scenic in nature, the Sheyenne River is not designated as a State Scenic River.

Suitability Factor Number 5: Estimated costs of land acquisition and management as a Wild and Scenic River.

The U.S. Forest Service may need to purchase about one mile of public easement along the river in order to restrict certain private uses of the land along the river. Cost is estimated at about $20,000. A river management plan may also need to be written. Estimated cost to develop such a plan is $10,000. In addition, signs identifying this stretch as a Wild and Scenic River might need to be completed. Annual management is estimated at about $500. No land acquisitions are planned.

BIOLOGICAL ASSESSMENT AND EVALUATION

FOR

REVISED LAND AND RESOURCE MANAGEMENT PLANS

AND

ASSOCIATED OIL AND GAS LEASING DECISIONS

Little Missouri National Grassland
Sheyenne National Grassland
Cedar River National Grassland
Grand River National Grassland
Denbigh Experimental Forest
Souris Experimental Forest
Buffalo Gap National Grassland
Fort Pierre National Grassland
Oglala National Grassland
Nebraska National Forest
Samuel R. McKelvie National Forest
Thunder Basin National Grassland

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December 2000

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Appendix H Biological Assessment and Evaluation

Section 1. Introduction

Land and Resource Management Plans (LRMP) provide long-term management direction and land allocation for National Forest System (NFS) lands. Federal regulations (36 CFR 219) require that LRMPs be revised on a 10 to 15 year cycle. To respond to this regulatory requirement, revised LRMPs for eight National Grasslands, two experimental forests and two National Forests on the northern Great Plains have been prepared. In addition, oil and gas leasing decisions, including direction on what lands are available to be leased, what stipulations will apply, and the decision to authorize Bureau of Land Management to lease the lands will be made for five areas. BLM will make leasing decisions for certain lands under their jurisdiction within these five areas.

Section 2 of the Endangered Species Act (ESA) mandates that "all federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act." Section 5 of ESA directs the Secretary of Agriculture to establish and implement a program to conserve fish, wildlife, and plants, including those protected under the Act. Section 7 of the Act directs all federal agencies to utilize their authorities in furtherance of the purposes of the Act by carrying out programs for the conservation of endangered and threatened species. Section 7 also directs departments and agencies to ensure that their actions are not likely to jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of their critical habitats. It also requires all federal departments and agencies to consult with the Secretary of Interior or Secretary of Commerce (marine species only) whenever an authorized action is likely to affect a listed or proposed species and / or its critical habitat. The **biological assessment** portion of this specialist report is the internal process used by the Forest Service to determine if proposed actions, a preferred LRMP alternative (Alternative 3) in this case, jeopardize any plant or animal species protected under the Act or proposed for such protection, and if consultation with the Secretary of Interior is necessary.

It is also the policy of the Forest Service (FSM 2670.32) to avoid or minimize impacts to species whose viability has been identified as a concern (sensitive species). Viability concerns have been identified for a relatively large number of Great Plains plant and animal species that are not currently protected under ESA. The **biological evaluation** portion of this specialist report discloses the predicted effects of management direction and decisions in the revised LRMPs and oil and gas leasing decisions on sensitive species. Alternative 3 is summarized as follows:

> This multiple-use alternative would modify the current Management Plan direction by adopting additional special area designations, such as Research Natural Areas, Special Interest Areas, and placing added emphasis on native plants and animals and recreation opportunities.

Alternative 3 is explained in more detail in Chapter 2 of the FEIS, and management direction under the preferred alternative is presented in the revised LRMPs.

Under Alternative 3, direction pertaining to oil and gas development is provided and includes direction on what lands are available for leasing, which specific lands are authorized for leasing, and what lease stipulations will apply to protect other resources, including biological resources. Oil and gas decisions are made for the Little Missouri, Cedar River, Thunder Basin and Oglala National Grasslands, and portions of the Grand River and Buffalo Gap National Grassland. The oil and gas analysis includes all federal oil and gas mineral ownership within those units whether federal or non-federal surface ownership. Accordingly, this biological assessment and evaluation applies to all lands with federal mineral ownership within the boundaries of the planning units for which oil and gas decisions are being made.

Forest Service and Bureau of Land Management (BLM) both make oil and gas leasing decisions based on the referenced analysis and this biological assessment. The Forest Service leasing decisions apply only to Federal minerals under Federal surface. In conjunction with the Forest Service, BLM also makes leasing decisions for Federal minerals under federal surface. Additionally, BLM makes a leasing decision for Federal minerals under non-federal surface within the boundaries of national grasslands and forests. BLM is responsible for implementing the leasing decisions by offering leases for sale and issuing them once they are sold. Implementation of the leasing decisions is not part of the LRMP revision process. However, leases are advertised for sale and issued consistent with the direction provided in the leasing decisions and the analysis on which the decisions are based.

Ground-disturbing activities are not authorized under the leasing decisions. Under the oil and gas leasing regulations at 36 CFR 228.102, ground disturbing activities can only be authorized upon approval of an Application for Permit to Drill (BLM) and accompanying Surface Use Plan of Operations (Forest Service). Such approval requires both Forest Service and BLM compliance with the National Environmental Policy Act and other applicable laws and regulations, including the ESA, at the time the action is proposed.

The analyses and results presented in this report were conducted by Forest Service biologists and botanists and represent the biological findings (determinations) of the Forest Service for threatened, endangered, proposed, candidate, and sensitive species. These species, plus those listed under state endangered species laws, are collectively referred to as “species at risk” in this report and in the FEIS and revised LRMPs. The list of federally threatened, endangered, and proposed species in the planning area was recently updated (September 8, 2000) by the U.S. Fish and Wildlife Service. The biological determinations in this report are based on the predicted effects of the management direction in the revised LRMPs and associated oil and gas leasing

decisions on each of these species. This biological assessment and evaluation is intended to be dynamic and may be updated when any of the following occur:

- A LRMP and/or oil and gas leasing decision is amended or revised,
- Additional species are brought under the protection of ESA,
- Additional species are proposed for protection under ESA,
- Critical habitat is designated or proposed,
- New significant information on a listed or proposed species becomes available,
- Additional species are identified as sensitive by the Forest Service,
- Occurrence of a listed, proposed, candidate, or sensitive species on a national grassland or forest where it had not been previously reported.

Area Affected

This biological assessment and evaluation addresses a combined planning effort for the following national grasslands and forests:

- Dakota Prairie Grasslands (administrative unit)
  - Little Missouri National Grassland (LMNG)*
  - Sheyenne National Grassland (SNG)
  - Grand River and Cedar River National Grasslands (GR/CRNG)*
- Medicine Bow-Routt National Forest (administrative unit)
  - Thunder Basin National Grassland (TBNG)*
- Nebraska National Forest (administrative unit)
- Oglala National Grassland (ONG)*
- Fort Pierre National Grassland (FPNG)
- Buffalo Gap National Grassland (BGNG)*
- Nebraska National Forest - Pine Ridge Ranger District (NNF-PRRD)
  - Nebraska National Forest – Bessey Ranger District (NNF - BRD)
  - Samuel R. McKelvie National Forest (SRMNF)

* Oil and gas leasing decisions apply to these planning units.

Two small experimental forests in North Dakota, Denbigh and Souris, are also administered as part of the Dakota Prairie Grasslands.

In this document, the term “planning unit” is used to refer to individual national grasslands or forests listed above. The term “planning area” refers collectively to the states of North Dakota, South Dakota, Nebraska, and Wyoming. The planning units combined encompass nearly three million acres, widely scattered over the four states. The planning area encompasses 250 million acres within Montana, Wyoming, North Dakota, South Dakota, and Nebraska. Although these public lands account for just over one percent of the northern plains, they are important for the ecological values, products, recreation, and educational opportunities they provide. These unique units of the National Forest System incur demands for livestock grazing, recreation, oil, gas, and mineral production and are recognized as significant contributors to the livelihoods

and life-styles of local citizens. They are also recognized as an important ecological resource and as significant contributors to wildlife habitat and biological diversity on the Great Plains, a region where federal and other public lands with conservation mandates are relatively small components of the larger landscape (Sieg et al. 1999).

From a broad-scale perspective, more than half of the ecosystems in this country that are determined to be critically endangered (more than 98% loss or degradation) are grasslands and an additional 24% are shrublands (Noss et al. 1995). The Great Plains, once the continent's largest ecosystem and considered by many to be the most characteristic of the United States, is now one of most altered and fragmented grassland ecosystems (USDA Forest Service 2000, Ostlie et al. 1997). Approximately 60% of the grasslands on the Great Plains have been converted to row-crop agriculture (Lauenroth et al. 1999). Wetland and aquatic resources within this region have also undergone major impacts from a host of factors including pollution, waste disposal, irrigation, drainage, power generation (Northern Great Plains Aquatic Assessment, Ostlie et al. 1997). A closer look at the amount of grasslands lost in the states within the northern plains is presented below:

Table H-1. Decline in Grassland Acres in the Northern Plains States.

Prairie Type and State	Past Area (acres)	Current Area (acres)	Decline (percent)
Tall-grass			
Nebraska	15,067,000	303,800	98.0
South Dakota	6,422,000	49,400	99.2
North Dakota	321,100	300	99.9
Mixed-grass			
Nebraska	190,190,000	4,693,000	75.3
South Dakota	3,952,000	1,185,600	70.0
North Dakota	35,074,000	11,115,000	68.3
Short-grass			
South Dakota	442,100	287,400	35.0
Wyoming	7,410,000	5,928,000	20.0

Sources: USDA Forest Service 2000 and Samson et al. (1998).

In addition to the loss of grasslands, much of the remaining grasslands and shrublands are being invaded by aggressive and non-native plant species, at the expense of native flora and fauna. The suppression and alteration of major ecological disturbances, primarily fire and herbivory, that helped shape today's biological communities across the Great Plains also add to the cumulative impacts to many of the species at risk in this region (USDA Forest Service 2000, Ostlie et al. 1997).

Biological Assessment and Evaluation Process

Supporting Information and Pre-field Review

Three lists of plant and animal species were developed. These lists included both terrestrial and aquatic plant and animal species. The first list is presented in **Table H-2** and includes those species currently protected under the Endangered Species Act and at risk of extinction throughout their range (range-wide imperilment). The second list in **Table H-3** includes those species that are candidates for listing under ESA or ranked by The Nature Conservancy and Natural Heritage Program (TNC / NHP) as G-2 (imperiled) or G-3 (vulnerable) species. These species may also be at risk of range-wide imperilment. The third and final list in Table H-6 includes species that may be at risk regionally or at a state level. Region 1 and / or 2 of the Forest Service classifies many of the species in **Table H-3** and Table H-6 as sensitive. The occurrence of each species on each individual National Grassland and Forest is also presented in each of the three tables. In addition to the Northern Great Plains Terrestrial and Aquatic Assessments, numerous other information sources were consulted or contacted to help develop these lists. These sources included but were not limited to: U.S. Fish and Wildlife Service, Bureau of Land Management, state wildlife agencies, Forest Service records, TNC / NHP databases, other government agency lists, species lists of various conservation organizations, species specialists, and published and unpublished scientific references. Many of the published references summarized museum records. A committee of scientists also reviewed these lists for accuracy and completeness. Where available, information on the distribution of species within individual national grasslands and forests was compiled and mapped.

Information on species at risk and their habitats was obtained from a large volume of published and unpublished references (see *References Consulted* section at the end of this document). The following websites were searched for information on each species at risk:

- Northern Plains Wildlife Research Center (www.npwrc.usgs.gov).
- Association for Biodiversity Information (www.natureserve.org).
- Great Plains National Grasslands (www.fs.fed.us / r2 / nebraska / gpng).

Species specialists were also consulted for several species. Throughout the biological assessment and evaluation process, FS biologists and botanists consulted with biologists from the U.S. Fish and Wildlife Service on habitat and management needs for listed, proposed and candidate plant and animals species. This information was used to help support the biological determination process and to identify conservation measures needed in the revised LRMPs to provide for the recovery and viability of species at risk on the national grasslands and forests. Forest Service biologists also consulted with BLM biologists and staff specialists regarding oil and gas development effects on species at risk and lease stipulations to protect biological resources. The draft biological assessment and evaluation was also sent to BLM for their review and comments.

Several recent broad-scale assessments also provided valuable context, as well as species information, in support of the biological assessment and evaluation. These assessments included:

- Northern Great Plains Terrestrial Assessment (USDA Forest Service 2000).
- Northern Great Plains Aquatic Assessment (Johnson 1998).
- An Ecological History of the Northern Plains (unpublished Forest Service report).
- The Status of Biodiversity in the Great Plains (Ostlie et al. 1997).
- Rare Plant Communities of the Northern Plains (Faber-Langendoen et al. 1997).
- The U.S. Northern Great Plains Steppe Assessment Map (Chuluun et al. 1997).
- America's Northern Plains: An Overview and Assessment of Natural Resources (Natural Resources Conservation Service 1996).
- Our Living Resources: a Report to the Nation on the Distribution, Abundance, and Health of U.S. Plants, Animals, and Ecosystems (LaRoe et al. 1995).
- Status and Trends of the Nation's Biological Resources (Mac et al. 1998).
- Terrestrial Ecoregions of North America: a Conservation Assessment (Ricketts 1999).
- Freshwater Ecoregions of North America: a Conservation Assessment (Abell 2000).

In addition to the broad-scale assessments listed above, numerous other key references also provided valuable insights and broad-scale information on species at risk, biological communities, and / or habitat conditions and trends across the Great Plains. These publications included:

Bogan, M.A. 1995. A biological survey of Fort Niobrara and Valentine National Wildlife Refuges. USDI National Biological Service, Final Report. 193pp.

Grossman, D.H., and K.L. Goodin. 1995. Rare terrestrial ecological communities of the United States. Pages 218 – 221 in LaRoe et al. Our living resources: a report to the nation on the distribution, abundance, and health of U.S. plants, animals and ecosystems. USDI National Biological Service. 530pp.

Joslin, G., and H. Youmans (coordinators). 1999. Effects of recreation on Rocky Mountain wildlife: a review for Montana. Montana Chapter of The Wildlife Society. 307pp.

Knight, R.L., and K.J. Gutzwiller. 1995. Wildlife and recreationists: coexistence through management and research. Island Press, Washington, D.C. 372pp.

Laurenroth, I.C. Burke, and M.P. Gutmann. 1999. The structure and function of ecosystems in the central North American grassland region. Great Plains Research, 9(2):223-260.

Pederson, R.L., D.G. Jorde, and S.G. Simpson. 1989. Northern Great Plains. Pages 281-310 In L.M. Smith, R.L. Pederson, and R.M. Kaminski (eds.) Habitat management for migrating and wintering waterfowl in North America.

Peterjohn, B.J., J.R. Sauer, and S. Orsillo. 1995. Breeding bird survey: population trends 1966-92. Pages 17 – 21 in LaRoe et al. Our living resources: a report to the nation on the distribution, abundance, and health of U.S. plants, animals and ecosystems. USDI National Biological Service. 530pp.

Robson, D.B. 1999. Reasons for prairie plant rarity. Pages 92 – 95 in J. Thorpe et al. (eds.). Proceedings of the fifth prairie conservation and endangered species conference. Provincial Museum of Alberta, Natural History Occasional Paper No. 24. 384pp.

Samson, F.B, and F.L. Knopf, (eds). 1996. Prairie conservation: conserving North America's most endangered ecosystem. Island Press, Washington D.C. 339pp.

Sidle, J.G. 1999. Species of concern on the North American Great Plains and their occurrence on national grasslands. Pages 349 – 353 in J. Thorpe et al. (eds.). Proceedings of the fifth prairie conservation and endangered species conference. Provincial Museum of Alberta, Natural History Occasional Paper No. 24. 384pp.

Sieg, C.H., C.H. Flather, and S. McCanny. 1999. Recent biodiversity patterns in the Great Plains: implications for restoration and management. Great Plains Research, 9(2):277-314.

From these sources and others we learned that across the United States, grassland and shrubland birds are experiencing the most widespread declines of any group of species and that conservation measures are needed to reverse these significant downward trends (Peterjohn et al. 1995, Knopf 1995). We also found out that the Great Plains is one of the most impacted and altered ecoregions on earth. These broad-scale assessments were also useful references for helping identify the primary threats to species at risk and their habitats across the Great Plains, and each of the assessments listed above is maintained as part of the administrative record for the revised LRMPs.

The broad-scale assessments and the additional references listed above were especially useful in helping identify direct, indirect, and cumulative effects and impacts to species at risk in the northern Great Plains planning area. Another important information source consulted during the biological assessment and evaluation process for several wildlife species was a working draft of "*Species of Common Conservation Concern in North America*" prepared under the guidance and facilitation of the Commission for Environmental Cooperation. The Commission was formed because of the North American Agreement on Environmental Cooperation (Canada, Mexico, United States). This draft provided scientific information compiled by species experts on the conservation needs of many migratory and transboundary species. Recovery plans for each of the threatened and endangered species and the 12-month administrative findings reports from the U.S. Fish and Wildlife Service were also key references for species classified as candidates for ESA protection.

A geographic information system (GIS) was developed to support this planning effort. This system included basic soils, water, topography, and vegetation information. The information was used to help evaluate the quantity and quality of potential habitat for species at risk. Information on the documented distribution of species at risk on each national grassland and forest was also included in the system and used for analysis to support this biological assessment and evaluation.

Field Reconnaissance

Surveys and inventories for listed and proposed species like the black-footed ferret, bald eagle, American burying beetle, blowout penstemon, mountain plover, Ute ladies' tresses and western prairie fringed orchid have been conducted for many years by various individuals, organizations, and government agencies. They include, but are not limited to, the Forest Service, U.S. Fish and Wildlife Service, universities, and state wildlife and natural resource agencies. Incidental sightings of species like the whooping crane have also been recorded.

Additional surveys and inventories have been conducted by the Forest Service and/or others for species like the swift fox, sturgeon chub, greater prairie chicken, sage grouse, California bighorn sheep, western burrowing owl, regal fritillary butterfly, tawny crescent butterfly, Barr's milkvetch and Dakota buckwheat. Many surveys focused on candidate species and species designated as sensitive by the Forest Service. The Forest Service has surveyed and inventoried black-tailed prairie dog colonies for many years.

Information gathered from these surveys, inventories, and observations was used to help describe and determine species distributions, habitat use, and habitat suitability.

Analysis of Effects

The expected effects to species at risk under Alternative 3 are disclosed in this document. These evaluations include direct, indirect, and cumulative effects. Cumulative effects are described at the scale of the northern Great Plains planning area, unless otherwise specified. Interrelated and interdependent actions are also identified and considered. The effects, expressed as biological determinations, are based on the assumption that the conservation measures, standards and guidelines in the revised LRMPs, are fully implemented and strategically located to benefit species at risk. Although it's acknowledged that objectives are not in themselves on-the-ground conservation measures, like standards and guidelines, they are included in the Conservation Measures section in each species or guild evaluation. Monitoring direction is also included in the Conservation Measures section of each evaluation.

Biological assessments and evaluations prepared by the Forest Service during the mid 1990s for the reissuance of a large number of livestock grazing permits in the planning area were valuable references and are maintained as part of the administrative record for this planning effort. These documents provided considerable information on the direct, indirect, and cumulative effects of livestock grazing on many of the species addressed in this biological assessment and evaluation.

The number of plant and animal species listed in Table H-2, Table H-3, and Table H-6 is relatively large. To reduce the amount of unnecessary analyses, any species listed in the tables that meet one or both of the following criteria (screens) was eliminated from further detailed analyses:

- Screen 1 - (Importance of Area)
- Presence of the species is questionable or incidental and/or the presence of potential and suitable habitat on or near the national grassland or forest is unknown or questionable or the amount of potential and suitable habitat is negligible.
- Screen 2 - (Threats)

- The species or potential and suitable habitat for the species may occur, but it's highly unlikely that land uses and allocations authorized by the Forest Service would significantly affect the species and / or its habitat either on NFS lands or downstream.

Those species eliminated from further detailed analyses are listed near the beginning of Sections 2, 3, and 4.

Effects of the programmatic management direction in the revised LRMPs for the following management activities were evaluated for the species listed in the three tables:

- Livestock grazing.
- Vegetation management.
- Plant and animal damage control.
- Fish and wildlife management.
- Recreation management.
- Travel and motorized use.
- Special area designation.
- Existing and projected oil and gas development (effects of management direction and final leasing decisions).

Effects analyses were conducted using information and data gathered in the pre-field review and field reconnaissance, in conjunction with information from both published and unpublished references, species specialists, and experienced Forest Service biologists and botanists.

Effects were analyzed for each individual species listed in Table H-2 and Table H-3 and most species in Table H-6. Effects analyses for many of the plant species in Table H-6 were discussed and presented for guilds or plant groups.

Biological Determinations

This biological assessment and evaluation process culminates with a biological determination of the likely effects of each alternative on each species or plant guild. The determinations and not the natural history information in this document are intended to be the focus of this assessment and evaluation. The primary purpose was not to reiterate and document the complete life histories of each species but to document the determinations and the most relevant information supporting each determination. The types of determinations that can be made for those species protected under ESA are determined by the U.S. Fish and Wildlife Service and National Marine Fisheries Service (1998). The determinations (and abbreviations) made for federally listed and proposed species are as follows:

- No effect.
- Is not likely to adversely affect.
- Is likely to adversely affect.
- Is likely to jeopardize a proposed species / adversely modify proposed critical habitat.
- Is not likely to jeopardize a proposed species / adversely modify proposed critical habitat.

Direction in Forest Service Manual 2670 establishes the types of determinations for Forest Service-designated sensitive species. The determinations (and abbreviations) made for these species are as follows:

- No impact.
- Beneficial impact.
- May adversely impact individuals but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide.
- Likely to result in a loss of viability on the planning area, in a trend to federal listing, or in a loss of species viability range-wide.

The determination options presented above for sensitive plant and animal species relate primarily to the impacts of Alternative 3 on the viability of sensitive species populations on each national grassland and forest within the planning area. The determination option for each species or plant guild is chosen after considering the likely effects or impacts of human activity, direct mortality risks, and habitat conditions (quality, quantity, and distribution). The merits and rationale for the biological determination for each species or plant guild were evaluated by several Forest Service biologists and botanists with the final determination for each species being the primary responsibility of the biologist or botanist from the respective administrative unit. It's important to point out that selection of the "may adversely impact individuals but not likely to result in a loss of viability..." determination does not imply mortality and may relate to indirect effects on individual animals.

All biological determinations assume that the conservation measures and management direction (both standards and guidelines) specified in the EIS or LRMPs will be implemented in a timely manner or evaluated at the site-specific project level and implemented if biologically appropriate. It's also assumed that objectives will be met in a timely manner or that measurable progress will be made in meeting the objectives over the next 10 to 15 years. It's also assumed that monitoring will be conducted as indicated in Chapter 4 of the LRMPs to determine the effectiveness of management direction. If some of these assumptions prove to be incorrect, the probability that some of the biological determinations made in this document are inaccurate will likely increase.

Specific biological determinations are not made for those species in Table H-3 and Table H-6 that are not designated as sensitive by the Forest Service. However, the expected effects are still evaluated and discussed.

Risk Assessment

In addition to the biological determinations discussed above, Forest Service biologists and botanists completed a risk assessment to further characterize the anticipated effects of Alternative 3 on population viability. The primary purpose of the assessment was to obtain additional information to be used to help establish monitoring priorities. Those species with higher risk levels would be higher priorities for monitoring. The assessment was completed for most threatened, endangered, proposed and sensitive species known to occur on or in the vicinity of each national grassland and forest and consisted of biologists and botanists selecting from the following menu of risk outcomes:

- **Outcome I** Implementation of Alternative 3 will eventually provide for habitat of sufficient quality, quantity, and distribution on and in the vicinity of the national grassland or forest to help maintain well-distributed populations of the species across its range on the planning unit. The concept of well distributed must be based on the distribution of potential and suitable habitat on the planning unit. Land uses are managed to avoid or reduce direct and indirect threats, and other factors such as disease, competition, or invasion of exotic species are not recognized as significant threats. There's no need for re-introductions, transplants or supplemental stocking since any unoccupied but suitable habitat will likely be repopulated through dispersal.
- **Outcome II** Implementation of Alternative 3 will eventually provide for habitat of sufficient quality, quantity and distribution on and in the vicinity of the national grassland or forest to help maintain populations of the species distributed across its range on the planning unit. However, some local populations or sub-populations may be at risk in localized areas due to management activities and / or reduced habitat quality and quantity. Land uses are managed to avoid or reduce direct and indirect threats in most areas, and other factors such as disease, competition, or invasion of exotic species may be local concerns but are not recognized as significant and widespread threats. The species will likely repopulate suitable but unoccupied habitats on the planning unit, and there's no need for re-introductions, transplants or supplemental stocking.
- **Outcome III** Implementation of Alternative 3 will eventually provide habitat of sufficient quality, quantity and distribution on and in the vicinity of the national grassland or forest to help maintain some populations of the species but with significant gaps in the historic distribution across the planning unit. Under Alternative 3 these gaps are likely to remain and will result in some limitation of interactions among local populations. Land uses are managed to avoid or reduce direct and indirect threats in some areas, and threats from other factors such as disease, competition, or invasion of exotic species may be local concerns but are not recognized as significant and widespread threats on the planning unit. Habitat enhancement and reintroductions or transplants may be needed to restore the potential distribution of the species in suitable but unoccupied habitat in the planning unit. Successful reintroductions or transplants of this species have been demonstrated.
- **Outcome IV** Implementation of Alternative 3 will eventually provide habitat of sufficient quality, quantity and distribution on and in the vicinity of the national grassland or forest to help maintain some populations of the species across its range on and in the vicinity of the national grassland or forest but with significant gaps in the historic distribution. Under Alternative 3, these gaps are likely to remain and will result in some limitation of interactions among local populations. Land uses are managed to avoid or reduce direct and indirect threats across some of the species' habitat on the planning unit, and threats from other factors such as disease, competition, or invasion of exotic species may be local concerns but are not recognized as significant and widespread threats on the planning unit. Habitat enhancement and reintroductions or transplants may be needed to restore the potential distribution of the species in suitable but unoccupied habitat on the planning unit. Successful reintroductions or transplants have not been demonstrated.

Risk Assessment, cont.

- **Outcome V** Implementation of Alternative 3 will most likely result in the species eventually existing in refugia on or in the vicinity of the national grassland or forest with strong limitations on interactions among local populations. Land uses may be managed to avoid or reduce direct and indirect threats but only in localized areas, and threats from other factors such as disease, competition or invasion of exotic species may be recognized as significant and widespread threats on the planning unit. Possible extirpation in response to environmental extremes or stochastic events such as prolonged drought, flooding, or hail cannot be ruled out. Habitat enhancement and reintroductions or transplants will be needed to restore populations and recover the potential distribution of the species in suitable but unoccupied habitat on the planning unit. Successful reintroductions or transplants have been demonstrated.
- **Outcome VI** Implementation of Alternative 3 will most likely result in the species eventually existing in refugia on or in the vicinity of the national grassland or forest with strong limitations on interactions among local populations. Land uses may be managed to avoid or reduce direct and indirect threats but only in a few localized areas, and threats from factors such as disease, competition or invasion of exotic species may be recognized as significant and widespread threats on the planning unit. Possible extirpation from the planning unit as a result of environmental extremes or stochastic events such as a prolonged drought, flooding, or hail cannot be ruled out. Habitat enhancement and reintroductions or transplants will be needed to restore populations and recover the potential distribution of the species in suitable but unoccupied habitat on the planning unit. Neither reintroductions nor transplants have been successfully demonstrated.

These outcomes are progressively ordered so that Outcome I represents those conditions with the highest probability of providing for well-distributed populations on or in the vicinity of the national grasslands or forests over the next 10 to 15 years, while Outcome VI includes those conditions with the lowest probability of providing for well distributed populations. Under Outcome VI, extirpation of the species from the vicinity of the national grassland or forest could occur as a result of a catastrophic event such as a widespread hailstorm, wildfire, flood or extended and serious drought. For most species, a single outcome was selected, but because of a higher level of uncertainty, two outcomes were identified for some species. It's acknowledged that, due to the multiple criteria within each outcome, some criteria in a selected outcome for an individual species may not apply. The selected outcome simply represents what is believed to be the "best fit" under the management direction prescribed under Alternative 3. No outcomes were selected and presented in this document for those situations where a "no effect" or "no impact" determination is made because of the absence or apparent absence of a species. Outcomes are only provided for those species known or confirmed to occur on the national grasslands or forests in the planning area. Like the biological determinations, the merits and rationale for the risk assessment for each species or plant guild were evaluated by several Forest Service biologists and botanists with the final risk assessment for each species being the primary responsibility of the biologist or botanist from the respective administrative unit.

Section 2. Biological Assessment for Species Protected Under the Endangered Species Act and at Risk of Range-wide Imperilment

Table H-2. Species Protected Under the Endangered Species Act and at Risk of Range-wide Imperilment.

	National Grassland or Forest									
Species	**LMNG**	**GRCRNG**	**SNG**	**TBNG**	**BGNG**	**FPNG**	**ONG**	**NNF PRRD**	**NNF BRD**	**SRMNF**
Blowout penstemon									K	PSH
Western prairie fringed orchid			K						PSH	PSH
Ute ladies'-tresses				PSH	PSH					
American burying beetle						PSH			K	P
Whooping crane	K	P			K	K	PSH	PSH	PSH / OS	PSH / OS
Bald eagle	K	K	K	K	K	K	K	K	K	K
Black-footed ferret	PSH	PSH		PSH	K	PSH	PSH		PSH	PSH
Mountain plover				K	PSH		PSH			
Topeka shiner									PSH / OS	PSH / OS

K = Known occurrence in vicinity; date of last observation suggests that species still occurs in area,

P = Possible but unconfirmed occurrence,

PSH = Species occurrence is unlikely or questionable; within species range and potential or suitable habitat may occur,

OS = Possible off-site occurrence (downstream, etc.)

Species Eliminated From Further Analysis

Screen 1 (Importance of Area)

Buffalo Gap National Grassland = Blowout Penstemon (Penstemon haydenii)

- Rationale: This species has not been reported on or near the Buffalo Gap National Grassland. Although the FWS included blowout penstemon on the species list for this area, the FS is unaware and does not suspect any potential or suitable habitat on or near this area. FS will consult with FWS if the species or potential or suitable habitat is eventually found on or near the national grassland.

Buffalo Gap National Grassland = Ute Ladies' Tresses (*Spiranthes diluvialis*)

- Rationale: This species has not been reported on or near the Buffalo Gap National Grassland. Although the FWS included Ute ladies' tresses on the species list for this area, the FS is unaware and does not suspect any potential or suitable habitat on or near this area. FS will consult with FWS if the species or potential or suitable habitat is eventually found on or near the national grassland.

Fort Pierre National Grassland = American Burying Beetle (*Nicrophorus americanus*)

- Rationale: Surveys for this species were conducted in 1993 on the Fort Pierre National Grassland, but no occurrences were or have been reported on or near this area. FS will consult with FWS if the species is eventually found on or near the national grassland.

Nebraska National Forest (Bessey Ranger District) and Samuel R. McKelvie National Forest = Black-footed Ferret (*Mustela nigripes*)

- Rationale: There are no current or historic occurrences of this species documented in or near the national forests. These areas of the Nebraska Sandhills do not have the potential for prairie dog colonies of sufficient size and number to support black-footed ferret populations. FS will consult with FWS if the species is eventually found on or near these national forests.

Screen 2 (Threats)

Nebraska National Forest (Bessey Ranger District) and Samuel R. McKelvie National Forest = Topeka shiner (*Notropis topeka*)

- Rationale: There are no current or historic occurrences of this species documented in waters on, near or downstream from the national forests. If the species did occur on or near this area, it is highly unlikely that any management direction under Alternative 3 could significantly affect instream flow or water quality for this species in the sandhill rivers. FS will consult with FWS if the species is eventually found on or near these national forests.

Nebraska National Forest (Pine Ridge Ranger District) = Whooping Crane (*Grus americana*)

- Rationale: Several years ago, a single whooping crane was observed using a pond on private land near the national forest. However, there is no known suitable wetlands habitat on the national forest. FS will consult with FWS if the species is eventually observed on or near the national forest.

Oglala National Grassland = Whooping Crane (*Grus americana*)

- Rationale: There are no current or historic occurrences of this species documented on or near this area. FS will consult with FWS if the species is eventually found on or near the national grassland.

Species Assessments

Blowout Penstemon (*Penstemon haydenii*)

Key references consulted for information on this species included the national recovery plan (U.S. Fish and Wildlife Service 1992), Flessner and Stubbendieck (1989), Stubbendieck et al. (1989), Stubbendieck et al. (1993), Fritz (1998), Weedon et al. (1982) and Great Plains Flora Association (1986). The Great Plains National Grasslands web site (www.fs.fed.us/r2/nebraska/gpng) was consulted for maps and information on the current distribution of the species.

Species Description

Blowout penstemon is a perennial forb of the figwort family that buds in early May and flowers from mid-May through late June. Primary pollinators appear to be several species of megachilid bees (Lawson et al. 1989). Seed capsules open in late July or August. Seeds fall near the base of the plant or become windborn. However, most reproduction occurs by rhizomes, and seedlings are rare (Stubbendieck et al. 1993, Weedon et al. 1982). The stems of this plant root adventitiously, thus maintaining the plant in shifting sands of blowouts (U.S. Fish and Wildlife Service 1992). It is the rarest plant endemic to the Great Plains (Stubbendieck et al. 1989).

Distribution and Status

Blowout penstemon is listed as endangered under ESA. Table H-2 summarizes species occurrence in the planning area. Over 900 plants were recently transplanted at two locations on the Nebraska National Forest (USDA Forest Service 2000), but prior to this, blowout penstemon had not been found during surveys on the Nebraska or Samuel R. McKelvie National Forests. However, a single population occurs on state school lands adjoining the Samuel R. McKelvie National Forest. The type specimen for this species was collected near the Nebraska National Forest circa 1900.

The species is mostly endemic to the Nebraska Sandhills, and naturally occurring populations are now restricted to seven areas in the sandhill region. To date, transplants have occurred on six properties including private ranches and national wildlife refuges in addition to the recent transplants on the Nebraska National Forest (USDA Forest Service 2000). Also, one additional population was recently located in eastern Wyoming on BLM land in Carbon County.

The plant has been propagated in greenhouses to safeguard the species and to provide stock for transplants back into suitable sites (Flessner and Stubbendieck 1989), although those greenhouse facilities are scheduled to close soon.

ESA Status and Other Organization Rankings

ESA -Endangered; TNC / NHP - G1, N1; NE - Endangered

Habitat

The species was once common in active sandhill blowouts. Blowout penstemon requires blowouts that are devoid or nearly devoid of vegetation, sites usually created by a combination of disturbance processes and characterized by active wind erosion. The species is considered a narrow-range species (Northern Great Plains Terrestrial Assessment) by only occurring in a single habitat with a very narrow set of physical and biological parameters. It is a successional plant, colonizing blowouts just after the sand begins to stabilize (Flessner and Stubbendieck 1989). The species declines with vegetation recovery. Historically, repeated fires and bison grazing were believed to maintain active blowouts for this species.

Blowout penstemon is usually found on the leeward side of craters within blowouts. These blowouts should not be confused with areas around windmills where livestock congregate and cause active wind erosion. Suitable blowouts are generally active and move across the landscape.

The Samuel R. McKelvie and Nebraska National Forests contain significant potential and suitable habitat for the species. Surveys for suitable blowout habitat were conducted on these areas from 1991 through 1994, and the results were as follows:

	NNF (BRD)	SRMNF
Number of Blowouts Surveyed	286	296
Number of Suitable Blowouts	50	44
Total Acres of Suitable Blowouts	30	28

Surveys for this species were also conducted on the South Dakota portion of the planning area in 1999, within the Grand River / Cedar River National Grasslands. The surveys were conducted in the Grand River Sand Dunes, an area of actively moving sand dunes located adjacent to the Grand River (USFS files, Medora Ranger District). Blowout penstemon was not found.

Recovery and Conservation Planning

A recovery plan was approved in 1992 (U.S. Fish and Wildlife Service 1992). According to the plan, this species will be considered for delisting when a minimum of 15,000 individuals is established in at least ten population groups. Each population group must have at least 300 plants. Current population estimates for the Nebraska Sandhills indicate that there are approximately 2,200 plants concentrated in seven naturally occurring population groups and another 9,000 plants in several transplant sites.

The recovery plan calls for the following:

- Protection of naturally occurring, reintroduced, and introduced populations and their habitat.
- Systematic surveys for additional naturally occurring populations and suitable habitat for establishing new populations.
- Development of propagation techniques
- Reintroduction of populations in areas of historic occurrence.
- Introduction of new populations in suitable habitat within the species range
- Various related tasks.

Blowout penstemon reintroductions have already been initiated on the Valentine National Wildlife Refuge and Nebraska National Forest.

The University of Nebraska greenhouse facility that grows penstemon seedlings is closing. The closure will greatly impede penstemon plantings and the achievement of recovery goals. Growing penstemon seedlings is relatively easy and an appropriate facility could be established at the Bessey nursery located on the Nebraska National Forest. The nursery could become the focal point of penstemon recovery throughout the Sandhills.

Direct and Indirect Effects on NFS Lands

Fire suppression can contribute to stabilization and increased vegetation cover on the sandhills, thereby reducing the number and size of suitable blowouts for reintroduction and establishment of new populations of this species.

Range management practices that incorporate reduced stocking rates and periodic rest from livestock grazing to increase vegetative cover and production can reduce the amount of suitable blowout habitat.

High livestock grazing intensities resulting in early seral vegetation and reduced amounts of vegetative cover can promote blowouts and thereby increase the amount of suitable habitat for this species.

Season-long livestock grazing can result in the grazing of blowout penstemon plants and loss of some reproductive opportunity (Fritz 1998). Shorter duration grazing did not demonstrate any significant effect on flowering plants. The investigator suggested that higher stocking rates could have altered the results of the study.

Prescribed burning, if strategically placed, could accelerate expansion of existing suitable blowout penstemon habitat.

The success of future transplants could be threatened by an ever-increasing use of blowouts by off-road and all-terrain vehicles, especially on the Nebraska National Forest near Halsey (U.S. Forest Service 2000). This use could cause direct mortality of recent transplants or established plants.

Invasive and non-native plants can compete with blowout penstemon for habitat.

Herbicide drift could result in loss of blowout penstemon plants.

Cumulative Effects

Range management practices on private lands in the Nebraska Sandhills can either enhance or reduce habitat suitability for blowout penstemon, depending primarily on the intensity and duration of grazing. Livestock grazing practices that reduce range conditions and vegetative cover enhance opportunities for blowout establishment. The latest information indicates that during the late 1980s, approximately 3% of the rangelands in the Nebraska Sandhills (333,000 acres) were in poor range condition (USDA 1989) and the opportunity for maintenance and establishment of blowouts is probably greatest in this condition class. At this time, there is no reason to expect significant changes in grazing practices or a significant change in current overall range condition and trends across the Sandhills. Therefore, the amount of suitable habitat for blowout penstemon is expected to remain relatively stable.

Active fire suppression has occurred for decades in the Sandhills. It is expected to continue, on both public and private lands, within the range of blowout penstemon. At this time, there is no reason to expect significant changes in the level of fire suppression occurring across the Nebraska Sandhills or in the amount of suitable habitat for the species.

Land use conversion of sandhills prairie for crop production through center-pivot irrigation development has altered approximately 3 to 4 percent of the Nebraska Sandhills (Bio / West, Inc. 1986, USDA 1989, Bleed and Flowerday 1990), and this has undoubtedly reduced or destroyed some potential blowout penstemon habitat. However, the number of acres under center-pivot irrigation has leveled off (Bleed and Flowerday 1990), and there's currently no reason to expect this trend to change appreciably in the near future.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a grazing permit. High intensity grazing can enhance habitat for blowout penstemon, especially if combined with other disturbance processes. At the same time, continuous or high intensity livestock grazing can cause mortality or reduced reproductive success of individual plants through grazing of plants, trampling, and habitat alteration.

Conservation Measures

The following conservation measures are presented as management direction under Alternative 3 in the revised LRMP:

Unit-wide Direction (Chapter 1)

- None

Geographic Area Direction (Chapter 2)

NNF (BRD) and SRMNF

- The objectives to provide specified amounts of early seral and low structure grasslands on both of these areas are summarized in Table H-5 and H-6 in Section 5 of this document.
- An objective of 50 to 250 acres of prescribed burning annually is established for both the Nebraska and Samuel R. McKelvie National Forests. If strategically located, this activity could enhance existing blowout penstemon habitat.
- Initiate blowout penstemon transplants into suitable habitat to eventually establish at least 2 populations on each national forest. (Objective and Standard)
- Retain selected blowouts that are suitable reintroduction sites through maintenance of disturbance processes (Standard).
- Protect naturally occurring and transplanted penstemon populations and their habitat (Standard).
- Conduct target surveys for naturally occurring penstemon populations (Standard).
- Implement travel management restrictions if damage occurs to blowout penstemon populations (Standard).
- Prioritize noxious weed control in occupied habitat (Standard).
- Restrict pesticide use where it would have adverse effects on the species (Standard).

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

NNF (BRD) and SRMNF

- Continue monitoring populations and habitat.

Biological Determinations, Risk Assessments, and Rationale

NNF (BRD)

Determination is "not likely to adversely affect." Suitable habitat and transplant sites will be maintained on the national forest, and protection measures are provided to prevent or reduce the loss of plants to management activities and land uses. Transplants have been demonstrated to be successful and an adequate number of transplant sites exist on private and public lands to meet the objectives of the recovery plan. Direction is provided to establish at least 2 populations on this planning unit. Outcome V was selected for the risk assessment. The rationale for Outcome V is the species will most likely continue to exist in refugia with strong limitations on interactions between populations. Gene transfer between existing populations by pollen or seed dispersal is virtually non-existent and there's likely a high potential for genetic isolation (Caha et al. 1998). Re-establishment of any natural or transplanted populations that are lost in the future will likely require transplants. The biological determination and the risk outcome are based on the assumption that greenhouse facilities will be available to produce stock for future transplants.

SRMNF

Determination is "no effect." There are no known populations of blowout penstemon on this national forest. There is suitable habitat for transplants, and this habitat will be maintained. Protection measures to prevent or reduce the loss of plants resulting from future transplants to management activities and land uses are provided. Direction is provided to establish at least 2 populations on this planning unit.

Western Prairie Fringed Orchid (*Platanthera praeclara*)

The national recovery plan for this species (U.S. Fish and Wildlife Service 1996) and the Recovery Strategy for Western Prairie Fringed Orchid on the Sheyenne National Grassland (USDA Forest Service 2000) were primary references for information on this species. The Northern Prairie Wildlife Research Center web site (www.npwrc.usgs.gov) was also reviewed for information on this species and its habitat.

Species Description

The western prairie fringed orchid is a perennial forb with large and showy inflorescences containing as many as 20 or more cream-colored flowers arranged on a spike. The lower petal of each flower is deeply lobed and fringed, hence the common name. Plants are usually 30 to 85 cm tall and have two to five relatively thick, elongate, glabrous leaves (Sheviak and Bowles 1986).

This species reproduces primarily by seed, with flowering occurring between late June and mid-July and seed dispersal (wind and water) occurring in mid-September on the Sheyenne National Grassland. Flowering patterns are often erratic, and some information suggests that the plant commonly undergoes periods of dormancy (Bowles 1983). Although the orchid is reportedly long-lived (Sheviak and Bowles 1986), more recent demographic data collected on the Sheyenne National Grassland demonstrate that most plants live 3 years or less (Sieg and King 1995). The species is self-compatible, but pollination is required for fruit and seed production (U.S. Fish and Wildlife Service 1996). Two species of hawkmoths have been identified as pollen vectors for the orchid on the National Grassland (Cuthrell and Rider 1993).

High numbers of the orchid correspond to years of above average precipitation. However, excessive flooding or drought can cause local population declines and extinction (Sieg and King 1995). In addition, vegetative orchids may result when physiological requirements are not met or when microhabitat conditions are not conducive to flower production (Goh et al. 1982.).

Distribution and Status

The distribution of the species includes Minnesota, Iowa, Missouri, Nebraska, North Dakota, and Manitoba. It is believed to be extirpated from South Dakota and Oklahoma. Table H-2 summarizes species occurrence in the planning area. Known populations of the species on NFS lands within the planning area are found only on the Sheyenne National Grassland. Small isolated populations are found on the Valentine National Wildlife Refuge near the Nebraska and Samuel R. McKelvie National Forests, but the species was not found on either NFS unit during surveys in the early 1990s. Potential and suitable habitat has also not been identified on either national forest.

The orchid population on the Sheyenne National Grassland is one of three remaining large metapopulations of this species. The other two metapopulations occur in Minnesota and Manitoba, Canada. Small populations are found throughout the rest of the species remaining range.

Because the orchid is associated with wetlands, mapped wetlands on the Sheyenne National Grassland provide the best estimate of potential or suitable acres of habitat. U.S. Fish and Wildlife Service National Wetland Inventory data (2000) show that approximately 6,722 acres of suitable wetland habitat are found on the Sheyenne National Grassland. Because orchid populations shift in time and space in response to water levels (Hof et al. 1999), not all of these wetland acres will support orchids in a given year.

Acres of occupied habitat on the Sheyenne National Grassland are based on the locations of known populations mapped during surveys conducted from 1982 to 2000 by the U.S. Forest Service, North Dakota Natural Heritage Program, and others. Occupied habitat is estimated to be approximately 3,091 acres. These surveys indicate an estimated population size of 9,759 flowering orchids for the Sheyenne National Grassland (North Dakota Natural Heritage database 2000). This represents the total of the highest number of flowering plants recorded for all survey sites.

ESA Status and Other Organization Rankings

ESA - Threatened; TNC / NHP - G2.

Habitat

This species is associated with sedge meadows primarily within the tallgrass prairie biome. It occurs in the Hummocky Sandhills habitat association and the Deltaic Plain habitat association (Manske 1980) on the Sheyenne National Grassland. Sieg and Bjugstad (1994), and Wolken (1995) provide detailed information on species composition and soil characteristics of orchid habitat in the Sheyenne National Grassland. Across its range, the species is generally found in fire and grazing adapted grassland communities, most often on unplowed calcareous prairies and sedge meadows (U.S. Fish and Wildlife Service 1996). It has also been documented in successional plant communities on disturbed sites.

Maintenance of functional, dynamic tallgrass prairie is key to survival of the species. Disturbances such as fire, flooding, and grazing occurred historically and may be important for orchid regeneration.

Recovery and Conservation Planning

A recovery plan was approved in 1996 (U.S. Fish and Wildlife Service 1996). Since the species is listed as threatened rather than endangered and most of the existing plants occur on lands in a protective ownership, the recovery plan emphasizes the need for actions that prevent further declines in orchid populations and habitat quality. The recovery plan focuses on protecting the habitat of the remaining populations from conversion to agricultural use and assuring that the frequency, timing, and intensity of management practices enhance or maintain orchid populations. According to the recovery plan, the species will be considered for delisting when sites that include occupied habitat harboring 90 percent of the plants in each ecoregion are protected under public ownership or at higher levels of protection.

The Forest Service and others have prepared a "Recovery Strategy for the Western Prairie Fringed Orchid on the Sheyenne National Grassland." This document is included as Appendix N of the Dakota Prairie Grassland LRMP. This recovery strategy is specific and describes authorized uses and management practices on the Sheyenne National Grassland.

Critical habitat has not been designated for this species.

Direct and Indirect Effects on NFS Lands

Burning, livestock grazing, and mowing can have positive or negative effects on western prairie fringed orchid populations, depending on frequency, intensity, and timing of the activity (U.S. Fish and Wildlife Service 1996).

Burning may directly impact orchids through mortality of individual plants and indirectly through effects on habitat. It has been suggested that flowering may be suppressed by litter accumulation and stimulated by fire (Bowles 1983).

Livestock may impact orchids directly through both grazing and trampling and indirectly through effects on orchid habitat. The influence of livestock grazing on orchid populations is related to when and how many times the grazing occurs, how long livestock are left in the pasture, and the stocking rates and is interconnected with other management activities (such as burning and mowing) and climatic conditions. Grazing systems that encourage heavy repeated grazing throughout the growing season are more likely to be detrimental to individual orchids, both in terms of reducing carbohydrate reserves and in preventing seed production. Livestock grazing may also negatively impact alternate plant hosts for orchid pollinators. Yet, some grazing may be important for regeneration by reducing competition from other vegetation.

Repeated mowing prevents orchids from completing their life cycle and reduces carbohydrate reserves needed for growth the following season.

A serious threat to orchid viability and recovery is the increase of non-native, invasive species like leafy spurge (U.S. Fish and Wildlife Service 1996). Leafy spurge occupies approximately 11,000 acres on the Sheyenne National Grassland. It has been documented in orchid habitat (Sieg and Bjugstad 1994), although the extent of the infestation is unknown. Leafy spurge reduces the quality of orchid habitat but at the same time, efforts to control spurge and other exotics with chemicals pose a direct threat to orchids and may also impact alternate host plants for orchid pollinators.

Any activities that lower water tables below the root zone of orchids have the potential of seriously reducing orchid populations (U.S. Fish and Wildlife Service 1996).

Roads can negatively affect populations of orchids by introducing non-native plant species along travel routes, by habitat fragmentation, and by loss of suitable habitat to disturbance.

Cumulative Effects

The Direct and Indirect Effects listed above are also likely to continue on private and other public lands near the Sheyenne National Grassland.

Loss of habitat is a threat on private lands. The tallgrass prairie ecosystem has been reduced to less than 4 percent of its original size (Steinauer and Collins 1996). Most orchid habitat on private lands has already been destroyed or highly altered, and most of these lands will remain unsuitable or poor quality for orchids. As much as 5 to 15 percent of the native prairie has been converted to cropland in the last 15 years (Natural Resources Conservation Service 1999) and it is expected that the decline of habitat on private lands can be expected to continue. Discussions in the Northern Great Plains Aquatic Assessment (Johnson 1998) indicate that some of the most extensive draining of wetlands in the planning area has occurred in the Red River Valley of North Dakota where approximately 1.2 million acres of wet meadows may have been drained.

Livestock grazing and mowing practices on native tallgrass prairie that are unfavorable for the conservation of orchids are likely to continue on some private lands.

Development activities such as road and building construction on private lands will continue, resulting in some loss of suitable habitat for the western prairie fringed orchid.

Insecticide spraying on adjacent croplands may reduce or threaten insect pollinators for the orchid.

For the Sheyenne National Grassland area, it has been suggested that pumping of water from the Sheyenne aquifer for irrigation and other uses may impact available water for the orchid. In the vicinity of the Sheyenne National Grassland, irrigation development began in 1977. As of 1998, the North Dakota State Water Commission had approved an annual ground-water appropriation for 19,129.9 acre-feet. This is 15 percent of the average annual recharge of ground water in the area of the Sheyenne Delta acquifer (North Dakota Water Commission 1998).

Data from North Dakota Water Commission observation wells show that any water-level fluctuations caused by irrigation withdrawals are masked by water-level fluctuations caused by natural variations in recharge and discharge. Based on observations from 1977 through 1997, water levels have primarily followed changing climate patterns, with decreases in years of low precipitation and increases in years of high precipitation (ibid).

Although data do not reveal impacts to Sheyenne Delta water levels from current wells, trends indicate that the number of irrigation wells has increased steadily since 1977. In addition, the Sheyenne Delta area was identified as an area with potentially irrigable acres in the North Dakota State Water Commission's State Water Management Plan (1999). Water use near the National Grassland may increase, and additional impacts to orchid populations on the National Grassland are possible if water tables are lowered through water management practices on and off the National Grassland.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a grazing agreement. Livestock grazing can probably have adverse or beneficial effects on orchid, depending on timing, intensity, and duration.

Conservation Measures

The following conservation measures are presented as management direction under Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

SNG

- Protect hydrologic regimes and wetlands (Standards, Guidelines).

Geographic Area (Chapter 2)

SNG

- Provide quality grassland and wetlands habitat (Objective, Guidelines).
- Protect hydrologic regimes in wetlands (Objective, Standards).
- Provide the ecological processes necessary to ensure that orchids set and disperse seed at levels necessary to support stable to increasing orchid populations (Objective, Guideline).
- Manage orchids and their habitat on the Sheyenne National Grassland according to the current recovery strategy (Standard).

SNG, cont.

- The recovery strategy mentioned above and additional direction in Chapter 2 address orchid needs relative to livestock grazing, mowing, burning, noxious weed control, revegetation, travel, construction, water management, and other activities and uses (Standards, Guidelines).

NNF (BRD), SRMNF

- In consultation and coordination with the U.S. Fish and Wildlife Service, evaluate opportunities for establishing orchid populations and implement if suitable habitat exists (Standard).

Management Area Direction (Chapter 3)

SNG

- Western prairie fringed orchid populations are found in the proposed 240-acre Fritillary Prairie RNA and the proposed 370-acre Platanthera RNA. RNAs will be managed to protect their ecological values. Management plans will be completed within 5 years.

Monitoring Direction (Chapter 4)

SNG, NNF (BRD), SRMNF

- Continue monitoring populations and habitat.

Appendices

SNG

- Recovery strategy for western prairie fringed orchid (see Appendix N in the Land and Resource Management Plan for the Dakota Prairie Grasslands).

Biological Determinations, Risk Assessment and Rationale

SNG

Determination is "not likely to adversely affect." The recovery strategy presented as an appendix to the revised LRMP provides state-of-the-art knowledge to guide conservation and protection of the species on the Sheyenne National Grassland. This determination is based solely on effects of Forest Service-authorized activities and land uses on the orchid. Other factors mostly or partly beyond the control of the Forest Service, such as the continued spread of leafy spurge and other exotic vegetation, and impacts to the water table, continue to be serious threats to the species on the Sheyenne National Grassland and long-term viability of local populations remains uncertain.

Outcome IV is the selected risk assessment under Alternative 3. The rationale is that implementation of the recovery strategy and relevant standards and guidelines provides for specific conservation measures to protect and enhance populations in terms of their sizes and distribution. In addition, the increased levels of rest and prescribed fire are likely to benefit the orchid. Alternative 3 also prescribes management for stable to increasing populations of the orchid by providing quality grasslands and wetlands, maintaining hydrologic regimes, and providing appropriate ecological processes.

Although Outcome IV is expected, Outcome VI may be more appropriate if other events become major factors in the future. These events could include the continued spread of noxious weeds, alteration of the hydrologic regime on and adjacent to the Sheyenne National Grassland, or environmental stochasticity such as drought.

NNF (BRD) and SRMNF

Determination is "no effect." There are no known populations of orchids on these areas. The availability of potential and suitable habitat will be determined.

Ute ladies' tresses (*Spiranthes diluvialis*)

The draft recovery plan (U.S. Fish and Wildlife Service 1995) for this species was a primary source of information on this species.

Species Description

Ute ladies' tresses is a perennial forb in the orchid family. It was first described as a species in 1994. It generally blooms from late July through August but, depending on location and climatic conditions, may bloom in early July or still be in flower as late as early October (U.S. Fish and Wildlife Service 1995). Its seeds are very small and require specific symbiotic association with mycorrhizal fungi for germination (Arditti 1992). Like other orchid species, some plants may germinate and remain underground in a saprophytic state for many years before emerging. After emerging, individual plants may survive annual periods of dormancy and bloom only rarely. Reproduction appears to be strictly sexual, with bumblebees (*Bombus* spp.) as the primary pollinators (Dresler 1981, Sheviak 1984, Sipes et al. 1993).

Distribution and Status

Table H-2 summarizes species occurrence in the planning area. Target surveys in priority areas on the Thunder Basin National Grassland were conducted for this species in 1998 by a highly qualified botanist. Only one priority area on the national grassland was not surveyed. The species was not located on the national grassland during these surveys. The closest population to the national grassland occurs within several miles on public domain lands administered by the Bureau of Land Management in Converse County (Wyoming Natural Heritage Program database 2000). Another population occurs along the Niobrara River on public domain lands in Niobrara County, Wyoming.

The species is presently found in 26 locations in Wyoming and Nebraska, with additional sites in Colorado, Utah, Idaho, Montana, and Washington. Thirty-two populations are known to occur across this area.

ESA Status and Other Organization Rankings

ESA - Threatened; TNC / NHP - G2

Habitat

This species inhabits moist soils in mesic or wet meadows, gravel bars, wet streambanks, and old oxbows between elevations of 4,300 to 7,000 feet (Stone 1993). Jennings (1990) observed that the orchid seems to require "permanent sub-irrigation," indicating a close affinity with floodplain areas where the water table is near the surface throughout the growing season and into the late summer or early autumn. This orchid colonizes early successional riparian habitats subject to seasonal flooding from snowmelt and intermittent heavy thunderstorms. It is not tolerant of long-term standing water and emergent vegetation development.

Recovery and Conservation Planning

A draft recovery plan for this species was prepared in 1995. This draft does not include population and habitat recovery goals and delisting criteria. The recovery plan direction focuses on restoring natural stream dynamics (hydrologic patterns).

Critical habitat has not been designated for this species.

Direct and Indirect Effects on NFS Lands

Properly functioning riparian systems provide conditions favorable for establishment and maintenance of riparian-dependent species such as Ute ladies' tresses. Certain management activities in both riparian zones and uplands can cause a loss of equilibrium within riparian systems resulting in excessive flooding events along drainageways, sedimentation, and/or channelization. Excessive removal of vegetation on uplands can result in rill, sheet, and gully erosion and high rates of soil and water runoff.

Increased rates of channelization in drainages can result in lowered water tables. Activities that lower water tables below the root zone of Ute ladies' tresses place individual plants or populations at risk.

Development of springs and seeps for livestock water can result in loss of suitable riparian habitat for Ute ladies' tresses populations. Many springs have been developed in the past for livestock and the net loss of these habitat types is very high in many parts of the Grassland.

Livestock grazing and burning can have positive, neutral, or negative effects on Ute ladies' tresses depending on frequency, intensity, and timing of the disturbance and the life history characteristics of Ute ladies' tresses.

Burning may directly affect Ute ladies' tresses by causing mortality of individual plants or by impacting habitat. Most perennial species such as Ute ladies' tresses are not permanently injured by burn events, however some species mortality may occur especially during hot burn events. Burning may affect habitat for Ute ladies' tresses by removing shade and cover, and reducing moisture conditions needed for survival.

At the same time, burning may invigorate Ute ladies' tresses habitat and enhance nutrient cycling in the soil. Most wetland and riparian habitats did not experience as frequent a fire regime as more upland habitats.

Grazing and burning can reduce dead material in plant communities and open up canopy layers of plants, allowing for the germination and establishment of new plants of Ute ladies' tresses. Although certain levels of livestock grazing have been shown to enhance populations of Ute ladies' tresses, repeated or excessive grazing may prevent the species from completing its life cycle and may also reduce carbohydrate reserves.

Livestock trampling in riparian areas and repeated visits to these areas for water can be a problem under some circumstances for Ute ladies' tresses. Populations of Ute ladies' tresses grow in wet and subirrigated soils that may be especially susceptible to trampling. Excessive and repeated soil compaction may result in reduced plant vigor. Individual plants may be directly affected by trampling.

Competition from non-native invasive plants can be a significant threat to Ute ladies' tresses. Invasive plants such as Kentucky bluegrass, smooth brome, and other species often form monocultures within riparian habitats, significantly reducing the diversity of native plant communities. Invasive species can out compete Ute ladies' tresses and reduce population numbers. Invasive species are often spread by livestock grazing and recreational activities.

Noxious weeds such as Canadian thistle reduce the quality of habitat for Ute ladies' tresses but at the same time, efforts to control Canadian thistle and other invasive species with chemicals can pose a direct threat to the species. In addition, many chemicals are restricted for use within riparian zones.

Ground-disturbing activities associated with oil, gas, mineral, and other types of development could put populations of this orchid at additional risk.

Roads can negatively affect plant populations of Ute ladies' tresses by introducing non-native plant species along travel routes, by habitat fragmentation, and by loss of suitable habitat to disturbance.

Recreation can have negative effects depending on type of recreational use, road and trail use patterns and intensities, rate of spread of invasive, non-native plant species along recreational routes, and other factors. Even limited recreation use on fragile wetland habitat may be detrimental to Ute ladies' tresses. Trampling to Ute ladies' tresses from recreational uses can result in loss of plants.

Grasshopper spraying has the potential to impact insect pollinator populations. Specific pollinator information for this plant species is not well known.

Cumulative Effects

Development activities such as road building and other construction on private lands will continue resulting in some loss of suitable habitat for the plant species and some possible mortality of sensitive plants and population loss.

Livestock grazing practices that are unfavorable for the conservation of sensitive plant species are likely to continue on some private lands.

Oil and gas exploration and development on public domain land has the potential to impact populations of this species. The Bureau of Land Management has oil and gas stipulations to protect and conserve riparian areas and could also use standard lease terms to avoid impacts to this species.

Interrelated and Interdependent Actions

Decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD) and eventual on-site development. Although the decision to make areas available for oil and gas leasing does not result in on-the-ground activities, oil and gas stipulations to protect and conserve threatened and endangered species and their habitats are needed at the time leasing availability decisions are made. Site-specific biological assessments and evaluations are also conducted at the time applications for permits to drill are considered by the Forest Service.

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures

There are no known occurrences of this species on the national grassland. If the species is eventually found on the national grassland or potential and suitable habitat is identified, the Forest Service will consult with the U.S. Fish and Wildlife Service.

Biological Determinations, Risk Assessments, and Rationale

TBNG

Determination is "no effect" since the species has not been found on this unit nor has potential and suitable habitat been identified. Surveys have been conducted but one additional area may need to be surveyed in the future. If the species is eventually found on the National Grassland, the U.S. Fish and Wildlife Service will be consulted to help insure that reasonable and prudent alternatives and conservation recommendations are implemented to protect and conserve the species on the National Grassland.

American Burying Beetle (*Nicrophorus americanus*)

The national recovery plan (U.S. Fish and Wildlife Service 1991) was a primary reference for information on this species.

Species Description

These beetles are the largest carrion beetles in the United States (U.S. Fish and Wildlife Service 1991). These insects require carrion up to 10 ounces in size for reproduction and generally produce only 1 brood annually (Lomolino et al. 1995, U.S. Fish and Wildlife Service 1991). A chamber is excavated and the carrion is buried. Eggs are deposited with the food source and, remarkable for insects, the female cares for the young (U.S. Fish and Wildlife Service 1991). Without an adequate source of food for the young, successful reproduction cannot take place. This species plays an important ecological role in nutrient recycling and decomposition.

Distribution and Status

Table H-2 summarizes species occurrence in the planning area. Entomologists have conducted surveys for the species in Nebraska and South Dakota, including surveys on the Ft. Pierre National Grassland and the Nebraska and Samuel R. McKelvie National Forests (Marrone 1993, Jameson and Ratcliffe 1995, Backlund and Marrone 1995). Observations of a few individual beetles are confirmed on the Nebraska National Forest near Halsey and on the nearby Valentine

National Wildlife Refuge (McDaniel 1992). The species to date has not been found on the Samuel R. McKelvie National Forest or on the Fort Pierre National Grassland.

This beetle was formerly distributed throughout temperate eastern North America and west as far as the Missouri River watershed in central Montana (U.S. Fish and Wildlife Service 1991). Its historic range has been reduced more than 90 percent and is currently limited to disjunct populations in Rhode Island, Oklahoma, Nebraska, Arkansas, and South Dakota (Ratcliff and Jameson 1992). Historically, documented distribution in South Dakota was limited to a few counties in the eastern part of the state and Haakon County. Recently (1995) live specimens were caught in Gregory, Tripp, and Todd counties in the southcentral portion of South Dakota (Douglas Backlund, pers. comm., cited in Black Hills National Forest LRMP Biological Assessment and Biological Evaluation). No known records, historical or contemporary, exist for Wyoming.

ESA Status and Other Organization Rankings

ESA - Endangered; TNC / NHP - G2; NE - Endangered.

Habitat

Existing populations inhabit a wide variety of habitats including maritime scrub plant communities in the Northeast; deciduous and coniferous communities on slopes and ridge-tops, deciduous riparian forest, and valley-bottom pastures in the South; and prairies with few trees in the Upper Midwest (U.S. Fish and Wildlife Service 1991). They have also been found in and near emergent vegetation around wetlands in the Nebraska Sandhills (Len McDaniel, pers. comm.). Their broad geographic range may indicate that vegetation structure and soil types are not constraining to the populations (U.S. Fish and Wildlife Service 1991). Common attributes identified in the Recovery Plan include level topography, well-drained soils, and a well-formed detritus layer (U.S. Fish and Wildlife Service 1991). Beetles found in South Dakota and Nebraska were associated with sandy soils, which conforms to other areas of the Midwest. Because comprehensive descriptions of suitable habitat and vegetation parameters are not available, it's not possible to quantify the amount of suitable habitat. Because of the limited number of observations and the incidental nature of these observations, it's also not possible to define the distribution of the species on the national forests.

Recovery and Conservation Planning

A Recovery Plan was approved in 1991. The plan recommends protection and management of occupied habitat, captive propagation, inventory for other populations, and the re-establishment of two additional self-sustaining populations (one in the west), with a minimum of 500 individuals per population.

Direct and Indirect Effects on NFS Lands

Two factors have been proposed as causal agents in the precipitous population declines in this species. The first factor is the reduction of the beetle's optimum size carrion, especially the young of passenger pigeons and greater prairie chickens. These may have been the most important carrion, but declines in the other birds and animals may have also contributed to the decline.

Cumulative Effects

Habitat fragmentation and increases in habitat edge on private and state lands in the Nebraska Sandhills may have resulted in increases in raccoon, skunk, and other scavenger populations, possibly resulting in reduced carrion for beetles.

Interrelated and Interdependent Actions

Unknown

Conservation Measures

The following conservation measures (see greater prairie chicken evaluation in this document for a detailed quantitative summary of these conservation measures) are presented as management direction in the revised LRMP (Alternative 3):

Unit-wide Direction (Chapter 1)

NNF (BRD) and SRMNF

- There are numerous standards and guidelines for enhancing prairie chicken and sharp-tailed grouse (optimum-sized carrion) populations and habitat and for protecting display grounds and nesting activities (see greater prairie chicken evaluation in this document for a detailed and quantitative summary of this direction).
- Restrict pesticide use where it would have adverse effects on the species (Standard).

Geographic Area Direction (Chapter 2)

NNF (BRD) and SRMNF

- There are numerous guidelines for enhancing prairie chicken and sharp-tailed grouse (optimum-sized carrion) populations and habitat (see greater prairie chicken evaluation in this document for a detailed and quantitative summary of this direction).

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

NNF (BRD) and SRMNF

- Continue surveys to further determine abundance and distribution.

Biological Determinations, Risk Assessments and Rationale

NNF (BRD)

Determination is "not likely to adversely affect." Beetles could be trampled by permitted livestock, recreational horses, and vehicles, but this is considered a "discountable effect." Population indices for the species are not available for these areas. However, given the enhancement of prairie chicken and sharp-tailed grouse habitat on these units, it's reasonable to conclude that the anticipated increases in long-term prairie grouse populations because of the enhanced habitat conditions should increase preferred carrion availability for the species. This is considered a possible "beneficial effect."

A risk outcome was not selected. It would be unreasonable to make such a prediction given the paucity of information about the species and its habitat.

SRMNF

Determination is "no effect." There are no known occurrences on this area.

Whooping Crane (Grus americana)

The recovery plan for this species (U.S. Fish and Wildlife Service 1994) and Lewis (1995) were two of the primary references consulted for information on this species.

Species Description

This is one of the rarest and largest North American birds. Whooping cranes are omnivorous feeders and seem to easily adjust to whatever suitable plant and animal foods they encounter during migration (EA Engineering, Science and Technology 1986, Armbruster 1990).

Distribution and Status

Table H-2 summarizes species occurrence in the planning area. Incidental use in the form of occasional foraging and roosting stops on or near several of the national grasslands is uncommon and has to be considered incidental. Whooping cranes occur as rare spring and fall migrants in the planning area. Spring migration through the planning area generally occurs sometime from late March through early May, while fall migration can be expected sometime from early September through the first week in November. Standard surveys for the species on NFS lands are not conducted since their occurrence is so sporadic and incidental. Forest Service maps of occurrence locations were consulted.

The population that migrates through portions of the planning area is known as the Aransas / Wood Buffalo population. These birds (approximately 120 in the population) winter in coastal Texas and nest in Canada (U.S. Fish and Wildlife Service 1994).

ESA Status and Other Organization Rankings

ESA - Endangered; TNC / NHP - G1, N1; MT, NE, SD - Endangered.

Habitat

Habitats used on or near NFS lands in the planning area by migrating whooping cranes include small ponds, upland grasslands, and rivers. The use is so rare and incidental that it was not possible to quantify the amount of potential and suitable habitat.

Recovery and Conservation Planning

The latest revision of the recovery plan for this species was approved in 1994. Critical habitat is designated at nine sites. However, none of the sites occur near any of the National Grasslands or Forests in the planning area.

Direct and Indirect Effects on NFS Lands

Whooping cranes could be exposed to grain-based rodenticides used for prairie dog poisoning if during migration they would land on national grasslands to forage or rest in areas where rodenticides were recently applied.

Fences and powerlines could also result in whooping crane mortality, but once again, due to the rare nature of whooping crane visits, this is considered a "discountable" effect or risk.

Cumulative Effects

The same direct and indirect effects described above may also occur on other landownership near NFS lands.

Whooping cranes can also be lost from collisions with structures such as powerlines and fences.

Wetland drainage and altered river flows (USDA Forest Service 2000, Johnson 1998, Sieg et al. 1999, Ostlie et al. 1997) have degraded and reduced whooping crane habitat.

Interrelated and Interdependent Actions

Unknown

Conservation Measures

Due to the rare, incidental and unpredictable nature of whooping cranes on these units, specific conservation measures are unwarranted. Observations of the species on the national grasslands and forests will be documented. The U.S. Fish and Wildlife Service will be consulted if whooping cranes are observed on the national grasslands or forests.

Biological Determinations, Risk Assessments, and Rationale

LMNG, GR/CRNG, BGNG, FPNG, NNF (BRD), SRMNF

Determination is "not likely to adversely affect." The likelihood of whooping cranes landing on the national grasslands and forests where rodenticides (grain baits) were recently applied is so remote that it is considered a "discountable effect." The reduced and limited amount of rodenticide use under Alternative 3 further supports the "discountable'' nature of this risk.

A risk outcome was not selected due to the rare and incidental use of the national grasslands and forests by migrating whooping cranes.

Bald Eagle (*Haliaeetus leucocephalus*)

The recovery plans for the bald eagle (U.S. Fish and Wildlife Service 1983, 1984), and the Federal Register rules to downlist and delist the species (U.S. Fish and Wildlife Service 1995 and 1999) were the primary references consulted for information on current status of the species. Gerrard (1983) was also consulted for additional information on status and population trend. Another primary reference for general life history and management needs was Green (1985).

Species Description

There are two subspecies of the bald eagle. In the planning area, the subspecies of concern is the northern bald eagle. This subspecies is thought to originate in the central provinces of Canada and in the Great Lakes states (Dinan 1983). Bald eagles are relatively long-lived birds that tend to return annually, as adults, to the same wintering areas. Although fish and waterfowl are common food sources, during winter they also hunt uplands for birds and mammals. They will also scavenge for many types of carrion.

Distribution and Status

Table H-2 summarizes species occurrence in the planning area. Bald eagles occur primarily as spring and fall migrants across the planning area. Successful nesting on or near NFS lands in the planning area was last recorded in 1975 along the Little Missouri River (Little Missouri National Grassland). Territorial pairs continue to be sighted on several of the National Grasslands, and recent nesting attempts have occurred on the Thunder Basin National Grassland. Numerous winter roost sites have been documented on the Thunder Basin National Grassland. Forest Service personnel and others conduct routine surveys for this species. Forest Service maps of occurrence locations were consulted during this assessment.

ESA Status and Other Organization Rankings

ESA - Threatened; TNC / NHP - G4, N4; NE, SD - Endangered

The bald eagle was downlisted to threatened in 1995 and proposed for delisting in 1999. To date, delisting has not occurred.

Habitat

Three elements are considered important for effective winter habitat: perches, roosts, and food. Bald eagles are commonly seen perched and roosting in trees along streams, rivers, lakes, and reservoirs. They are also seen in ponderosa pine forests within the planning area. Roost sites obviously need perches, and roosts are often located in areas protected from the wind by trees and / or terrain. Wintering eagles on and near NFS lands in the planning area are frequently observed feeding on carrion along roads and in areas where waterfowl concentrate. They are also commonly observed hunting over prairie dog colonies where it's presumed they are hunting for prairie dogs, other prey species, or carrion.

Recovery and Conservation Planning

Nebraska, South Dakota, and North Dakota are included in the Northern States Bald Eagle Recovery Zone; Wyoming is in the Pacific States Bald Eagle Recovery Zone. Recovery plans for the northern states and Pacific states recovery zones were prepared in 1983 and 1984, respectively. Although critical habitat has been designated, none of the areas is on or near NFS lands within the planning area. The general goals for delisting the species is 1,200 and 800 occupied breeding territories in the Northern States and Pacific recovery zones, respectively. Delisting goals have already been met for the Northern States recovery zone and mostly met in the Pacific recovery zone (U.S. Fish and Wildlife Service 1995 and 1999).

Direct and Indirect Effects on NFS Lands

Roosting and future potential nesting habitat in deciduous forests along streams and rivers can decline if livestock grazing practices prevent tree regeneration and/or accelerate tree declines already occurring.

Reductions in prairie dog populations by poisoning may reduce winter feeding areas for bald eagles. Secondary poisoning risks from prairie dog poisoning are unlikely (Tietjen 1976).

Power line electrocution can cause eagle mortality.

Oil and gas exploration and development and recreation activities can disturb wintering and nesting bald eagles (Joslin and Youmans 1999).

Coal production can result in the loss of occupied and potential bald eagle habitat. Under Alternative 3, 47,990 acres are designated for mineral production and development (MA 8.4) on the Thunder Basin National Grassland. Coal production and reclamation is regulated by other state and federal agencies. The Office of Surface Mining is the federal agency with responsibility for approving mining plans. The state of Wyoming has delegated primacy for approval of mining and reclamation plans to the Wyoming Department of Environmental Quality. Forest Service reviews mining and reclamation plans to determine compliance with LRMP direction. Mining and reclamation plans also require consultation with the U.S. Fish and Wildlife Service.

Cumulative Effects

Reductions in the threats to the species across its range, such as DDT pesticides, have obviously reversed the population declines that resulted in its ESA listing (Ostlie et al. 1997). The recent downlisting from endangered to threatened is indicative of positive changes across the range of the species. An increasing number of nests and nesting attempts in the northern Great Plains planning area are also indicative of positive trends.

Alteration of hydrologic flows due to irrigation and hydroelectric dams along major rivers in the planning area (Johnson 1998, Ostlie et al. 1997) has reduced periodic scouring needed downstream for establishment of cottonwood seedlings. This can result in a gradual decline of cottonwood stands used for nesting.

Development of large irrigation and hydroelectric dams has created new waterfowl concentration areas that are favorite hunting areas for bald eagles.

Management for waterfowl production on the nearby national wildlife refuges increases prey and carrion availability for bald eagles.

Oil and gas exploration and development and recreation activities on public domain lands can also affect bald eagles and their habitat. The Bureau of Land Management also uses oil and gas stipulations to protect and conserve bald eagles and their habitats.

Depending on the final selected route, the new proposed railroad (Powder River Basin Expansion Project) corridor could degrade eagle habitat along the Cheyenne River on the Buffalo Gap National Grassland.

New 230 and 340 KV powerlines proposed across the Thunder Basin National Grassland could increase mortality risks to bald eagles.

Interrelated and Interdependent Actions

Oil and gas exploration and development activities, unless carefully managed, can disturb and displace bald eagles, causing reduced reproductive success, nest abandonment or reduced use or abandonment of winter roosting areas (Romin and Muck 1999, Richardson and Miller 1997, Lerczak 1992, Joslin and Youmans 1999). Decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD) and eventual on-site development. Although the decision to make areas available for oil and gas leasing does not result in on-the-ground activities and possible effects on bald eagles, oil and gas stipulations to protect and conserve bald eagles and their habitat are needed at the time leasing availability decisions are made. Site-specific biological assessments and evaluations are also conducted at the time applications to permit drilling are considered by the Forest Service. The number of new wells predicted in the reasonable and foreseeable development analysis for the national grasslands with moderate to high oil and gas potential is as follows:

	Oil and Gas Wells	Coalbed Methane Wells
LMNG	600	60
CRNG		
BGNG	85	0
ONG	15	0
TBNG	140-230	600

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement. Unless carefully managed, livestock grazing can cause deterioration and eventual loss of riparian habitats. It can also result in requests to control prairie dog populations on NFS lands.

Conservation Measures

The following conservation measures are presented as management direction in the revised LRMPs (Alternative 3):

Unit-wide Direction (Chapter 1)

All National Grasslands and Forests

- Protect nests and winter roost sites from disturbances or habitat destruction (Standards, Guidelines).
- Prohibit development of new facilities within 1 mile of bald eagle nests and winter roosts (Standard).
- Prohibit or limit activities causing disturbances to bald eagles within 1 mile of nests from 2/1 to 7/31 and from 11/1 to 3/31 within 1 mile of a winter roosting area. (Standard, Guideline)
- Avoid projects that would reduce water flows to levels that would threaten the integrity and health of riparian systems (Standards).
- Emphasize regeneration and health of riparian habitats (includes cottonwood riparian). (Objective, Standards, Guidelines)
- Bury new electric (< 33 KV) and telephone lines (Guideline).

All National Grasslands and Forests, cont.

- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

FPNG, BGNG, ONG, TBNG, NNF (BRD), SRMNF

- Require new aboveground utility lines to have 80-inch spacings between conductors and ground-wires. Modify existing lines or install perch-inhibitors when special use permits are reissued (Standard).

All National Grasslands Except SNG

- Expand prairie dog populations (see black-tailed prairie dog evaluation in this document for a detailed and quantitative summary of this direction). (Standards and Guidelines)

Geographic Area Direction (Chapter 2)

All National Grasslands Except SNG

- Expand prairie dog populations (see black-tailed prairie dog evaluation in this document for a detailed and quantitative summary of this direction). (Guidelines)

All National Grasslands and Forests

- The objectives to provide a diverse mosaic of seral stage and structure grasslands on these areas are summarized in Table H-5 and H-6 in Section 5 of this document and this should enhance prey base.

Management Area Direction (Chapter 3)

TBNG

- Cheyenne River Zoological Special Interest Area (MA 2.1b) is established with standards to expand prairie dog populations; reduce disturbances from management activities and other land uses; and ensure regeneration of the cottonwood and willow gallery forests along the river. This area is 5,980 acres in size (see MA 2.1b in the revised LRMP for details of management direction).

Monitoring Direction (Chapter 4)

All National Grasslands and Forests

- Continue surveys to further determine status of breeding and wintering eagles.
- If bald eagle nesting occurs in the future on these lands, monitor the effectiveness of oil and gas stipulations for this species.
- Monitor the effectiveness of oil and gas stipulations in protecting winter roosting areas.

Appendices

All National Grasslands and Forests

- Apply oil and gas stipulations (Appendix D in revised LRMPs) to protect nests and winter roosts. Scientific references to support the oil and gas stipulations for bald eagle nests and winter roosting areas include Lerczak (1992) and Romin and Muck (1999).

Biological Determinations, Risk Assessments, and Rationale

All National Grasslands and Forests

Determination is "not likely to adversely affect." Outcome II is selected as the risk assessment. Management to emphasize regeneration on at least 80% of the riparian habitat will slow, prevent, or possibly reverse the decline of roosting and potential nesting habitat associated with gallery forests. This is especially important for cottonwood floodplains, which are used for roosting and perching. Expansion of prairie dog populations may also enhance foraging habitats and prey base for migrating and wintering bald eagles. These actions contribute to a higher level of probability that regional bald eagle populations will be viable over the long-term and are considered benefical effects. This prediction seems reasonable given the apparent increases in number of eagles using these areas and the increasing number of eagle pairs and nesting attempts within the planning area. Also, regional trends for the number of bald eagles and breeding territories continue to increase (Green 1985, Gerrard 1983, Swenson 1983, U.S. Fish and Wildlife Service 1995 and 1999), as does the number of nesting attempts. However, the potential impacts (reduced channel scouring) of large dams like the Angostura irrigation project on the Cheyenne River in South Dakota on downstream hydrology and cottonwood regeneration may be problematic. It is possible that potential nesting and winter roosting habitat for some distance below this dam may be on a long-term decline and improved grazing management in these areas on national grasslands and private lands may only slow the rate of decline. It's acknowledged that negative effects of large reservoirs on downstream cottonwood regeneration and potential future nesting habitat may be partially offset by positive impacts such as enhanced winter food availability (fish and waterfowl) as a result of the reservoirs.

Black-footed Ferret (*Mustela nigripes*)

Anderson et al. (1986), Clark (1989), Biggins and Godbey (1995), Joslin and Youmans (1999), U.S. Fish and Wildlife Service et al. (1994) and the national recovery plan (U.S. Fish and Wildlife Service 1988) were consulted as primary references for background information on this species.

Species Description

The black-footed ferret is a medium-sized carnivore and the only ferret native to North America. Black-footed ferrets are primarily nocturnal and live almost exclusively in prairie dog colonies. Prairie dogs are their primary prey. Ferrets mate in April or May and have 1 litter per year, typically of 3 to 5 young. The species is active all year and do not hibernate.

Distribution and Status

Table H-2 summarizes species occurrence in the planning area. Black-footed ferret surveys have been conducted on all NFS lands where prairie dog poisoning has occurred in the past. Many of these surveys were initiated in the 1970s and were conducted to varying degrees of standardization and intensity until the early 1990s. Although occasional ferret-like sign was observed on the various NFS units, wild ferrets were never found and confirmed by Forest Service or U.S. Fish and Wildlife Service biologists on or near these lands. An exception to this is a sighting by a biologist near the Buffalo Gap National Grassland but that sighting remains questionable, although the U.S. Fish and Wildlife Service lists it as a confirmed sighting. It is believed the last unquestionable historical record of a wild ferret occurred near the Buffalo Gap National Grassland in 1965 and involved a roadkill near Cottonwood, South Dakota. It is

believed that all ferrets on NFS lands in the planning area today are the result of an ongoing reintroduction program on the Buffalo Gap National Grassland and adjoining Badlands National Park (U.S. Fish and Wildlife Service et al. 1994). During surveys in the summer and fall of 2,000, 89 adults and 58 wild-born litters totaling 140 kits were observed in the reintroduction habitat. The most recent ferret locations in the reintroduction area were consulted in this evaluation and are maintained in the administrative record.

All other known ferret populations in the wild are also the result of reintroduction programs. Other reintroduced populations are located in Montana, Wyoming, Arizona, and in a new site along the border of Colorado, Utah, and Wyoming.

ESA Status and Other Organization Rankings

ESA - Endangered; TNC / NHP - G1, N1; MT, NE, SD - Endangered

Habitat

Prairie dogs and their colonies are the habitat of black-footed ferrets, and ferret movements off prairie dog colonies represent dispersal to find other prairie dog colonies. Based on the most recent information on habitat use by ferrets in the Conata Basin / Badlands reintroduction area (William Perry and Travis Livieri, personal communication), prairie dog colony complexes of 1,000 to 1,800 acres may be sufficient to support the minimum adult population of 30 as specified in the recovery plan for reintroduction areas. However, the authors of the recovery plan and others studying black-footed ferrets (Biggins and Godbey 1995, Bevers et al. 1997) have suggested the need for much larger colony complexes to increase the probability of long-term persistence of ferret populations.

Various authors have provided estimates of minimum viable populations (MVP). Frankel and Soule' (1981) provided a general rule that at least 50 adults are needed to maintain short-term (30 generations) genetic fitness. Groves and Clark (1986), using data from the Meeteetse ferret population, suggested that a MVP of 214 breeding adult ferrets would be needed to maintain an effective population of 50 adults. Using the area requirements of ferrets in the Conata Basin / Badlands reintroduction area, a minimum complex size of 7,490 to 12,840 acres would be needed to support 214 adult ferrets. Harris et al. (1989) used demographic data from both South Dakota and Wyoming ferret populations in a computer simulation model and suggested that 90 to 100 ferrets would have a 95% probability of surviving 50 to 100 years.

The total acreage of active prairie dog colonies on each National Grassland and Forest at the time of the last surveys (1996-1998) is as follows:

- GR / CRNG - 1,520.
- LMNG - 2,860.
- TBNG - 18,340.
- ONG – 740.
- BGNG - 13,280.
- FPNG – 720.
- NNF (BRD) – 70.

These acreages include fully and partially active colonies but do not include colonies that were inactive at the time of the last survey. Prairie dog populations on all or most of the national grasslands and forests listed above have likely increased since the last surveys.

Recovery and Conservation Planning

The latest recovery plan was approved in 1988 (U.S. Fish and Wildlife Service 1988), and the recovery objective is to ensure the immediate survival of the species by accomplishing the following:

- Increasing the captive population of black-footed ferrets to a census size of 200 breeding adults by 1991.
- Establishing a prebreeding census population of 1,500 free-ranging black-footed ferret breeding adults in 10 or more populations, with no fewer than 30 breeding adults in any population by the year 2010.
- Encourage the widest possible distribution of reintroduced black-footed ferret populations.

An environmental impact statement for black-footed ferret reintroduction in the Badlands National Park and Conata Basin portion of the Buffalo Gap National Grassland was issued in 1994 (U.S. Fish and Wildlife Service et al. 1994).

Direct and Indirect Effects on NFS Lands

Prairie dog poisoning obviously reduces prey availability for black-footed ferrets. Repeated poisoning also reduces burrow availability for shelter. Primary and secondary poisoning of ferrets from consuming poisoned prairie dogs or bait are not considered significant threats. Use of burrow fumigants pose a direct threat to individual ferrets. Under the direction for rodenticide use and prairie dog management in Alternative 3, the total acreage of active prairie dog colonies will be expected to increase on each national grassland and forest over the next 10 years to the levels presented below. The lower end of the range is predicted if favorable precipitation and grassland production conditions prevail over the next 10 years, and the upper end of the range is predicted if drought conditions are common during the period. These acreages of active prairie dog colonies occur both in and outside (dispersal habitat) black-footed ferret reintroduction habitat areas.

- GR/CRNG – 2,500 to 3,900.
- LMNG – 5,400 to 9,400.
- TBNG – 30,000 to 47,000.
- ONG – 1,200 to 1,900.
- BGNG – 22,000 to 36,000.
- FPNG – 1,200 to 1,900.
- NNF (BRD) - unknown.

Establishment of black-footed ferret reintroduction habitat on national grasslands will make significant contributions to help meet the national recovery objectives for the species.

Currently, there is limited data from controlled experiments that document significant reductions in prairie dog populations due to recreational shooting (Knowles 1987, Vosburgh and Irby 1998). Accidental ferret mortality associated with prairie dog shooting is possible (Joslin and Youmans 1999).

Livestock grazing can be used to either help contain or increase prairie dog colony acreages, which in turn affects habitat availability and suitability for ferrets.

Intense development and activity associated with recreation and oil, gas, and mineral development could result in direct and indirect negative effects (Joslin and Youmans 1999). Well pads and oil and gas access roads reduce the amount of suitable ferret habitat. Increased vehicle travel due to oil and gas activities may also increase mortality risks to black-footed ferrets.

Coal production can result in the loss of black-footed ferret habitat. Under Alternative 3, 47,990 acres are designated for mineral production and development (MA 8.4) on the Thunder Basin National Grassland. Coal production and reclamation is regulated by other state and federal agencies. The Office of Surface Mining is the federal agency with responsibility for approving mining plans. The state of Wyoming has delegated primacy for approval of mining and reclamation plans to the Wyoming Department of Environmental Quality. Forest Service reviews mining and reclamation plans to determine compliance with LRMP direction. Mining and reclamation plans also require consultation with the U.S. Fish and Wildlife Service.

Cumulative Effects

It is likely that reductions in prairie dog populations on private lands through poisoning will continue, thereby resulting in further losses of ferret habitat. Reductions from estimates of historic prairie dog colony acreages in the states within the planning area range from 75% to 90% (Mulhern and Knowles 1997). Additional reductions of prairie dog colonies on adjoining and nearby Indian Reservations could also occur in the future.

Lands previously owned by The Nature Conservancy have been added to the Cheyenne River ferret reintroduction habitat on the Thunder Basin National Grassland. Other opportunities to cooperate with tribal organizations in black-footed ferret recovery probably also exist, but additional coordination is needed to ascertain the likelihood of future cooperative projects with adjoining Indian reservations to enhance black-footed ferret recovery opportunities.

Oil and gas exploration and development on public domain lands could also have impacts on black-footed ferrets and their habitat. The Bureau of Land Management has oil and gas stipulations that require ferret surveys and consultation with U.S. Fish and Wildlife Service if ferrets are observed.

Prairie dog poisoning on public domain lands, National Wildlife Refuges and National Parks could reduce the amount of potential black-footed ferret habitat. However, poisoning on federal lands by these agencies is either no longer occurring or has been limited only to situations involving human health or safety concerns.

Construction of the new proposed railroad tracks (Powder River Basin Expansion Project) and train traffic along this new transportation corridor could result in some habitat loss and additional mortality risks to ferrets on the Thunder Basin and Buffalo Gap National Grasslands.

Plague epizootics in prairie dog colonies could reduce and further fragment black-footed ferret habitat.

Interrelated and Interdependent Actions

Oil and gas exploration and development activities, unless carefully managed, can result in habitat loss, risks, and adverse disturbances to black-footed ferrets (U.S. Fish and Wildlife Service 1990). Decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD) and eventual on-site development. Although the decision to make areas available for oil and gas leasing does not result in on-the-ground activities and possible effects on black-footed ferrets, oil and gas stipulations to protect and conserve ferrets and their habitat are needed at the time leasing availability decisions are made. Site-specific biological assessments and evaluations are also conducted at the time applications to permit drilling are considered by the Forest Service. The number of new wells predicted in the reasonable and foreseeable development analysis for the national grasslands with moderate to high oil and gas potential is as follows:

	Oil and Gas Wells	Coalbed Methane Wells
LMNG	600	60
BGNG	85	0
TBNG	140-230	600

The reintroduction habitat allocated on the Buffalo Gap National Grassland is located outside the areas with moderate or high oil and gas production potential. However, the potential ferret habitat on the Little Missouri and Thunder Basin National Grasslands is located in nationally significant oil and gas production areas. Approximately 63%(32,500 acres) of the reintroduction habitat area on the Thunder Basin National Grassland is currently leased, and of that amount, approximately 35% (11,500) is held by production.

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement. Livestock grazing permittees commonly request prairie dog poisoning on NFS lands to reduce forage consumption and clipping by prairie dogs.

Conservation Measures

The following conservation measures are presented as management direction in the revised LRMPs (Alternative 3):

Unit-wide Direction (Chapter 1)

LMNG, GRNG, FPNG, BGNG, ONG, TBNG

- Limit and restrict activities and land uses in prairie dog colonies that are occupied or thought to be occupied by black-footed ferrets to reduce disturbances. This protection extends from March 1 through August 31 and to the immediate expansion zone (1/8 mile) of these colonies (Standards, Guidelines).
- Expand prairie dog populations through reduced use of rodenticides, livestock grazing management, landownership adjustments, and if needed, restrictions on prairie dog shootng (Standards, Guidelines).
- Manage for no net loss of suitable black-footed ferret habitat due to management activities and land uses. This is based on the amount of suitable habitat available when the activity or land use is proposed (Standard).

LMNG, GRNG, FPNG, BGNG, ONG, TBNG, cont.

- Limit oil and gas development to 1 well per 80 acres of occupied ferret habitat (Standard).
- Align new roads outside prairie dog colonies or minimize roads within colonies (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat, including prairie dog colonies, for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

LMNG, GRNG, FPNG, BGNG, ONG, TBNG

- Expand prairie dog populations (Guidelines).
- Establish new prairie dog colony complexes (Guidelines). New complexes that may serve as black-footed ferret reintroduction habitat 15 or more years in the future are prescribed for the following areas:
- LMNG (2 new complexes plus southerly expansion of Horse Creek complex),
- GRNG (southern half of Grand River National Grassland),
- FPNG (Sand and Timber Creek drainages),
- ONG.

Management Area Direction (Chapter 3)

LMNG, BGNG, TBNG

- One expanded and three new black-footed ferret reintroduction habitat areas (MA 3.63) are established. Standards are provided to expand prairie dog populations and reduce disturbances and risks to ferrets from management activities and other land uses. The size of these areas and the amount of black-footed ferret habitat in each one are as follows:

Area (MA 3.63)	NFS Acres	Current Prairie Dog Colony Acreage	Predicted Prairie Dog Colony Acreage in 10 Years
Horse Creek (LMNG)	29,180	300	1,200 to 2,800
Conata Basin / Badlands (BGNG)	78,720	10,890	17,800 to 28,200
Smithwick (BGNG)	25,310	300	1,200 to 2,800
Cheyenne River (TBNG)	53,830	12,430	20,300 to 32,200

- The predicted prairie dog colony acreages in 10 years for each area, the low end of the range is predicted if precipitation patterns are generally favorable for vegetative growth over the next 10 years, and the high end of the range is predicted if drought conditions and favorable colony expansion conditions extend through much of the period.
- Apply oil and gas stipulations (Appendix D in revised LRMPs) for black-footed ferrets to all prairie dog colonies in black-footed ferret reintroduction habitat (MA 3.63) (Standard).
- Limit oil and gas development to 1 well per 80 acres in all prairie dog colonies in black-footed reintroduction habitat (MA 3.63) (Standard).

- Prohibit prairie dog shooting in black-footed ferret reintroduction habitat (MA 3.63) (Standard).
- Only use rodenticides to reduce prairie dog populations in black-footed ferret reintroduction habitat (MA 3.63) after consultation and concurrence with U.S. Fish and Wildlife Service (Standard).
- As needed and in consultation with appropriate state and federal agencies, establish new prairie dog colonies in black-footed ferret reintroduction habitat (MA 3.63) through prairie dog relocation (Standard).

Monitoring Direction (Chapter 4)

LMNG, GRNG, FPNG, BGNG, ONG, TBNG

- Continue monitoring populations (in MA 3.63) and habitat.
- Monitor effectiveness of landownership adjustments and cooperative agreements in reducing private land conflicts and enhancing long-term opportunities for prairie dog habitat expansion.
- Monitor effectiveness of oil and gas stipulations in protecting this species and its habitat.

Appendices

LMNG, BGNG, TBNG

- Appy oil and gas stipulations (Appendix D in revised LRMPs) for black-footed ferrets to all prairie dog colonies in black-footed ferret reintroduction habitat (MA 3.63) and to only those colonies outside MA 3.63 that are occupied or thought to be occupied by black-footed ferrets. The primary reference to support the oil and gas stipulations for black-footed ferrets and their habitat is U.S. Fish and Wildlife Service (1990).

Biological Determinations, Risk Assessments, and Rationale

LMNG

Determination is "not likely to adversely affect." It is highly unlikely that wild ferrets occur in this area. However, the Horse Creek area is made available as black-footed ferret reintroduction habitat, and active management will be used to accelerate prairie dog expansion. It's likely that sufficient habitat will be available for reintroductions and to support at least 30 adult ferrets in this area within the next 10 to 15 years. However, growth of the colony complex would need to continue beyond the next 10 to 15 years to increase the likelihood of long-term viability for the ferret population in the Horse Creek area. If the management efforts to develop new complexes are successful, additional reintroduction habitat may be available in the future.

GR/CRNG

Determination is "not likely to adversely affect." It is highly unlikely that wild ferrets occur in this area. However, if management efforts to develop one or more new complexes in the south half of the national grassland are successful, new reintroduction habitat may be available here in 15 or more years.

FPNG

Determination is “not likely to adversely affect.” It is highly unlikely that wild ferrets occur in this area. However, if management efforts to develop a new complex in the northeast part of this national grassland are successful, new reintroduction habitat may be available here in 15 or more years.

BGNG

Determination is "not likely to adversely affect" for those areas on this national grassland outside the Conata Basin/Badlands experimental population area (U.S. Fish and Wildlife Service et al. 1994). New reintroduction habitat on the Buffalo Gap National Grassland is allocated in the Smithwick, South Dakota area. It’s likely that sufficient habitat will be available for reintroductions and to support at least 30 adult ferrets in this area within the next 10 to 15 years. However, growth of the colony complex will need to continue beyond the next 10 to 15 years to increase the likelihood of long-term viability for a ferret population in this area.

Determination is "not likely to jeopardize a proposed species" for those areas on this national grassland within the Conata Basin/Badlands experimental population area (U.S. Fish and Wildlife Service et al. 1994). Under Alternative 3, the Conata Basin/Badlands Black-footed Ferret Reintroduction Habitat Area is substantially expanded. This is a beneficial effect. Estimated current and 10-year ferret carrying capacities for ferrets in this area, including the habitat on the Badlands National Park, as determined using 2 different modeling approaches are 191 to 438 and 236 to 540 ferret families, respectively (Northern Great Plains Terrestrial Assessment). These projections did not include capacity provided by dispersal habitat located outside the reintroduction area but within the experimental population area. These projections demonstrate that both current and projected carrying capacities for this reintroduction area exceed the viability probabilities of a 50 to 100 year survival period for 90 to 100 ferrets reported by Harris et al. (1989). Allocation of the expanded Conata Basin/Badlands reintroduction represents a significant contribution to the national recovery program, especially when considering that this area appears to be at low risk of plague epizootic.

Outcomes III and V are selected as the risk assessment for this species on the Buffalo Gap National Grassland. The rationale for Outcome III is that the black-footed ferret habitat remains fragmented with significant gaps of suitable habitat for successful dispersal, but the focus to develop the nearby Smithwick ferret habitat area will reduce the level of fragmentation. Also, the observations of 58 wild-born litters (140 kits) during the summer and fall of 2,000 certainly demonstrate at least short-term success of ferret reintroductions in the Conata Basin/Badlands area. Outcome V is selected as the most appropriate risk assessment if plague should become problematic in this area in the future.

ONG

Determination is “not likely to adversely affect.” It is highly unlikely that wild ferrets occur in this area. If management efforts to develop a new prairie dog complex on this national grassland are successful, the additional suitable habitat for ferret dispersal would certainly complement the ferret reintroduction habitat on the adjoining Buffalo Gap National Grassland.

TBNG

Determination is “not likely to adversely affect.” It is highly unlikely that wild ferrets occur in this area. Direction under Alternative 3 allocates an expanded reintroduction habitat area. Estimated current and 5-year ferret carrying capacities for ferrets in this area as determined using 2 different modeling approaches are 162 to 208 (Biggins et al. 1993) and 158 to 204 (U.S. Fish and Wildlife Service et al. 1994) ferret families, respectively. These projections did not include capacity provided by dispersal habitat located outside the reintroduction area. These projections demonstrate that both current and projected carrying capacities for this reintroduction area exceed the viability probabilities of a 50 to 100 year survival period for 90 to 100 ferrets reported by Harris et al. (1989).

Allocation of this area as black-footed ferret reintroduction habitat represents a significant contribution to the national recovery program, assuming that plague does not decimate prairie dog populations in the future. A recent, nearby plague epizootic suggests that plague may be problematic in this area in the future.

NNF (BRD)

Determination is "no effect." It is highly unlikely that black-footed ferrets occur in these small isolated colonies in the Nebraska Sandhills, and it is highly unlikely that the area supports any potential ferret habitat. This part of the Sandhills is not capable of supporting large prairie dog colony acreages because of steep and rough topography and the capability to grow tall and dense vegetation. It appears that the area may not be able to support viable long-term prairie dog populations.

Mountain Plover (*Charadrius montanus*)

The following were key references consulted for this evaluation:

- The proposed rule to list the mountain plover as a threatened species (February 16, 1999 Federal Register Volume 64, Number 30, Pages 7587-7601).
- Information on the Northern Prairie Wildlife Research Center website (Johnson and Igl 2000 and Dechant et al. 2000).
- A mountain plover fact sheet on a U.S. Fish and Wildlife Service website (www.r6.fws.gov).
- Knopf (1996).
- USDA Forest Service (1994).

Species Description

The mountain plover is a medium-sized, ground-nesting bird of the uplands. It looks much like a small, pale version of the more common killdeer, but without chest stripes. The nest is a shallow depression in the ground containing three well-camouflaged eggs. Incubation lasts 29 days. The species feeds primarily on insects, especially spiders, beetles, grasshoppers, and other invertebrates.

Generally, mountain plovers arrive on the breeding grounds from mid-March to mid-April, and depart for fall migration in early August to late October (Graul 1973, 1975; Wallis and Wershler 1981; Olson 1984; Leachman and Osmundson 1990; Knopf 1996 *a, b*).

If the first nest fails before June, the female may attempt to renest (Knopf 1996*b*). Multiple nesting (the male incubates a first clutch while the female incubates a second clutch simultaneously) has been reported (Graul 1973, Knopf 1996*a*). Mountain Plovers exhibit fidelity to nest sites used the previous year (Graul 1973, 1975).

These are gregarious birds outside the breeding season. They forage and roost in loose flocks of changing composition. Flock size may exceed 1000 on southern Great Plains in late summer. Density at Charles M. Russell National Wildlife Refuge, Montana, was 16 breeding plovers per 247 acres (100 ha) in prairie dog towns and 1.7 birds per square mile (0.28 per sq. km.) in the entire area (Olson 1984). The brood usually moves 0.6 to 1.2 miles (one to two km.) from the nest site in the first two to three days (Knopf and Rupert 1996). More than half of the clutches are lost to predators, mainly coyote and swift fox. Chicks also experience high rates of predation (Knopf 1996).

Distribution and Status

Table H-2 summarizes species occurrence in the planning area. Surveys for the species on NFS lands by Forest Service biologists have been conducted on the Oglala, Thunder Basin, and Little Missouri National Grasslands. The species is believed to currently occur only on the Thunder Basin National Grassland. There are about 14,000 acres of nesting habitat identified on the national grassland, and it is estimated that 30 or more nests occur on this area annually. It is also estimated that 150 or more adults and fledglings use the national grassland annually. There appears to be suitable habitat on the national grassland that is currently not being used. Maps of the current nesting habitat and nesting sites on the national grassland maintained by the Forest Service were consulted for this evaluation. On the Oglala and Buffalo Gap National Grasslands, prairie dog colonies are assumed to be suitable but unoccupied habitat.

The former distribution of mountain plovers on the northern Great Plains included eastern and central Montana and sites throughout Wyoming. There are only a few records of mountain plover in North Dakota (Roosevelt 1885, Stewart 1975, Berkey et al. 1994), and the species was formerly a rare breeder in western South Dakota. The most recent sighting in South Dakota was in 1977 (South Dakota Ornithologists' Union 1991). Some birds have been recorded recently in western Nebraska.

A status survey (Leachman and Knopf 1991) indicated recent population declines rangewide of 50-89%. Breeding Bird Survey data show an average annual 3.7% decline between 1966 and 1993 (Knopf 1996). Population analysis for the period 1966 through 1996 showed a population decline of 2.7% annually (Commission on Environmental Cooperation 2000). The breeding distribution has also contracted, with both peripheral populations disappearing and core populations going from widely distributed to only locally present (Knopf 1996).

Mountain plovers breed from southeastern Alberta and southwestern Saskatchewan through central Montana, south to southcentral Wyoming, east-central Colorado and northeastern New Mexico, and east to northern Texas and western Kansas (National Geographic Society 1987).

The species breeds almost exclusively on the dry tablelands of the western Great Plains and Colorado Plateau, and winters mostly in California, southern Texas and Arizona, and in Mexico. Adults and fledglings leave the breeding grounds by early August. An additional small population resides yearlong in the Davis Mountains of western Texas (Knopf 1996). Current estimated populations are estimated between 8,000 to 10,000 birds.

ESA Status and Other Organization Rankings

ESA = Proposed; TNC / NHP G2; FS – Sensitive (R1 and R2)

The mountain plover has been proposed for listing as threatened under the Endangered Species.

The Committee on Environmental Cooperation, established under the North American Free Trade Act has identified the mountain plover as well as the black-tailed prairie dog as priority grassland species for conservation action.

Habitat

Mountain plover prefer large, flat grassland expanses with sparse, short vegetation, and bare ground (Giezentanner 1970; Graul 1973, 1975; Knowles et al. 1982; Olson 1984; Olson and Edge 1985; Shackford 1987; Wershler and Wallis 1987; Leachman and Osmundson 1990; Parrish et al. 1993; Knopf and Miller 1994; Knowles 1996). Areas disturbed by prairie dogs, heavy grazing, or fire can provide suitable habitat (Finzel 1964, Wallis and Wershler 1981, Knowles and Knowles 1984, Olson 1984, Shackford 1987, Wershler and Wallis 1987). Burning can benefit mountain plover when used to maintain areas of shorter grass within mixed grassland (Wallis and Wershler 1981, Knopf 1996*b*). In the short-grass prairie, mountain plover are attracted to prescribed burns (Svingen and Giesen 1999).

Mountain plover often are associated with blue grama or buffalo grass (Bradbury 1918; Laun 1957; Finzel 1964; Giezentanner 1970; Graul 1973, 1975; Graul and Webster 1976; Wallis and Wershler 1981, Parrish 1988, Parrish et al. 1993). The species often nests near cow pies, rocks, or clumps of vegetation (Graul 1975, Wallis and Wershler 1981, Olson and Edge 1985, Knopf and Miller 1994, Knopf 1996*a*, Parrish 1988, Parrish et al. 1993). Litter cover near nests in Montana was greater than that in the surrounding habitat (Olson 1984, Olson and Edge 1985).

On a northern Montana shrub-grassland, cattle grazing alone, without prairie dog towns, did not provide suitable habitat (Olson and Edge 1985). Mountain plover have been reported following sheep herds, inhabiting areas around stock tanks, and increasing in numbers where American bison are pastured (Knowles 1996). In Alberta, heavy grazing in summer or late winter improved habitat for mountain plover by providing short grass in mixed-grass areas (Wallis and Wershler 1981, Wershler and Wallis 1987). In Colorado, shortgrass pastures grazed heavily in summer were used for foraging and nesting (Giezentanner 1970). However, mountain plover may be excluded by extreme or long-term overgrazing (Laun 1957, Wallis and Wershler 1981).

In Montana, mountain plover were rarely seen outside of prairie dog colonies, and colonies smaller than 25 acres were considered marginal habitat (Knowles et al. 1982, Knowles 1996, Olson 1984). In Colorado, minimum area needed per brood was at least 69 acres, with brooding areas often overlapping (Graul 1973, Knopf and Rupert 1996). Three males defended territories averaging 40 acres. Prairie dog colonies also may provide greater food resources and more vulnerable prey for mountain plover (Olson 1985). Colonies occupied by mountain plover often are associated with cattle pastures and stock ponds (Knowles et al. 1982, Olson and Edge 1985). Within prairie dog colonies, mountain plover chose nest sites with shorter vegetation, more bare ground, and higher forb density (Olson 1984, Olson and Edge 1985). Prairie dogs within shrub-grassland pastures can control sagebrush growth and provide suitable nesting habitat (Olson 1984, Olson and Edge 1985).

Nests have been documented on high plains shortgrass prairie, desert tablelands, prairie dog colonies, and sagebrush / blue grama habitats. In central and southwestern Montana, southeastern Wyoming, and northeastern Colorado, nesting often occurs in shortgrass prairie with a history of heavy grazing or in low shrub semi-deserts. Nesting areas are characterized by very short vegetation, significant areas of bare ground (typically >30%), and flat or gentle slopes (< 12%) (Graul 1975, Graul and Webster 1976, Knowles et al. 1982, Olson 1984, Olson and Edge 1985, Olson-Edge and Edge 1987, Knopf and Miller 1994, Knopf 1996). Nesting can also occur in barren fields that subsequently are planted with millet or sunflowers, resulting in losses of eggs and chicks (Knopf 1996). Nests are on the ground in shallow depressions that may be lined with plant material and / or adjacent to dried cattle dung (Knopf and Miller 1994). Adults often take chicks to windmill / water tank areas to forage (Knopf 1996), but site around tank must be dry. The species generally avoids moist soils.

In areas where mountain plover are associated with prairie dog towns, the size of towns is an important factor. Mountain plover in Montana occurred at highest densities on towns 15-124 acres (6-50 ha) and were less abundant on smaller towns (Knowles et al. 1982, Olson 1984, Olson-Edge and Edge 1987). Average size of towns used by mountain plover in northcentral Montana was 142 acres (57.5 ha) (Knowles and Knowles 1984).

There's currently over 14,000 acres of occupied mountain plover habitat identified on the Thunder Basin National Grassland. Almost all of this is on prairie dog colonies. No attempt has been made yet to define and map potential and suitable habitat.

Current sizes of prairie dog colonies on the Thunder Basin, Buffalo Gap and Oglala National Grasslands are presented in this biological assessment in the black-footed ferret evaluation. The colony acreages in the table represent area on national grasslands only, and in some cases, an additional unknown acreage extends onto adjoining private or state lands.

Using the habitat use information from Colorado on habitat use by broods (Graul 1973, Knopf and Rupert 1996), 82 colonies on the Thunder Basin National Grassland could potentially support at least one brood. At least 65 colonies could support a minimum of one breeding territory. These statistics will continue to look more favorable for the mountain plover as prairie dog populations expand under the revised LRMP.

Recovery and Conservation Planning

A recovery plan or conservation strategy has not been prepared for this species. Critical habitat has not been designated for this species. Keys to conservation include providing short, sparse grasslands of adequate size. Mixed-grass areas can be made suitable for breeding mountain plovers by preserving large prairie dog colonies and, in some situations, implementing heavy grazing.

Direct and Indirect Effects on NFS Lands

Livestock grazing at moderate and high intensities can improve habitat for this species by reducing vegetation cover (Wershler and Wallis 1987, Knowles et al. 1982, Bock et al. 1993). The risk of losing nests to livestock trampling is considered insignificant (Knopf 1996). Livestock grazing at reduced intensities can result in deterioration and loss of plover habitat due to increased height and density of vegetation.

Prairie dog management focusing on colony expansion can improve mountain plover habitat.

Prairie dog shooting could result in adverse disturbances and direct and indirect risks to mountain plover (Joslin and Youmans 1999).

Burning to maintain areas of shorter grass within mixed grassland can be beneficial (Wallis and Wershler 1981, Knopf 1996). Burning of short-grass prairie attracts nesting mountain plovers (Svingen and Giesen 1999).

Oil and gas development activities can affect plover (USDA Forest Service and Bureau of Land Management 1994, U.S. Fish and Wildlife Service 2000). Oil and gas development structures can serve as raptor perches with the effect of higher mortality risks to mountain plover in the area. Increased vehicle travel due to oil and gas activities can also increase mortality risks to mountain plover. Well pads reduce the amount of suitable plover habitat. Similar effects are likely associated with coalbed methane development.

Grasshopper spraying on rangelands may negatively impact this species.

Nests and nestlings can be destroyed by off-road vehicle travel.

Disturbances from human activity can negatively affect mountain plover (Joslin and Youmans 1999).

Coal production can result in the loss of occupied and potential mountain plover habitat. Under Alternative 3, 47,990 acres are designated for mineral production and development (MA 8.4) on the Thunder Basin National Grassland. Coal production and reclamation is regulated by other state and federal agencies. The Office of Surface Mining is the federal agency with responsibility for approving mining plans. The state of Wyoming has delegated primacy for approval of mining and reclamation plans to the Wyoming Department of Environmental Quality. Forest Service reviews mining and reclamation plans to determine compliance with LRMP direction. Mining and reclamation plans also require consultation with the U.S. Fish and Wildlife Service.

Cumulative Effects

Continued conversion of rangeland to croplands can be expected to occur on private lands (USDA Forest Service 2000, Ostlie et al. 1997, Chuluun et al. 1997). Although fallow cropland may attract nesting plovers, it may also pose additional risk to females and nests due to cultivation practices.

Continued poisoning of prairie dog towns on private lands can be expected to occur. The average size of prairie dog towns on private land is likely to remain small and unsuitable for mountain plover nesting.

Absence of prescribed fire on private land is likely to continue, thereby reducing nesting habitat opportunities for mountain plover. Mountain plover use habitat that has been heavily grazed and most privately owned land is probably moderately grazed.

Oil and gas exploration and development on public domain lands could also have impacts on mountain plover and their habitat. The Bureau of Land Management has oil and gas stipulations for protecting mountain plover and their habitat.

Prairie dog poisoning on public domain lands, National Wildlife Refuges and National Parks could reduce the amount of potential and suitable mountain plover habitat. However, poisoning on federal lands by these agencies is either no longer occurring or has been limited primarily to situations involving human health or safety concerns.

Loss of prairie dog populations due to plague could adversely impact plover populations.

Construction of the new proposed railroad corridor (Powder River Basin Expansion Project) could result in some loss of mountain plover habitat on the Thunder Basin National Grassland.

Interrelated and Interdependent Actions

Oil and gas exploration and development activities, unless carefully managed, can result in habitat loss, risks, and adverse disturbances to mountain plover. Decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD) and eventual on-site development. Although the decision to make areas available for oil and gas leasing does not result in on-the-ground activities and possible effects on mountain plover, oil and gas stipulations to protect and conserve plovers and their habitat are needed at the time leasing availability decisions are made. Site-specific biological assessments and evaluations are also conducted at the time applications to permit drilling are considered by the Forest Service. The number of new wells predicted in the reasonable and foreseeable development analysis for the national grasslands that have occupied or potential plover habitat and moderate to high oil and gas potential is as follows:

	Oil and Gas Wells	Coalbed Methane Wells
BGNG	85	0
ONG	15	0
TBNG	140-230	600

Approximately 71%(10,100 acres) of the mountain plover habitat currently mapped on the Thunder Basin National Grassland is currently leased for oil and gas production and approximately 25%(2,600 acres) of this acreage is held under production.

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement. Livestock grazing permittees commonly request prairie dog poisoning on NFS lands to reduce forage consumption and clipping by prairie dogs. The extensive number of grazing permits affects management flexibility to prescribe burn large areas.

Roadless designation and wilderness proposals would likely reduce prairie dog shooting, thereby enhancing mountain plover habitat and reducing disturbance of plovers.

Conservation Measures

The following conservation measures are presented as management direction in the revised LRMPs (Alternative 3):

Unit-wide Direction (Chapter 1)

TBNG

- Do not construct new facilities within ¼ mile of mountain plover nesting habitat (Standard).

- Limit and restrict activities and land uses in occupied mountain plover habitat to reduce disturbances and risks. This protection extends outward ¼ mile from nests and nesting areas from March 15 through July 31 (Standards, Guidelines).
- Expand mountain plover habitat through prescribed burns, livestock grazing management and by increasing prairie dog populations (see black-footed ferret evaluation) through reduced use of rodenticides, livestock grazing management, landownership adjustments, and if needed, restrictions on prairie dog shooting (Standards, Guidelines).
- Manage for no net loss of mountain plover habitat due to management activities and land uses. This is based on the amount of suitable habitat available when the activity or land use is proposed (Standard).
- In consultation with state wildlife agencies and U.S. Fish and Wildlife Service, restrict or limit prairie dog shooting from March 15 through July 31 in occupied mountain plover habitat (Guideline).
- Limit oil and gas development in mountain plover habitat to 1 well per 80 acres (Standard).
- Align new roads outside prairie dog colonies (Guideline).
- Limit vehicle speeds on resource and local roads in occupied habitat (Standard).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

BGNG, ONG, TBNG

- Expand prairie dog populations (Guidelines).
- Use prescribed burning to help meet vegetation objectives (Guideline).
- The objectives to provide specified amounts of early seral and low structure grasslands on these areas are summarized in Table H-5 and H-6 in Section 5 of this document.

BGNG, ONG

- Do not construct new facilities within ¼ mile of mountain plover nesting habitat (Standard).
- Limit and restrict activities and land uses in occupied mountain plover habitat to reduce disturbances and risks. This protection extends outward ¼ mile from nests and nesting areas from March 15 through July 31 (Standards, Guidelines).
- Expand mountain plover habitat through prescribed burns, livestock grazing management and by increasing prairie dog populations through reduced use of rodenticides, livestock grazing management, landownership adjustments, and if needed, restrictions on prairie dog shooting (Standards, Guidelines).
- Manage for no net loss of mountain plover habitat due to management activities and land uses. This is based on the amount of suitable habitat available when the activity or land use is proposed (Standard).

BGNG, ONG, cont.

- In consultation with state wildlife agencies and U.S. Fish and Wildlife Service, restrict or limit prairie dog shooting from March 15 through July 31 in occupied mountain plover habitat (Guideline).
- Limit oil and gas development in mountain plover habitat to 1 well per 80 acres (Standard).
- Align new roads outside prairie dog colonies (Guideline).
- Limit vehicle speeds on resource and local roads in occupied habitat (Standard).
- Evaluate the effectiveness of large prescribed burns in attracting and inventorying mountain plover (Standard).
- In cooperation with state wildlife agencies and U.S. Fish and Wildlife Service, evaluate desirability and feasibility of trying to establish a nesting population with reintroduced birds (Standard).

ONG

- Establish at least one prairie dog colony complex. This expansion of prairie dog colonies may provide additional mountain plover habitat. (Objectives, Guidelines)

Management Area Direction (Chapter 3)

BGNG, TBNG

- Expansion and protection of prairie dog populations in black-footed ferret reintroduction habitat (see MA 3.63 for management details in revised LRMPs).

TBNG

- Cheyenne River Zoological Special Interest Area (MA 2.1b) is established with standards to expand prairie dog populations and to reduce disturbances from management activities and other land uses. This area is 5,980 acres in size (see MA 2.1b for management details in the revised LRMP).

Monitoring Direction (Chapter 4)

BGNG, ONG, TBNG

- Continue monitoring populations and habitat.
- Monitor the effectiveness of oil and gas stipulations in protecting this species and its habitat.

Appendices

BGNG, ONG, TBNG

- Apply oil and gas stipulations (see Appendix D in revised LRMPs) for mountain plover. The primary references to support the oil and gas stipulations for mountain plover nesting habitat is U.S. Fish and Wildlife Service (2000) and Dechant et al. (1998).

Biological Determinations, Risk Assessments, and Rationale

TBNG

Determination is "not likely to jeopardize". The rationale for this determination is that prairie dog colony acreages (preferred plover habitat) and the number of larger colonies will increase under Alternative 3. Protection is also afforded to nest sites and nesting areas from disturbances and land uses (on and off prairie dog colonies) that would have adverse impacts on survival or nest success. Prescribed fire and low grassland structure levels (heavy grazing intensities) are also prescribed for selected areas, and if strategically located and timed for plovers, would also result in enhanced habitat conditions for the species. These management actions are considered beneficial effects.

Outcomes IV and VI are both selected as the risk assessment. The rationale for Outcome IV is that more than 150 (estimated) mountain plover currently use the Thunder Basin National Grassland annually, and the amount of suitable habitat will be increasing over the next 10 to 15 years. Disturbances and risks from management activities and various land uses are also reduced through numerous standards and guidelines. However, suitable mountain plover habitat in prairie dog colonies remains highly fragmented because prairie dog populations remain highly fragmented. It's assumed that under Outcome IV, problems and conflicts occurring on the winter ranges of mountain plover do not become more troublesome. Outcome VI would be a more accurate risk assessment if plague epizootics become more widespread and frequent in the future on the Thunder Basin National Grassland, but the possibility of future plague is largely beyond the control or influence of the Forest Service.

BGNG/ONG

Determination is "not likely to jeopardize a proposed species or adversely modify proposed critical habitat." Plovers have not been confirmed on or near these areas but surveys have not been conducted to current protocol standards so their presence cannot be totally ruled out at this time. Efforts to survey for plovers and to evaluate the potential of establishing nesting populations through burning, livestock grazing, and possible plover reintroductions could eventually result in significant contributions to the recovery program for this species. This is considered a possible beneficial effect.

Section 3 - Biological Evaluation for Species that are Globally Imperiled or Vulnerable and/or Candidates for Protection Under ESA

The following table displays the distribution of plant and animal species in the planning area that are ranked as G2 (imperiled globally) or G3 (vulnerable globally) by the Natural Heritage Program and/or are classified as candidate species for protection under ESA by the U.S. Fish and Wildlife Service. The sturgeon chub and black-tailed prairie dog are also candidates for protection under ESA. All of these species are classified as sensitive by the Forest Service in Region 1 and/or 2.

Table H-3. Species that are Globally Imperiled or Vulnerable and/or Candidates for Protection Under ESA.

Species	National Grassland or Forest									
	LMNG	GRCRNG	SNG	TBNG	BGNG	FPNG	ONG	NNF PRRD	NNF BRD	SRMNF
Dakota buckwheat	K	K			K		P			
Smooth goosefoot	K	K			P				P	K
Barr's milkvetch				K	K		P			
Dakota skipper	K	P	K							
Powesheik skipper			K							
Ottoe skipper	K	K		UQ	P	P	P	P	P	P
Regal fritillary	K	K	K	UQ	P	K	P	P	K	P
Sturgeon chub	UQ	UQ		UQ	K/OS					
Swift fox	UQ	UQ		K	K	UQ	K	UQ		
Black-tailed prairie dog	K	K		K	K	K	K		K	UQ

K = Known occurrence in vicinity; date of last observation indicates that species still occurs in area,

P = Possible but unconfirmed occurrence,

UQ = Species occurrence is unlikely or questionable; within species range and potential or suitable habitat may occur,

OS = Possible off-site occurrence (downstream, etc.).

Species Eliminated From Further Analysis

Screen 1 (Importance of Area)

TBNG = Ottoe Skipper (*Hesperia ottoe*)

- Rationale: This national grassland, especially the Spring Creek Geographic Area, is along the periphery of the range of this species but the species has not been observed on or near the grassland. If the species presence is confirmed in the future, this biological evaluation will be revisited and revisions to management direction considered.

TBNG = Regal Fritillary (*Speyeria idalia*)

- Rationale: This national grassland, especially the Spring Creek Geographic Area, is along the periphery of the range of this species but the species has not been observed on or near the grassland. If the species presence is confirmed in the future, this biological evaluation will be revisited and revisions to management direction considered.

LMNG = Sturgeon Chub (*Macrohybopsis gelida*)

- Rationale: Although the species was reintroduced in the Little Missouri River, follow-up surveys have not documented survival or reproduction. If the species presence is confirmed in the future, this biological evaluation will be revisited and revisions to management direction considered. FS will also consult with FWS.

GR/CRNG = Sturgeon Chub (*Macrohybopsis gelida*)

- Rationale: Although the species has been documented in the lower reaches of the Grand River, it has not been reported in or near the vicinity of the national grassland. If the species is found in the future this far west in the Grand River, this biological evaluation will be revisited and revisions to management direction considered. FS will also consult with FWS.

TBNG = Sturgeon Chub (*Macrohybopsis gelida*)

- Rationale: Although the species has been documented in the lower reaches of the Cheyenne River below Angostura Reservoir in South Dakota, it has not been reported in the upper reaches of the Cheyenne River in the vicinity of the national grassland. The species has also not been reported for the Little Powder River. If the species presence is confirmed in the future, this biological evaluation will be revisited and revisions to management direction considered. FS will also consult with FWS.

LMNG and GR/CRNG = Swift Fox (*Vulpes velox*)

- Rationale: The presence of this species on or near these national grasslands remains uncertain. If the species presence is confirmed in the future, this biological evaluation will be revisited and revisions to management direction considered. FS will also consult with FWS.

FPNG = Swift Fox (*Vulpes velox*)

- Rationale: The presence of this species on or near these national grasslands remains uncertain. If the species presence is confirmed in the future or reintroduced near the national grassland, this biological evaluation will be revisited and revisions to management direction considered. FS will also consult with FWS.

NNF (Pine Ridge Ranger District) = Swift Fox (*Vulpes velox*)

- Rationale: Although the swift fox have been observed on grasslands near the national forest, none have been sighted on the planning unit. The vegetation and topography of the national forest makes it unlikely that swift fox would occupy habitats on this area. FS will revisit this biological evaluation and consult with FWS if swift fox are eventually observed on this planning unit.

SRMNF = Black-tailed Prairie Dog (*Ludovicianus cynomys*)

- Rationale: Although prairie dogs may disperse into or across this area, there are no prairie dog colonies currently on this planning unit. There are no records of authorized prairie dog poisoning. If a colony is confirmed in the future, this biological evaluation will be revisited and revisions to management direction considered. FS will also consult with FWS.

Species Evaluations

Dakota Buckwheat (*Eriogonum visheri*)

Species Description

Dakota buckwheat is an erect spreading herbaceous annual containing both basal and cauline leaves and arising from a slender taproot (Heidel and Dueholm 1995). Small yellow flowers occur on an open inflorescence. It has shiny, dark brown achenes (Flora of the Great Plains 1986). It is a member of the Polygonaceae family.

Dakota buckwheat first emerges in the spring from May through late June, depending on its geographic location. Flowers first appear from late June to late July and continue to be produced into September. Seeds ripen and fall throughout this period. This species is wind-pollinated and self-fertile (Ode 1987). Seed is dispersed by wind and water action.

Distribution and Status

Table H-3 summarizes species occurrence in the planning area. Dakota buckwheat is considered a regional endemic to western North Dakota, western South Dakota, and southeast Montana (NatureServe 2000, Montana Natural Heritage Program 2000). Known occurrences on or near NFS lands within the planning area include the Little Missouri, Grand River/Cedar River, and Buffalo Gap National Grasslands. It may be possible that the species could occur on the Oglala National Grassland. Forest Service maps of occurrence locations were consulted. All of these National Grasslands probably contain potential and suitable habitat that could function as important refugia for the species. The Little Missouri and Buffalo Gap National Grasslands contain some of the most extensive populations of this species.

Dakota buckwheat is considered a regional endemic to North Dakota and South Dakota, with a high probability that this species may also occur in Montana (Lenz 1993). The eight county distribution for South Dakota is associated with the badlands along the Grand River and Moreau River drainages in the northwestern part of the state and the badlands in south central South Dakota. Most federally administered Dakota buckwheat populations are located within the Northern Great Plains planning area although a population was discovered in 1993 on the Sioux Ranger District of the Custer National Forest in South Dakota (Heidel and Dueholm 1995). Dakota buckwheat has the distinction of being the only known vascular plant that is endemic to the Dakotas (Ode 1987).

Dakota buckwheat is known from 43 element occurrence records in North Dakota (North Dakota Natural Heritage database 2000). In South Dakota, Dakota buckwheat is known from 38 populations on or near the Buffalo Gap National Grassland and 16 populations on or near the Grand River/Cedar River National Grasslands (South Dakota Natural Heritage database 2000). The size of these populations varies widely from few to several thousand individuals. In Montana, the species has been documented at a single location in the southeast part of the state (Montana Natural Heritage Program 2000).

The species was first collected and identified as a new species by Stephen Sargent Visher in 1912 and described as a new species in 1913 by Aven Nelson. The species did not receive full recognition as a taxonomically distinct species until James Reveal studied the genus *Eriogonum* more thoroughly in the 1960s (Ode 1987).

ESA Status and Other Organization Rankings

TNC / NHP G3, N3; BLM - Sensitive; FS – Sensitive (R1 and R2)

The species has no ranking under ESA. The species is ranked as S2 / S3 in North Dakota and S3 in South Dakota (NatureServe.com). S2 ranking signifies that the species is imperiled in state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of other factors making it very vulnerable to extirpation from the state. S3 ranking is rare in the state (20+ occurrences). Dakota buckwheat is ranked as S1 in Montana, meaning critically imperiled because of extreme rarity.

Habitat

Dakota buckwheat is considered an obligate resident of badlands. It is a primary successional species that inhabits mostly barren, actively eroding clay and shale substrates. Important habitats are toeslopes of eroding clay knobs. These badlands landforms contain habitats for a variety of plant and wildlife species not commonly found in the adjacent rolling grassland plains (Ode 1987).

Common native plant species found with Dakota buckwheat include broom snakeweed, saltbush, and knotweed. Non-native and invasive plant species found in buckwheat habitat include Russian thistle, sweetclover, and kochia.

Soil analyses demonstrate that Dakota buckwheat grows in a very harsh soil environment characterized by dense clay soils that are sodium-affected and nutrient-poor (Ode 1987). In addition, these soils have a high shrink-swell capacity. These characteristics inhibit secondary plant succession and provide Dakota buckwheat with a habitat niche that is largely free from most plant competition.

Conservation Planning

A conservation strategy has not been prepared.

Direct and Indirect Effects on NFS Lands

Immediate threats to known populations include habitat invasion by non-native plant species and development activities (Lenz 1993). Competition from non-native and invasive plants, such as Russian thistle and kochia, can be a significant threat. Noxious weeds such as leafy spurge and Canadian thistle occur in scattered populations throughout the mixed grass and shortgrass plains. Noxious weeds reduce the quality of habitat but at the same time, efforts to control spurge and other noxious weed species with chemicals can pose a direct threat to Dakota buckwheat.

Roads can negatively affect Dakota buckwheat populations by introducing non-native plant species along travel routes, by habitat fragmentation, and by loss of suitable habitat to disturbance.

Ground-disturbing activities associated with oil and gas development, mineral exploration, scoria pits, and other types of development could result in mortality of Dakota buckwheat plants or place their populations at risk.

Recreation can have negative effects on Dakota buckwheat plants and populations, depending on types of recreational use, road and trail use patterns and intensities, rate of spread of invasive and non-native plant species along recreational routes, and other factors. Even limited

recreation use on fragile claypan habitat may be detrimental to Dakota buckwheat. Trampling from recreational uses can result in mortality to individual plants.

Burning may directly impact the species by causing mortality or indirectly through modification of its habitat. Most buckwheat habitat contains scarce vegetative cover and probably is not at high risk for frequent fire regimes.

Excessive livestock trampling can interfere with reproduction of Dakota buckwheat or can damage individual plants. Livestock trampling during wet times of year can cause excessive soil compaction and may result in reduced plant vigor for the buckwheat. At the same time, some hoofprint depressions have created habitat microniches used by the species. Livestock grazing at light to moderate intensities does not seem to be a threat (Ode 1987).

Cumulative Effects

Many of the threats listed above for NFS lands also occur on other nearby land jurisdictions.

Interrelated and Interdependent Actions

Decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD) and eventual on-site development. Site-specific biological assessments and evaluations are conducted at the time applications to permit drilling are considered by the Forest Service and potential effects on any Dakota buckwheat populations in the proposed project area are addressed then.

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in the revised LRMPs (Alternative 3):

Unit-wide Direction (Chapter 1)

LMNG, GRCRNG, BGNG, ONG

- Prioritize this species for preparation of a conservation strategy (Objective).
- Conduct target surveys for this species (Objective).
- Manage vegetation so native forbs periodically complete their full reproductive cycle. (Standard, Guideline)
- Do not authorize new developments or placement of salt or minerals in occupied habitat (Guideline).
- Prioritize occupied habitat for noxious weed control using methods that do not pose adverse risks to Dakota buckwheat (Guideline).
- Design timing, intensity and frequency of mowing, burning and livestock grazing to benefit Dakota buckwheat (Standard).
- Require permits to collect sensitive plants or parts of sensitive plant species (Standard).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

- None

Management Area Direction (Chapter 3)

BGNG

- Establishment of the 12,030-acre Rake Creek backcountry nonmotorized area (MA 1.31) will eliminate risk of off-road vehicle travel to Dakota buckwheat populations in this area.

Monitoring Direction (Chapter 4)

LMNG, GRCRNG, BGNG, ONG

- Continue monitoring populations and habitat.

Biological Determinations, Risk Assessments, and Rationale

LMNG, GRCRNG, BGNG

Determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." Dakota buckwheat habitat is locally abundant and widely distributed throughout its range on the national grasslands. Additional suitable habitat occurs on private, state, and other federal lands. Under Alternative 3, protection is provided for known populations and their habitat. Therefore, there's a higher likelihood for long-term viability of the populations on and in the vicinity of the national grasslands as a result of the management direction in the revised LRMPs. However, the continued spread of noxious weeds and non-native and invasive plant species remains a potentially serious concern in localized areas.

Outcomes II and IV are selected as the risk assessments. Where populations are well distributed across the landscape, Outcome II is selected because recolonization of suitable but unoccupied habitat is more likely. Outcome IV is selected where the populations are more isolated and if lost, recolonization from other populations would be less likely. Successful transplants of this species into suitable and unoccupied habitat have not been demonstrated.

ONG

Determination is "no impact". The species presence on this area has not been confirmed and documented. However, management direction is provided for this species and potential habitat on this area. If the species presence had been confirmed, the determination would have been "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

Smooth Goosefoot (*Chenopodium subglabrum*)

Species Description

Smooth goosefoot is a slender, annual forb with linear leaves and well developed branches (Heidel and Dueholm 1995). It is distinguised on the basis of its linear, 1-veined smooth leaves. The tiny flowers are borne in clusters on slender panicles. Each flower lacks petals but has 5 sepals and 5 stamens. The 1-seeded fruit is compressed and relatively large; 1-2 mm across. (Montana Natural Heritage Program 2000, Great Plains Flora Association 1986).

This species is recognized most readily when mature, starting at the end of June until late August or September (Heidel 1990). It is distinguished by its readily detachable seed pericarp that exposes a jet-black seed. It flowers from July through September. Smooth goosefoot is a member of the Chenopodiaceae family.

Distribution and Status

Table H-3 summarizes smooth goosefoot occurrence in the planning area. The species is known from populations on or near the Little Missouri and Grand River / Cedar River National Grasslands. Smooth goosefoot has also been found on the Samuel R. McKelvie National Forest. The closest known population to the Thunder Basin National Grassland occurs further south on state land in Converse County, Wyoming (Wyoming Natural Heritage Program database 2000). Species distribution is centered in Nebraska and South Dakota, with additional outlying populations found in southern Canada, eastern Oregon, and Washington, through the western states to North Dakota, Kansas, Wyoming, Colorado, Utah, Nevada, Montana, and Idaho. However, records from at least five of these states are in question (Lenz 1993). Efforts to relocate South Dakota historic collections from the Sioux Ranger District on the Custer National Forest were unsuccessful (Heidel and Dueholm 1995). The species was first collected in North Dakota in 1946. All of the known populations in North Dakota are very small, and habitat is considered limited and threatened (Lenz 1993).

The Great Plains Flora Association (1986) notes that smooth goosefoot is quite rare and has been collected infrequently during the past several decades. The population(s) located during the 1989 survey of Theodore Roosevelt National Park is among the most recent collections of this species anywhere (Heidel 1990).

There are three records of smooth goosefoot on the Little Missouri National Grassland, all of which are located along the sandy floodplains of the Little Missouri River (North Dakota Natural Heritage database 2000). There are an additional six populations in Little Missouri River floodplain habitat on private and National Park Service land. The North Dakota Natural Heritage Element Occurrence Rankings for most of the known populations range from fair viability to probably not viable (North Dakota Natural Heritage database 2000). The EO rankings are based upon integrated measures of population size, population condition, and landscape context.

In 1993, the Little Missouri River experienced significant flood events that may have affected some of the known populations on the Little Missouri National Grassland. Subsequent monitoring of some of the populations since the flooding event has resulted in the inability to verify several of the previously known populations (S. Rinehart, field notes). It is not known if populations within the National Park were also affected. Therefore the population occurrences

for this species may have been reduced in North Dakota. No target surveys have been conducted since the flood for this species (North Dakota Heritage Program, Kathy Duttenhefner, personal communication).

In 1999, the species was located on the Grand River Sand Dunes on the Grand River National Grassland in South Dakota (S.Rinehart, field notes). The small population was found within the 6EN Sand Dune exclosure. The majority of the population was found growing in conjunction with the narrow ecotone of stabilizing sand and pioneer vegetation trailing the actively moving sand dune. This area is fenced from livestock grazing.

ESA Status and Other Organization Rankings

TNC / NHP G3; IUCN - Rare; COSEWIC - V; FS – Sensitive (R1).

Smooth goosefoot is ranked as S1 in the State of North Dakota, critically imperiled because of extreme rarity (5 or fewer occurrences or few remaining individuals or acres) or because of some factor in its biology making it especially vulnerable to extinction. In addition, known populations contain very few individuals. Smooth goosefoot is ranked as S1 in Montana, S3 in Nebraska, SU in South Dakota, and S2 in Wyoming (NatureServe.com). In addition, it is given a rarity rank in Alberta, Manitoba, and Saskatchewan.

To date, the U.S. Fish and Wildlife Service has not considered the species for listing as threatened and endangered, and it cannot be considered until distribution and taxonomy are settled in the western parts of the species' range (Heidel 1990).

Habitat

Smooth goosefoot appears to be restricted to sand dunes, sandy soils, and sandy riverbanks (Great Plains Flora Association 1986, Heidel 1990, Lenz 1993). It is considered a primary successional species on actively eroding slopes at the edge of stabilizing sand (Smith and Bradley 1990). Populations are highest in areas of finer and more compacted sand. In addition, the species is tolerant of alkali-impregnated areas, including areas that are so sodium affected few other plants will grow there. The species is considered both a halophyte (salt-loving) and xerophyte (adapted for growth under dry conditions) plant. Populations throughout its range on all habitats are always very low (Smith and Bradley 1990).

In addition, Heidel (1990) noted that the species is found intermittently along a narrow discontinuous band of early successional habitat of the Little Missouri River in western North Dakota. In this habitat, it grows near the edge of sandy riverbank terraces that are ephemerally flooded and where bare soil is exposed. It was also noted that smooth goosefoot prefers open to partially shaded habitat.

Within the planning area, longterm threats to the species and its habitats are loss of successional habitat from altered natural processes of fire, rest, and grazing regimes. In its riverine habitat, Heidel (1990) identified loss of habitat from altered river hydrology and diminished river successional stages.

The greatest intermediate threats to smooth goosefoot are non-native and invasive plant species, including noxious weeds such as leafy spurge and Russian knapweed. In addition, the use of chemical herbicide spraying to control noxious weeds can also cause mortality to the species. Livestock grazing and trampling can also damage individuals and reduce populations.

Throughout the planning area, smooth goosefoot is uncommon and populations are sparse, even in what appears to be suitable habitat (Heidel 1990).

In Canada, the species is found on sand dunes and sandy hills within the mixed grass plains. The primary threats to its habitat occur from conversion of native grassland to tame pasture and cropland, loss of natural habitat through changes in grazing and fire regime, invasion of non-native species, and management that has favored stabilization of sand dunes (Smith and Bradley 1990). A study on stabilization of sand dunes in Canada attributes a lack of fire cycle to a loss in the dynamic nature of actively moving sandy areas. Large areas of sandy plains in Canada have become stabilized over the last forty years (Smith and Bradley 1990).

Conservation Planning

A conservation strategy has not been prepared.

Direct and Indirect Effects on NFS Lands

In North Dakota, primary management threats are invasion by non-native plant species and noxious weeds, particularly leafy spurge and Russian knapweed that can overrun habitat along the Little Missouri River (Lenz 1993). All of the 1989 populations on the Theodore Roosevelt National Park were in proximity to leafy spurge (Heidel 1990). Noxious weeds such as leafy spurge can be a significant threat to this species. Leafy spurge prefers riparian habitats and large populations are found along the Little Missouri River in habitats occupied by smooth goosefoot. Noxious weeds reduce the quality of habitat but, at the same time, efforts to control spurge and other invasive species with chemicals can pose a direct threat to smooth goosefoot. In addition, many chemicals are restricted for use within riparian zones. Biocontrol may be especially important in riparian habitats occupied by smooth goosefoot.

The primary threats to the population on the Grand River National Grassland are competition from invasive and non-native plants including smooth brome and other aggressive grass species that were introduced to help stabilize the sand dune. Non-native plant species such as Kentucky bluegrass and smooth brome compete with this species for habitat, especially on more mesic sites. On drier sites, exotic species such Russian thistle), sweetclover, crested wheatgrass, and kochia compete aggressively with this species. Invasive species are spread by vehicles along road corridors and by ORVs, vehicles, and livestock. Heavy livestock grazing seems to encourage spread of Russian thistle, sweetclover, and kochia.

Management activities can cause a loss of equilibrium in riparian systems such as the Little Missouri River, resulting in excessive flooding events along drainages and excessive erosion, sedimentation, and / or channelization. This, in turn, may reduce successional habitat for smooth goosefoot.

Sand dune habitat for smooth goosefoot requires a fire regime to retain the active nature of these communities. At the same time, burning may directly impact the species by causing mortality to individuals and populations.

Off-road vehicle use on sand dunes and sandy areas can harm individuals and alter habitat.

Burning and livestock grazing can have positive or negative effects on smooth goosefoot depending on frequency, intensity, and timing of disturbance. Many sand dunes and actively eroding sandy areas have been stabilized by changes in grazing and fire regimes, resulting in loss of open soil conditions required by the species. Livestock may graze on smooth goosefoot, preventing the species from completing its life cycle or resulting in loss of individuals.

However, livestock grazing may be beneficial after seed set. Grazing can reduce dead material and open up canopy layers of plants, allowing for the germination and establishment of new plants. Excessive livestock trampling in riparian areas and repeated visits to these areas for water can be a problem for smooth goosefoot. Individual plants may be directly affected by trampling. Livestock trampling can interfere with species reproduction if damage occurs early in the year during flowering and seed stages. Excessive and repeated soil compaction may result in reduced plant vigor for smooth goosefoot.

Roads can negatively affect smooth goosefoot populations by introducing non-native plant species along travel routes, by habitat fragmentation, and by loss of suitable habitat to disturbance.

Ground-disturbing activities associated with oil and gas development, mineral exploration, scoria pits, and other types of development could result in mortality to the species and place populations at risk.

Recreation can have negative effects on smooth goosefoot populations resulting in trampling of the species, soil compaction, and introduction of invasive and non-native species.

Cumulative Effects

Continued loss of suitable habitat through conversion of rangelands to croplands (USDA Forest Service 2000, Ostlie et al. 1997, Sieg et al. 1999) and tame pasture can be expected to occur on private lands.

- Stabilization of sand dunes and actively eroding sandy areas will continue on private lands, resulting in continued loss of habitat for this species.
- Development activities such as road building and facilities construction will continue, resulting in some loss of suitable habitat for this species and some possible plant and population mortality.
- Changes in livestock grazing and fire regimes that are unfavorable for the conservation of this sensitive plant species will continue on both private and public lands.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD), eventual on-site development, and additional roads, traffic, and pipelines. Site-specific biological assessments and evaluations are conducted at the time applications to permit drilling are considered by the Forest Service and potential effects on any smooth goosefoot populations in the proposed project area are addressed then.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in the revised LRMPs (Alternative 3):

Unit-wide Direction (Chapter 1)

LMNG, GRNG, BGNG, NNF (BRD), SRMNF

- Prioritize this species for preparation of a conservation strategy (Objective).
- Conduct target surveys for this species (Objective).
- Manage vegetation so native forbs periodically complete their full reproductive cycle. (Standard, Guideline)
- Do not authorize new developments or placement of salt or minerals in occupied habitat (Guideline).
- Prioritize occupied habitat for noxious weed control using methods that do not pose adverse risks to smooth goosefoot populations (Guideline).
- Design timing, intensity and frequency of burning and livestock grazing to benefit smooth goosefoot (Standard).

LMNG, GR/CRNG

- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).
- Require permits to collect sensitive plants or parts of sensitive plant species (Standard).

Geographic Area Direction (Chapter 2)

BGNG, NNF (BRD), SRMNF

- Conduct target surveys for the species prior to construction or other ground-disturbing activities (Standard).
- Establish and maintain quality habitat for this species (Standard).
- Prioritize control of noxious weeds in occupied habitat (Standard).
- Discourage establishment of invasive and non-native plant species into suitable habitat (Standard).
- Restrict ORV use in occupied habitat (Standard).

Management Area Direction (Chapter 3)

GRNG

- Establishment of the 100 acre Grand River Sand Dune Special Interest Area that provides habitat for this species.

Monitoring Direction (Chapter 4)

LMNG, GRNG

- Continue monitoring populations and habitat.

Biological Determinations, Risk Assessments, and Rationale

LMNG, GRNG

Determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." Outcome VI is selected as the risk assessment for this species on and near these areas. Although the LRMP provides protection for known populations and prescribes specific management to maintain sandy habitat under beneficial disturbance processes, smooth goosefoot is known only from small isolated populations. This makes populations vulnerable to extirpation as a result of many possible factors such as the continued spread of noxious weeds and non-native and invasive plant species. Some of these factors are largely beyond the control of the Forest Service. The population on the Grand River National Grassland is protected within the Grand River Sand Dunes Special Interest Area but is still vulnerable.

SRMNF

No biological determination is made for this species on these areas because the species is not listed as sensitive in Region 2 of the Forest Service. However, management direction is provided for this species and its habitat on these areas.

BGNG, NNF (BRD

No biological determination is made for this species on these areas because the species is not listed as sensitive in Region 2 of the Forest Service, and its presence on these areas has not been confirmed and documented. However, management direction is provided for this species and potential habitat on these areas. If the species presence had been confirmed, the determination would have been "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

Barr's Milkvetch (*Astragalus barrii*)

Species Description

This perennial forb is endemic to the northern Great Plains region. The plant grows in low, dense mats and its trifoliate leaves are densely pubescent (Flora of the Great Plains 1986). The species flowers from June through August, depending on locality and annual weather patterns. As a long-lived perennial, it may produce few or no flowers in any particular year. This species was first described by R.C. Barneby in 1956. It is a member of the Fabaceae family.

Distribution and Status

Table H-3 summarizes species occurrence in the planning area. The species is known to occur on the Buffalo Gap National Grassland and may be possible of occurring on the Oglala National Grassland. It is also known from four populations on the Thunder Basin National Grassland in Wyoming and an additional population near the national grassland (Wyoming Natural Heritage Program database 2000). In South Dakota, Barr's milkvetch is known from 16 populations on or near the Buffalo Gap National Grassland (South Dakota Natural Heritage database 2000).

Barr's milkvetch occurs in sparse populations in four counties in southwest South Dakota, six counties in northeast Wyoming, and three counties in eastern Montana (Schassberger 1990). It is also reported from a single location in Nebraska north of Chadron. (NatureServe.com 2000). Throughout its range, the species is known from 80 extant sites comprising at least 17, 000 individuals (NatureServe.com 2000).

ESA Status and Other Organization Rankings

TNC / NHP G3; IUCN - Rare; FS – Sensitive (R1)

The species has no status under ESA. Barr's milkvetch is ranked as S1 in Nebraska, critically imperiled because of extreme rarity (5 or fewer occurrences or few remaining individuals or acres) or because of some factor in its biology making it especially vulnerable to extinction (NatureServe.com 2000). It is ranked as S3 in South Dakota, Wyoming, and Montana, either very rare or found locally within a restricted range (threatened within its range).

Habitat

The species occurs in areas of sparse vegetative cover. Within the planning area, it is found on eroding knolls, buttes, and hilltops in thin barren soil that has eroded from sandstone or siltstone. The species appears to be restricted to specific rock stratum in and along several major drainages (Schassberger 1988). Schassberger (1988) states that due to its intolerance to competition from other plant species, it may not be present in habitat in more advanced successional stages. In the Montana portion of its range, the species has occassionally been found with overstory cover such as ponderosa pine, Rocky Mountain juniper, big sagebrush, and shadscale (Schassberger 1988). In Montana, the species is found on eroding knolls and barren hilltops of a particular limestone caprock. In Wyoming, the Powder River populations of the species are found on eroding sandstone bluffs.

Drought-induced loss of individual Barr's milkvetch plants in Montana suggests that a long-term change towards a warmer and drier climate might threaten the existence of some populations, especially those on more exposed locations (Schassberger 1990).

Conservation Planning

A conservation strategy has not been prepared.

Direct and Indirect Effects on NFS Lands

Competition from non-native invasive plants can be a significant threat to Barr's milkvetch. Invasive species such as broom snakeweed and sweetclover can out compete milkvetch and reduce population numbers. Invasive species are often spread by livestock grazing, roads, and recreational activities.

Noxious weeds reduce the quality of habitat for this species. At the same time, efforts to control leafy spurge, Canadian thistle, and other species with chemicals can pose a direct threat to Barr's milkvetch.

Burning can have positive or negative effects on the species depending on frequency, intensity, and timing of disturbance. Burning may directly impact the species by causing mortality or indirectly through modification of its habitat.

Livestock grazing can reduce dead material within plant communities and open up canopy layers of plants, allowing germination and establishment of new plants.

Livestock trampling that causes excessive and repeated soil compaction may result in reduced plant vigor. In addition, individual plants may be directly affected by trampling.

Grasshopper spraying has the potential to impact insect pollinator populations (Arenz and Joern 1996, Ostlie et al. 1997). Information about specific pollinators for this species is lacking, however it is suspected to be insect pollinated (Schassberger 1990).

Excessive removal of vegetation on uplands can result in rill, sheet, and gully erosion and excessive soil and water runoff. Increased erosion can result in lowered water tables. Any activities that lower water tables below the effective rooting zone of this species will place individual plants or populations at risk.

Ground-disturbing activities associated with oil, gas, mineral, and other types of development could result in loss of Barr's milkvetch plants or populations.

Recreation can have negative effects depending on types of recreational use, road and trail use patterns and intensities, and rate of spread of non-native plant species along recreational routes. Even limited recreation use on shallow soil habitat may be detrimental to Barr's milkvetch.

Off-road vehicles can harm Barr's milkvetch plants and alter habitat.

Coal production could result in loss of suitable habitat for the species. However, none of the existing populations on the Thunder Basin National Grassland occurs within Management Area 8.4 (mineral production and development).

Cumulative Effects

Many of the same effects listed above occur on adjoining land jurisdictions.

Insecticide spraying on adjacent lands may reduce or threaten insect pollinators (Arenz and Joern 1996, Ostlie et al. 1997).

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD) and eventual on-site development. Site-specific biological assessments and evaluations are conducted at the time applications to permit drilling are considered by the Forest Service and potential effects on any Barr's milkvetch populations in the proposed project area are addressed then.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in the revised LRMPs (Alternative 3):

Unit-wide Direction (Chapter 1)

BGNG, ONG, TBNG

- Prioritize this species for preparation of a conservation strategy (Objective).
- Conduct target surveys for this species (Objective).
- Manage vegetation so native forbs periodically complete their full reproductive cycle. (Standard, Guideline)
- Do not authorize new developments or placement of salt or minerals in occupied habitat (Guideline).
- Prohibit use of pesticides that would adversely affect species at risk (Guideline).
- Prioritize occupied habitat for noxious weed control using methods that do not pose adverse risks to Barr's milkvetch populations (Guideline).
- Design timing, intensity and frequency of burning and livestock grazing to benefit Barr's milkvetch (Standard).

Geographic Area Direction (Chapter 2)

- None

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

BGNG, ONG, TBNG

- Continue monitoring populations and habitat.

Biological Determinations, Risk Assessments, and Rationale

BGNG and TBNG

No determination is made for this species on these national grasslands because Barr's milkvetch is not listed as sensitive in Region 2 of the Forest Service. However, management direction is provided for this species and potential habitat on these areas. Outcome II is selected as the risk assessment for this species on and near these national grasslands. Numerous populations occur across both of the national grasslands. Given the management direction that protects Barr's milkvetch and the fact that its habitat does not seem to be highly susceptable to excessive livestock grazing, construction, fire, or noxious weed establishment, these populations should be relatively secure.

ONG

Biological determinations and risk outcomes are not provided for this species on the national grassland because Barr's milkvetch is not listed as sensitive in Region 2 of the Forest Service and because there are currently no known populations on the national grassland. However, management direction was provided for this species and potential habitat.

Dakota Skipper (*Hesperia dacotae*)

Royer and Marrone (1992), Dana (1991), and Opler et al. (1995) which is available on the Northern Prairie Wildlife Research Center website (www.npwrc.usgs.gov) were consulted as primary references for this species.

Species Description

The Dakota Skipper is a moderate-sized butterfly with a wingspan of approximately 1 to 1 3/8 inches. It displays the hooked antennae typical of skippers, and has a characteristic rapid, skipping flight. The wings of the male are dark orange on the dorsum, and light orange on the ventrum. The female is darker brown above and grayer below (Royer and Marrone 1992).

After hatching, Dakota skipper larvae move downward to the ground surface, where they build a subsurface burrow-like chamber. Young larvae spend most of their time in this burrow, leaving only to feed at night (Klassen et al. 1989). Older larvae move into debris-covered silk chambers on the ground surface (Dana 1991). Larvae feed on grasses, particularly little bluestem (Royer 1996). Larvae overwinter as fourth instar, and resume feeding the following spring. Adults emerge from pupal stage in mid-June in western North Dakota and the third week of June in eastern North Dakota. Like others in the skipper family, adults are diurnal and feed on nectar of selected forbs. Mating occurs shortly after emergence. The main flight of adults lasts from two to three weeks. Females oviposit on grasses and forbs (Dana 1991).

Distribution and Status

The Dakota skipper historically ranged from southern Manitoba through North Dakota, Minnesota, South Dakota, Iowa, and Illinois. The species is now largely restricted to northeastern South Dakota, western Minnesota, and the drift prairie area of North Dakota (Royer and Marrone 1992).

Table H-3 summarizes this species' occurrence in the planning area. Several extant sites are documented in North and South Dakota, including on or near the Little Missouri and Sheyenne National Grassland (Royer and Marrone 1992, Royer 1995, Royer 1996, Swengel and Swengel 1999). Dakota skippers have been observed near the Grand River National Grassland and may be present on the Grand River and Cedar River National Grasslands, but inventories are incomplete.

The Dakota skipper is unusually sensitive to land management, and some sites on the Sheyenne National Grassland may have already been lost (Royer and Marrone 1992).

ESA Status and Other Organization Rankings

TNC / NHP G2 / 3; FS – Sensitive (R1)

The Dakota skipper has no special status under ESA.

Habitat

The Dakota skipper is considered an obligate resident of undisturbed tallgrass to mixed grass prairies. Two types of habitat are used. In eastern North Dakota (which includes the Sheyenne National Grassland), bluestem prairie is the preferred habitat. Suitable sites contain wood lily, harebell, and alkali grass (Royer and Marrone 1992). Little bluestem, bluegrass, and Scribner panicgrass are important caterpillar hosts. Extensive stands of narrow-leaved purple coneflower may also be present (Royer and Marrone 1992). Purple coneflower, fleabane, black-eyed susans and harebell are some of the important nectar sources for adult skippers. In western North Dakota (which includes the Cedar River and Little Missouri National Grasslands), drier habitats are used. This may also be the case on the Grand River National Grassland in northwest South Dakota. On the Little Missouri National Grassland, this habitat is most likely to occur along river valleys. Harebell and wood lily are often present, as is purple coneflower (Royer and Marrone 1992).

Conservation Planning

Moffat and McPhillips (1983) provide a general set of habitat management guidelines for butterflies in the northern Great Plains. Dana (1991) developed management guidelines for a reserve in southwest Minnesota. Royer and Marrone (1992) prepared a conservation assessment on this species for North and South Dakota.

Direct and Indirect Effects on NFS Lands

Areas heavily grazed by livestock are not used by Dakota skipper (McCabe 1981), and lightly grazed areas may be unsuitable (Dana 1983).

Habitat that is invaded by exotics, such as brome grass, leafy spurge, and to some extent, bluegrass, are soon degraded (Royer and Marrone 1992). Careful use of herbicides to control exotic invasive plant species can help enhance habitat management for this species.

Prescribed burning is also a significant cause of mortality (Dana 1991, NatureServe 2000, Swengel 1996). Mortality rates from prescribed burning are influenced by date (with early spring burning being less impactive) and fuel loads (burns of low-fuel areas are less impactive).

Mowing and haying in late fall may be favorable for maintaining skipper habitat (McCabe 1981, Dana 1983, Swengel 1996, Swengel and Swengel 1999).

Insecticide spraying on adjacent lands may reduce or threaten non-target insect populations (Arenz and Joern 1996, Ostlie et al. 1997).

Cumulative Effects

Many of the effects listed above are likely occurring on adjoining private lands, and within the administrative boundaries of these National Grasslands.

Additional threats to the species on adjacent private lands, as well as throughout the species' former range in the planning area, are the continuing conversion of native grasslands to cropland, broadscale insecticide applications, and use of grasslands for hay production (USDA Forest Service 2000, Ostlie et al. 1997, Chuluun et al. 1997).

Approximately 40% of the private rangelands on the northern prairie (71 million acres) are in poor to fair range condition and this indicates a loss of higher successional plant communities

(Natural Resources Conservation Service 1996). Rangelands in these conditions provide unsuitable to marginally suitable habitat for this species.

Interrelated and Independent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

Moffat and McPhillips (1983) suggested the following for Dakota skipper management:

- Manage to reduce or eliminate bluegrass, brome grass, and western snowberry, through very late (October) mowing,
- Fire is not recommended for this species on small sites.

Dana (1991) offered the following recommendations relevant to the types of management proposed in this document:

- Use fire to maintain healthy prairie, keeping in mind the high mortality that likely occurs with late spring, summer, or early fall burns,
- To keep fuel loads low, prescribed burns should occur every third season,
- Divide sites into several management units, and burn them in rotation,
- Use grazing and mowing along with fire to manage for healthy prairie.

The following conservation measures are presented as management direction in the revised LRMP (Alternative 3):

Unit-wide Direction (Chapter 1)

LMNG, SNG, GR/CRNG

- Modify livestock grazing during drought to reduce impacts to habitat (Standard).
- Manage for native forb abundance and diversity (Guideline).
- Delay mowing until July 15 or later (Guideline).
- Numerous objectives, standards and guidelines call for enhanced riparian regeneration and health.
- Maintain hydrological regimes and protect and restore developed springs and seeps (Guideline).
- Design vegetation management and pesticide application projects to reduce mortality and to maintain nectar and larvae host plants (Guideline).
- Do not authorize vegetation management and construction projects that would further isolate populations or prevent recolonization (Standard).
- Prohibit control of native insects until an evaluation of impacts to other resources is made (Guideline).

LMNG, SNG, GR/CRNG, cont.

- Prohibit use of pesticides that would adversely affect species at risk (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

LMNG, SNG, GR/CRNG

- The objectives to provide specified amounts of ungrazed and high structure grasslands on these areas are summarized in Table H-5 and H-6 in Section 5 of this document.

SNG

- Emphasize late fall mowing instead of prescribed burning at historic or known sites with Dakota skipper. (Guidline)
- Rest areas with historic or known populations of sensitive skippers (Guideline).
- Conduct butterfly and skipper surveys (Guideline).

Management Area Direction (Chapter 3)

SNG

- Initiate intensive restoration efforts to meet desired conditions that include active and passive methods. (Guideline under MA 3.64)
- Native reseeding project may be initiated with local seed sources. (Guideline under MA 3.64)
- Dakota skippers are found in the proposed 240 acre Fritillary Prairie RNA. RNAs will be managed to protect their ecological values. Management plans will be completed within 5 years.

Monitoring Direction (Chapter 4)

LMNG, SNG, GR/CRNG

- Continue monitoring populations and habitats.

Appendices

LMNG, SNG, GR/CRNG

- Appendix I provides suggested stocking rates for livestock grazing to provide quality habitat for management indicator species and other wildlife. This appendix is referenced by a standard under geographic area direction (Chapter 2) to use this appendix to help develop and implement range management practices for meeting vegetation objectives.

Biological Determinations, Risk Assessments, and Rationale

SNG, LMNG, GRCRNG

The determination of effect for Alternative 3 is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide". This determination was reached after considering that

Alternative 3 would result in improved habitat conditions for the Dakota skipper through the implementation of more rest (especially the emphasis on resting sensitive skipper sites on the Sheyenne National Grassland), as well as the increased emphasis on restoring native vegetation (especially forbs). Alternative 3 would also result in increased high structure and late sere habitat, as well as focus survey efforts on for this species on the Sheyenne National Grassland.

In terms of risk assessment, the situation near the Sheyenne National Grassland is of great concern. Alternative 3 would improve habitat conditions for Dakota skipper over the planning period. Extant Dakota skipper populations exist on and near (Brown Ranch Nature Conservancy property) the National Grassland, so recolonization of restored habitat is possible. However, these extant populations are small and thus susceptible to extirpation from stochastic events. If such an event occurred before restored habitat on the Sheyenne National Grassland was recolonized (restoration of suitable habitat conditions will likely take several years), the species would be extirpated locally. This is due to the lack of nearby alternate populations, and the general scarcity of native grasslands in this region (Chuluun et al. 1997). Successful reintroduction of this species has not been demonstrated. Therefore, an Outcome VI is selected as the risk assessment.

Outcome IV is selected as the risk assessment for this species on the Little Missouri and Grand River / Cedar River National Grasslands (assuming the species is present). The primary rationale is the proposed use of rest and emphasis on increasing vegetative structure and floristic diversity. The added emphasis on riparian regeneration and health also supports this evaluation. Recolonization of any populations lost on the national grassland from other source populations is more likely due the more continuous and less fragmented habitat (Chuluun et al. 1997) compared to that occurring near the Sheyenne National Grassland.

Powesheik Skipper (*Oarisma powesheik*)

Royer and Marrone (1992), Swengel and Swengel (1999), and Opler et al. (1995) which is available on the Northern Prairie Wildlife Research Center website (www.npwrc.usgs.gov) were consulted as primary references for this species.

Species Description

The Powesheik skipper (aka Powesheik or eastern skipperling) has 1-inch wide, triangular, dark brown upper wings, and pale brown underwings with white veins. In southeastern North Dakota (near the Sheyenne National Grassland), the main flight typically occurs in late June to early July (Royer 1996). Mating occurs soon after emergence. Eggs are deposited on host plant leaves, which the larvae begin consuming after hatching. The fifth-stage caterpillar hibernates over winter.

Distribution and Status

The Powesheik skipper was historically common across the tallgrass prairies but is now restricted to isolated, remnant sites. Its current distribution extends from Michigan west to southeastern Manitoba, and eastern North and South Dakota. Several sites are documented in southeastern North and northeastern South Dakota.

Table H-3 summarizes occurrence in the planning area. The only known occurrence within the planning area is on the Sheyenne National Grassland. Royer and Marrone (1992) have failed to relocate the species on the Sheyenne, but the skipper was observed there by Swengel and Swengel (1999) in annual surveys conducted from 1994-1997.

ESA Status and Other Organization Rankings

TNC / NHP G2 / 3; FS – Sensitive (R1)

The Powesheik skipper has no special status under the Endangered Species Act.

Habitat

The Powesheik skipper is considered an obligate resident of undisturbed prairie, particularly in the grass / wetland ecotone. Even small areas of such prairie are acceptable (Royer and Marrone 1992). Important habitats are composed of perennial forb, grass, and sedge components growing on saturated soils. These areas form the transition area between aquatic and upland sites (Swengel and Swengel 1999). Swengel and Swengel (1999) found the highest Powesheik skipper densities in relatively dry pastures with pockets of mesic prairie in the swales. The presence of a significant Asteraceae component is considered a requisite. Important nectar sources for adult skipperlings include purple coneflower, black-eyed susans, stiff-leaved coreopsis and white clover. On the Sheyenne National Grassland, acceptable habitats would occur in the "Lowland to Midland" landforms. Indicator plants of suitable habitat may include: Joe Pye weed, gayfeather, and spikerushes (Royer and Marrone 1992)

Spikerush is potentially an important larval host. The Powesheik skipper is frequently associated with areas that support regal fritillary, Dakota skipper, and Arogos skipper. It is also roughly synchronous and sympatric with these species.

Conservation Planning

A conservation strategy has not been prepared for this species, but Royer and Marrone (1992) completed a conservation assessment for North and South Dakota.

Moffat and McPhillips (1983) provide a general set of habitat management guidelines for butterflies in the northern Great Plains.

Direct and Indirect Effects on NFS Lands

Powesheik skippers could be impacted by several proposed activities, particularly grazing and burning (Swengel and Swengel 1999).

This species would be negatively impacted by any project which lowered groundwater levels.

Habitat invaded by woody and exotic vegetation losses much of its value to this skipper, but exotic vegetation control, particularly by herbicides, can also reduce habitat quality.

Use of insecticides also poses a threat to this skipper.

Powesheik skippers are particularly sensitive to burning, as all caterpillar stages are above ground (NatureServe 2000). The degree of threat depends on frequency of fire. In general, any area burned more than once per four years or any area burned as a single unit is unlikely to protect powesheik skippers (NatureServe 2000).

The species apparently tolerates mowing well (Swengel 1996).

Cumulative Effects

Many of the effects listed above are likely occurring on adjoining lands in this region and in the vicinity of these NFS lands.

Additional threats to the species on private lands across the planning area are the continuing conversion of native grasslands to cropland (USDA Forest Service 2000, Ostlie et al. 1997, Chuluun et al. 1997), broadscale insecticide applications (Arenz and Joern 1996, Ostlie et al. 1997), and use of grasslands for hay production.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in the revised LRMPs (Alternative 3):

Unit-wide Direction (Chapter 1)

SNG

- Modify livestock grazing during drought to reduce impacts to habitat (Standard).
- Manage for native forb abundance and diversity (Guideline).
- Delay mowing until July 15 or later (Guideline).
- Numerous standards and guidelines provide for enhanced management and protection of wetlands.
- Maintain hydrological regimes and protect and restore developed springs and seeps (Guideline).
- Design vegetation management and pesticide application projects to reduce mortality and to maintain nectar and larvae host plants (Guideline).
- Do not authorize vegetation management and construction projects that would further isolate populations or prevent recolonization (Standard).
- Prohibit use of pesticides that would adversely affect species at risk (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

SNG

- The objectives to provide specified amounts of ungrazed and high structure grasslands on this area are summarized in Table H-5 and H-6 in Section 5 of this document.
- Emphasize late fall mowing instead of prescribed burning at historic or known sites with Dakota skipper. (Guidline)
- Rest areas with historic or known populations of sensitive skippers (Guideline).
- Conduct butterfly and skipper surveys (Guideline).

Management Area Direction (Chapter 3)

SNG (MA 3.66)

- Initiate intensive restoration efforts to meet desired conditions that include active and passive methods (Guideline).
- Native reseeding project may be initiated with local seed sources (Guideline).

Monitoring Direction (Chapter 4)

SNG

- Continue monitoring populations and habitats.

Appendices

SNG

- Appendix I provides suggested stocking rates for livestock grazing to provide quality habitat for management indicator species and other wildlife. This appendix is referenced by a standard under geographic area direction (Chapter 2) to use this appendix to help develop and implement range management practices for meeting vegetation objectives.
- The orchid recovery strategy described in Appendix N will also result in habitat improvement and enhancement for this skipper.

Biological Determinations, Risk Assessments, and Rationale

SNG

Determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." Outcome VI is selected as the risk assessment for this species on and near the national grassland. Implementation of the orchid recovery strategy will also benefit this species. The rationale is that the management direction under Alternative 3 results in adjustments in livestock grazing intensities, introduction of rest pastures (particularly in butterfly areas), and added emphasis on restoring native vegetation. These actions will improve habitat conditions for the species. It's acknowledged that it may take two or more decades to restore much of the tallgrass prairie on this national grassland. This is partially due to invasive exotic plant species like smooth brome that are difficult to control. The rationale for the selection of Outcome VI is the relative lack of native grasslands in this region (Chuluun et al. 1997). This reduces the likelihood that other populations would be available to recolonize

populations that might be lost on the national grassland as a result of a natural event. Also, a successful reintroduction of this species has not been demonstrated.

Ottoe Skipper (*Hesperia ottoe*)

Royer and Marrone (1992), Dana (1991), and Opler et al. (1995) which is available on the Northern Prairie Wildlife Research Center website (www.npwrc.usgs.gov) were consulted as primary references for this species.

Species Description

The Ottoe (or Prairie) skipper is a moderate-sized butterfly with a wingspan of approximately 1.5 inches. It displays the hooked antennae typical of skippers, and has a characteristic rapid, skipping flight. The wings of the male are dark orange on the dorsum, and light orange on the ventrum. The female is darker brown above and grayer below (Royer and Marrone 1992).

After hatching, young larvae move to a host plant and build an elevated silk shelter, leaving only to feed at night (Klassen et al. 1989). Larvae feed on grasses, particularly little bluestem (Royer 1996). Larvae overwinter as fourth instar, and resume feeding the following spring. Adults emerge from pupal stage in mid-June in eastern North Dakota. Like others in the skipper family, adults are diurnal and feed on nectar of selected forbs. Mating occurs shortly after emergence. The main flight of adults lasts from June into August. Females oviposit on grasses and forbs (Dana 1991).

Distribution and Status

The Ottoe skipper occurs in southern Michigan, Illinois, and Wisconsin, and from westren Minnesota west to eastern Montana and south to Colorado and Texas (NatureSreve 2000), as well as in portions of Canada.

Table H-6 summarizes species occurrence and status in the planning area. This species is known to occur on the Little Missouri National Grassland and may be possible of occurring on the Grand River / Cedar River, Fort Pierre, Buffalo Gap, and Oglala National Grasslands and on the Nebraska and Samuel R. McKelvie National Forests. The species has not been found on the Sheyenne National Grassland (Opler et al. 1995).

Populations of this species are generally small and localized.

Organization Rankings

This species is listed as sensitive in Forest Service Region 1. The International Network of Natural Heritage programs and Conservation Data Centeres, has assigned the Ottoe skipper a rank of G3, meaning “vulnerable”. The national ranking for the United States (N3), is similar.

Habitat

This is a species of undisturbed open mid-grass to tallgrass prairie. Drier prairie sites may be favored. Favored nectar plants include blazing star, hoary vervain, and purple coneflower.

Conservation Planning

Moffat and McPhillips (1983) provide a general set of habitat management guidelines for butterflies in the northern Great Plains. Dana (1991) developed management guidelines for a reserve in southwest Minnesota. Royer and Marrone (1992) prepared a conservatoin assessment on this species for North and South Dakota.

Direct and Indirect Effects on NFS Lands

The Ottoe skipper is unusually sensitive to land management (Royer and Marrone 1992). Prescribed grazing, burning, and mowing can all help maintain prairie habitat, but each method also carries risks to Ottoe skippers (NatureServe 2000). Areas grazed by livestock are typically not used by this skipper. Mortality rates from prescribed burning are influenced by date (with early spring burning being less impactive) and fuel loads (burns of low-fuel areas are less impactive) (Dana 1991). Conversely, fire-suppression, as well as any other managment that results in few flowering forbs, can also threaten this species (NatureServe 2000). The primary benefits of fire are reduction of excessive litter, enhanced nutritional quality of grass, ameliorated larval microclimate, and enhanced forb flowering (NatureServe 2000).

Habitat that is invaded by exotics, such as brome grass, leafy spurge, and (to some extent), bluegrass, are soon degraded (Royer and Marrone 1992). Conversely, pesticide use, even herbicides used to treat exotics, can result in direct mortality and loss of forbs. Pesticides for insect control could result in mortality of non-target insect populations (Arenz and Joern 1996, Otlie et al. 1997).

Cumulative Effects

Because of this species low vagility, the cumulative effects area considered was relatively small, and coincided with the administrative boundaries of relevent planning units. Additional threats to the species on circumscribed non-NFS lands are the conversion of native grasslands to cropland and tame grasslands used for hay production (Finch 1991, Ostlie et al. 1997, USDA Forest Service 2000) and pesticide application projects (Arenz and Joern 1996, Ostlie et al. 1997).

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

Dana (1991; cited in NatureServe 2000) offered the following recommendations relevant to the types of management proposed in this document:

- Maintain healthy prairie using fire as the primary tool.
- To keep fuel loads low, prescribed burns should occur every third season.
- Divide sites into several managment units, and burn them in rotation.
- Use grazing and mowing along with fire to manage for healthy prairie.

The following conservation measures are presented as management direction in the revised LRMPs (Alternative 3):

Unit-wide Direction (Chapter 1)

LMNG, GRCRNG, FPNG, BGNG, ONG, NNF (PRRD), NNF (BRD), SRMNF

- Do not authorize vegetation management and construction projects that would further isolate populations (Standard).
- Design vegetation management and pesticide application projects to reduce mortality and to maintain nectar and larvae host plants (Guideline).
- Manage for native forb abundance and diversity to provide foraging habitat for big game, grassland birds, and other grassland wildlife (Guideline).
- Restrictions on use of insecticides provide added protection to the species (Guideline).

LMNG, GR/CRNG

- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

LMNG, GR/CRNG, FPNG, BGNG, ONG, NNF (PRRD), NNF (BRD), SRMNF

- The objectives to provide specified amounts of ungrazed and high structure grasslands on these areas are summarized in Table H-5 and H-6 in Section 5 of this document.
- Prescribed burning objectives are established for each geographic area on each national grasssland and forest.

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

LMNG, GR/CRNG, FPNG, BGNG, ONG, NNF (PRRD), NNF (BRD), SRMNF

- Monitor populations and habitats.

Appendices

LMNG, GR/CRNG, FPNG, BGNG, ONG, NNF (PRRD), NNF (BRD), SRM

- Appendix I provides suggested stocking rates for livestock grazing to provide quality habitat for management indicator species and other wildlife. This appendix is referenced by a standard under geographic area direction (Chapter 2) to use this appendix to help develop and implement range management practices for meeting vegetation objectives.

Biological Determinations, Risk Assessments and Rationale

LMNG

Determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." Under this alternative, adjustments in livestock grazing intensities, introduction of rest pastures, use of surveys before prescribed burning, and added emphasis on restoring native vegetation should improve habitat conditions for this species. Restrictions on use of pesticides also provide added protection to the species. Outcome IV is selected as the risk assessment. . Under Alternative 3, ungrazed habitats will be available but significant gaps in the species historical distribution still remain and are permanent. Habitat enhancement will be needed help restore some populations in suitable habitats. Also, successful reintroductions of this species have not been demonstrated.

GR/CRNG

Determination is “no impact”. The species presence on these areas has not been confirmed and documented. However, management direction is provided for this species and potential habitat on this area. If the species presence had been confirmed, the determination would have been "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

FPNG, BGNG, ONG, NNF (PRRD), NNF (BRD), SRMNF

A biological determination or risk outcome are not given for this species on these areas because the species is not listed as sensitive in Region 2 of the Forest Service and because there are currently no known populations on or near these areas. However, management direction is provided for the species and potential and suitable habitat on these areas.

Regal Fritillary (*Spyeria idalia*)

Royer and Marrone (1992), Fritz 1997 and Opler et al. (1995) which is available on the Northern Prairie Wildlife Research Center website (www.npwrc.usgs.gov) were key references for this evaluation.

Species Description

This species is a very distinctive and large member of the brush-footed butterfly family (*Nymphalidae*). The wingspan is about 3-4”, with the dorsal surface orange and black.

Once this species hatches from its egg, the catepillar overwinters unfed. In spring, the catepillars feed on violets (Royer and Marrone 1992). Adult males emerge in early to mid-June and appear through early July. Females follow one to two weeks later, and continue into August. Eggs are laid near but not necessarily on violets. The species tends to widely disperse over large areas.

Distribution and Status

This species was once widely distributed in the northeastern and midwestern United States, but the range has declined drastically in recent decades. The regal fritillary is now found mostly in prairie remnants in the north-central plains.

Table H-3 summarizes this species' occurrence in the planning area. Regal fritillaries are known to occur on or near the Little Missouri (Royer 1195), Grand River / Cedar River, Sheyenne, and Fort Pierre National Grasslands and Nebraska National Forest (Bessey Ranger District). It may possibly occur on the Buffalo Gap and Oglala National Grasslands, Nebraska National Forest (Pine Ridge Ranger District) and Samuel R. McKelvie National Forest.

ESA Status and Other Organization Rankings

TNC / NHP G3; FS – Sensitive (R1 and R2)

The species has no status under ESA.

Habitat

The species is most commonly associated with tallgrass to mixed grass / bluestem prairies. Preferred habitats include big and little bluestem, western wheatgrass, and green needlegrass, with a variety of Asteracea species that serve as nectar sources for adults (e.g. milkweeds, purple prairie coneflower, pale coneflower, prairie coneflower, white prairie-clover, harebell, fleabane, blanket flower, and coneflower). Swampy and subirrigated meadows are also used by adults (Arnett 1997, Fritz 1997). Other nectar sources for adults include *Asclepias* spp., *Cirsium* spp., *Monarda* spp., and *Liatris* spp. Larvae feed only on species of violets. The principle requirement in all habitats appears to be the presence of extensive grasslands with high densities of violet and other nectar sources (Royer and Marrone 1992). Because violets are short statured and rapidly displaced by tallgrass species, some form of disturbance is needed.

Conservation Planning

A conservation strategy has not been prepared. However, recommendations are provided in Royer and Marrone (1992).

Moffat and McPhillips (1983) provide a general set of habitat management guidelines for butterflies in the northern Great Plains.

Direct and Indirect Effects on NFS Lands

Projects that lower groundwater levels could negatively impact this species and its habitat.

Grasshopper spraying on rangelands could negatively impact this species, depending on timing.

Invasion of native grassland communities by woody plants and exotic vegetation could reduce native plant species vital to this butterfly.

Prescribed burns can kill adults and larvae. Livestock grazing can reduce habitat suitability for this species, though light livestock grazing can benefit the species (Moffat and McPhillips 1983).

Mowing can reduce habitat suitability for this species, particularly if done early.

Cumulative Effects

Many of the effects listed above are likely occurring on adjoining lands in this region and near these NFS lands.

Additional threats to the species on private lands across the planning area are the continuing conversion of native grasslands to cropland, broad-scale insecticide applications (Arenz and Joern 1996, Ostlie et al. 1997), and use of grasslands for hay production (USDA Forest Service 2000, Ostlie et al. 1997, Chuluun et al. 1997).

Careful use of herbicides to control exotic invasive plant species can help enhance habitat management for this species.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in the revised LRMPs (Alternative 3):

Unit-wide Direction (Chapter 1)

LMNG, GRCRNG, SNG, BGNG, FPNG, ONG, NNF (PRRD), NNF (BRD), SRMNF

- Modify livestock grazing during drought to reduce impacts to habitat (Standard).
- Manage for native forb abundance and diversity (Guideline).
- Delay mowing until July 15 or later (Guideline).
- Numerous standards and guidelines provide for enhanced management and protection of wetlands.
- Maintain hydrological regimes and protect and restore developed springs and seeps (Guideline).
- Design vegetation management and pesticide application projects to reduce mortality and to maintain nectar and larvae host plants (Guideline).
- Do not authorize vegetation management and construction projects that would further isolate populations or prevent recolonization (Standard).
- Prohibit use of pesticides that would adversely affect species at risk (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

LMNG, GRCRNG, SNG, BGNG, FPNG, NNF (BRD), SRMNF

- Numerous objectives, standards and guidelines call for the use of rest and a variety of livestock grazing intensities to create an enhanced mosaic of vegetation composition and structure conditions across the landscape (see Section 5 of this document).

SNG

- Emphasize late fall mowing instead of prescribed burning at historic or known sites with Dakota skipper (Guideline).
- Rest areas with historic or known populations of sensitive skippers (Guideline).
- Conduct butterfly and skipper surveys (Guideline).

Management Area Direction (Chapter 3)

LMNG, GRCRNG, SNG, BGNG, FPNG, NNF (BRD), SRMNF

- Numerous areas with special biological resources have been allocated to management areas (MA 2.1, 2.2 and 3.64) that emphasize management of these special resources. Many of these allocations will focus interest and management on rare butterflies and skippers in these areas including the regal fritillary

SNG

- Approximately 63,760 acres of this national grassland is allocated to "ecosystem restoration" (MA 3.66). These areas are to be managed to restore and maintain native plant and animal species and communities and ecological processes and functions for tallgrass prairie and oak savanna.
- Regal fritillary butterflies are found in the proposed 240 acre Fritillary Prairie RNA and the proposed 370 acre Platanthera Prairie RNA. RNAs will be managed to protect their ecological values. Management plans will be completed within 5 years.

Monitoring Direction (Chapter 4)

LMNG, GRCRNG, SNG, BGNG, FPNG, ONG, NNF (PRRD), NNF (BRD), SRMNF

- Continue monitoring of populations and habitats. This includes continued monitoring of potential and suitable habitat on the Nebraska National Forest (PRRD) and Oglala National Grassland.

Appendices

LMNG, GRCRNG, SNG, BGNG, FPNG, ONG, NNF (PRRD), NNF (BRD), SRMNF

- Appendix I provides suggested stocking rates for livestock grazing to provide quality habitat for management indicator species and other wildlife. This appendix is referenced by a standard under geographic area direction (Chapter 2) to use this appendix to help develop and implement range management practices for meeting vegetation objectives.

Biological Determinations, Risk Assessments, and Rationale

LMNG, GRCRNG, FPNG, NNF (BRD)

Determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." Outcome II is selected as the risk assessment for this species on and near these areas. Habitats near these units are less fragmented and more continuous (Chuluun et al. 1997) than those near the Sheyenne National Grassland.

SNG

Determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." Under this alternative, adjustments in livestock grazing intensities, introduction of rest pastures, use of surveys before prescribed burning, limits of insecticide spraying and added emphasis on restoring native vegetation should improve habitat conditions for this species and reduce mortality risks. Outcome IV is selected as the risk assessment for this species on and near the Sheyenne National Grassland. The rationale is that habitat conditions will begin improving on this national grassland under Alternative 3. It's acknowledged that it may take two or more decades to restore much of tallgrass prairie on this unit due to several factors including invasive exotic plant species like smooth brome. The primary viability concern is the relative scarcity of native grasslands in this region (Chuluun et al. 1997), however this species has reasonably good dispersal capabilities (Debinski and Drobney 2000) and may still have the capability to recolonize vacant habitats on this area.

BGNG, ONG, NNF (PRRD), SRMNF

Determination is "no impact". The species presence on these areas has not been confirmed and documented. However, management direction is provided for this species and potential habitat on these areas. If the species presence had been confirmed, the determination would have been "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

Sturgeon Chub (*Macrohybopsis gelida*)

The sturgeon chub status report (Werdon 1993) and the 90-day administrative finding report by the U.S. Fish and Wildlife Service (U.S. Fish and Wildlife Service 1994) were key references for this evaluation.

Species Description

The sturgeon chub is a slender minnow with small eyes, a small horizontal mouth, and low ridges or keels along the sides and back. It is unique within the Cyprinidae family in having keeled scales. Adults typically range in size from 50 to 70 mm, with maximum sizes near 100 mm. It is presumed to be a benthic taste feeder and is highly specialized for swift and turbid water (Lee et al. 1980). It has small, conical barbels at the corners of its mouth and a long, somewhat flattened snout that projects far beyond the upper lip (Pflieger 1978). Sturgeon chub mature reproductively at 2 years of age, and it is thought that they spawn in deep water in swift current (Botrell et al. 1964).

Distribution and Status

Table H-3 summarizes sturgeon chub distribution in the planning area. In South Dakota, it is found in the Missouri River, White River, Cheyenne River, and Grand River (Bailey and Allum 1962 cited in Lee et al. 1980). The Buffalo Gap and Fort Pierre National Grasslands are within the immediate watersheds of these rivers. More current surveys indicate it is still in portions of the Cheyenne and White Rivers and several tributaries of those rivers (G. Cunningham personal communication, U.S. Fish and Wildlife Service 1993, Hampton and Berry 1997, Fryda and Berry unpublished data). Current information on the presence of the species in the Grand River is lacking.

Sturgeon chub have recently been reintroduced into the Little Missouri River in North Dakota near the Little Missouri National Grassland, but the success of this effort is unknown at this time. The species was considered widely distributed in the Little Missouri River in the late 1970s (Reigh 1978 and Reigh and Owen 1979, cited in Kelsh 1993). However, Kelsh (1993) did not document this species on 24 sampling stations along the Little Missouri between Marmarth and Medora. Other later surveys of the Little Missouri River (Peterka 1993) also failed to document sturgeon chub in this river system. Kelsh (1993) hypothesizes that the extended droughts of the 1980s may have resulted in the extirpation of sturgeon chub from this system.

Historically, the sturgeon chub occurred throughout 2,300 miles of the mainstem Missouri River and 1,150 miles of the mainstem Mississippi River. The species also was found in the Yellowstone River in Montana and 24 tributaries of the Yellowstone or main stem Missouri River throughout the basin. The sturgeon chub occurred in portions of four tributaries in Wyoming, eight in Montana, seven in North Dakota, four in South Dakota, eight in Nebraska, and four in Kansas. The species currently occupies about 935 miles or 40% of its former range in the Missouri River; however, only 705 miles or 30% of its range supports stable populations. Like the sicklefin chub, populations of the sturgeon chub in the Mississippi River are very low and primarily found in 12%of its former range in a 140-mile reach of the river from St. Louis, Missouri, downstream to Grand Tower, Illinois. The species continues to be found in the Yellowstone River but likely has been extirpated from 21 of 24 (88%) former tributary habitats throughout its range. When considering the loss of tributary habitats, it is estimated that the sturgeon chub now occupies about 20% of its total historical range.

The present status of the sturgeon chub mirrors that of the sicklefin chub in the upper Missouri River Basin and the lower Missouri River in Missouri where populations are considered stable but low in numbers. Unlike the sicklefin chub, however, the upper basin populations are confined to several large tributaries and a smaller reach of the Missouri River.

This species is considered extirpated from the mainstem reservoirs and river reaches from the headwaters of Lake Sakakawea near Williston, North Dakota, to Sioux City, Iowa, and is close to extirpation in the channelized Missouri River in Iowa and Nebraska. The species also is extirpated from many of the large, braided channel Great Plains tributaries west of the Missouri River. Except for very low populations in the lower Platte River, the species does not occur in formerly occupied Kansas and Nebraska tributary rivers. Furthermore, it does not occur in any historical tributaries in the upper Missouri River basin except for the Powder River in Wyoming and Montana, the Yellowstone River in North Dakota and Montana, and the White and Cheyenne Rivers in South Dakota. The species also is now found near the mouths of Crazy Woman Creek in Wyoming and the Little White River and Bear-in-the-Lodge Creek in South

Dakota, tributaries to currently occupied historical habitats. Current information on the presence of the species in the Grand River in South Dakota is lacking.

The sturgeon chub was historically found in the Mississippi and Missouri River drainages, extending from Louisiana, northwest into Montana and Wyoming. It is now extirpated from 23 of 27 tributaries where it occurred historically (Werdon 1993). The species is still documented in the Yellowstone River in Montana.

ESA Status and Other Organization Rankings

FWS Candidate; TNC / NHP G2 N2; FS Sensitive (R1)

Habitat

Sturgeon chub are associated with medium to large Great Plains rivers. Sturgeon chub appear to be turbid water specialists that live primarily over gravel in the current of turbid, silty, and free-flowing rivers (Baxter and Simon 1970, Pflieger 1978). Turbid water adaptations for this species include small eyes and external taste buds abundantly developed overhead, body, and fins. The taste buds are probably of primary importance in locating food. The feeding habits of the sturgeon chub have not been studied (Baxter and Simon 1970). The function of the keels on the scales is unknown, but they may act as current detectors for orientation (Pflieger 1978).

Conservation Planning

A conservation strategy has not been prepared for this species.

Direct and Indirect Effects on NFS Lands

Small impoundments may modify hydrological flow patterns, especially during droughts, and reduce downstream flow. Flow reductions could make isolated populations more vulnerable to extirpation during droughts.

Stocking of piscivorous game fish could also threaten disjunct and isolated sturgeon chub populations. This problem is probably further exacerbated by the reduced sturgeon chub stock or lack of stock for recolonizing areas of local extinction.

Toxic spills into rivers and streams could also threaten local populations

Cumulative Effects

Aquatic resources and habitats in the planning area are some of the most fragmented and altered within North America (Abell 2000). In this area, major river impoundments are one of the primary threats to aquatic resources and to this species (Johnson 1998, Ostlie et al. 1997). Agricultural water uses may affect water availability in streams and rivers during drought. Pollution and toxic spills from industry and agriculture alters water quality, reduces habitat suitability, and / or poisons aquatic life (Johnson 1998, Ostlie et al. 1997).

Sand and gravel extraction operations have restricted fish movements and destroyed habitat.

Stocking of piscivorous game fish could also threaten disjunct and isolated sturgeon chub populations. This problem is probably further exacerbated by the reduced sturgeon chub stock or lack of stock for recolonizing areas of local extinction.

Interrelated and Interdependent Actions

Decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD) and eventual on-site development. Site-specific biological assessments and evaluations are conducted at the time applications to permit drilling are considered by the Forest Service and potential effects on sturgeon chub populations in the project area would be addressed at that time.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in the revised LRMP (Alternative 3):

Unit-wide Direction (Chapter 1)

BGNG

- Manage land treatments to conserve site moisture and to protect long-term stream, wetland, and riparian area health (Standard).
- Allow only those actions next to perennial and intermittent streams, seeps, springs, lakes, and wetlands that maintain or improve long-term proper functioning of riparian ecosystem conditions (Standard).
- Locate activities and facilities away from riparian areas unless alternatives have been assessed and determined to be more environmentally damaging (Guideline).
- Design and construct all stream crossing and other in-stream structures to provide for sufficient passage of flow and sediment, withstand expected flood flows, and allow free movement of aquatic life (Standard).
- When possible, restore intermittent streams to continually flowing perennial streams (Guideline).
- Design and construct facilities to minimize the risk of accidental spills and discharge of petroleum and other materials into waters occupied by sensitive fish species (Standard).
- Do not authorize uses that would deplete instream flows below levels needed to protect sturgeon chub and sensitive fish habitat (Standard).
- Manage livestock grazing to maintain or improve riparian areas (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

BGNG

- Continue surveys in Cheyenne and White Rivers to establish baseline population and distribution information (Objective).
- Assess the potential impacts of construction of additional small impoundments in upper watersheds on hydrologic flow and downstream sturgeon chub habitat (Objective).

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

BGNG

- Continue monitoring populations and habitat.

Biological Determinations, Risk Assessments, and Rationale

BGNG (Cheyenne and White Rivers and tributaries)

No biological determination is made for this species on these areas because the species is not listed as sensitive in Region 2 of the Forest Service. However, management direction is provided for this species and its habitat in these areas.

Outcome II is selected as the risk assessment for this species in these two rivers and tributaries. The rationale is that added safeguards and considerations are being focused on the species and adverse reductions in water flow resulting from future Forest Service management actions are unlikely. Also, recent surveys in both rivers indicate that sturgeon chub seemed to be well-distributed along these rivers (Hampton and Berry 1997, Fryda and Berry unpublished data). For example, along the reach of the Cheyenne River from Angustora Reservoir to the Missouri River, sturgeon chub were found in 5 of 9 sampled reaches. In the White River, sturgeon chub were found in all but one sampled reach. However, it needs to be recognized that the Forest Service is a minor player in the upper watersheds of the Cheyenne and White Rivers. Many other factors and forces have a much greater influence on the species, and this includes major projects like the Angustora irrigation project. Selection of Outcome II assumes that factors beyond the authority of the Forest Service don't become major additional threats in the future.

Swift Fox (*Vulpes velox*)

The swift fox conservation assessment and conservation strategy (Kahn et al. 1997), Joslin and Youmans (1999), and the 12-month administrative findings report by the U.S. Fish and Wildlife Service were key references for this evaluation.

Species Description

The swift fox is a small canid with a black-tipped tail. Winter pelage is dark buffy gray above with orange-tan sides and legs and during the summer, the coat is shorter and more reddish. The species differs from the kit fox in that it has smaller ears, broader snout, and a shorter tail (see Nowak 1991). Swift fox are considered endemic residents of grassland prairies on the Great Plains, while kit fox occupy the more desert environments further south (Kahn et al. 1997).

They are monestrous and apparently monogamous and form pairs in early winter. Pairs may last for years and may be for life with breeding occurring in late winter. Gestation lasts 7-8 weeks, and there's one litter per year. In Oklahoma, most litters are born in March or early April. Litter size usually is 3-6 (Egoscue 1979). Pups first emerge from den at about 1 month in late May and early June. Young are tended by both sexes and disperse in late summer or early fall.

Dispersal of young begins in September and August. Dispersal distances average approximately 7 miles (11 km), with an observed maximum distance of approximately 40 miles (64 km) (Mercure et al. 1993). Density of a locally abundant population in Wyoming was reported as one pair per 2 to 4 square miles (5-8 km^2) (Clark and Stromberg 1987).

Swift fox use dens year-round to protect themselves from predators and the weather and either excavate their own dens or enlarge burrows of other animals.

Distribution and Status

Table H-3 summarizes occurrence in the planning area. Populations occur on and near Thunder Basin, Buffalo Gap, and Oglala National Grasslands. Forest Service maps of occupied swift fox habitat on NFS lands were reviewed for this evaluation.

Current swift fox distribution is still relatively widespread in the planning area and includes portions of South Dakota, Wyoming, and Nebraska. Swift fox are apparently absent from North Dakota although several recent observations suggest the species may exist at extremely low densities in the southwestern counties. In Wyoming, swift fox occupy much of their historical range, although surveys in some counties are incomplete. Swift fox are known to occur in very limited numbers in the panhandle and southwestern Nebraska. Distributions and associated densities appear highly variable.

Recent accounts suggest that the swift fox may be increasing and reoccupying some portions of their historic range. The swift fox was originally found in central plains of North America, from southern Alberta and Saskatchewan south to northern Texas. The present range is now much restricted and the species exists in highly disjunct populations. Extirpated in Canada (1978 COSEWIC report), recent reintroductions have resulted in a wild population of approximately 150 animals in two release areas. The viability of this population is questionable. The swift fox occupies 20-30% of its historic range.

ESA Status and Other Organizational Rankings

TNC / NHP G3, N3; FS Sensitive (R1 and R2)

This swift fox was petitioned for listing under ESA in 1992. The 90-day finding from U.S. Fish and Wildlife Service concluded that a species listing may be warranted range-wide. The 12-month finding issued in 1995 by the U.S. Fish and Wildlife Service resulted in a "warranted, but precluded decision," concluding that the magnitude of threats to the species is low to moderate although the immediacy of threats remains imminent. The recent candidate status of the swift fox was dropped in January 2001.

Habitat

Swift fox appear to be habitat generalists and occupy a variety of shrubland and grassland types. Habitats commonly include intermittent and permanent water sources during most years. They seem to prefer areas where grassland structural characteristics are varied and diverse (Uresk and Javersak, in press). The species also occurs in predominately agricultural landscapes and appear to be very adaptive to these unnatural habitats. There is a tendency for swift fox to prefer level to moderately rolling terrain that affords good visibility for detecting other predators, such as coyotes and golden eagles (Hillman and Sharps 1978, Hines 1980).

They are opportunistic feeders taking a variety of prey and carrion. Small mammals including black-tailed prairie dogs, northern pocket gophers and thirteen-lined ground squirrels made up most of their summer diet in South Dakota (Uresk and Sharps 1986); small birds, grasshoppers, beetles, grass and prickly pear cactus comprised the rest. Swift fox are commonly observed hunting roadsides, presumably in search of carrion. The species caches excess food under snow in winter.

The swift fox inhabits open prairie and arid plains, including areas intermixed with winter wheat fields. The species occupies burrows when inactive and may dig burrows or use burrows made by other mammals (prairie dog, badger), usually in sandy soil on high ground (e.g. hill top, Pruss 1999) in open prairies, along fencerows, and occasionally in plowed fields. Individuals may use several different dens throughout year.

Young are born in an underground den about 3 ft (1 m) below ground surface (Banfield 1974). Dens usually have multiple entrances. Slight disturbances may cause females to move young to different dens.

Conservation Planning

A swift fox conservation assessment and conservation strategy has been prepared (Kahn et al. 1997). A Canadian recovery plan calls for extensive reintroductions and the conservation of prairie habitats.

Direct and Indirect Effects on NFS Lands

Mortality can result from collisions with automobiles (Egoscue 1979, Sovada et al. 1998, Black et al. 1998).

Swift fox are easily shot, trapped, and poisoned and therefore are susceptible to mortality from predator control (Uresk and Sharps 1986). Use of M-44s by government animal damage control agents could result in accidental swift fox mortality.

Prairie dog poisoning on NFS lands could reduce prey availability, especially during winter when many other prey species are unavailable. Swift fox may be more vulnerable to coyotes and other predators when they hunt fewer and smaller prairie dog colonies.

Disturbances, traffic risks, and habitat loss could result from oil and gas development.

Coal production can result in the loss of occupied and potential swift fox habitat. Under Alternative 3, 47,990 acres are designated for mineral production and development (MA 8.4) on the Thunder Basin National Grassland. Coal production and reclamation is regulated by other state and federal agencies. The Office of Surface Mining is the federal agency with responsibility for approving mining plans. The state of Wyoming has delegated primacy for approval of mining and reclamation plans to the Wyoming Department of Environmental Quality. Forest Service reviews mining and reclamation plans to determine compliance with LRMP direction. Mining and reclamation plans also require consultation with the U.S. Fish and Wildlife Service.

Cumulative Effects

Predator control on private lands to reduce livestock losses may result in accidental swift fox mortality. In some areas, predator control on private lands may have an indirect effect of

enhancing swift fox populations by reducing overall coyote populations, thereby reducing predation on swift fox.

Elimination of prairie dog towns on private lands may hinder swift fox expansion and recovery.

Risks to swift fox could occur where the new proposed railroad corridor crosses private and state lands.

Disturbances, traffic risks, and habitat loss could result from oil and gas development on other land jurisdictions.

Although construction of the new proposed railroad corridor (Powder River Basin Expansion Project) could result in additional sources of carrion for swift fox, it could also result in increased risks of swift fox being struck by trains and service vehicles on the Thunder Basin and Buffalo Gap National Grasslands.

Interrelated and Interdependent Actions

Oil and gas exploration and development activities, unless carefully managed, can result in habitat loss, risks, and adverse disturbances to swift fox. Decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD) and eventual on-site development. Although the decision to make areas available for oil and gas leasing does not result in on-the-ground activities and possible effects on mountain plover, oil and gas stipulations to protect and conserve plovers and their habitat are needed at the time leasing availability decisions are made. Site-specific biological assessments and evaluations are also conducted at the time applications to permit drilling are considered by the Forest Service. The number of new wells predicted in the reasonable and foreseeable development analysis for the national grasslands known to currently support swift fox and have moderate to high oil and gas potential is as follows:

	Oil and Gas Wells	Coalbed Methane Wells
BGNG	85	0
ONG	15	0
TBNG	140-230	600

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement. Livestock grazing permittees or grazing associations commonly request predator control and poisoning on NFS lands to reduce livestock losses. Although there may be overall benefit to swift fox populations by reduced coyote or red fox populations, risks to individual swift fox can occur depending on the predator control methods.

Conservation Measures and Mitigation

The U.S. conservation strategy (Kahn et al. 1997) calls for the following:

- Development of a survey protocol to monitor trends in the distribution and population status of swift fox throughout the species range.
- Define what constitutes suitable swift fox habitat within various geophysiographic regions and identify components of swift fox habitat.
- Implementation of habitat and population management practices on state and federal lands that emphasize the conservation of swift fox.

Conservation Measures and Mitigation, cont.

- Reestablishment of local populations in unoccupied suitable habitat, with initial emphasis in the northern portion of the species range.
- Periodic monitoring of genetic diversity and species health.

The following conservation measures are presented as management direction in the revised LRMPs (Alternative 3):

Unit-wide Direction (Chapter 1)

BGNG, ONG, TBNG

- Reduce disturbances to swift fox within 0.25 miles of natal dens from March 1 to August 31 (Standard).
- Prohibit use of M-44s in occupied swift fox habitat (Standard).
- Manage for a mosaic of grassland structure conditions (Guideline).
- Numerous objectives, standards and guidelines to increase prairie dog populations and colony size.
- Identify key habitats on national grasslands (Guideline).
- Increase and expand distribution of swift fox on national grasslands (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

BGNG, ONG, TBNG

- Objectives call for specified levels of ungrazed habitat and a more diverse grassland vegetation mosaic through desired levels of rest, seral stages and vegetation structure (see tables in Section 5).
- Numerous objectives, standards and guidelines to increase prairie dog populations and colony size.
- Use predator control methods that do not pose a significant and direct mortality risk to swift fox (Standard).

Management Area Direction (Chapter 3)

BGNG

- A 9,540 acre special plant and wildlife habitat area (MA 3.64) is established for swift fox
- management. Providing sufficient and secure habitat for swift fox is the management priority in this area. This area supports what is believed to be the largest swift fox population in South Dakota.

Monitoring Direction (Chapter 4)

BGNG, ONG, TBNG

- Continue monitoring populations and habitat.
- Monitor the effectiveness of oil and gas stipulations for protecting this species and its habitat.
- Monitor the effectiveness of the suggested stocking rates in Appendix I in meeting the desired vegetation composition and structure objectives.

Appendices

BGNG, ONG, TBNG

- Apply oil and gas stipulations (see Appendix D in revised LRMPs) for swift fox.
- Appendix I provides suggested stocking rates for livestock grazing to provide quality habitat for management indicator species and other wildlife. This appendix is referenced by a standard under geographic area direction (Chapter 2) to use this appendix to help develop and implement range management practices for meeting vegetation objectives.

Biological Determinations, Risk Assessments, and Rationale

TBNG, BGNG, ONG

Determination is "may adversely impact individuals but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." Outcome II is selected as the risk assessment for this species on these areas. The **r**ationale is the added protection to reduce disturbances near natal den areas and the expansion of prairie dog populations. Restrictions on the use of M44s in occupied swift fox habitat also reduce risks to individual swift fox. The added emphasis on creating a more diverse grassland landscape by managing for a mosaic of structural stages should also benefit swift fox (Uresk and Javersak, in press).

It is possible that plague epizootics could reduce prairie dog populations in the future but swift fox populations have been observed to remain viable over long periods in the absence of prairie dogs. However, the ability of swift fox to achieve higher densities in areas with large prairie dog populations is not disputed.

Black-tailed Prairie Dog (*Cynomys ludovicianus*)

Hoogland (1995), Jones et al. (1983), Van Pelt (1999) and the 12-month administrative findings report for the petition to list the black-tailed prairie dog as a threatened species (U.S. Fish and Wildlife Service 1999) were primary references consulted during this evaluation.

Species Description

Black-tailed prairie dogs are diurnal, burrowing rodents that live in densely populated colonies on North American grasslands and shrublands. Densities ranging from 3 to 18 prairie dogs per acre have been documented in South Dakota (Cincotta 1985, Hoogland 1995). This species is monoestrus and typical litter size, when young first emerge from their natal burrows, ranges from 1 to 6 with an average of approximately 3 (Hoogland 1995). Prairie dogs eat a variety of

plant material and their diets vary depending on local plant species composition (Fagerstone 1981). They seem to prefer grasses including western wheatgrass, blue grama, and buffalograss. Forbs and various plant parts including roots are also consumed. They also clip vegetation to maintain visibility. Long-term colonization of a site frequently results in a reduction in grasses and an increase in forbs and bare ground (Coppock et al. 1983, Archer et al. 1987), and colonies frequently expand to fill adjoining suitable habitat. Some yearling prairie dogs will normally disperse in May or June to other colonies or to establish new colonies. Dispersal distances up to 6.2 mi (10 km) have been documented (Knowles 1985).

Distribution and Status

Table H-6 summarizes species occurrence and status in the planning area. Maps of prairie dog colonies maintained by the Forest Service were reviewed for this evaluation, as was information on the distribution of existing prairie dog colonies within the planning area (Sidle et al. in press, Sidle 1999).

Black-tailed prairie dog colonies now cover about 800,000 acres in the United States, Canada, and Mexico, and this represents an overall reduction in colony acreage since European settlement of North America of greater than 90% (Knowles 1998, Mulhern and Knowles 1997, Ostlie et al. 1997, Biggins and Godbey 1995, Northern Great Plains Terrestrial Assessment).

ESA Status and Other Organizational Rankings

ESA Candidate; TNC / NHP G3, N3; FS Sensitive Species (R1 and R2)

The species was petitioned in 1998 for listing as a threatened species by several conservation organizations. The U.S. Fish and Wildlife Service found the listing was warranted but precluded by higher listing priorities. The species was given candidate status.

Habitat

This species occurs mostly on shortgrass and mixed grass prairie on the Great Plains. Some populations are also found in the Nebraska Sandhills. Suitability of habitats for this species is enhanced by low vegetative cover and increased visibility to detect predators. Because of this, these animals prefer areas with disturbed soils and / or grasslands grazed by cattle or bison. They can also modify shrublands to meet their needs by cutting down individual shrubs from the perimeter of their colonies. They typically colonize grasslands of a wide variety of soil types and that are flat to gently rolling. They avoid wetlands and areas with high water tables. Hoogland (1995), Jones et al. (1983), Knowles (1982), and Clippenger (1989) were consulted for additional information on the habitat relationships of this species.

The active prairie dog colony acreage on each national grassland and forest determined from surveys conducted between 1996 and 1998 is as follows:

Table H-4. Acres of Active Prairie Dog Colonies.

National Grassland or Forest	Current Colony Acreage	Current Number of Colonies
LMNG	2,860	149
SNG	NA	NA
GR/CRNG	1,520	37
FPNG	720	42
BGNG	13,280	296
ONG	740	9
NNF (BRD)	70	8
NNF (PRRD)	NA	NA
SRMNF	NA	NA
TBNG	18,340	146

These acreages presented above have undoubtedly increased on most of the planning units since these surveys were conducted.

The number of colonies and their size on each national grassland and forest based on the 1996-98 surveys are as follows:

Table H-5. Number and Size of Prairie Dog Colonies (1996-1998).

National Grassland or Forest	Total Number of Colonies	1-24 Acres		25-49 Acres		50-99 Acres		100+ Acres	
LMNG	149	113	76%	18	12%	9	6%	9	6%
SNG	NA								
GR/CRNG	19	9	47%	5	26%	0	0%	5	26%
FPNG	42	33	79%	6	14%	1	2%	2	5%
BGNG	232	133	57%	44	19%	27	12%	28	12%
ONG	9	4	44%	1	11%	2	22%	2	22%
NNF (BRD)	8	8	100%		0%		0%		0%
NNF (PRRD)	NA								
SRMNF	NA								
TBNG	124	47	38%	17	14%	26	21%	34	27%

Conservation Planning

Statewide or regional habitat conservation strategies involving federal, state, county, and tribal agencies and other interested organizations have not been prepared. However, preparation of state-wide conservation strategies is currently underway in each state within the planning area.

The Commission for Environmental Cooperation (2000) suggested the possibility of developing an international North American conservation strategy.

Direct and Indirect Effects on NFS Lands

Prairie dog poisoning reduces or eliminates prairie dog populations.

Livestock grazing and its affects on vegetation can be managed to either help contain or increase prairie dog colony acreages.

Ground-disturbing activities associated with development of impoundments, rangeland ripping and pitting, pipelines, oil and gas, and other construction activities can enhance habitat suitability for prairie dogs.

Prairie dogs are popular targets for many recreational shooters. However, empirical data, resulting from controlled experiments, that document significant reductions in prairie dog populations, as a result of recreational shooting, are limited at this time. As a minimum, it's suspected that recreational shooting of prairie dogs can significantly reduce prairie dog densities and indefinitely maintain reduced densities in smaller isolated colonies. Shooting prairie dogs in colonies that have been previously poisoned could likely prevent or slow population recovery in those colonies.

Roadless designation and wilderness proposals would likely reduce recreational shooting of prairie dogs in those areas.

Coal production can result in the loss of occupied and suitable prairie dog habitat. Under Alternative 3, 47,990 acres are designated for mineral production and development (MA 8.4) on the Thunder Basin National Grassland. Coal production and reclamation is regulated by other state and federal agencies. The Office of Surface Mining is the federal agency with responsibility for approving mining plans. The state of Wyoming has delegated primacy for approval of mining and reclamation plans to the Wyoming Department of Environmental Quality. Forest Service reviews mining and reclamation plans to determine compliance with LRMP direction. Mining and reclamation plans also require consultation with the U.S. Fish and Wildlife Service.

Cumulative Effects

Across the Great Plains, approximately 55% of all prairie dog colonies occur on private and state lands (Mulhern and Knowles 1997). It's likely that reductions in prairie dog populations on private lands within the planning area through poisoning, loss of habitat (cultivation), and shooting will continue. Poisoning on federal lands including public domain land, national parks and national wildlife refuges has been substantially reduced primarily to situations involving human health and safety.

Some states within the planning area are currently considering possible closed seasons on prairie dog shooting during part of the year to enhance reproduction and survival of young prairie dogs.

Plague, an exotic disease that's highly lethal to prairie dogs, is a serious threat to the persistence of local and possibly regional black-tailed prairie dog populations. Currently, plague epizootics periodically occur across approximately 66%of the black-tailed prairie dog range (Commission on Environmental Cooperation 2000).

Approximately 40% of the private rangelands on the northern prairie (71 million acres) are in poor to fair range condition and this indicates a loss of higher successional plant communities (Natural Resources Conservation Service 1996). Flat to rolling shortgrass and mixed grass prairies in these conditions provide suitable habitats for black-tailed prairie dogs.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement. Livestock grazing permittees or grazing associations commonly request prairie dog poisoning on NFS lands to reduce forage consumption and clipping by prairie dogs.

Conservation Measures

The following conservation measures are presented as management direction in the revised LRMPs (Alternative 3):

Unit-wide Direction (Chapter 1)

LMNG, GRCRNG, FPNG, BGNG, ONG, NNF (BRD), TBNG

- Prohibit activities that would flood burrows (Standard).
- Limit use of rodenticides to reduce prairie dog populations to situations involving public health and safety and damage to private and public facilities (Standard)..
- Do not use burrow fumigants (Standard).
- Consult state-wide prairie dog conservation strategies for additional guidance on the appropriate response to complaints of unwanted prairie dogs on adjoining agricultural lands (Guideline).
- In consultation with state wildlife agencies, restrict prairie dog shooting where shooting is preventing or slowing a desired prairie dog population expansion (Guideline).
- Conduct an active landownership adjustment plan to reduce conflicts with adjoining landowners over prairie dog management (Guideline).
- Align new roads outside prairie dog colonies or minimize road construction within colonies (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat, including prairie dog colonies, for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

LMNG, GRCRNG, FPNG, BGNG, ONG, NNF (BRD), TBNG

- Numerous objectives, standards and guidelines provide for increased prairie dog populations and for establishment of new colony complexes. The predicted acreages of prairie dog colonies in 10 years under the management direction in Alternative 3 are as follows:

National Grassland or Forest	Predicted Colony Acreage in 10 Years
LMNG	5,400 to 9,400
SNG	NA
GR/CRNG	2,500 to 3,900
FPNG	1,200 to 1,900
BGNG	22,000 to 36,000
ONG	1,200 to 1,900
NNF (BRD)	Unknown
NNF (PRRD)	NA
SRMNF	NA
TBNG	30,000-48,000

- The predicted acreages in 10 years were derived from a prairie dog expansion model. The lower end of the ranges is expected if normal or above normal precipitation patterns prevail over the next 10 years. If drought conditions prevail and vegetation conditions are conducive to colony expansion and establishment, the upper end of the ranges is expected.
- The objectives to provide specified amounts of early seral and low structure grasslands on these areas are summarized in the tables in Section 5 of this document.

Management Area Direction (Chapter 3)

LMNG, BGNG, ONG, TBNG

- Expansion and protection of prairie dog populations in black-footed ferret reintroduction habitat (MA3.63). Details on current and predicted prairie dog populations in these areas are presented in the black-footed ferret assessment in this document.

TBNG

- Cheyenne River Zoological Special Interest Area (MA 2.1b) is established with standards to expand prairie dog populations and to reduce disturbances from management activities and other land uses. This area is 5,980 acres in size (see MA 2.1b for management details in the revised LRMP).

Monitoring Direction (Chapter 4)

LMNG, GR/CRNG, FPNG, BGNG, ONG, NNF (BRD), TBNG

- Continue monitoring populations and habitat.

Appendices

LMNG, GR/CRNG, FPNG, BGNG, ONG, NNF (BRD), TBNG

- Appendix H provides a description of quality habitat for this species. This appendix is referenced by a standard under unit-wide direction (Chapter 1) to provide quality habitat for this species.
- Appendix I provides suggested stocking rates for livestock grazing to provide quality habitat for management indicator species and other wildlife. This appendix is referenced by a standard under geographic area direction (Chapter 2) to use this appendix to help develop and implement range management practices for meeting vegetation objectives.

Biological Determinations, Risk Assessments, and Rationale

GR/CRNG, FPNG, BGNG, ONG

A determination of "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide" is concluded for the prairie dog populations on each national grassland under the revised LRMPs. Outcome II is selected as the risk assessment for this species on these areas. The rationale is that Alternative 3 provides for the expansion and establishment of at least one colony complex on each national grassland, and prairie dog populations on each of these areas are expected to expand. This assumes that all or most rangelands supporting prairie dog colonies will continue to be grazed by livestock, thereby retaining high habitat suitability levels for prairie dogs. In addition, livestock grazing will be increased in some areas to accelerate expansion. Additional restrictions on poisoning and possible restrictions on shooting will also result in expanded prairie dog populations. Re-colonization of any inactive colonies would likely occur without reintroductions. However, reintroductions may be used in some areas to accelerate prairie dog colony expansion.

LMNG, TBNG

A determination of "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide" is concluded for the prairie dog populations on these national grasslands under the revised LRMP. Outcome II is selected as the risk assessment for this species on these areas. The rationale is that Alternative 3 provides for expansion of prairie dog populations. This assumes that all or most rangelands supporting prairie dog colonies will continue to be grazed by livestock, thereby retaining high habitat suitability levels for prairie dogs. Additional restrictions on poisoning and possible restrictions on shooting could also result in expanded prairie dog populations. Re-colonization of any inactive colonies would likely occur without reintroductions. If plague epizootics become problematic in the future on these areas, Outcome III may be a more appropriate selection.

NNF (BRD)

A determination of "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide" is concluded for the prairie dog populations on this area. However, Outcome V is selected as the risk assessment for this species on this area. The rationale is that the prairie dog colonies are protected under Alternative 3, but because habitat capability is marginal for prairie dogs in this area of the Nebraska Sandhills, long-term viability is still questionable. Also, it is possible that prairie dog reintroductions may be necessary to recover inactive colonies; two colonies that have been inactive for several years still have not recolonized.

Section 4. Biological Evaluation for Species that are at Risk Regionally or at State Levels

These species are listed as sensitive by the Forest Service and / or classified as threatened or endangered under state law. They are all ranked as G4 (apparently secure globally) or G5 (secure globally) by the Natural Heritage Program. Some of the species may have local populations within the planning area or on NFS lands that may be at risk of being extirpated. The distribution of these plant and animal species is shown in the following table.

Table H-6. Species at Risk Regionally or at State Levels.

Species	National Grassland or Forest										
	Classification	**LMNG**	**GRCRNG**	**SNG**	**TBNG**	**BGNG**	**FPNG**	**ONG**	**NNF PRRD**	**NNF BRD**	**SRMNF**
Labrador bedstraw	FS – Sensitive (R1)			K							
Marsh bellflower	FS – Sensitive (R1)			K						P	K
Buckbean	FS – Sensitive (R1) IA - Threatened			K							
Nodding buckwheat	FS – Sensitive (R1)	K			P	P		P			
Slender cottongrass	FS – Sensitive (R1)			K						P	P
Lanceleaf cottonwood	FS – Sensitive (R1)	K			P	P					
Torrey's cryptantha	FS – Sensitive (R1)	K			P						
Dogberry	FS – Sensitive (R1)			K							
Crested shield fern	FS – Sensitive (R1)			K						P	P
Marsh fern	FS – Sensitive (R1)			K						P	K
Oak fern	FS –Sensitive (R1) IA - Threatened			K	UQ						
Sensitive fern	FS – Sensitive (R1)			K						P	K
Leathery grape-fern	FS – Sensitive (R1)			K							
Little grape-fern	FS – Sensitive (R1)			K							
Spinulose woodfern	FS – Sensitive (R1)			K						P	K
Northern lady-fern	FS – Sensitive (R1)			K							
Shining flatsedge	FS – Sensitive (R1)			K	UQ					P	P
Umbrella flatsedge	FS – Sensitive (R1)			K						P	P
Frostweed	FS – Sensitive (R1)			K	UQ					P	P
Broad-leaved goldenrod	FS – Sensitive (R1)			K							
Beach heather	FS – Sensitive (R1)			K							
Marsh horsetail	FS – Sensitive (R1)			K							
Meadow horsetail	FS – Sensitive (R1)			K							
Sand lily	FS – Sensitive (R1)	K	P		P	P		P	P	P	P
Blue lips	FS – Sensitive (R1)	K			P	P		P			
Alyssum-leaf phlox	FS – Sensitive (R1)	K	P		P	P		P	P		
Limber pine	FS – Sensitive (R1)	K									
Upright pinweed	FS – Sensitive (R1)	P		K						P	P

Species	National Grassland or Forest										
	Classification	**LMNG**	**GRCRNG**	**SNG**	**TBNG**	**BGNG**	**FPNG**	**ONG**	**NNF PRRD**	**NNF BRD**	**SRMNF**
Alkali sacaton	FS – Sensitive (R1)	K	P		P	P		P			
Purple sandgrass	FS – Sensitive (R1) MN - Spp Concern			K						P	P
Delicate sedge	FS – Sensitive (R1) IA - Spp Concern			K							
Foxtail sedge	FS – Sensitive (R1)			K							
Handsome sedge	FS – Sensitive (R1)			K							
Showy lady's slipper	FS – Sensitive (R1) IA - Threatened			K							
Small white lady's slipper	FS – Sensitive (R1) IA, MN - Spp Concern COSEWIC - E			K						P	P
Wahoo spindle-tree	FS – Sensitive (R1)			K							
Golden stickleaf	FS – Sensitive (R1)	K									
Adder's tongue	FS – Sensitive (R1) IA - Spp Concern			K						P	K
Hooker's townsendia	FS – Sensitive (R1)	K			P	K		P			
Loesel's twayblade	FS – Sensitive (R1)			K						P	K
Bog willow	FS – Sensitive (R1) IA - Threatened			K							
Belfragii's bug	FS – Sensitive (R1)	K	P	K							
Tawny crescent butterfly	FS – Sensitive (R1 & 2)	K	P		P			P	K		
Arogos skipper	FS – Sensitive (R1)		P	P	P	P	P	P			
Flathead chub	FS – Sensitive (R2)	K/OS	K/OS		K/OS	K/OS		K/OS		K/OS	K/OS
Longnose sucker	SD - Threatened	K/OS									
Plains topminnow	FS – Sensitive (R2)				K/OS	K/OS				K/OS	K/OS
Northern leopard frog	FS – Sensitive (R1 & 2) MT - Spp Concern COSEWIC - V	K	K	K	K	K	K	K	K	K	K
Tiger salamander	FS – Sensitive (R2)	K	K	K	K	K	K	K	K	K	K
Pale milk snake	FS – Sensitive (R2) MT - Spp Concern	P	P		P	P	P	P	K	K	P
Blanding's turtle	IUCN - Lower Risk SD - Endangered									P	K

Species	National Grassland or Forest									
	Classification	**LMNG**	**GRCRNG**	**SNG**	**TBNG**	**BGNG**	**FPNG**	**ONG**	**NNF PRRD**	**NNF BRD**	**SRMNF**
American bittern	FS – Sensitive (R2) PIF - Moderate Priority WY - Spp Concern Priority	K	K	K		K	K	K		P	K
Greater prairie chicken	FS – Sensitive (R1 & 2) MN - Spp Concern COSEWIC - XT			K			K			K	K
Yellow-billed cuckoo	FS – Sensitive (R2) PIF - Moderate Priority MT, WY - Spp Concern	UQ	K	K	K	K	UQ	K	K	K	K
Long-billed curlew	FS – Sensitive (R2) BLM - Sensitive COSEWIC - V WY - Spp Concern PIF - High Priority WY-PIF - Level 1	K	P		K	K	K	K		K	K
American peregrine falcon	FS – Sensitive (R1 & 2) TNC / NHP – G4T4, N3 MT,NE,SD–Endangered WY – Spp Concern	K	P	P	K	K	K	K	K	P	P
Northern goshawk	FS – Sensitive (R1 & 2) BLM - Sensitive MT, WY - Spp Concern	P	P	P	K	P	P	P	P	P	P
Sage grouse	FS – Sensitive (R1) WY-PIF - Level 1 COSEWIC - E	K			K	K					
Ferruginous hawk	FS – Sensitive (R2) BLM - Sensitive COSEWIC - V MT, WY - Spp Concern WY-PIF - Level 1	K	K		K	K	K	K	K	K	K
White-faced ibis	FS – Sensitive (R2) BLM - Sensitive MT, WY - Spp Concern			P	P	UQ	UQ	UQ			UQ

Species	National Grassland or Forest										
	Classification	**LMNG**	**GRCRNG**	**SNG**	**TBNG**	**BGNG**	**FPNG**	**ONG**	**NNF PRRD**	**NNF BRD**	**SRMNF**
Common loon	FS – Sensitive (R2) BLM - Sensitive				UQ	UQ	UQ	UQ		UQ	UQ
Merlin	FS – Sensitive (R2) WY - Spp Concern	K	P	P	K	K	K	K	K	K	K
Pygmy nuthatch	FS – Sensitive (R2)				P			P	K		
Western burrowing owl	FS – Sensitive (R1 & 2) BLM - Sensitive COSEWIC - E MT - Spp Concern MN - Endangered WY-PIF - Level 1	K	K	P	K	K	K	K	K	K	K
Sprague's pipit	FS – Sensitive (R1)	K	K	P	K	K	P			P	P
Upland sandpiper	FS – Sensitive (R2)	K	K	K	K	K	K	K	K	K	K
Loggerhead shrike	FS – Sensitive (R1 & 2) BLM - Sensitive COSEWIC - T MT - Spp Concern PIF - Moderate Priority MN - Threatened WY-PIF - Level 1	K	K	K	K	K	K	K	K	K	K
Baird's sparrow	FS – Sensitive (R1 & 2) BLM - Sensitive MT - Spp Concern PIF - High Priority MN - Endangered WY-PIF - Level 1	K	K	P	K	UQ	P	UQ			
Fox sparrow	FS – Sensitive (R2)	P	P	P	K	P	K	P	P	K	K
Trumpeter swan	IUCN - Lower Risk FS – Sensitive (R2) BLM - Sensitive MT,WY - Spp Concern WY-PIF - Level 1					K					UQ

Species	National Grassland or Forest									
	Classification	**LMNG**	**GRCRNG**	**SNG**	**TBNG**	**BGNG**	**FPNG**	**ONG**	**NNF PRRD**	**NNF BRD**	**SRMNF**
Black tern	FS – Sensitive (R2) BLM - Sensitive PIF - Moderate Priority IA - Spp Concern WY-PIF - Level 1	K	K	K	K	K	K	P		P	P
Black-backed woodpecker	FS – Sensitive (R1 & 2) BLM – Sensitive WY – Spp Concern				P						
Lewis' woodpecker	FS – Sensitive (R2)				K	P		K	K		
Townsend's big-eared bat	IUCN - Vulnerable FS – Sensitive (R1 & 2) BLM - Sensitive MT,WY - Spp Concern	P			K	K		P	P		
Mountain lion	SD - Threatened	P			K	P		P	K		
Fringe-tailed myotis	WY - Spp Concern FS – Sensitive (R2)				K	K		K	K		
River otter	NE - Endangered SD - Threatened	K		K						P	P
California bighorn sheep	FS – Sensitive (R1)	K									
Dwarf shrew	FS – Sensitive (R2) MT, WY - Spp Concern				UQ	UQ					

K = Known occurrence in vicinity; date of last observation indicates that species still occurs in area,

P = Possible but unconfirmed occurrence,

UQ = Species occurrence is unlikely or questionable; within species range and potential habitat may occur,

OS = Possible off-site occurrence (downstream, etc.).

Species Eliminated From Further Analysis

Screen 1 (Importance of Area)

TBNG = Oak Fern (Gymnocarpium dryopteris), Shining Flatsedge (Cyperus bipartitus), Frostweed (Helianthemum bicknelli)

- Rationale: The occurrence of these species on this area has not been confirmed and documented. If the presence of one or more of these species is confirmed in the future, this biological evaluation will be revisited and revisions to management direction considered.

SNG, TBNG, BGNG, FPNG, ONG, SRMNF = White-faced Ibis (*Plegadis chihi*)

- Rationale: Observations of this species on these areas are extremely rare and incidental or have not documented. Breeding on these areas is unlikely and has not been confirmed and documented.

TBNG, BGNG, FPNG, ONG, NNF-BRD, SRMNF = Common Loon (*Gavia immer*)

- Rationale: Observations of this species on these areas are extremely rare and incidental or have not been documented. Breeding on these areas is highly unlikely.

BGNG, ONG = Baird's Sparrow (*Ammodramus bairdii*)

- Rationale: Observations of this species on these areas are rare or have not been documented. Breeding on these national grasslands is unlikely and has not been confirmed and documented. If breeding should be confirmed in the future, this biological evaluation will be revisited and revisions to management direction considered.

SRMNF = Trumpeter Swan (*Cygnus buccinator*)

- Rationale: Although some trumpeter swans winter along the Snake River just south of this national forest, none have been observed using wetlands habitats on this area. Nesting by the species has not been observed in wetlands habitats on the national forest. If nesting should be confirmed in the future, this biological evaluation will be revisited and revisions to management direction considered.

TBNG, BGNG = Dwarf Shrew (*Sorex nanus*)

- Rationale: Occurrence of this species on these national grasslands is questionable. If the presence of the species is confirmed in the future, this biological evaluation will be revisited and revisions to management direction considered.

LMNG, FPNG = Yellow-billed Cuckoo (*Coccyzus americanus*)

- Rationale: The presence of this species and suitable habitat are questionable. If breeding is confirmed in the future on or near this area, this biological evaluation will be revisited and revisions to management direction considered.

All Planning Units = American Peregrine Falcon (*Falco peregrinus*)

- Rationale: Occurrence of this species on or near the planning units is highly incidental, unpredictable and limited to migrants passing through these areas. Although an oil and gas stipulation is provided for possible future peregrine falcon nests (Romin and Muck 1999, Joslin and Youmans 1999, Richardson and Miller 1997) on the Little Missouri National Grassland, potential and suitable nesting habitat on this area or on the other national grasslands and forests within the planning area either does not exist or is negligible.

All Planning Units except TBNG = Northern Goshawk (*Accipiter gentilis*)

- Rationale: Occurrence of this species on or near the planning units is highly incidental, unpredictable, and currently limited to migrants passing through these areas. If breeding is confirmed in the future on or near these areas, this biological evaluation will be revisited and revisions to management direction considered.

Screen 2 (Threats)

All Planning Units = Tiger Salamander (*Ambystoma tigrinum*)

- Rationale: It is highly unlikely that land use activities and allocations under Alternative 3 would significantly affect the species and / or its habitat. Under Alternative 3, no significant changes in the amount or distribution of wetlands are prescribed. Local adult and larvae populations of this species appear to be largely determined by annual climatic conditions (precipitation) (Larson et al. 1998).

All Planning Units = Pale Milk Snake (*Lampropeltis triangulum*)

- Rationale: It is highly unlikely that land use activities and allocations under Alternative 3 would significantly affect the species and / or its habitat. This species appears to occupy a wide range of habitats (Luce et al. 1997) and spends considerable time underground or under rocks and logs. They are occasionally killed on roadways but this likely has an insignificant effect on local populations (Walter Deptula, personal communication).

LMNG, TBNG, BGNG, ONG, NNF-PRRD = Townsend's Big-eared Bat (*Corynorhinus townsendii*)

- Rationale: It is highly unlikely that land use activities and allocations under Alternative 3 would significantly affect the species and / or its habitat. Most of these units do not have open mine shafts that provide habitat for this species, and management activities and recreation seldom occur or are minimal in habitats that provide natural caves (badlands formations) for the species.

LMNG, SNG, NNF (BRD), SRMNF = River Otter (*Lutra canadensis*)

- Rationale: It's highly unlikely that any activities or allocations authorized by the Forest Service could cause adverse effects on the species or its habitat.

Screens 1 and 2

LMNG, TBNG, BGNG, ONG, NNF-PRRD = Mountain Lion (*Felis concolor*)

- Rationale: Lion use of most of these areas can best be described as incidental, and factors largely beyond the control or authority of the Forest Service determine their populations and use of these areas.

The following species that are classified as sensitive by the Bureau of Land Management were also dropped from further detailed analysis. None of the species were listed under ESA as threatened, endangered, proposed or candidate, and none met the Forest Service criteria for sensitive species classification. Also, none were listed as endangered or threatened within the planning area under state law.

- Meadow jumping mouse (*Zapus hudsonius*),
- Merriam's shrew (*Sorex merriami*),
- Hairy woodpecker (*Picoides villosus*),
- Le Conte's sparrow (*Ammodramus caudacutus*),
- Snapping turtle (*Chelydra serpentina*),
- Spiney softshell turtle (*Trionyx spiniferus*).

Evaluations for Individual Species

Upright Pinweed (*Lechea stricta*)

Species Description

This perennial canescent forb blooms early to mid season depending on location and weather conditions. The plant is erect, densely branched above, scarcely woody, and has small, crowded leaves (Stevens 1963, Great Plains Flora Association 1986). Flowers are greenish in dense, slender, terminal clusters. Fruit is a capsule with small seeds. It is a member of the Cistaceae family.

Distribution and Status

Distribution of this species includes New York and Ontario, west to North Dakota, and south to Ohio, Indiana, Illinois, and Nebraska (Great Plains Flora Association 1986). Within the planning area, upright pinweed is known from two populations in North Dakota (North Dakota Natural Heritage database 2000) and two populations in Nebraska (Great Plains Flora Association 1977). In addition, a recently discovered population was found in the Hecla Sand Hills of north central South Dakota on private land (Dave Ode, South Dakota Heritage Program, personal communication). In North Dakota, one of the populations is found in Richland County on the Sheyenne National Grassland. This population is large, containing approximately 4000 individuals concentrated within 1/10 of an acre. The other population in North Dakota is known from a historical record on private land in western North Dakota, Bowman County. The populations in Nebraska are both located on private land.

Table H-6 summarizes species occurrence and status in the planning area. Upright pinweed is currently found on the Sheyenne National Grassland and may possibly occur on the Little Missouri National Grassland and the Nebraska and Samuel R. McKelvie National Forests.

Organization Rankings

Upright pinweed is classified as sensitive in Region 1 of the Forest Service. The species is ranked G4 globally, apparently secure although it may be quite rare in parts of its range.

The species is ranked as S1 in both North Dakota and Nebraska (NatureServe 2000). A S1 rank means a species is critically imperiled in the state because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because of some factor in its biology making it especially vulnerable to extinction.

Habitat

Upright pinweed is categorized as a mid-range of versatility species, being found associated primarily with one habitat type but may also be found in other habitat types across the tallgrass and mixed grass prairie. It is found in sandy habitats within the choppy sandhills of the tallgrass prairie on the Sheyenne National Grassland, but may also occur in sandy depressions on the mixed grass prairie in the western part of the planning area (North Dakota Natural Heritage Database 2000). Within the Northern Great Plains planning area, the habitat components associated with this species are uncommon and occupy a minor percentage of the total land base.

Upright pinweed prefers sandy soils, prairie meadows, and open prairie conditions (Great Plains Flora Association 1986, Barker et al. 1977, Stevens 1963). The large population on the Sheyenne National Grassland is found in the big bluestem / little bluestem habitat type. Soils for this population are fine sands with low organic matter.

Upright pinweed habitat on the tallgrass prairie on the Sheyenne National Grassland was traditionally dominated by grass species such as big bluestem (*Andropogon gerardi*), indiangrass (*Sorghastrum nutans*), and switchgrass (*Panicum virgatum*). These communities intergraded into mixed grass prairie on the Sheyenne National Grassland (Seiler 1973). Within these communities, the disturbance processes of herbivory, fire, and climatic fluctuations were significant determinants for plant distribution and community composition (Northern Great Plains Terrestrial Assessment 2000).

Conservation Planning

Statewide or regional habitat conservation strategies have not been developed for this species in the planning area.

Direct and Indirect Effects on NFS Lands

Noxious weeds such as leafy spurge occur throughout the tallgrass prairie. Noxious weeds reduce the quality of habitat but at the same time, efforts to control spurge and other invasive species with herbicides can pose a direct threat to upright pinweed.

Competition from non-native plants can be a significant threat to pinweed and its habitat. The currently known population on the Sheyenne National Grassland contains Kentucky bluegrass and sweet clover. Invasive species such as Kentucky bluegrass often form monocultures significantly reducing the diversity of native species.

Recreation can have negative effects on pinweed if recreation use increases the introduction or spread of invasive plant species into its habitat.

Roads can negatively affect upright pinweed by introducing non-native plant species along travel routes, by habitat fragmentation, and by loss of suitable habitat to disturbance.

Increased rates of channelization in drainages can result in lowered water tables. Any activities that lower water tables below the effective rooting zone of pinweed will place individuals or populations at risk.

Burning, livestock grazing, and mowing can have positive or negative effects on this species depending on frequency, intensity, and timing of disturbance and on the reproductive characteristics of upright pinweed. Properly timed burning, grazing, and mowing may be beneficial in maintaining the quality of native grassland habitats for pinweed. Lack of disturbance on the tallgrass prairie can cause some sites to convert to shrub habitats.

Burning may directly impact pinweed by causing mortality or indirectly impact the species through effects on its habitat. Burning improves the nutrient cycling within soils. However, summer burning may prevent completion of the life cycle for upright pinweed. Very early spring and late fall burning should have no effect on the species and may be beneficial.

Upright pinweed is not considered palatable to cattle but could be grazed by sheep or goats. Grazing can prevent upright pinweed from completing its life cycle and producing seeds. Excessive and continuous grazing can lead to impacts on plant regrowth, thereby reducing the vigor of plants within the population.

Grazing can also reduce dead material within plant communities and open up canopy layers of plants, allowing for the germination and establishment of new plants of upright pinweed.

Livestock trampling can be a problem to upright pinweed. Trampling can damage individual plants. In addition, excessive and repeated soil compaction from trampling may result in reduced plant vigor.

Repeated mowing may prevent upright pinweed from completing its life cycle and may also reduce carbohydrate reserves. Mowing should have no affect after seed set.

Cumulative Effects

Noxious weeds are likely to remain threats to the habitat of this species on private and public lands in and around the Sheyenne National Grassland (Ostlie et al. 1997).

Continued loss of suitable habitat through conversion of rangelands to croplands can be expected to occur on private lands (Chuluun et al. 1997, Ostlie et al. 1997, USDA Forest Service 2000).

Livestock grazing and mowing practices that are unfavorable for the conservation of sensitive plant species are likely to continue on some private lands.

Development activities such as road and building construction on private lands will continue, resulting in some loss of suitable habitat for sensitive plant species and some possible mortality of sensitive plants and population loss.

Drainage on adjacent private land may lower water table levels below the root zone of some sensitive plant species, putting individuals or populations at risk.

Insecticide spraying on adjacent croplands may reduce or threaten insect pollinators (Arenz and Joern 1996, Ostlie et al. 1997).

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

In the western part of the planning area, decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD), eventual on-site development, and additional roads and pipelines.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction under Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

LMNG, SNG, NNF (BRD), SRNMF

- Avoid placing new facilities, roads, trails, fences, salting and minerals, and other developments in habitat (Guideline).
- Identify habitats as priority areas for noxious weed control (Guideline).
- Avoid the use of noxious weed and invasive plant control methods that may negatively impact populations (Guideline).
- Design timing, intensity, and frequency of mowing, burning, and livestock grazing to maintain or increase populations (Standard).
- Ensure that management actions do not contribute to loss of population viability (Standard).
- Protect known populations from land use activities that cause increased trampling or soil compaction (Guideline).
- Enhance and improve habitat for known populations through restoration programs (Guideline).

LMNG, SNG

- Require permits to collect sensitive plants or parts of sensitive plant species (Standard).
- Prohibit use of pesticides that would adversely affect species at risk (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

SNG

- Objectives call for specified levels of ungrazed habitat and a more diverse grassland vegetation mosaic through desired levels of rest, seral stages and vegetation structure (see tables in Section 5).
- Develop and implement conservation strategy (Guideline).
- Conduct target plant surveys or baseline assessments (Guideline).

Management Area Direction (Chapter 3)

- None.

Monitoring Direction (Chapter 4)

LMNG, SNG, NNF (BRD), SRNMF

- Monitor populations and habitat

Biological Determinations, Risk Assessments, and Rationale

SNG

Determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." This determination is based on the habitat enhancement prescribed through the restoration of ecological processes to varying levels across the landscape. Alternative 3 will provide for increases in mid to higher seral conditions that should favor the mosaic of landscape habitat conditions across the Sheyenne National Grassland. The acres of rangeland annually rested from livestock grazing under Alternative 3 also more closely approximates the grazing conditions under which tallgrass prairie habitats evolved as compared to current grazing conditions (USDA Forest Service 2000). In addition, the level of prescribed fire under Alternative 3 is a step towards restoring the natural fire regime. Alternative 3 provides for no net increase (from current levels) of noxious weeds. The existence and spread of noxious and exotic species is one of the primary threats to the maintenance of high quality, tallgrass prairie habitat (USDA Forest Service 2000).

In addition, Alternative 3 provides for specific conservation and mitigation measures to be applied to upright pinweed including baseline population assessments, target surveys, and a conservation strategy.

Outcome VI is the selected risk assessment for this area under Alternative 3. Rationale for outcome VI is that upright pinweed is known from very limited populations in the vicinity of the planning unit. This will result in strong limitations on interactions among local populations, high potential for genetic isolation, and uncertainty about the species response to climatic stochastic. Threats to the species from management activities on the private land populations are also a consideration. The largest known population occurs on the Sheyenne National Grassland where habitat is threatened by serious competition from invasive and noxious weeds. Although habitats should be enhanced and the known population should receive adequate protection under Alternative 3, viability concerns remain because of the threats of invasive and noxious weeds and the degree of isolation.

LMNG

Determination is “no impact.” The species presence on this national grassland has not been confirmed and documented. However, management direction is provided for this species and potential habitat on these areas. If the species presence had been confirmed, the determination would have been "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

NNF (BRD), SRMNF

No determination is made because the species is not listed as sensitive in Region 2 of the Forest Service. Also, the species presence on these areas has not been confirmed and documented.

Handsome Sedge (*Carex formosa*)

Species Description

This perennial sedge is cespitose with short, tough rootstocks. The fruit is an achene, and fruiting occurs from early June to mid-July (Great Plains Flora Association 1986). It is a member of the Cyperaceae family.

Distribution and Status

This species is a rare inhabitant of mesic deciduous forests throughout its range, which is centered around the Great Lakes and extends from New England to North Dakota (Challey and Heidel 1993).

Table H-6 summarizes species occurrence and status in the planning area. In the planning area, handsome sedge is only known to occur in eastern North Dakota. There are no known occurrences in South Dakota (Dave Ode, South Dakota Heritage Program, personal communication). In North Dakota, the species is known from five element occurrence records, all located along the Sheyenne River valley in Richland County (North Dakota Natural Heritage database 2000). Of these populations, only one population is known from U.S. Forest Service lands where it occurs on the Sheyenne National Grassland. The population on the SNG represents the western-most extension of this species’ range. The North Dakota populations appear to be highly disjunct occurrences from the nearest known population in western Minnesota (Challey 1991, Lenz prof. knowledge).

Organization Rankings

The Global Conservation Status Rank of handsome sedge is G4 (NatureServe 2000). It is classified as a sensitive species in Region 1 of the Forest Service.

Handsome sedge is ranked as S1 in North Dakota, critically imperiled because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres), or because of some factor of its biology making it especially vulnerable to extirpation from the state (North Dakota Natural Heritage Inventory 1999).

At one time, this species was a candidate for listing as threatened and endangered (federal listing) because it appears to be rare with highly localized distribution throughout its range (Challey 1991).

Habitat

The species appears to be restricted to moist eastern deciduous woodlands on alluvial soils. Dominant vegetation includes green ash and aspen. The one known population on the Sheyenne National Grassland is found in the riverine wetlands complex, consisting of mesic areas resulting from upland drainage patterns of the Sheyenne River (North Dakota Natural Heritage Database 2000). Here it occurs on the river bottom near the base of north-facing bluffs along the river valley margin.

Habitat for this species in North Dakota has been fragmented by roads and agricultural activities (Challey 1991). Within the Northern Great Plains planning area, the greatest losses of riparian and wetland habitat since pre-settlement (by percentage) have occurred in North Dakota, with the most extensive drainage occurring to tallgrass prairie wetlands in eastern North Dakota (NGP Aquatic Assessment 1998).

Conservation Planning

Statewide or regional habitat conservation strategies have not been developed for this species in the planning area.

Direct and Indirect Effects on NFS Lands

Handsome sedge may be sensitive to grazing or trampling by livestock (USDA Forest Service 1991). Habitat occurs in areas that are typically very shaded. Livestock use these areas for shade in the heat of the summer, if accessible. In addition, excessive and repeated soil compaction from trampling may result in reduced plant vigor.

Livestock grazing can prevent handsome sedge from completing its life cycle and producing seeds. In addition, excessive and continuous livestock grazing can lead to impacts on plant regrowth, thereby reducing the vigor of plants within the population. This species may have moderate palatability to cattle. It is considered a grass-like plant and may be selected by livestock for forage.

Noxious weeds such as leafy spurge occur in scattered populations throughout the tallgrass prairie. Noxious weeds such as leafy spurge and Canada thistle reduce the quality of habitat for handsome sedge but at the same time, efforts to control spurge and other invasive species with chemicals can pose a direct threat to the species. In addition, many chemicals are restricted for use within riparian areas.

Competition from invasive, non-native plants can be a primary threat. Invasive species such as Kentucky bluegrass and smooth brome have the potential to compete with handsome sedge for habitat, significantly reducing population numbers. Encroachment by exotic woody species may also threaten species habitat.

Roads can negatively affect handsome sedge and known populations by introducing non-native plant species along travel routes, by habitat fragmentation, and by loss of suitable habitat to disturbance.

Recreational river use may increase in the species' habitat as users explore shorelines from the river. While this habitat is not conducive to camping due to its wet nature, soil compaction and trampling can occur. Recreational use can also increase the rate of spread of non-native plant species along recreational routes.

Increased rates of channelization in drainages can result in a lowered water table. Any activities that lower water tables below the effective rooting zone of handsome sedge will place individuals or populations at risk.

Cumulative Effects

Noxious weeds will likely remain a problem in the habitat of this species on private and public lands in and around the Sheyenne National Grassland (Ostlie et al. 1997).

Continued loss of suitable habitat through conversion of woodlands to croplands and draining of croplands can be expected to occur on private lands (USDA Forest Service 2000, Ostlie et al. 1997, Chuluun et al. 1997).

Livestock grazing practices that are unfavorable for the conservation of sensitive plant species are likely to continue on some private lands.

Development activities such as road and building construction on private lands will continue, resulting in some loss of suitable habitat for sensitive plant species and possible mortality of sensitive plants and population loss.

Drainage ditches and irrigation can alter the hydrologic regime of mesic habitats, inducing drier conditions to these habitats, preventing the plants from completing their life cycle, and / or killing the plants.

Interrelated and Interdependent Actions

Determining federal range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

SNG

- Avoid placing new facilities, roads, trails, fences, salting and minerals, and other developments in habitat (Guideline).
- Identify habitats as priority areas for noxious weed control (Guideline).
- Avoid the use of noxious weed and invasive plant control methods that may negatively impact populations (Guideline).
- Design timing, intensity, and frequency of mowing, burning, and livestock grazing to maintain or increase populations (Standard).
- Maintain hydrological regimes and protect and restore developed springs and seeps where habitat would be enhanced (Guideline).

SNG, cont.

- Ensure that management actions do not contribute to loss of population viability (Standard).
- Protect known populations from land use activities that cause increased trampling or soil compaction (Guideline).
- Enhance and improve habitat for known populations through restoration programs (Guideline).
- Require permits to collect sensitive plants or parts of sensitive plant species (Standard).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

SNG

- Develop and implement a conservation strategy (Guideline).
- Conduct target plant surveys or baseline assessments (Guideline).
- Protect habitat supporting the Eastern Prairie Boggy Wetland plant guild from livestock grazing (see tables in Section 5) (Guideline).
- Objectives call for specified levels of ungrazed habitat and a more diverse grassland vegetation mosaic through desired levels of rest, seral stages and vegetation structure (see tables in Section 5).
- Avoid use of goats or sheep for noxious weed control (Guideline).
- Avoid placing water developments, oilers, livestock salt, or mineral near or in Eastern Prairie Boggy Wetland guild (Guideline).
- Designate and sign recreation trails adjacent to or within habitats to encourage user to stay on trails (Guideline).
- Discourage recreation activities in occupied habitats (Guideline).
- Handsome sedge is found in MA 3.64 (1250 acres). Numerous standards and guidelines provide priority protection for species at risk.

Management Area Direction (Chapter 3)

SNG

Management Area 3.64 provides the following conservation measures:

- Limit all motorized use to administrative use (Standard).
- Protect wetland habitat to maintain hydrologic regimes (Standard).
- Maintain disturbance processes favorable to wildlife and plant species (Standard).
- Allow no new road or trail construction except when necessary to correct resource damage (Standard).
- Conflicts that cannot be mitigated are resolved in favor of plant and wildlife species (Standard).
- Prohibit removal of mineral material (Standard).

- Do not include this MA in any grazing allotment (Guideline).
- Locate new and re-locate existing recreation trails to prevent habitat damage (Standard).
- No new utility corridors or additional development within existing corridors will be permitted (Standard).

Monitoring Direction (Chapter 4)

SNG

- Monitor populations and habitat.

Biological Determinations, Risk Assessments, and Rationale

SNG

Determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." Under this alternative, varying levels of habitat enhancement and restoration are proposed that should benefit the species. Natural processes such as rest can enhance riparian and wetland habitat. In addition, some of the proposed management activities should provide additional specific protection measures for the known population of the species.

The increased levels of prescribed fire are a positive step towards restoring the fire regime. Alternative 3 provides for no net increase (from current levels) of noxious weeds. The existence and spread of noxious and exotic species is one of the primary threats to the maintenance of high quality tallgrass prairie habitat (Northern Great Plains Terrestrial Assessment 2000).

Under Alternative 3, the known population of handsome sedge and its primary habitat are found under Management Area 3.64 (Special Plant and Wildlife Habitat) that provides several conservation measures that will benefit this species. In addition, Alternative 3 provides for specific conservation and mitigation measures to be applied to handsome sedge including baseline population assessments, target surveys, and a conservation strategy.

Under the management activities proposed, habitats should be enhanced for this species. The known population should receive adequate protection. Viability should be affected by proposed management throughout the planning unit and planning area.

Outcome VI is selected as the risk assessment under Alternative 3. Rationale for outcome VI is that handsome sedge is known from very limited populations within the planning area. This will result in strong limitations on interactions among local populations, high potential for genetic isolation, and uncertainty about the species response to climatic stochasticity. Threats to the species from management activities on the private land populations are also a consideration. On the Sheyenne National Grassland, habitat for handsome sedge is threatened by serious competition from invasive and noxious weeds. Alternative 3 provides for specific mitigation and conservation measures for this species, but because of its continued isolation and threats from invasive and noxious weeds, concerns over viability remain.

Belfragi's Chlorochroan Bug (*Chlorochroa belfragii*)

Species Description

Belfragi's bug (also known as Belfragi's chlorochroan bug or green stink bug) is a large, little-researched animal found in the north-central United States. Stink bugs are easily recognized by their shield-like shape and five –segmented antennae (U.S. Fish and Wildlife Service 1995). They are well known for their ability to produce a strong, disagreeable odor, which aids in their defense. The Belfragi's bug is elongate and about 0.5 inch long. Its overall color is green, with a distinct pale yellowish stripe along the midline of its back.

Distribution and Status

This species has been collected in Nebraska, South and North Dakota, Illinois, and Manitoba. As summarized in Table H-6, it occurs on or near the Sheyenne and Little Missouri National Grasslands and may also be present on the Grand River and Cedar River National Grasslands. The status of Belfragi's bug on the other national grasslands is unknown. Based on this species' habitat affiliations, populations have likely declined dramatically from historic conditions, but little is actually known.

Organization Rankings

The Belfragi's bug is classified as sensitive in Region 1 of the Forest Service. Very little is known of its current population levels, and so the species has not been assigned a ranking by the International Network of Natural Heritage programs and Conservation Data Centeres.

Habitat

Mesic prairie seems to be the primary habitat for this species (U.S. Fish and Wildlife Service 1995). Belfragi's bug likely feeds on grasses, particularly prairie cordgrass.

Conservation Planning

Statewide or regional habitat conservation strategies have not been prepared for this species.

Direct and Indirect Effects on NFS Lands

The proposed management activities that are most likely to impact Belfragi's bug are the use of insecticides and herbicides and livestock grazing.

Cumulative Effects

All of the activities listed above under direct and indirect effects are likely occurring on private lands as well, within the cumulative effects area of the administrative boundary of the Sheyenne, Little Missouri, Grand River, and Cedar River National Grasslands (Ostlie et al. 1997, USDA Forest Service 2000, Arenz and Joern 1996). In addition, water withdrawal on lands adjacent to the Sheyenne National Grassland may result in decreased mesic prairie available to the Belfragi's bug.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

LMNG, GR/CRNG, SNG

- Do not authorize vegetation management and construction projects that would further isolate populations (Standard).
- Design vegetation management and pesticide application projects to reduce mortality and to maintain nectar and larvae host plants (Guideline).
- Manage for native forb abundance and diversity to provide foraging habitat for big game, grassland birds, and other grassland wildlife (Guideline).
- Prohibit control of native insects until an evaluation of impacts to other resources is made (Guideline).
- Prohibit use of pesticides that would adversely affect species at risk (Guideline).

Geographic Area Direction (Chapter 2)

LMNG, GR/CRNG, SNG

Objectives call for specified levels of ungrazed habitat and a more diverse grassland vegetation mosaic through desired levels of rest, seral and vegetation structure (see tables in Section 5).

Management Area Direction (Chapter 3)

LMNG

- The 209-acre Burning Coal Vein / Columnar Junipers SIA provides habitat for this species. Livestock grazing is not allowed in this area (Standard).

Monitoring Direction (Chapter 4)

LMNG, GR/CRNG, SNG

- Monitor populations and habitat
- Monitor the effectiveness of the suggested stocking rates in Appendix I in meeting desired vegetation composition and grassland structure levels.

Appendices

LMNG, GR/CRNG, SNG

- Appendix I provides suggested stocking rates for livestock grazing to provide quality habitat for management indicator species and other wildlife. This appendix is referenced by a standard under geographic area direction (Chapter 2) to use this appendix to help develop and implement range management practices for meeting vegetation objectives.

Biological Determinations, Risk Assessments, and Rationale

SNG, LMNG

Proposed management activities have the potential to impact Belfragi's bug habitat, but little is known of this species' ecology. Because proposed activities would result in increased habitat diversity, increased ecological integrity, and (on the Sheyenne National Grassland) an increased focus on mesic prairie restoration, this species will likely benefit overall. Due to the potential adverse impacts of grazing and insecticide and herbicide use however, the following determination is made: "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

It was difficult to conduct a risk assessment for this species due to the lack of information on the species. However, based on its habitat associations and the management direction under Alternative 3, outcome IV was selected. The land surrounding the planning units generally offer refugia of undisturbed prairie, and while such refugia would be available under Alternative 3 as part of the proposed rest areas, the portions suitable to this species are likely to be small and isolated. Habitat enhancement will be needed to restore populations and recover the potential distribution of the species on the relevant planning units.

GR/CRNG

Determination is "no impact." The species presence on these areas has not been confirmed and documented. However, management direction is provided for this species and potential habitat on these areas. If the species presence had been confirmed, the determination would have been "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

Tawny Crescent Butterfly (*Phyciodes batesii*)

Species Description

The tawny crescent is a medium-sized (1.5 inch wide) member of the brush-footed butterfly family (Nymphalidae). The upper surface of the wings is a complex pattern of dark orange and black. On the underside, the forewing has black patches, while the hind wing is clear yellow.

The subspecies *P. b. lakota,* which occurs in the planning area, is the focus of this account. Adults mate in June and lay egg clusters on the underside of aster leaves. Larvae overwinter as third (Royer and Marrone 1992) or fourth (NatureServe 2000) instars, and then pupate the following June to emerge as adults. Dogbane and spurge are favored nectar sources for adults.

Distribution and Status

The tawny crescent occurs from central Alberta east to central Ontario and southern Quebec, south into North Dakota, Minnesota, Wisconsin, Michigan, and Pennslyvania, as well as further south in the Applachian Mountains to northern Georgia, and through the Rocky Mountain States to Arizona. Isolated populations are also found in the Black Hills and the Nebraska Pine Ridge (NatureServe 2000).

Table H-6 summarizes species occurrence and status in the planning area. The species is known to occur on the Little Missouri National Grassland and the Nebraska National Forest (Pine Ridge). It may possibly occur on the Grand / Cedar River, Thunder Basin and Oglala National Grasslands.

Declines from historic conditions are likely related to habitat loss and degradation. Subspecies *P. b. batesii* has declined greatly, and may go extinct. Since the reasons for this precipitous decline is largely unexplained, there is no assurance that *P. b. lakota* will not decline in the future as well (NatureServe 2000).

Organization Rankings

This species is classified as sensitive in Regions 1 and 2 of the Forest Service. The tawny crescent butterfly has a global conservation status rank of G4, meaning "apparently secure."

Habitat

The subspecies *P. b. lakota* uses a variety of open dry habitats, like oak savannahs, pine barrens, ponderosa pine savannas, and aspen parkland (NatureServe 2000, Fritz 1997). Typical habitat in North Dakota is moist clearings in natural aspen stands or green ash woodlands. In western North Dakota, it is found on north-facing slopes and other mesic sites (Royer and Marrone 1992). It was recently found in riparian drainages within ponderosa pine forest on the Nebraska National Forest (Fritz 1997). There appears to be a strong association in North Dakota between tawny crescents and green ash forest margins that border bluestem prairie. As mentioned above, aster serves as larvae hosts, and dogbane and spurge are favored nectar sources for adults.

Conservation Planning

A conservation strategy has not been prepared. However, Moffat and McPhillips (1983) provide a general set of habitat management guidelines for butterflies in the northern Great Plains. Royer and Marrone (1992) prepared a conservation status report for this species in North and South Dakota.

Direct and Indirect Effects on NFS Lands

Projects that lower groundwater levels could negatively impact this species and its habitat.

Herbicide treatments to control leafy spurge reduce nectar sources.

Grasshopper spraying on rangelands could negatively impact this species.

Prescribed burns can kill adults and larvae.

Livestock grazing can reduce habitat suitability for this species, especially where riparian and other wetland sites are degraded. Light livestock grazing can also be used to help maintain suitable prairie habitat for butterflys (Swengel and Swengel 1995).

Intensive mowing and haying can cause direct mortality and reduce habitat suitability for this species (Swengel and Swengel 1995).

Cumulative Effects

Because of this species low vagility, the cumulative effects area considered was relatively small, and coincided with the administrative boundaries of relevant planning units. Additional threats to the species on circumscribed non-NFS lands are the conversion of native grasslands to cropland and hay production (Finch 1991, Ostlie et al. 1997, USDA Forest Service 2000, Arenz and Joern 1996).

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

Royer and Marrone (1992) provided recommendations to federal land management agencies. These included: 1) limit grazing in tawny crescent habitat, particularly along wooded margins, and 2) protect, maintain and enhance spring and stream flows. Moffat and McPhillips (1983) suggested:

- Maintain and enhance spring and stream flows.
- Before constructing roads alongside a riparian area, conduct a clearance survey.
- Limit leafy spurge control in drainages to targeted, non-chemical means.
- Enhance nectar sources and larval host plants.

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

LMNG, GR/CRNG, ONG, NNF (PRRD), TBNG

- Do not authorize vegetation management and construction projects that would further isolate butterfly populations (Standard).
- Design vegetation management and pesticide application projects to reduce mortality and to maintain nectar and larvae host plants (Guideline).
- Manage land treatments to conserve site moisture and to protect long-term stream, wetland, and riparian area health (Standard).
- Allow only those actions next to perennial and intermittent streams, seeps, springs, lakes, and wetlands that maintain or improve long-term proper functioning of riparian ecosystem conditions (Standard).
- Design activities to protect and manage the riparian ecosystem (Standard).

- Locate activities and facilities away from riparian areas unless alternatives have been assessed and determined to be more environmentally damaging (Guideline).
- Design and construct all stream crossing and other in-stream structures to provide for sufficient passage of flow and sediment, withstand expected flood flows, and allow free movement of aquatic life (Standard).
- When possible, restore intermittent streams to continually flowing perennial streams (Guideline).
- Manage livestock grazing to maintain or improve riparian areas (Guideline).
- Manage for native forb abundance and diversity to provide foraging habitat for big game, grassland birds, and other grassland wildlife (Guideline).
- Prohibit control of native insects until an evaluation of impacts to other resources is made (Guideline).
- Prohibit use of pesticides that would adversely affect species at risk (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

LMNG, GR/CRNG, ONG, NNF (PRRD), TBNG

- Objectives call for specified levels of ungrazed habitat and a more diverse grassland vegetation mosaic through desired levels of rest, seral stages and vegetation structure (see tables in Section 5).

Management Area Direction (Chapter 3)

LMNG

- Habitat for this species may possibly occur in the proposed 5,880-acre Cottonwood Creek Badlands RNA. RNAs will be managed to protect their ecological values. Management plans will be completed within 5 years.

Monitoring Direction (Chapter 4)

LMNG, GR/CRNG, ONG, NNF (PRRD), TBNG

- Monitor populations and habitat.
- Monitor the effectiveness of the suggested stocking rates in Appendix I in meeting desired vegetation composition and grassland structure levels.

Appendices

LMNG, GR/CRNG, ONG, NNF (PRRD), TBNG

- Appendix I provides suggested stocking rates for livestock grazing to provide quality habitat for management indicator species and other wildlife. This appendix is referenced by a standard under geographic area direction (Chapter 2) to use this appendix to help develop and implement range management practices for meeting vegetation objectives.

Biological Determinations, Risk Assessments, and Rationale

LMNG, NNF (PRRD)

Determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." Under this alternative, adjustments in livestock grazing intensities, increased attention to riparian and wooded draw habitats, direction on protecting and restoring streams and springs, introduction of rest pastures and added emphasis on restoring native vegetation overall should improve habitat conditions for this species.

Outcome II is selected as the risk assessment for the tawny crescent butterflies. This species' habitat, while very local, is widely distributed. Land uses, particularly livestock grazing, spring development, and pesticide use, will be managed in such a way to avoid direct threats to this species. No need for supplemental stocking is anticipated.

GR/CRNG, TBNG, ONG

Determination is "no impact." The species presence on these areas has not been confirmed and documented. However, management direction is provided for this species and potential habitat on these areas. If the species presence had been confirmed, the determination would have been "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

Arogos Skipper (*Atrytone arogos*)

Species Description

The arogos skipper has a wingspan of about 1.25 inches. Males are yellow-orange on the dorsum, with wide dark borders. Females are darker. The under surfaces of both sexes are bright golden (Royer and Marrone 1992, NatureServe 2000).

There are two subspecies; *A. a. iowa*, is the subspecies that occurs in the planning area, and is the focus of this account.

After hatching, arogos skipper larvae live in nests of rolled or tied leaves. Larvae likely overwinter as fourth instar, and resume feeding the following spring. In North Dakota, adults emerge from pupal stage in mid-June and persist into July (Royer and Marrone 1992).

Distribution and Status

The arogos skipper (both subspecies combined) is resident throughout much of the eastern and central United States, from New York south to Florida, and from North Dakota to the Texas Gulf Coast, and west to eastern Wyoming (NatureServe 2000). The species is mostly found in widely separated and isolated colonies. It is seldom common anywhere.

Table H-6 summarizes this species' occurrence in the planning area. *A. a. iowa* is thought to occur on the Sheyenne, Fort Pierre, Buffalo Gap, Thunder Basin, Oglala, and the Grand River and Cedar River National Grasslands (Royer 1996, NatureServe 2000).

Populations of *A. a. iowa* are more stable than those of the eastern subspecies, *A.a. argos.* (Royer and Marrone 1992, NatureServe 2000), but *A. a. iowa* is still assumed to have suffered a sharp decline from historical conditions. In 1869, Scudder identified this subspecies as the most

abundant of its genus in Iowa. Today, it is very local and uncommon. The reasons for decline are undoubtedly the widespread alternation, destruction, and fragmentation of prairie habitats (Panser 1988 cited in NatureServe 2000).

Organization Rankings

Arogos skipper is classified as a sensitive species in Region 1 of the Forest Service. The International Network of Natural Heritage Programs and Conservation Data Centeres, has assigned this skipper a rank of G3/G4, meaning "vulnerable" or "apparently secure." The national ranking for the United States (N3/N4), is similar.

Habitat

The arogos skipper uses relatively undisturbed tall, mixed, and shortgrass prairies. Adults visit species such as purple coneflower, long-headed coneflower, black-eyed susan, and various thistles. Larvae host plants include big bluestem, little bluestem, and possibly *Panicum* species.

Conservation Planning

Moffat and McPhillips (1983) provide a general set of habitat management guidelines for butterflies in the Northern Great Plains. Royer and Marrone (1992) prepared a conservation assessment on this species for North and South Dakota.

Direct and Indirect Effects on NFS Lands

Management practices that might impact arogos skipper include grazing and the use of pesticides (particularly for leafy spurge, Canada thistle, and grasshopper control).

The impact of controlled burning and mowing on this species is not well understood (NatureServe 2000).

Habitat that is invaded by exotics, such as brome grass, leafy spurge, and bluegrass, is soon degraded (Royer and Marrone 1992).

Cumulative Effects

Because of this species' low vagility, the cumulative effects area considered was relatively small, and coincided with the administrative boundaries of relevant planning units. Factors affecting arogos skipper populations within this area are the continuing conversion of native grasslands to cropland, groundwater withdrawal, and the use of grasslands for early summer hay production, as well as the types of management mentioned above (Ostlie et al. 1997, USDA Forest Service 2000, Arenz and Joern 1996).

Interrelated and Independent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

Moffat and McPhillips (1983) offered the following conservation measures:

- Protect the Sheyenne sandhills area from overgrazing.
- Exclude livestock from known Arogos skipper locations.
- Increase bluestem and enhance nectar sources.

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

GR/CRNG, SNG, TBNG, BGNG, FPNG, ONG

- Do not authorize vegetation management and construction projects that would further isolate butterfly populations (Standard).
- Design vegetation management and pesticide application projects to reduce butterfly mortality and to maintain nectar and larvae host plants (Guideline).
- Manage for native forb abundance and diversity to provide foraging habitat for big game, grassland birds, and other grassland wildlife (Guideline).
- Prohibit control of native insects until an evaluation of impacts to other resources is made (Guideline).
- Prohibit use of pesticides that would adversely affect species at risk (Guideline).

GR/CRNG, SNG

- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

GR/CRNG, SNG, TBNG, BGNG, FPNG, ONG

- Objectives call for specified levels of ungrazed habitat and a more diverse grassland vegetation mosaic through desired levels of rest, seral stages and vegetation structure (see tables in Section 5).
- Emphasize late fall mowing instead of prescribed burning at historic or known sites with Argos Skipper (Guideline).
- Rest areas with historic or known populations of sensitive skippers (Guideline).
- Conduct butterfly and skipper surveys (Guideline).

Management Area Direction (Chapter 3)

SNG

- MA 3.66
- Initiate intensive restoration efforts to meet desired conditions that include active and passive methods. Native reseeding projects may be initiated with local seed sources (Guideline).

Monitoring Direction (Chapter 4)

GR/CRNG, SNG, TBNG, BGNG, FPNG, ONG

- Monitor populations and habitat
- Monitor the effectiveness of the stocking rates in Appendix I in meeting desire vegetation composition and grassland structure levels.

Appendices

GR/CRNG, SNG, TBNG, BGNG, FPNG, ONG

- Appendix I provides suggested stocking rates for livestock grazing to provide quality habitat for management indicator species and other wildlife. This appendix is referenced by a standard under geographic area direction (Chapter 2) to use this appendix to help develop and implement range management practices for meeting vegetation objectives.

Biological Determinations, Risk Assessments, and Rationale

GR/CRNG, SNG

Determination is "no impact." The species presence on these areas has not been confirmed and documented. However, management direction is provided for this species and potential habitat on these areas. If the species presence had been confirmed, the determination would have been "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." Under this alternative, adjustments in livestock grazing intensities, introduction of rest pastures (particularly in butterfly areas), use of surveys, and added emphasis on restoring native vegetation, especially forbs, should improve habitat conditions for this species.

TBNG, BGNG, FPNG, ONG

No biological determination is made for this species on these areas because the species is not listed as sensitive in Region 2 of the Forest Service. Also, the species presence on these areas has not been confirmed and documented. However, management direction is provided for this species and potential habitat on these areas.

Flathead Chub (*Platygobio gracilis*)

Species Description

This member of the Cyprinidae family is a large (95-190 mm) silvery minnow, with small eyes and sickle-shaped pectoral fins. The flathead chub spawns during mid or late summer when water temperatures are relatively high. They feed primarily on terrestrial insects and small invertebrates (Lee et al. 1980), but also consume some aquatic vegetation. Flathead chubs provide a forage base for larger piscivorous fish and are commonly used as baitfish by anglers (Lee et al. 1980).

Distribution and Status

The flathead chub is found in large, turbid rivers from the Northwest Territories south through the Great Plains.

Table H-6 summarizes species occurrence and status in the planning area. Much of this information is presented in Tibbs (1998). The species is currently found in the Cheyenne River (Buffalo Gap National Grassland and Thunder Basin National Grassland) and in Little Missouri River (Little Missouri National Grassland) and some of their tributaries. It is also found in the Grand River (Grand River National Grassland). It also occurs in the Bad River (Buffalo Gap National Grassland), Dismal River (Nebraska National Forest), Niobrara River (Samuel R. McKelvie National Forest), Hat Creek (Oglala National Grassland) and Antelope Creek (Thunder Basin National Grassland).

Recent studies have indicated that the range and populations of this species may be declining (Tabor 1993). The flathead chub has declined in abundance in the lower Missouri River, largely as a result of water pollution and changes in water regime due to impoundments (U.S. Fish and Wildlife Service 1995).

Organization Rankings

The flathead chub has been assigned a global rank of G5. It is classified as a sensitive species in Region 2 of the Forest Service.

Habitat

This species inhabits a wide variety of aquatic habitats, but is most abundant in the main channels of turbid, moderate to strong current rivers, with mud, rock, or sand substrates. They can also be found in pools in small clear streams. The flathead chub appears to be tolerant of a wide variety of environmental conditions.

Conservation Planning

A statewide or regional conservation plan has not been prepared for this species. However, Region 3 (Midwest Region) of the U.S. Fish and Wildlife Service has prepared a range-wide status assessment for this species (Tibbs 1998).

Direct and Indirect Effects on NFS Lands

Toxic spills into rivers and streams could threaten local populations.

Small impoundments on federal rangelands may modify hydrological flow patterns, especially during droughts and runoff events, and alter or reduce downstream flow.

Cumulative Effects

Flathead chub are impacted by many other activities in the planning area, with the most serious being changes in natural hydrologic regimes due to impoundments and dewatering (Ostlie et al. 1997, Tibbs 1998, Johnson 1998, Natural Resource Conservation Service 1996). In fact, aquatic resources and habitats in the planning area are some of the most fragmented and altered within North America (Abell 2000). In addition, flathead chubs are often used as baitfish.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD) and eventual on-site development and additional roads, traffic and pipelines.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

LMNG, GR/CRNG, TBNG, BGNG, ONG, NNF (BRD), SRMNF

- Manage land treatments to conserve site moisture and to protect long-term stream, wetland, and riparian area health (Standard).
- Allow only those actions next to perennial and intermittent streams, seeps, springs, lakes, and wetlands that maintain or improve long-term proper functioning of riparian ecosystem conditions (Standard).
- Design activities to protect and manage the riparian ecosystem (Standard).
- Locate activities and facilities away from riparian areas unless alternatives have been assessed and determined to be more environmentally damaging (Guideline).
- Design and construct all stream crossing and other in-stream structures to provide for sufficient passage of flow and sediment, withstand expected flood flows, and allow free movement of aquatic life (Standard).
- When possible, restore intermittent streams to continually flowing perennial streams (Guideline).
- Design and construct facilities to minimize the risk of accidental spills and discharge of petroleum and other materials into waters occupied by sensitive fish species (Standard).
- Do not authorize uses that would deplete instream flows below levels needed to protect sensitive fish habitat (Standard).
- Manage livestock grazing to maintain or improve riparian areas (Guideline).

Geographic Area Direction (Chapter 2)

- None

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

LMNG, GR/CRNG, TBNG, BGNG, ONG, NNF (BRD), SRMNF

- Monitor populations and habitat

Biological Determinations, Risk Assessments, and Rationale

TBNG, BGNG, ONG, NNF (BRD), SRMNF

The biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." The management direction provides adequate protection for this species and its habitat from adverse negative effects resulting from Forest Service authorized activities and allocations. The flathead chub's adaptability to a wide range of environmental conditions also helps support this determination.

Outcome II is the selected risk assessment for this species in these areas. Because of the species current distribution, it's likely that the species would repopulate any unoccupied but suitable habitat in these areas.

LMNG, GR/CRNG

No biological determination is made for this species on these areas because the species is not listed as sensitive in Region 1 of the Forest Service. The conservation measures listed above are expected enhance its habitat and/or protect the species and its habitat from possible adverse effects of Forest Service authorized activities and allocations.

Longnose Sucker (*Catastomus catastomus*)

Species Description

This member of the Catostomidae family ranges from dwarf forms to over 600 mm in length. It is highly variable morphologically across its range (Lee et al. 1980). This species spawns during spring and early summer when water temperatures are relatively cold. Bottom invertebrates make up the bulk of the longnose sucker's diet.

Distribution and Status

The longnose sucker is the most widespread sucker in northern North America (NatureServe 2000). It is found throughout most of Alaska and Canada, south to New England, West Virginia, Maryland, northern Ohio, northern Indiana, Minnesota, Nebraska, eastern Colorado, Idaho, and Washington. It is also found in northeastern Asia (NatureServe 2000).

Table H-6 summarizes species occurrence and status in the planning area. The only NFS lands in the planning area associated with this species are the Little Missouri National Grassland, where the species occurs in the Little Missouri River.

Organization Rankings

The longnose sucker is listed as threatened by South Dakota. Its global conservation rank is G5, meaning "secure". It is not classified as a sensitive species in either Region 1 or 2 of the Forest Service.

Habitat

The longnose sucker is found in cool, spring-fed streams where it feeds on the bottom on algae, crustaceans, snails, and insect larvae. It spawns in lakes or in shallow-flowing streams over gravel.

Conservation Planning

A statewide or regional conservation plan has not been prepared for this species.

Direct and Indirect Effects on NFS Lands

Activities that have the greatest potential to impact this species' habitat are those that contribute to non-point water pollution, such as excessive livestock grazing in riparian areas.

Toxic spills into rivers and streams could also threaten local populations.

Small impoundments on federal rangelands may modify hydrological flow patterns, especially during droughts, and reduce downstream flow.

Cumulative Effects

Aquatic resources and habitats in the planning area are some of the most fragmented and altered within North America (Abell 2000). In addition to the potential impacts of grazing, toxic spills, and small impoundments on non-National Forest System Lands, longnose suckers are impacted by many other activities in the Little Missouri River drainage, with the most serious being changes in natural hydrologic regimes due to spring development, large impoundments and dewatering (Ostlie et al. 1997, Johnson 1998, Natural Resource Conservation Service 1996).

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement. This further results in the need to provide livestock water, often in the form of small impoundments in drainages.

Decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD) and eventual on-site development and additional roads, traffic and pipelines.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

LMNG

- Manage land treatments to conserve site moisture and to protect long-term stream, wetland, and riparian area health (Standard).
- Allow only those actions next to perennial and intermittent streams, seeps, springs, lakes, and wetlands that maintain or improve long-term proper functioning of riparian ecosystem conditions (Standard).

LMNG, cont.

- Design activities to protect and manage the riparian ecosystem (Standard).
- Locate activities and facilities away from riparian areas unless alternatives have been assessed and determined to be more environmentally damaging (Guideline).
- Design and construct all stream crossing and other in-stream structures to provide for sufficient passage of flow and sediment, withstand expected flood flows, and allow free movement of aquatic life (Standard).
- When possible, restore intermittent streams to continually flowing perennial streams (Guideline).
- Manage livestock grazing to maintain or improve riparian areas (Guideline).

Geographic Area Direction (Chapter 2)

- None

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

- None

Biological Determinations, Risk Assessments, and Rationale

LMNG (Little Missouri River and tributaries)

Biological determinations are not made for this species since it is not listed as sensitive by Region 1 of the Forest Service. The conservation measures listed above are expected enhance its habitat and / or protect the species and its habitat from possible adverse effects of Forest Service authorized activities and allocations.

Plains Topminnow (*Fundulus sciadicus*)

Species Description

The plains topminnow is a small fish (38-64 mm) that is olive brown in color, with bronze reflections. It lacks the side bars present on the banded killifish. Breeding males have orange or red colored fins (Ashton and Dowd 1991). Spawning occurs in early summer. Eggs are deposited on submerged aquatic vegetation and algae. Likely food items consist of small aquatic insects and aquatic vegetation (Lee et al. 1980).

Distribution and Status

There are two disjunct population centers for this species. One is centered in Nebraska and the other is mostly limited to Missouri.

Table H-6 summarizes species occurrence and status in the planning area. It is known to occur in the Dismal River (Nebraska National Forest), Niobrara River (Samuel R. McKelvie National Forest), and Cheyenne River (Buffalo Gap and Thunder Basin National Grasslands), and Antelope Creek (Thunder Basin National Grassland).

Specific rangewide population trend data is not available, but it appears that some population loss or range retraction has occurred, especially on the periphery of the northern portion of its range (NatureServe 2000).

Organization Rankings

The plains topminnow is classified as a sensitive by Region 2 of the Forest Service. The global rank of the plains topminnow is G4.

Habitat

The plains topminnow prefers shallow streams with clear water and sand or gravel substrates. This species will also utilize sloughs and backwater habitats. Special habitat requirements include abundant aquatic vegetation.

Conservation Planning

A statewide or regional conservation plan has not been prepared for this species.

Direct and Indirect Effects on NFS Lands

Plains topminnow and its habitat can be negatively affected by excessive grazing in riparian areas.

Other potential threats are toxic spills into rivers, and small impoundments on federal rangelands that modify hydrological flow patterns, especially during droughts, and reduce downstream flow.

Cumulative Effects

Aquatic resources and habitats in the planning area are some of the most fragmented and altered within North America (Abell 2000). In addition to the potential impacts of grazing, toxic spills, and impoundments on non-National Forest System Lands within the relevant watersheds, plains topminnow are impacted by many other activities in Nebraska and eastern Wyoming (i.e. the cumulative effects area for this species). The most serious of these are probably the changes in natural hydrologic regimes due to impoundments and dewatering (Ostlie et al. 1997, Johnson 1998, Natural Resource Conservation Service 1996).

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement. Decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD) and eventual on-site development and additional roads, traffic and pipelines.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

TBNG, BGNG, NNF (BRD), SRMNF

- Manage land treatments to conserve site moisture and to protect long-term stream, wetland, and riparian area health (Standard).
- Allow only those actions next to perennial and intermittent streams, seeps, springs, lakes, and wetlands that maintain or improve long-term proper functioning of riparian ecosystem conditions (Standard).
- Design activities to protect and manage the riparian ecosystem (Standard).
- Locate activities and facilities away from riparian areas unless alternatives have been assessed and determined to be more environmentally damaging (Guideline).
- Design and construct all stream crossing and other in-stream structures to provide for sufficient passage of flow and sediment, withstand expected flood flows, and allow free movement of aquatic life (Standard).
- When possible, restore intermittent streams to continually flowing perennial streams (Guideline).
- Design and construct facilities to minimize the risk of accidental spills and discharge of petroleum and other materials into waters occupied by sensitive fish species (Standard).
- Do not authorize uses that would deplete instream flows below levels needed to protect sensitive fish habitat (Standard).
- Manage livestock grazing to maintain or improve riparian areas (Guideline).

Geographic Area Direction (Chapter 2)

- None

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

TBNG, BGNG, NNF (BRD), SRMNF

- Monitor populations and habitat.

Biological Determinations, Risk Assessments, and Rationale

TBNG, BGNG (Cheyenne River and tributaries)

The biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." The management direction provides adequate protection for this species and its habitat from adverse negative effects resulting from Forest Service authorized activities and allocations.

The risk assessment for this species in the Cheyenne River was difficult. The Cheyenne River, including its upper reaches, is more characteristic of a turbid Great Plains river and was probably never quality clear water habitat for the species. In fact, it's believed that the presence of the species in the upper reaches of the river is the result of introductions (Baxter and Simon 1970). As the result of more controlled grazing, small impoundment construction in uplands,

and Angostura Reservoir in South Dakota, current water clarity probably exceeds historic levels. However, much of the river still provides marginal habitat for the species. Outcomes III or V is selected as the risk assessments for this species in those reaches of the river within or immediately downstream from these national grasslands. These higher risk levels are the result of natural habitat conditions and not management of the national grasslands.

NNF (BRD), SRMNF (Dismal and Niobrara Rivers)

The biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." The management direction provides adequate protection for this species and its habitat from adverse negative effects resulting from Forest Service authorized activities and allocations. In fact, because of the lack of significant runoff in the Nebraska sandhills, it is highly unlikely that any authorized activities or allocations could significantly alter water quality or quantity on site or downstream in these sandhill rivers.

Outcome I or II is selected as the risk assessments for this species in these rivers. Water quantity and quality in the sandhill rivers in these areas have largely been unaltered from human activities. It's also likely that the species could repopulate any unoccupied but suitable habitat in these rivers.

Northern Leopard Frog (*Rana pipiens*)

Species Description

Northern leopard frogs are typically 2-3 ½ inches long, and are either brownish or greenish, with two or three irregular rows of dark round spots with light borders. They breed from March to June. Egg-laying usually occurs over a span of about 10 days at a particular site. Typically, hundreds or even thousands of eggs are deposited into an egg mass. Aquatic larvae metamorphose in summer but may overwinter in that condition in some areas (NatureServe 2000). Metamorphosis occurs between late July and mid-September.

Metamorphosed frogs feed primarily on invertebrates such as insects, though some amphibians and small fish are also taken. Larvae eat algae, plant tissue, organic debris, and small invertebrates (NatureServe 2000).

Distribution and Status

Northern leopard frogs are widespread throughout Canada and the United States, being found from Great Slave Lake and Hudson Bay south to Kentucky and New Mexico (NatureServe 2000).

Table H-6 summarizes species occurrence and status in the planning area. It is known to occur on all units.

Although the northern leopard frog is still widespread and common in many areas, some populations appear to have declined, especially those in the Rocky Mountains of Colorado, Wyoming, and Montana (NatureServe 2000). Reasons for this decline include habitat loss, commercial overexploitation, and competition by bullfrogs.

Organization Rankings

The northern leopard frog is classified as sensitive in Regions 1 and 2 of the Forest Service. It has been assigned a rank of G5 by the International Network of Natural Heritage programs and Conservation Data Centeres. A G5 rank is for taxa that are "secure."

Habitat

Northern leopard frogs are wetland obligates, using a wide variety of aquatic habitats, such as springs, slow streams, marshes, reservoirs, and lakes. It is most often found at sites with permanent water and rooted aquatic vegetation. Aquatic vegetation such as rushes or sedges are important in breeding ponds for egg mass attachment. In summer, adults are often found wandering in wet meadows, where they generally avoid vegetation over 12 inches while foraging. It overwinters underwater.

The number and total acreage of constructed and natural wetlands (seasonal and permanent) on each planning unit are as follows:

Planning Unit	Number of Wetlands	Total Acreage of Wetlands
LMNG	3,899	2,446
SNG	4,858	7,865
GR/CRNG	609	695
FPNG	928	2,995
BGNG	2,991	3,874
ONG	334	564
NNF(PPRD)	13	4
NNF (BRD)	108	181
SRMNF	76	387
TBNG	Not Available	Not Available

The data in the above table for the Samuel R. McKelvie National Forest does not include the large wetlands complexes associated with those portions of Merritt Reservoir located on the national forest. Also, wetlands under forest canopies may have been partially or totally missed during the inventory, so the above data likely underestimate the amount of wetlands, especially on the Nebraska National Forest (Pine Ridge Ranger District). The actual amount of wetlands that is suitable for this species is unknown.

Conservation Planning

Statewide or regional habitat conservation strategies have not been prepared for this species.

Direct and Indirect Effects on NFS Lands

Proposed management is unlikely to have much affect on northern leopard frog populations or their habitats. Potential impacts include creation of new wetlands such as stock ponds. The most likely impact however, is potential changes in wetland emergent vegetation due to livestock grazing, although livestock rarely forage on flooded emergents. Any management that resulted in lowered water tables and the loss or degradation of wetland habitat would also impact this species.

Cumulative Effects

Northern leopard frogs are affected by additional management activities within the administrative boundaries of the planning units (i.e. the cumulative effects area). These include use of the frog for commercial purposes, wetland drainage and filling, and water pollution (Ostlie et al. 1997, Johnson 1998, Corn and Peterson 1996, Pederson et al. 1989, Davis 2000, Natural Resource Conservation Service 1996).

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

All Planning Units

- Manage land treatments to conserve site moisture and to protect long-term stream, wetland, and riparian health from damage by increased runoff (Standard).
- Allow only those actions next to perennial and intermittent streams, seeps, springs, lakes, and wetlands that maintain or improve long-term proper functioning of riparian ecosystem conditions (Standard).
- Design activities to protect and manage the riparian ecosystem. Maintain the integrity of the ecosystem, including quantity and quality of surface and ground water (Standard).
- Maintain and protect the hydrologic regime that supplies ground water to the wetlands so as to support species and habitats dependent on the existing water table and its natural variations (Standard).
- To provide protection for riparian areas, locate activities and facilities away from the water's edge or outside the riparian areas, woody draws, wetlands, and floodplains unless alternatives have been assessed and determined to be more environmentally damaging (Guideline).
- Do not deposit waste material below high water lines, in riparian areas, in areas immediately adjacent to riparian areas, or in natural drainage-ways (Guideline).
- Maintain long-term ground cover, soil structure, water budgets, and flow patterns of wetlands to sustain their ecological function and meet regulations found in Section 404(b)(1) of the Clean Water Act (Standard).
- Design and implement livestock grazing strategies to provide well-developed emergent vegetation through the growing season on 30-50% of the wetlands distributed across watersheds and landscapes (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

SNG

- Prohibit additional draining of the Sheyenne National Grassland (Standard).

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

All Planning Units

- Monitor populations and habitat.
- Monitor restoration of waterbodies that have been degraded by Forest Service permitted or management actions.

LMNG, GR/CRNG, SNG

- Monitor the extent that surface water, sub-surface flows, and aquifers have been protected from contamination by management actions.

Biological Determinations, Risk Assessments, and Rationale

All Planning Units

Management activities will have minimal potential to affect northern leopard frogs because of the riparian and wetland management direction and the fact that no wetland drainage or filling is expected. Based on these considerations, the biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

Outcome I is selected as the risk assessment for this species. Adverse impacts from activities authorized by the Forest Service are not expected. In fact, the construction of large numbers of small impoundments on the national grasslands has created a considerable amount of new habitat for this species.

Blanding's Turtle (*Emydoidea blandingii*)

Species Description

The Blanding's turtle is a medium (5-10") sized turtle with a yellow chin and throat, and long neck. Its smooth carapace is brown or gray with profuse light spots, while its plastron is yellowish with black blotches. A well-developed hinge lies between the pectoral and abdominal scutes.

This turtle is mostly aquatic, but can be found wandering on land searching for mates, nesting sites, or new habitat (Rowe and Moll 1991). In addition, turtles have been observed to "estivate" on land for several hours to several days to avoid cool water temperatures (Ross and Anderson 1990, Rowe and Moll 1991)

Eggs are laid in sandy soil in upland areas, usually in warm sunny sites. Like other freshwater and terrestrial turtles, Blanding's turtle often chooses disturbed sites. The breeding cycle for this species begins with courtship and copulation in March-May. Nesting occurs mid-June to mid-July in Nebraska. In Nebraska, clutch size averages about 15 eggs. Incubation length varies with the ambient temperature.

Blanding's turtles are omnivorous (Graham and Doyle 1977), feeding on crayfish, insects, and vegetable matter, as well as fish, eggs, and frogs (Lagler 1943, Bleakney 1963). Unlike most aquatic turtles, Blanding's turtles will eat food both in the water and out of the water.

Distribution and Status

The Blanding's turtle's range is centered in the Great Lakes region, forming a broad band from Nebraska northeast through the Midwest to Nova Scotia. In this relatively wide area, the species distribution is spotty, with some widely disjunct populations. Within the planning area, Blanding's turtle is known to occur along the Snake River in the vicinity of the Samuel R. McKelvie National Forest.

The Blanding's turtle is believed to be declining in many areas, but its current status is poorly documented. Habitat loss and high levels of predation on eggs are the most likely causes of its decline.

Organization Rankings

The Blanding's turtle is endangered in South Dakota and has a global conservation rank of G4. It is not classified as a sensitive species in Regions 1 and 2 of the Forest Service.

Habitat

Blanding's turtle inhabits aquatic habitats with soft bottoms and aquatic vegetation, including riverine (low gradient pools), lacustrine (shallow water), and palustrine (forested wetlands, herbaceous wetland, riparian, and scrub-shrub wetland) systems.

Specific habitats include marshes, ponds, swamps, lake shallows, backwater sloughs, shallow slow-moving rivers, protected coves, and inlets of large lakes, oxbows, and pools adjacent to rivers (Kofron and Schreiber 1985, Nyboer 1992, Ernst et al. 1994). Prairie marsh or wet prairie, especially associated with sandy soils, is the preferred habitat in the western part of the range (Kofron and Schreiber 1985, Nyboer 1992).

Hibernation most often occurs within organic substrate of ponds and creeks, although turtles have been reported overwintering beneath leaves several feet from the water (Conant 1951).

Conservation Planning

Canada has developed a recovery plan for Blanding's turtle.

Direct and Indirect Effects on NFS Lands

Livestock grazing, prescribed burning, and mowing may have minor impacts on Blanding's turtle by influencing water quality and aquatic vegetation.

Mortality can result from traffic on roadways.

Cumulative Effects

Most Blanding's turtle habitat occurs on private land within the planning area, but little is known of the species' status. Impacts to Blanding's turtle habitat on areas other than the planning units in Nebraska include: cultivation to the edge of sloughs and ponds, inundation or drainage of wetland habitat for agriculture, river channelization, and water impoundments (Ostlie et al. 1997, Johnson 1998, Pederson et al. 1989, Davis 2000, Natural Resource Conservation Service 1996). Lowering water levels to remove undesired fish such as carp has also been harmful to Blanding's turtle, as has development of upland nesting sites and habitat fragmentation. The decline of habitat on private lands can be expected to continue as agricultural uses intensify.

Road mortality has also been suggested as a threat. The turtles' habit of wandering long distances to nest may be a limiting factor in their adaptation to humans. Like other chelonians, Blanding's turtles are easily trapped and susceptible to collection for the pet trade. Collectors may earn $45 for a 6-8 inch (15-20 cm) turtle.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a grazing agreement.

Conservation Measures and Mitigation

Within the planning area, we know almost nothing about the Blanding's turtle. If the species is at risk and actually declining in the waters on and near the Nebraska and Samuel R. McKelvie National Forest, the first step should be a detailed inventory of aquatic areas in these areas followed by a monitoring program.

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

NNF (BRD), SRMNF

- Manage land treatments to conserve site moisture and to protect long-term stream, wetland, and riparian area health (Standard).
- Allow only those actions next to perennial and intermittent streams, seeps, springs, lakes, and wetlands that maintain or improve long-term proper functioning of riparian ecosystem conditions (Standard).
- Design activities to protect and manage the riparian ecosystem (Standard).
- Locate activities and facilities away from riparian areas unless alternatives have been assessed and determined to be more environmentally damaging (Guideline).
- Design and construct all stream crossing and other in-stream structures to provide for sufficient passage of flow and sediment, withstand expected flood flows, and allow free movement of aquatic life (Standard).

- When possible, restore intermittent streams to continually flowing perennial streams (Guideline).
- Manage livestock grazing to maintain or improve riparian areas (Guideline).

Geographic Area Direction (Chapter 2)

- None

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

NNF (BRD), SRMNF

- Monitor restoration of waterbodies that have been degraded by Forest Service permitted or management actions?

Biological Determinations, Risk Assessments, and Rationale

SRMNF (Snake River)

Biological determinations are not made for this species on this area since it is not listed as sensitive by Region 2 of the Forest Service. The conservation measures listed above are expected enhance its habitat and/or protect the species and its habitat from possible adverse effects of Forest Service authorized activities and allocations.

NNF (BRD) (Middle Loup and Dismal Rivers)

No biological determination is made for this species on this area because the species is not listed as sensitive in Region 2 of the Forest Service. Also, the species presence on this area has not been confirmed and documented. However, management direction is provided for this species and potential habitat on this area.

American Bittern (*Botaurus lentiginosus*)

Species Description

The American bittern is a stocky wading bird with a straight pointed bill, relatively short neck and legs, and somewhat pointed wings. It is brownish overall, with a dull yellow bill and greenish yellow legs and feet.

The American bittern is a non-colonial nester. The nest is placed on a mound of reeds, sedges or cattails, rising 3-8 inches above the water. Most often the nest site is in shallow (2-8 inches) water, but it is occasionally placed on dry ground in dense, tall (>12") grasslands (Gibbs et al. 1992). Nests are usually accessed by two, well-beaten pathways (Gabrielson 1914).

Egg-laying begins in late April or early May, and continues until mid-June. In the north-central U.S., nests may contain eggs from about early May to early July (Brewer et al. 1991). Clutch size usually ranges from three to five (Duebbert and Lokemoen 1977). Incubation lasts about 24-28 days (Burns 1915, Vesall 1940), and chicks remain at or near the nest for two weeks (Gabrielson 1914, Vesall 1940, Terres 1980).

The American bittern eats mainly fishes, crayfishes, amphibians, mice and shrews, insects, and other animals. It feeds its young by regurgitation. It is a solitary feeder that relies more on stealth than pursuit to capture prey. Its coloration, particularly its ventral stripes, provides camouflage in dense, vertical marsh vegetation, and complements its inactive feeding repertoire (Kushlan 1978). Crypsis is thought to function mostly to reduce visibility to prey and competitors rather than to predators (Kushlan 1978).

Distribution and Status

American bitterns nest throughout most of southern Canada and the northern United States. They winter along much of the United States' southern coastline and into Mexico

In the planning area, American bittern are known or may possibly occur on all planning units, with the exception of the Pine Ridge area of the Nebraska National Forest and the Thunder Basin National Grassland. Due to a scarcity of habitat, nesting is likely very limited, with the species only being common on the Sheyenne National Grassland (D. Svingen prof. opin.).

This species is typically present on the breeding grounds from mid-April to late August, with exceptionally late birds being present into early December (Bent 1963, Johnsgard 1980, Gibbs et al. 1992).

Across its broad range, bittern populations are declining due to habitat destruction. Breeding Bird Survey (BBS) data (1966-1987) indicate a decline in the north-central United States (Brewer et al. 1991) and possibly in New England (USFWS 1987). BBS data suggest a 2.4% annual decline in U.S. populations between 1966 and 1989.

Organization Rankings

Region 2 of the Forest Service classifies the American bittern as a sensitive species. The International Network of Natural Heritage programs and Conservation Data Centeres has assigned the American bittern a rank of G4, meaning "apparently secure." The national ranking for the United States (N4), is similar. The American bittern was listed as a "nongame species of management concern" by the USDI Fish and Wildlife Service in 1987 (cited in Gibbs et al. 1992).

Habitat

General

American bitterns are closely associated with wetlands and adjacent grasslands. In summer, bitterns use temporary, seasonal, semi-permanent, and permanent wetlands, as well as fens. In South Dakota, American bitterns most often were located in semi-permanent wetlands with open water in the center, a band of emergent vegetation around the periphery, and idle grassland in the adjacent uplands (Weber et al. 1982). Another study in South Dakota found that the occurrence of American bitterns within semi-permanent wetlands was related positively to the percentage of the wetland area that was vegetated (Naugle 1997 in DeChant et al. 1999). In North Dakota, American bittern density was highest in fen wetlands, followed by temporary and semi-permanent wetlands, seasonal wetlands, and permanent wetlands (Kantrud and Stewart 1984). In the Prairie Pothole region of North Dakota and South Dakota, American bitterns preferred seasonal and semi-permanent wetlands and avoided alkali wetlands, as well as other wetlands dominated by open water (Johnson et al. cited in Dechant et al. 1999). Bitterns tended to be more common in wetlands that were not isolated from other wetlands (ibid).

Nesting

American bitterns nest in uplands adjacent to wetlands or in the wetlands themselves. Most upland nests are in ungrazed grasslands, such as idle pasture, retired cropland, or uncut hayland (Dechant et al. 1999, NatureServe 2000). In Manitoba, Montana, North Dakota, and South Dakota, American bitterns nested in mid to tall (12-39 inch; 30-99 cm), dense, idle grasslands where the average maximum height of the leaf canopy (effective vegetation height) was >24 inches (60 cm), 100% vertical visual obstruction was usually >20 inches (50 cm), and litter cover was >50% (Kantrud and Higgins 1992). They avoided nesting in areas where vegetation height or 100% vertical visual obstruction values were less than about 12 inches (30 cm) or where the total cover contained >10% dead vegetation. Dominant plant species around nests were smooth brome, wheatgrass, alfalfa, and big bluestem (Duebbert and Lokemoen 1977, Kantrud and Higgins 1992). Nests were partially or completely concealed by vegetation on the side, but partially or completely exposed on top. No nests were found in cover <12 inches (30 cm) tall (Duebbert and Lokemoen 1977). Average vertical visual obstruction values of vegetation ranged from 17 to 39 inches (44 to 99 cm) around nests in North Dakota and Minnesota (Svedarsky 1992). Nests were located in tall (>24 inch (60 cm)) vegetation (Svedarsky 1992).

A study comparing idle grasslands to areas under various grazing systems found that American bitterns nested only in idle mixed-grass and were absent from the following (Messmer 1985):

- Short-duration (a system of pastures rotated through a grazing schedule of about 1 week grazed and 1 month ungrazed, repeated throughout the season)
- Twice-over (grazing a number of pastures twice per season, with about a 2-month rest in between grazing)
- Season-long (leaving cattle on the same pasture all season) grazing systems

One nest was found in a pasture under the short-duration system, but it had been initiated before cattle began grazing the area

Within wetlands and wet meadows, American bitterns nest in rush, sedge, bulrush, prairie cordgrass, sprangletop, tall mannagrass, common reed, reed canary grass, bur-reed, or cattail (Dechant et al. 1999, NatureServe 2000).

Area

American bitterns prefer relatively large ($\geq$7 acres; 3 ha) wetlands (Brown and Dinsmore 1986). Weber (1978) found that the occurrence of American bitterns in South Dakota wetlands was related to the area of adjacent idle grassland. The number of natural and constructed wetlands (riverine, lacustrine, and palustrine) and their total acreage on each of the planning units as determined by the National Wetlands Inventory are as follows:

Table H-7. Natural and Constructed Wetlands on the Planning Units.

Planning Unit	Number of Wetlands	Total Acreage of Wetlands	Greater than 7 Acres	
			Number	Acres
LMNG	3,899	2,446	20	262
SNG	4,858	7,865	144	2,490
GR/CRNG	609	695	10	207
FPNG	928	2,995	87	1,779
BGNG	2,991	3,874	73	1137
ONG	334	564	13	238
NNF(PPRD)	13	4	0	0
NNF (BRD)	108	181	8	73
SRMNF	76	387	5	335
TBNG	Not Available	Not Available	Not Available	

The data in the above table for the Samuel R. McKelvie National Forest does not include the large wetlands complexes associated with those portions of Merritt Reservoir located on the national forest. Also, wetlands under forest canopies may have been partially or totally missed during the inventory, so the above data likely underestimate the amount of wetlands, especially on the Nebraska National Forest (Pine Ridge Ranger District). The amount of wetlands habitat greater than 7 acres in size and adjoining grasslands that are currently suitable for bittern nesting is unknown.

Conservation Planning

There is no conservation plan for the American bittern. However, many federal and state waterfowl management efforts recognize the need to provide appropriate upland and wetland habitat for various associated species. Such efforts undoubtedly benefit American bitterns.

Direct and Indirect Effects on NFS Lands

Livestock grazing, burning, and mowing that reduces or eliminates grassland cover and emergent vegetation can reduce habitat suitability for American bitterns (Duebbert and Lokemoen 1977, Messmer 1985).

The design and construction of new water impoundments that provide extensive and well-developed emergent zones can create new habitat for bitterns, especially if suitable grassland cover adjoins the new wetlands.

Cumulative Effects

American bittern are most threatened by wetland loss and degradation due to drainage, filling, conversion, siltation and pollution. Wetland and upland conversion to agriculture has been substantial in the planning area (Ostlie et al. 1997, Johnson 1998, USDA Forest Service 2000, Chuluun et al. 1997, Abell et al. 2000, Pederson et al. 1989, Davis 2000, Natural Resource Conservation Service 1996). In addition, wetland and adjacent upland areas on private and public lands are frequently heavily grazed reducing appropriate vegetative cover for the American bittern. Conversely, private lands enrolled under the Conservation Reserve Program (CRP) may provide alternative nesting locations.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement. These agreements are long term and collectively cover virtually all land suitable for grazing, including those areas near wetlands used by American bitterns. Consequently, there are few ungrazed wetlands and nearby uplands left idle. The extensive number of grazing permits affects management ability to idle selected wetlands and other areas.

Conservation Measures and Mitigation

Keys to management include protecting wetlands and adjacent uplands and maintaining idle upland habitat. The U.S. Geological Survey has developed several management recommendations (Dechant et al. 1999) for the American bittern. Those most relevant to the type of management proposed in this document are:

- Protect wetlands from siltation, eutrophication, chemical contamination, and other forms of pollution (Gibbs et al. 1992).
- Maintain water levels at < 24 inches, April-August (Hands et al. 1989 in DeChant et al 1999). Avoid complete draw-downs before mid-August. Use slow draw-downs to mimic natural wetland succession.
- If stock ponds are a part of a management plan, manage for growth of emergent vegetation (Weber 1978).
- Maintain a wide vegetative margin around wetlands to protect breeding habitat and to deter nest predators (Daub 1993 in DeChant et al. 1999).
- To maintain tall, dense, upland vegetation, disturbance (e.g., mowing, burning, and grazing) should not occur more often than every 2-5 year (Duebbert and Lokemoen 1977).

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

LMNG, GR/CRNG, SNG, BGNG, FPNG, ONG, NNF (BRD), SRMNF

- Manage land treatments to conserve site moisture and to protect long-term stream, wetland, and riparian area health from damage by increased runoff (Standard).
- Allow only those actions next to perennial and intermittent streams, seeps, springs, lakes, and wetlands that maintain or improve long-term proper functioning of riparian ecosystem conditions (Standard).
- Design activities to protect and manage the riparian ecosystem (Standard).
- Maintain and protect the hydrologic regime that supplies ground water to wetlands (Standard).
- Do not deposit waste material below high water lines or in riparian areas (Guideline).
- Maintain long-term ground cover, soil structure, water budgets, and flow patterns of wetlands (Standard).

LMNG, GR/CRNG, SNG, BGNG, FPNG, ONG, NNF (BRD), SRMNF, cont.

- Manage for high structure habitat in upland areas in proximity to wetlands with well-developed emergent vegetation (Guideline).
- Design and implement livestock grazing strategies to provide well-developed emergent vegetation through the growing season on 30 to 50% of wetlands (Guideline).

BGNG, FPNG, ONG, NNF (BRD), SRMNF

- Design new water impoundments to provide wetlands habitat (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

LMNG, GR/CRNG, SNG, BGNG, FPNG, ONG, NNF (BRD), SRMNF

- Objectives call for specified levels of ungrazed habitat and a more diverse grassland vegetation mosaic through desired levels of rest, seral stages and vegetation structure (see tables in Section 5).

Management Area Direction (Chapter 3)

BGNG

- Kadoka Lake and Weta Pond were allocated (1,160 acres) to MA 3.64, and this allocation will help ensure that management activities in and around these larger wetlands will provide suitable nesting and brooding conditions for waterfowl, bitterns and other wildlife.
- Limestone Butte Reservoir was allocated (206 acres) to MA 3.64, and this allocation will help ensure that management activities in and around this large wetland will provide suitable nesting and brooding conditions for waterfowl, bitterns and other wildlife.

SRMNF

- Allocation of the Lord Lakes complex (611 acres) to MA 3.64 will help ensure that management activities in and around this large wetland and grassland complex will provide suitable nesting and brooding conditions for waterfowl, bitterns and other wildlife.

Monitoring Direction (Chapter 4)

- Monitor populations and habitat
- Monitor the effectiveness of the suggested stocking rates in Appendix I in meeting desired vegetation composition and grassland structure levels.

Appendices

LMNG, GR/CRNG, SNG, BGNG, FPNG, ONG, NNF (BRD), SRMNF

- Appendix I provides suggested stocking rates for livestock grazing to provide quality habitat for management indicator species and other wildlife. This appendix is referenced by a standard under geographic area direction (Chapter 2) to use this appendix to help develop and implement range management practices for meeting vegetation objectives.

Biological Determinations, Risk Assessments, and Rationale

LMNG, GR/CRNG, SNG

Biological determinations are not made for this species on these areas since it is not listed as sensitive by Region 1 of the Forest Service. The conservation measures listed above are expected enhance its habitat and/or protect the species and its habitat from possible adverse effects of Forest Service authorized activities and allocations.

NNF (BRD)

Determination is “no impact.” The species presence on these areas has not been confirmed and documented. However, management direction is provided for this species and potential habitat on these areas. If the species presence had been confirmed, the determination would have been "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

BGNG, FPNG, ONG, SRMNF

The biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." Several of the larger wetlands on these areas are allocated to MA 3.64 that prioritizes management of these areas for wetlands values. Objectives are also established to establish more structurally diverse grasslands, including increasing levels of high structure grasslands. Management direction also addresses the need to maintain emergent vegetation and grassland nesting cover near major wetlands. The risk assessment for this species was difficult because the number of bittern expected to be using habitats on or near these planning units is expected to be naturally very low. Outcome I or II is selected as the risk assessments for this species on these areas. It needs to be acknowledged that these planning units only provide minimal amounts of potential habitat for this species and this, plus the fact that American bitterns are dispersed solitary nesters, suggests that habitat enhancement activities on these lands will likely have minimal impact on American bittern populations in the planning area.

Greater Prairie Chicken (*Tympanuchus cupido pinnatus*)

Several key references were consulted and reviewed during this evaluation. Those references included Prose (1985), Bjugstad (1987), Schroeder and Robb (1993), Kobriger (1964), Bergerud and Gratson (1988), Svedarsky and Van Amburg (1996) and Svedarsky et al. (1999).

Species Description

The greater prairie chicken is brownish in overall color, with an intricate patterning of light and dark barring and spotting. It is approximately 17 inches in size.

Three greater prairie chicken subspecies are recognized. The heath hen (*T. c. cupido*) is now extinct. The Attwater’s prairie chicken (*T .c. attwateri*) is almost extinct (National Geographic 1987). This account pertains to the subspecies found in the planning area, *T.c. pinnatus.* Another close relative, the lesser prairie chicken (*T. pallidicinctus*) is currently a candidate species for protection under ESA.

Like sharp-tailed and sage grouse, greater prairie chickens establish spring display grounds for courtship and breeding. The location of some display grounds become traditional and is used annually. Shifts in annual locations of individual display grounds also occur in response to changing cover conditions and other factors. The number of display grounds varies with annual fluctuations in prairie chicken populations.

The greater prairie chicken nests on the ground in tall and dense grass. A typical clutch size ranges from 12 to 14 eggs. After an incubation period of 23-28 days, the eggs hatch and the young leave the nest with the hen, becoming independent at about 6-8 weeks of age (Baicich and Harrison 1997).

The primary diet of greater prairie chicken is forb and grass seeds supplemented occasionally with woody fruits and buds and insects. During winter, they increasingly rely on agricultural grains. However, on the Nebraska National Forest in the Nebraska sandhills, they seem to rely almost exclusively on native foods throughout the year. Young broods rely strongly on a diet of insects and succulent greens.

Distribution and Status

Distribution

Greater prairie chickens range from eastern North Dakota, northwestern and central Minnesota, northern Wisconsin, and northern Michigan, south to northeastern Colorado, Kansas, southern and northeastern Oklahoma, central Missouri, and southern Illinois. The Attwater's subspecies is found in southeastern Texas (DeGraaf et al. 1991).

The greater prairie chicken originally was found in 16 states, but has now been extirpated in seven of these. In the remaining states, the population trend in the last 25 years has been downward (Schroeder and Robb 1993). Conversely, the greater prairie chicken expanded into Alberta, Colorado, Manitoba, North Dakota, Ontario, and Saskatchewan. Most of this expansion was in the late 19th and early 20th centuries, following the demise of the great bison herds and the initial plowing of the drier prairies. This range expansion likely occurred as a result of the increase in mid and tall grass species due to the reduced bison grazing intensity and the availability of high-energy winter foods in the form of cultivated crops (Schroeder and Robb 1993). Greater prairie chickens are no longer present in Alberta, Manitoba, Ontario, and Saskatchewan.

Status

There is over 100,000 acres of habitat for greater prairie chicken on the private and federal lands within the Sheyenne National Grassland of which approximately 50,000 is on federal land. Recent surveys have indicated approximately 20 active prairie chicken and mixed display grounds in this area, most of which are on federal land. Annual counts of the number of males on display grounds have been conducted most years since 1961 (Kobriger et al. 1987). The number of males counted has fluctuated from a high of 410 (1980) to a low of 69 (1997). Some of this variation is undoubtedly the result of varying survey methods and intensities. Recent male counts are below the last 10 and 20-year averages of 173 and 215, respectively (B. Stotts, official file correspondence). Based on the 1997 and 1998 display ground counts, prairie chickens currently make up approximately 34% of the prairie grouse population on the Sheyenne National Grassland.

Approximately 114,000 acres of the Fort Pierre National Grassland is considered greater prairie chicken habitat. Recent surveys indicate there's approximately 90 active prairie chicken and mixed prairie chicken / sharp-tailed grouse display grounds on or near the National Grassland. The number of males counted on display grounds in a 10% block sample of this unit over the last ten years has varied from 12 (1989) to the most recent inventory of 303 (2000). Extrapolating the average number of males per display ground (7.6 per prairie chicken display ground and 3.8 per mixed display ground) to the estimated number of active display grounds on the National Grassland results in a current estimate of approximately 600 males for the entire unit. Assuming a 50:50 sex ratio, the estimated pre-breeding prairie chicken population for the Fort Pierre National Grassland and some of the adjoining private lands is approximately 1200 birds. This is undoubtedly an underestimate for the National Grassland and all the intermingled private lands since some prairie chicken display grounds on private lands were probably missed during surveys. Like elsewhere, annual fluctuations in prairie chicken populations are to be expected and can be considerable, especially during drought. Long-term population trend and the magnitude of annual fluctuation are more meaningful analyses. Enhanced nesting, brooding, and roosting cover can reduce the magnitude of annual population fluctuations during droughts. Based on the 1999 and 2000 display ground counts, prairie chicken currently make up approximately 77% of the prairie grouse population on the National Grassland and have substantially increased over the last decade. This percentage has varied from 28 to 82% since monitoring began in the late 1980s.

There are approximately 4,000 acres of primary habitat for prairie chicken in the larger valleys of the Nebraska National Forest (Bessey Ranger District). The adjoining hills provide additional habitat. All potential habitat is not currently occupied by prairie chickens. Recent surveys identified 9 active display grounds but additional grounds were likely missed. Reliable and repeated counts of males on display grounds have not been made. No estimates of total population of prairie chickens can be made since display ground surveys have been incomplete. Based on the 1998 and 1999 harvests, prairie chickens currently make up approximately 18 to 23%of the prairie grouse population on the National Forest (Len McDaniel, official file correspondence). This percentage has varied from 0 to 36% since monitoring began in 1980.

There are approximately 31,000 acres of primary habitat in the larger valleys for prairie chicken on the Samuel R. McKelvie National Forest, and the adjoining hills provide additional habitat. This habitat is essentially unoccupied by prairie chicken. Recent surveys identified 2 active display grounds but they were present for only 1 year and were not observed subsequently. It's possible that one or more display grounds on the National Forest were probably missed. Since harvests were first monitored beginning in 1979, prairie chickens have made up 3% or less of the annual prairie grouse population on the National Forest (Len McDaniel, official file correspondence).

Although prairie chickens can make considerable seasonal movements, they are considered non-migratory in the planning area.

Table H-6 summarizes species occurrence and status in the planning area. Greater prairie chicken populations are found on the Sheyenne and Fort Pierre National Grasslands and the Nebraska and Samuel R. McKelvie National Forests.

Organization Rankings

The greater prairie chicken is classified as a sensitive species in Regions 1 and 2 of the Forest Service. The Partners in Flight program identifies the greater prairie chicken as a "high priority" in North Dakota, South Dakota, and Nebraska. It is ranked as a G4 species.

Habitat

General

Greater prairie chickens are grassland specialists, and are largely restricted to tallgrass, sandhills, and mixed grass prairies. Optimal habitat in its northern range is interspersed with moderate amounts of small-grain cropland.

Breeding

Display grounds are typically slightly elevated open areas of short grass.

Nesting

Greater prairie chickens in the planning area usually select the tallest and densest mid and tall grass cover available for nesting. Quality nesting cover is generally found in areas that are annually grazed by livestock at light grazing intensities or in areas that have received one or more years of rest (i.e. undisturbed habitat). Cover can become too tall and dense in the more productive prairies east of the planning area, but this is seldom a problem on most sites in the grasslands within the planning area. Greater prairie chicken productivity is maximized where quality nesting cover is provided over large areas, rather than as small islands or patches within a moderate or heavily grazed landscape. Nest densities and overall prairie chicken production in the planning area decrease as the nesting cover is reduced in height, density, and patch size. Most nest sites are selected and egg-laying initiated before significant spring plant growth, so residual cover from previous growing seasons is critical, especially during drought periods. There is also some evidence of nest-site fidelity by nesting hens. Providing traditional nesting areas, while recognizing the need for periodic but infrequent disturbance, is probably beneficial in enhancing prairie chicken production. Hens selecting nest sites also preferred pastures without livestock present. Although mid to tall, warm-season grass species are more rigid and better withstand snowpack, plant species composition of herbaceous nesting cover on the public rangelands in the planning area does not seem overly important. The exception to this generalization is where shortgrass species like blue grama dominate a potential mid or tall grass site because of extended heavy livestock grazing. In these cases, cover is usually insufficient to attract, conceal, or shelter a nesting hen.

Providing quality nesting cover on uplands rather than in lowlands subject to frequent flooding is also important. On the Sheyenne National Grassland, important nesting habitat occurs in the hummocky sandhills habitat association on mid and upland sites and on upland sites in the deltaic plain habitat association (Manske and Barker 1987). On the mid-grass prairies of the Fort Pierre National Grassland, nesting occurred primarily on rolling and flat uplands and seldom along lowland drainages (Rice and Carter 1984). However, unlike sharp-tailed grouse that frequently nest in the steeper hills, greater prairie chickens in the Nebraska sandhills nest primarily in the more productive valleys and meadows, including areas approaching a wetlands classification (Len McDaniel, personal communication, Kobriger 1964).

Other

Broods need some disturbed habitats (grazed, mowed, or burned) reasonably close to the nesting habitat. Broods seem to prefer areas disturbed in previous years and not during the current year. Quality brood habitat provides a mosaic of structural stages from tall and dense vegetation patches for shelter and protection to more open vegetation for ease of mobility and foraging on insects and succulent greens.

Prairie chickens roost on the ground in the night. Preferred vegetation structure at night roosts is mid and tall vegetation with an average visual obstruction reading greater than 8 inches (2.0 dm). Like sharp-tailed grouse, greater prairie chicken will use snow burrows for roosting when snow depths are adequate.

Most northern plains grasslands typically provide marginal high-energy winter foods for prairie chickens. Winter grains on private croplands including corn, sorghum and sunflower, are important winter staples, especially during periods of deep snow. However, in the Nebraska sandhills, winter grains are less critical, and it appears that some prairie chicken populations generally find sufficient high-energy foods such as rose hips in the native grasslands.

Conservation Planning

Apparently secure prairie chicken populations exist across much of the Nebraska sandhills including the Nebraska National Forest (Bessey Ranger District). Long-term trends in South Dakota populations are downward, but the prairie chicken population on the Fort Pierre National Grassland seems reasonably secure although the effects of future extended droughts on this population need to be closely monitored. Additional conservation planning to ensure viability appears to be currently unnecessary for these units.

Prairie chickens are essentially absent from the Samuel R. McKelvie National Forest even though there's potential habitat on the unit. There's also nearby huntable populations. A comprehensive conservation strategy to promote viable populations on this large public area has not been developed.

The species is protected yearlong in North Dakota, and a literature review and background study that addresses prairie chicken on the Sheyenne National Grassland has been recently prepared Svedarsky and Van Amburg (1999). This study includes a set of prairie chicken management recommendations, and efforts to develop a comprehensive conservation strategy by the Forest Service, North Dakota Game and Fish Department, and others to implement the recommendations are continuing. Another recent publication (Svedarsky et al. 1999) also sets out a strategy for conserving this species across its current range.

Direct and Indirect Effects on NFS Lands

Greater prairie chickens on NFS lands are most likely to be affected by vegetative management activities (livestock grazing, prescribed burning, and mowing).

Grazing

Livestock grazing during droughts can further reduce the quality and quantity of nesting, brooding and roosting cover thereby exasperating the negative effects of drought on prairie chicken habitat and populations. Annual livestock grazing at moderate and high grazing intensities can reduce and eliminate quality nesting cover. It can also encourage changes in plant species composition that reduce the ability of range sites to produce quality nesting cover, even in the absence of annual livestock grazing. Annual livestock grazing in planned grazing systems at light grazing intensities or of short duration can improve and maintain quality nesting and brooding habitat. Livestock grazing systems that combine periodic annual rest (undisturbed habitat) between periods of light to moderate grazing intensities can also improve the quality of nesting and brooding habitat. Livestock grazing can also influence predator populations, hunting efficiency of predators and ultimately prairie chicken survival and nest success.

Prairie dog foraging and clipping activity could reduce habitat suitability for prairie chicken nesting, brooding, and roosting.

Burning/Mowing

Prescribed burning and mowing can influence suitability of nesting and brooding habitat either favorably or negatively, depending on timing, location, and extent. Burning can help control development of undesirable woody vegetation in or near brooding, nesting, and roosting habitat.

Other

Continued spread of leafy spurge on the Sheyenne National Grassland will further deteriorate prairie chicken habitat, by both displacing native vegetation and increasing competition between prairie chickens and permitted livestock for a decreasing base of grassland vegetation. On the other hand, use of herbicides to reduce and control leafy spurge can reduce important forbs and other plants used by prairie chicken.

Human disturbance can cause disruption of breeding or abandonment of display grounds (Joslin and Youmans 1999, Westemeier and Gough 1999).

Since grasshoppers and other insects are important foods for prairie chickens and their broods, its possible that grasshopper spraying on rangelands could negatively impact prairie chicken populations.

Gallinaceous birds are vulnerable to grain-based rodenticides. Prairie chickens could be poisoned by rodenticides being used to reduce or eliminate prairie dog populations.

Cumulative Effects

The same impacts listed above under Direct and Indirect Effects are probably occurring or have the same or greater likelihood of occurring on private and state lands in the planning area. In addition, loss of native grasslands to cultivation continues on private lands (Ostlie et al. 1997, USDA Forest Service 2000, Chuluun et al. 1997). The continued loss of native grasslands on private land has been substantial in the vicinity of the Sheyenne National Grassland, and much of the new cropland is being allocated to potato production that provides no value to prairie chickens. Coyote reductions on the Sheyenne National Grassland to reduce losses to permitted

livestock and livestock on adjoining private lands can indirectly result in increases in red fox, a more serious threat to prairie chicken (Svedarsky and Van Amburg 1999).

Most meadows on private sandhill ranches are mowed annually for hay production and the stubble is then sometimes grazed by livestock. Although this may be beneficial for greater prairie chicken broods, it can reduce the amount of quality nesting habitat below critical levels if other quality nesting cover is not available in adjoining areas.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

Westemeier and Gough (1999) recommended the following:

- Conduct annual monitoring of display grounds.
- Strive for minimum viable populations with >100 males, but preferably >250 booming males.
- A grassland:cropland interspersion ratio of 75:25 on the landscape is generally ideal.
- Maintain grasslands, particularly with the use of prescribed burning, light-to moderate intensity rotation grazing, and / or high mowing.
- At least 30% of the habitat within 1-2 miles of key booming rounds should have Visual Obstruction Readings of 2.0 dm (8 inches).
- Remove tree lines (such as tree rows) from fragmented grasslands.

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

SNG, FPNG, NNF (BRD), SRMNF

- Modify livestock grazing practices as needed to reduce adverse impacts of drought to food and cover for prairie grouse and other wildlife. (Objective and Standard)
- Delay mowing of grasslands until July 15 or later to protect ground-nesting birds (Guideline).
- Manage for native forb abundance and diversity to provide foraging habitat for big game, grassland birds, and other grassland wildlife (Guideline).
- Manage for high structure habitat in large blocks in proximity to prairie grouse display grounds (Guideline).
- Limit activities within 1.0 mile of active great prairie chicken display grounds from March 1 to June 15 to prevent adverse effects on reproductive success. (Standard, Guideline)
- Manage prairie grouse display ground viewing activities to reduce disturbance and adverse impacts to the birds on the display grounds (Guideline).

SNG, FPNG, NNF (BRD), SRMNF, cont.

- Emphasize quality nesting and brooding habitat within 1.0 mile of active greater prairie chicken display grounds (Guideline).
- Identify or establish reference areas to help determine potential habitat capability for this species at the local area (management indicator species) (Objective).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

FPNG, NNF (BRD), SRMNF

- Design and implement livestock grazing strategies that provide quality nesting and brooding habitat on at least 30% of the area within 1.0 mile of active display grounds (Standard).

Geographic Area Direction (Chapter 2)

SNG, FPNG, NNF (BRD), SRMNF

- Objectives call for specified levels of ungrazed habitat and a more diverse grassland vegetation mosaic through desired levels of rest, seral stages and vegetation structure (see tables in Section 5).
- Provide diverse and quality nesting, brooding, and roosting habitat for greater prairie chickens at levels that, in combination with habitat on adjoining lands, helps support a stable to increasing population of at least 250 adult male prairie chickens within 10 to 15 years on the Sheyenne National Grassland (Objective).
- Objectives are provided for prairie chicken habitats and to maintain stable to increasing population trends.
- Emphasize management for greater prairie chicken in the southern and western portion of the Sheyenne Geographic Area (Guideline).
- Manage for high vegetative structure in areas where it would enhance greater prairie chicken nesting habitat quality (Guideline).
- Manage for high plant species diversity, including forbs, in areas where it would enhance greater prairie chicken brooding habitat quality. Emphasize areas in proximity to nesting habitat (Guideline).
- Establish and maintain quality foraging habitat for greater prairie chicken and associated species by enhancing and / or maintaining a diversity of forbs (Guideline).
- Provide habitat at levels that will support a viable population of at least 250 adult male prairie chickens on the Sheyenne National Grassland over the next 10 to 15 years (Objective).
- Provide habitat at levels that will support a viable population of at least 250 adult male prairie chickens on the Samuel R. McKelvie National Forest over the next 10 to 15 years (Objective).
- At the onset of drought evaluate the need to modify livestock grazing practices to reduce adverse impacts of drought on fodd and cover for prairie grouse and other wildlife (Standard).

Management Area Direction (Chapter 3)

SNG

- The proposed Fritillary Prairie and Platanthera Prairie RNAs provide habitat for greater prairie chicken. RNAs will be managed to protect their ecological values. Management plans will be completed within 5 years (Objective).
- In selected areas allocated to MA 3.66, initiate intensive restoration efforts to meet desired conditions that include active and passive methods. Native reseeding projects may be initiated with local seed sources (Guideline).

FPNG

- The proposed Mallard South RNA (1,030 acres) provides habitat for greater prairie chicken. This RNA will be managed to protect its ecological values. A management plans will be completed within 5 years (Objective).

SRMNF

- The 2,500-acre Steer Creek proposed RNA provides some of the best potential habitat for greater prairie chicken restoration. RNAs will be managed to protect their ecological values. Management plans will be completed within 5 years.

Monitoring Direction (Chapter 4)

SNG, FPNG, NNF (BRD), SRMNF

- Continue monitoring populations and habitat.
- Monitor reference areas to help determine potential habitat capability at the local level.
- Monitor the effectiveness of the suggested stocking rates in Appendix I in meeting desired vegetation composition and grassland structure levels.

Appendices

SNG, FPNG, NNF (BRD), SRMNF

- Appendix H provides a description of quality habitat for this species. This appendix is referenced by a standard under unit-wide direction (Chapter 1) to provide quality habitat for management indicator species.
- Appendix I provides suggested stocking rates for livestock grazing to provide quality habitat for management indicator species and other wildlife. This appendix is referenced by a standard under geographic area direction (Chapter 2) to use this appendix to help develop and implement range management practices for meeting vegetation objectives.

Biological Determinations, Risk Assessments, and Rationale

SNG

Greater prairie chickens will be impacted by proposed activities, especially proposed livestock grazing. The direction to increase native forbs, increase high structure, and use rest pastures, as well as the direction to limit disturbance of displaying and nesting birds, will improve the species viability over current conditions. Overall, the determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

The greater prairie chicken population on this national grassland is threatened by low numbers, but habitat is available. A population viability outcome score of III has been assigned because significant gaps in the historic distribution occur, and these gaps are likely permanent. Habitat enhancement will be necessary, while reintroduction may also be needed. Such reintroductions have occurred, and succeeded.

FPNG, NNF (BRD)

The biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." Outcome II is selected as the risk assessment for this species on these areas. Habitat suitability for greater prairie chickens is expected to be enhanced due to lighter livestock grazing intensities, additional ungrazed acres, and more high structure grasslands. Management direction also calls for needed adjustments in livestock grazing levels during drought periods. Prairie chickens on both units are part of larger populations that extend beyond NFS boundaries, and any unoccupied suitable habitat would be repopulated through dispersal.

The amount of prairie dog colony expansion expected on the Fort Pierre National Grassland over the next 10 years (see prairie dog evaluation in Section 3 of this document) is not expected to have an adverse impact on prairie chicken populations on the planning unit. In fact, it is possible that up to some point, additional prairie dog colony expansion and the resulting enhanced habitat diversity could possibly be beneficial to prairie chickens. Currently, less than 1 percent of the potential prairie chicken habitat on the planning unit is affected by prairie dog foraging and clipping. In 10 years, the percent of potential prairie chicken habitat expected to be impacted by prairie dogs is projected to be between 1 and 2 percent. However, it is acknowledged that continued colony expansion over the next 2 decades or longer would most likely begin having adverse impacts on prairie chicken habitat and populations on the Fort Pierre National Grassland.

SRMNF

The biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." Outcome III is selected as the risk assessment for greater prairie chicken populations on this area under Alternative 3. Habitat suitability for greater prairie chickens is expected to be enhanced due to lighter livestock grazing intensities, additional ungrazed acres, and more high structure grasslands. Management direction also calls for needed adjustments in livestock grazing levels during drought periods. If good and timely progress is made in meeting the desired vegetation composition and structure objectives, it is expected that the much of the new and improved habitat will attract birds through dispersal from prairie chicken

populations around the national forest. However, some reintroductions may be needed in some areas to help meet population objectives for the species.

Yellow-billed Cuckoo (*Coccyzus americanus*)

Species Description

Yellow-billed cuckoos are 12 inches long, grayish-brown on the back and upper tail, and whitish below. The lower mandible is yellow. A rufous patch on the primaries is evident in flight. The subspecies to be expected in the planning area is *C. a. americanus*.

This species' breeding season begins in late March to late May. It builds its stick platform nest in a tree or bush, about 2-20 feet above the ground. Usually 3-4 eggs are laid, which are then incubated for 9-11 days. The young move out of the nest in 7-8 days, but cannot fly until about 21 days of age (Baicich and Harrison 1997).

The yellow-billed cuckoo forages among leaves for caterpillars, which comprise the bulk of their diet. This bird also eats other insects, spiders, small fruits, and other small animals, such as lizards and frogs (DeGraaf et al. 1991).

Distribution and Status

Yellow-billed cuckoos breed from California and northern Utah to southwestern Quebec and southern New Brunswick, south to southern Arizona and into Mexico. The species winters in South America (DeGraaf et al. 1991).

In the planning area, the yellow-billed cuckoo is a rare migrant on the Thunder Basin National Grassland, and Nebraska National Forest. Limited suitable nesting habitat is available on the Thunder Basin planning unit.

The yellow-billed cuckoo is still relatively common in much of the southeastern United States but has declined greatly in many portions of the west. Breeding Bird Survey data indicate a significant population decline of 1.6%/year from 1966-1996. Western populations of this species deserve special attention (NatureServe 2000). Population declines are associated with loss of native riparian habitat in the west.

Organization Rankings

The yellow-billed cuckoo is classified as a sensitive species in Region 2 of the Forest Service. It has been assigned a global conservation rank of G5 by the International Network of Natural Heritage progams and Conservation Data Centeres. A G5 rank is for taxa that are demonstrably widespread, abundant, and secure globally.

Habitat

Yellow-billed cuckoos favor moderately dense thickets near watercourses, as well as second growth woodlands. It avoids very dense woods. In the planning area, they nest in relatively large cottonwood riparian habitats (Oakleaf et al. 1996). It is also less apt to be found in altered habitats such as riparian areas within cultivated landscapes (Peterson 1995). The presence of low dense shrubby vegetation with abundant prey populations is an important habitat feature (DeGraaf et al. 1991).

Based on information presented in the FEIS, the amount of existing riparian habitat on each of the planning units is as follows:

Planning Unit	Miles of Streams and Rivers	Acres of Riparian Habitat
LMNG	189	40,100
GR/CRNG	41	1,700
SNG	9	3,800
FPNG	28	150
BGNG	101	7,600
ONG	11	1,200
NNF(PRRD)	30	3,700
NNF (BRD)	5	100
SRMNF	24	1,100
TBNG	99	7,200

The data in the above table does not include riparian habitat associated with ponds and lakes. It also only represents riparian habitat associated with perennial streams and rivers and does not include forested habitats associated with intermittent water courses. The amount of this riparian habitat that is suitable for yellow-billed cuckoos is unknown.

Conservation Planning

Statewide or regional habitat conservation strategies have not been prepared for this species.

Direct and Indirect Effects on NFS Lands

Livestock grazing can reduce shrubby undergrowth in riparian areas.

Cumulative Effects

Impacts to cuckoo habitats also occur on non-National Forest System lands in the planning area, and are largely due to grazing, agricultural development, dam construction, road construction, and urban sprawl (Ostlie et al. 1997, USDA Forest Service 2000, Chuluun et al. 1997).

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

Conservation measures suggested in the scientific literature (summarized in NatureServe 2000), include:

- Improve riparian habitats.
- Remove livestock grazing to allow natural regeneration of cottonwoods and willows.

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

LMNG, GR/CRNG, BGNG, ONG, TBNG, NNF (BRD), SRMNF

- Design and implement livestock grazing strategies to provide for thick and brushy understories and multi-story and multi-age structure in riparian habitats, wooded draws, and woody thickets, contingent on local site potential (Guideline).
- Manage livestock grazing to maintain or improve riparian / woody draw areas (Guideline).
- Implement management practices that will move at least 80% of riparian and wooded draw areas toward self-perpetuating tree and shrub regeneration (Objective).
- Conduct actions so that habitats are maintained or improved toward robust stream health (Standard).

Geographic Area Direction (Chapter 2)

- None

Management Area Direction (Chapter 3)

TBNG

- The 5,980-acre Cheyenne River Zoological Special Interest Area (MA 2.1) provides a management emphasis on riparian habitats. This area possibly provides potential nesting habitat for this species.

SRMNF

- The 2,690-acre special plant and animal habitat (MA 3.64) along Steer Creek provides a management emphasis on riparian habitats. This area may provide potential nesting habitat for this species.

LMNG

- The proposed Little Missouri River RNA provides a management emphasis on healthy riparian habitats. This area may provide potential habitat for the yellow-billed cuckoo. RNAs will be managed to protect their ecological values. Management plans will be completed within 5 years (Objective).

Monitoring Direction (Chapter 4)

LMNG, GR/CRNG, BGNG, ONG, NNF (PRRD), TBNG, NNF (BRD), SRMNF

- Monitor populations and habitat.
- Monitor the extent that riparian area vegetation is regenerating.

Biological Determinations, Risk Assessments, and Rationale

LMNG, GR/CRNG, SNG

Biological determinations are not made for this species on these areas since it is not listed as sensitive by Region 1 of the Forest Service. The conservation measures listed above are expected enhance its habitat and/or protect the species and its habitat from possible adverse effects of Forest Service authorized activities and allocations.

BGNG, ONG, TBNG, NNF (PRRD), NNF (BRD), SRMNF

The biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide". Outcome II is the selected risk assessment. Management direction clearly promotes regeneration of cottonwood riparian habitats across at least 80% of this habitat type on these planning units. Even when considering the impacts of Angustora Reservoir on the downstream cottonwood forests, there's probably more cottonwood and understory vegetation along the Cheyenne River today than in historical times just prior to European occupation of this region. Although populations of this species appear to be very limited in or near these areas, it's likely that suitable but unoccupied habitats could be filled through dispersal.

Long-billed Curlew (*Numenius americanus*)

Species Description

The long-billed curlew is a sickle-billed shorebird whose large bill distinguishes it from other shorebirds. Overall, the long-billed curlew is about 23 inches in size and cinnamon-brown above and buffy below, with brightly colored buffy wing linings.

The long-billed curlew nests on the ground in a shallow scrape. Egg-laying begins by early May in Saskatchewan. Clutch size is 3-5 (usually 4) eggs laid over 4-7 days. Incubation is by both sexes and lasts 28-30 days (Redmond and Jenni 1986). Nestlings are precocial. Young are tended by both parents and brooded at night for several days after hatching. Females usually depart when young are 2-3 weeks old; males tend young until fledging at 41-45 days

The long-billed curlew is fairly opportunistic, feeding on various insects (grasshoppers, beetles, caterpillars, etc.) and some berries. During migration, the bird also feeds on crayfishes, crabs, snails, and toads. The species may obtain insect larvae by probing into loose soil (Allen 1980). Predation on nestling birds has been observed.

Distribution and Status

Distribution

Long-billed curlews breed from interior British Columbia and southern Alberta through southern Manitoba, south to central California, and east to western North Dakota, central South Dakota, central Nebraska, western Kansas, northeastern New Mexico, and northern Texas (National Geographic Society 1987). The species winters in central California, along the Texas coast, and in Mexico.

Long-billed curlews arrive on the breeding grounds from about mid-March through May and depart for the wintering grounds from August to October. In some areas, fall departure may begin as early as June or July (Allen 1980), especially by unsuccessful breeders (Allen 1980, Paton and Dalton 1994). Peak breeding season in North Dakota is early May through early June (Stewart 1975).

Table H-6 summarizes species occurrence and status in the planning area. The long-billed curlew is known or may possibly occur on the Little Missouri, Grand River and Cedar River, Thunder Basin, Buffalo Gap, and Oglala National Grasslands; and Nebraska (Bessey Ranger District) and Samuel R. McKelvie National Forests.

Status

The status of long-billed curlews varies by population. The North American Breeding Bird Survey (BBS) indicates a non-significant decline for 1966-1996 across the species' range (-1.5 percent annual change, P = 0.13; n = 221; Sauer et al. 1997). Significant decline, however, was recorded for the planning area (see U.S. Fish and Wildlife Service Region 6,–3.3%, P=0.04, n=93; Sauer et al. 1997), while significant increases were recorded for populations further west.

Organization Rankings

The long-billed curlew is classified as a sensitive species by Region 2 of the Forest Service. The species has been assigned a G5 ranking by the International Network of Natural Heritage programs and Conservation Data Centeres. A G5 rank is for taxa that are demonstrably widespread, abundant, and secure globally. The long-billed curlew's rankings in the United States are similar (N5). The long-billed curlew is considered Moderately High Priority on the 1998 Watch List (Carter et al. 1998), but is listed as High Priority for Wyoming, North and South Dakota, and Nebraska. Population declines in eastern Wyoming have been significant (Oakleaf et al. 1996).

Habitat

General

In summer, long-billed curlews use expansive, open, level to gently sloping or rolling grasslands with short vegetation such as shortgrass prairie or recently grazed mixed-grass prairie (Graul 1971, Stewart 1975, Johnsgard 1980, Bicak et al. 1982, Cochran and Anderson 1987, Eldridge 1992, Oakleaf et al. 1996, Gillihan and Hutchings 2000). Preference for areas in which vegetation density is concentrated near ground level may be important in terms of the feeding behavior of long-billed curlews or their ability to see potential predators.

The acres of flat to gently rolling grassland habitat on each of the planning units, based on vegetation and slope (less than 10%), are as follows:

Planning Unit	Acres of Potential Grassland Habitat
LMNG	323,000
GR/CRNG	89,100
FPNG	89,500
BGNG	361,500
ONG	69,100
NNF (BRD)	4,000
SRMNF	31,000
TBNG	92,300

The amount of this habitat that is currently suitable for curlews on each area is unknown.

Nest

Long-billed curlew commonly nest in wet and dry prairie and in pastures. The species rarely nests in hayland, cropland, fallow, or stubble fields (McCallum et al. 1977, Renaud 1980, Cochran and Anderson 1987, Shackford 1994).

Proximity to water may be an important factor in habitat selection (McCallum et al. 1977, Cochran and Anderson 1987, King 1978, Oakleaf et al. 1996). Shackford (1987) suggested that a drop in the water table in the panhandle of Oklahoma caused long-billed curlews to favor areas near irrigated fields over upland, shortgrass sites. Because curlews are known to return to the same area to nest each year regardless of whether water is still available, curlews may be found nesting far from water if water sources have disappeared (McCallum et al. 1977).

In the Platte River Valley of Nebraska, long-billed curlews nested at higher densities in wet meadows than in upland prairie (Faanes and Lingle 1995). Within the sandhill grasslands of Nebraska, proximity of mixed-grass uplands to wet meadows was the most important criterion in nest-site selection (Bicak 1977). Wet meadows were used for feeding, loafing, and fledging young and were aggressively defended (Bicak 1977). Curlews in Nebraska also nested on upland slopes of native vegetation near moist meadows that were used for foraging (Johnsgard 1980). In North Dakota, long-billed curlews nested on grazed mixed-grass and on shortgrass prairie (Stewart 1975). Curlews preferred gently rolling terrain with gravelly soils. In Wyoming, nest sites were characterized by less bare ground and higher percent cover of grasses (values were not given) than random sites within hayfields and pastures that contained nests (Cochran and Anderson 1987).

Nests often are located near cowpies or other conspicuous objects, possibly for concealment (Silloway 1900, King 1978, Johnsgard 1979, Allen 1980, Cochran and Anderson 1987). Additionally, nests often occur on hummocks, possibly to improve visibility of predators and to prevent flooding in otherwise level fields (Cochran and Anderson 1987).

Habitat characteristics of the landscape surrounding nest sites also influence long-billed curlew populations (King 1978, Allen 1980, Pampush and Anthony 1993). After eggs hatch, adults and broods continue to forage in shortgrass and mixed-grass habitats, but they increase their use of areas with more vegetative cover (e.g., cropland, stubble fields, and weedy areas) (King 1978; Allen 1980; Pampush and Anthony 1993), particularly if vegetation is sparse at the nest site. Use of areas with tall, dense vegetation may have provided chicks with an important source of shade or concealment cover (King 1978, Pampush and Anthony 1993). In central South Dakota, long-billed curlews with chicks were reported in grass that was 7 inches (18 cm) tall (Spomer 1981).

Forage

Curlews forage in grasslands, cultivated fields, stubble fields, wet meadows, prairie dog colonies, and occasionally along wetland margins (Silloway 1900, Johnsgard 1980, Shackford 1987).

Conservation Planning

There is no state or regional conservation plan for long-billed curlew.

Direct and Indirect Effects on NFS Lands

Grazing

Although livestock grazing can result in nest loss due to trampling (Redmond and Jenni 1986), and disturbance to nesting birds (Cochran and Anderson 1987), livestock grazing would generally be beneficial to long-billed curlew in the planning area. This is because livestock grazing can provide the short vegetation, particularly during the pre-laying period, that is preferred by curlews (Bicak et al. 1982, Cochran and Anderson 1987, Bock et al. 1993, Oakleaf et al. 1996).

In Nebraska, curlews were present on grazed areas and were absent from ungrazed areas (Cole and Sharpe 1976). Long-billed curlews in southern Alberta used only continuously grazed mixed-grass pasture and were absent from mixed-grass pasture grazed in early summer, spring-grazed tame pasture, and deferred-grazed (grazed after 15 July) mixed-grass pasture (Prescott et al. 1993). In northwestern South Dakota, long-billed curlews were seen either in pastures with cattle or in unoccupied pasture; no curlews were observed in pastures with sheep (Timken 1969).

Burning

Burning can improve habitat for long-billed curlews by removing shrubs and increasing habitat openness (Pampush and Anthony 1993). During the breeding season following a fall range fire, there was a 30% increase in the estimated curlew breeding density in western Idaho (Redmond and Jenni 1986).

Mowing

Haying can be used to provide the short vegetation preferred by nesting curlews, but should be timed so that short vegetation is available early in the season and active nests are not damaged (Cochran and Anderson 1987, Oakleaf et al. 1996). In Alberta, however, long-billed curlews did not use haylands (Prescott 1997).

Other

Pesticides can be detrimental to long-billed curlews, both directly and indirectly, by affecting prey availability (Blus et al. 1985).

Human activities and disturbance can cause nest abandonment (Joslin and Youmans 1999).

Cumulative Effects

Continued conversion of rangeland to croplands can be expected to occur on private lands across the planning area's short and mixed grass prairies, to the detriment of long-billed curlews (Ostlie et al. 1997, USDA Forest Service 2000, Chuluun et al. 1997). The absence of prescribed fire on private land is likely to continue, thereby reducing quality nesting habitat opportunities for the long-billed curlew.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement. These agreements are long term and collectively cover virtually all land suitable for grazing which are also the lands suitable for the long-billed curlew. The extensive areas under grazing permits limit opportunities for prescribe burning large areas.

Conservation Measures and Mitigation

Keys to management include providing large, open, level to gently rolling grasslands with short vegetation, and tailoring grazing regimes to local conditions. The U.S. Geological Survey has developed several management recommendations for the long-billed curlew (Dechant et al. 2000), relevant to national grassland and forest management:

- Protect breeding habitat of curlews from detrimental human activities, such as vehicular use, researcher disturbance, and shooting (Sugden 1933, Redmond and Jenni 1986).
- Tall, dense residual vegetation should be removed before the pre-laying period (March to April) so that adults do not have to leave their territories to forage (Redmond 1986). Removal of residual vegetation is especially important after years of above-normal precipitation. Haying and grazing can be used to provide the short vegetation and reduced vertical plant density preferred by nesting curlews, but should be timed so that short vegetation is available early in the season (Cochran and Anderson 1987).
- Burn areas where fire will improve habitat by reducing shrub coverage and increasing habitat openness (Redmond and Jenni 1986, Pampush and Anthony 1993).
- Adjust timing and intensity of grazing treatment according to environmental factors (Bicak et al. 1982, Cochran and Anderson 1987, Bock et al. 1993).
- Avoid grazing during the incubation period; in Wyoming, nests in areas that were grazed during incubation had lower hatching success rates than nests in other areas (Cochran and Anderson 1987).

Gillihan and Hutchings (2000) also provide recommendations for managing this species and its habitat.

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

LMNG, GR/CRNG, TBNG, BGNG, FPNG, ONG, NNF (BRD), SRMNF

- Delay mowing of grasslands until July 15 or later to protect ground-nesting birds (Guideline).
- Restrict prairie dog shooting where significant risks have been identified for other wildlife species (Guideline).

Geographic Area Direction (Chapter 2)

LMNG, GR/CRNG, TBNG, BGNG, FPNG, ONG, NNF (BRD), SRMNF

- Objectives call for a more diverse grassland vegetation mosaic through desired seral stages and vegetation structure (see tables in Section 5).
- Objectives are established for the use of prescribed fire.

Management Area Direction (Chapter 3)

BGNG

- Allocation of the 12,030 acre Rake Creek backcountry non-motorized area (MA 1.31) contains ideal habitat for long-billed curlews. This allocation will help maintain low levels of human disturbance due to motorized access.
- Allocation of the 9,540-acre swift fox special interest area contains ideal habitat for long-billed curlew. A diverse vegetation mosaic is prescribed for this area, and this will help provide quality nesting, brooding and foraging habitat for curlews.

Monitoring Direction (Chapter 4)

LMNG, GR/CRNG, TBNG, BGNG, FPNG, ONG, NNF (BRD), SRMNF

- Monitor populations and habitat.

Biological Determinations, Risk Assessments, and Rationale

TBNG, BGNG, FPNG, ONG, NNF (BRD), SRMNF

Long-billed curlews require a diversity of grassland structure: very short grass for nesting sites and taller vegetation for brood habitat. Because of the direction emphasizing increasing vegetative structural diversity, habitat conditions will likely improve over that currently existing. Expected increases in prescribed fire acreage and prairie dog towns will also benefit long-billed curlews. The biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

Outcome II is the selected risk assessment. Habitat is well distributed and of sufficient quality to maintain the species' presence, but some concern is warranted due to population declines noted throughout the planning area. This species is capable of long dispersal and repopulating suitable but unoccupied habitats.

LMNG, GR/CRNG

Biological determinations are not made for this species on these areas since it is not listed as sensitive by Region 1 of the Forest Service. The conservation measures listed above are expected enhance its habitat and/or protect the species and its habitat from possible adverse effects of Forest Service authorized activities and allocations.

Northern Goshawk (*Accipiter gentilis*)

Species Description

The goshawk is the largest (21-26 inches long) North American member of the genus *Accipiter*. Adults have blue-gray backs and whitish underparts with dense gray barring. Immature goshawks are dark brown above and buffy below, with thick streaks of dark brown.

The subspecies in the planning area is *A. g. atricapillus,* and is the focus of the following discussion.

Northern goshawks nest in large stick nests placed in trees. Goshawks occasionally use nests built by other species. One to four eggs are laid, and incubated for about 38 days. Young leave the nest at 43-50 days of age, but remain dependent on their parents for another 6-8 weeks.

This species preys on medium to large birds and small mammals, including American robins, woodpeckers, tree squirrels, and grouse (Squires and Reynolds 1997).

Distribution and Status

Northern goshawks breed from western and central Alaska and northern Yukon to Labrador and Newfoundland, south to southern Alaska, central California, southern New Mexico, western South Dakota, northern Minnesota, and northwestern Connecticut, and in the northern Appalachian Mountains (DeGraaf 1991). They winter in or near their breeding range as well as disperse southward into the Great Basin, Great Plains, and the eastern United States.

Table H-6 summarizes species occurrence and status in the planning area. The species is known to occur, possibly as a breeder, on the Thunder Basin National Grassland, and is known or may possibly occur as a winter migrant on the Nebraska National Forest (PRRD) and Oglala, Buffalo Gap, Fort Pierre, Grand River/Cedar River, Little Missouri and Sheyenne National Grasslands. However, no nesting is known to occur on the NFS units in the planning area.

From a global scale, the northern goshawk is still relatively abundant and widespread, though population trends are difficult to determine. Breeding Bird Survey and Christmas Bird Count data do not show significant changes in populations in recent decades. Counts from migration monitoring stations are complicated by normal population fluctuations resulting from periodic invasions of large numbers of birds (NatureServe 2000).

Organization Rankings

The northern goshawk has a global ranking of G5 and a national ranking of N4 (NatureServe 2000). It is classified as a sensitive species in Regions 1 and 2 of the Forest Service.

Habitat

The northern goshawk is a forest habitat generalist that uses a wide variety of forest conditions. Nests in the planning area are primarily in mature, dense ponderosa pine stands with canopy closures of 60 to 85% and at least 120 square feet basal areas (Erickson 1987, Bartelt 1977, Phillips et al. 1990, Phillips and Beske 1990). Nest trees in the Black Hills ranged from 8 to 16 inches diameter at breast height. As many as 2 to 4 alternate nests may be used by pairs, and some nests may not be used for several years and then reused. Although nest sites are usually located in dense forest stands, they also tend to be near a forest opening or road (Erickson 1987, Speiser and Bosakowski 1987, Bartelt 1977). The amount of ponderosa pine habitat on the Nebraska National Forest (Pine Ridge Ranger District) and Thunder Basin National Grassland is approximately 22,000 and 10,000 acres, not including over 10,000 acres of additional forests that have burned over the last 3 decades on the Nebraska area.

Goshawks hunt in various habitats including open sagebrush and grasslands, riparian, deciduous forests and coniferous forests. Since goshawks need relatively open understories for efficient hunting (Speiser and Bosakowske 1987, Oakleaf et al. 1996), denser understories can reduce foraging habitat quality in forested environments.

A more detailed and expanded discussion of habitat needs for this species is presented in the Biological Assessment and Evaluation for the revised Black Hills National Forest LRMP (USDA 1996).

Conservation Planning

A statewide or regional habitat conservation strategy has not been prepared for *A. g. atricapillus.*

Direct and Indirect Effects on NFS Lands

Disturbance during the nesting period can cause reduced reproductive success and nest abandonment (Reynolds et al. 1992, Bartelt 1977, Joslin and Youmans 1999, Romin and Muck 1999). Reynolds et al. (1992) recommended minimizing human presence until young leave the area (approximately March 1 through September 30).

Timber management could result in destruction of nests and alteration of foraging habitat and prey availability.

Fire suppression has caused many ponderosa pine stands to become denser with considerably more trees in the understory, to the detriment of goshawk foraging habitat quality. In addition, the increased ladder fuels translate into a greater potential for stand-replacing fires and thus potential loss of goshawk nesting habitat.

Vegetation management projects, including livestock grazing, could reduce prey availability for migrating or breeding goshawks.

Cumulative Effects

The impacts listed above under Direct and Indirect Effects also occur on other land jurisdictions in the planning area. Additional impacts to northern goshawks elsewhere in Wyoming, North and South Dakota and Nebraska are more widespread timber harvest and increased disturbance to nesting birds due to a lack of spatial and temporal buffers, and the lack of diverse foraging habitat on rangeland due to low diversity of vegetative structure and composition.

Interrelated and Interdependent Actions

Decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD) and eventual on-site development and additional roads, traffic and pipelines. Determining ponderosa pine forests to be within the suitable timber base can result in pre-commercial thinning and commercial timber sales.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

TBNG

- Manage livestock grazing to maintain or improve riparian areas. (Guideline)
- Prohibit above-ground oil and gas facilities within 0.5 mile of active raptor nests. (Standard)
- Restrict activities (seismic, prescribed burning, construction, etc.) within 0.5 mile of active raptor nests. (Guideline)

Geographic Area Direction (Chapter 2)

TBNG

- Objectives call for a more diverse grassland vegetation mosaic through rest, desired seral stages and vegetation structure (see tables in Section 5).
- Objectives are established for the use of prescribed fire.
- During vegetation management projects, use methods that emphasize development of structural stages 4 and 5. The longterm objective is to have approximately 40% of the forest cover in structural stage 4 and 20% in structural stage 5 (Objective).
- Fire will be reintroduced as determined by project specific resource needs (Objective).
- Management activities should replicate natural biological processes and vegetative patterns and patch sizes (Guideline).
- During vegetation management projects, maintain an average of 4 snags per forested acre (Standard).
- Retain all soft snags unless they are a safety hazard (Guideline).
- When necessary to meet the minimum snag standard, create snags from live tree replacement (Guideline).

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

TBNG

- Monitor populations (evidence of nesting) and habitat.

Biological Determinations, Risk Assessments, and Rationale

TBNG

The biological determination for goshawks that migrate through this area is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." The biological determination for breeding and nesting goshawks in the area would have to be “no impact” since recent nesting has not been confirmed.

Outcome 1 or 2 is the selected risk assessment for this species on this area. No commercial timber sales are planned for potential nesting habitat in the ponderosa pine forests on this national grassland. No projects that would reduce prey availability across extensive areas of this national grassland are planned.

Greater Sage Grouse (*Centrocercus urophasianus*)

Species Description

The greater sage grouse is the largest grouse in North America. Adults are grayish-brown overall, with black belly patches and spike-like tail features. Males (26-30 inches in length) have black throats, white breasts, and are considerably larger than females. Females have white throats and are approximately 22 inches in length. Like several other grouse species, greater sage grouse utilize communal display grounds for courtship and breeding.

The American Ornithologists’ Union officially split the sage grouse into two species, the greater sage grouse and Gunnison’s sage grouse, in summer 2000. The species that occurs in the planning area, the greater sage grouse, is the focus of this account.

Greater sage grouse nest on the ground, most often below sagebrush. A typical clutch has 7 or 8 eggs, which are incubated by the female for 25 to 27 days. The nestlings are precocial, and leave the nest as soon as their down is dry. Some re-nesting may occur if the first nest is destroyed.

Greater sage grouse feed on soft material, mostly sagebrush during the winter, and a combined diet of sagebrush and various forbs during the spring and summer. Sage grouse are unique in that they lack a muscular gizzard like other gallinaceous birds and cannot grind and digest seeds (Wallestad 1975). Juveniles initially consume a diet of forbs and invertebrates (Johnson 1987).

Distribution and Status

Greater sage grouse are found from central Washington, southern Idaho, Montana, southeastern Alberta, southwestern Saskatchewan, North Dakota, and western South Dakota, south to eastern California, south-central Nevada, southern Utah, and Colorado (DeGraaf et al. 1992). Some populations are migratory, moving several miles to wintering range. Those on the planning units however, are believed to be nonmigratory.

Table H-6 summarizes species occurrence and status in the planning area. Greater sage grouse occur on the Little Missouri, Buffalo Gap (Fall River County), and Thunder Basin National Grassland. At least 26 active sage grouse display grounds have been documented over the last several years on private and public lands within the administrative boundary of the Little Missouri National Grassland. A total of approximately 50,000 acres of national grasslands occurs within a 2-mile radius of all the known display grounds. Within the 50,000 acres, there's approximately 16,000 acres of interspersed sagebrush and grassland. There's approximately 16,000 acres of interspersed big sagebrush and grassland habitat on the Buffalo Gap National Grassland, but only 1 display ground was located in 2,000. Only 9 males were observed on this display ground. On the Thunder Basin National Grassland, there's over 438,000 acres of interspersed sagebrush and grassland habitat and over 70 active display grounds have been observed over the last several years on private and public lands within the administrative boundary of the national grassland. Sage grouse are scattered throughout this habitat across the national grassland, with pockets of higher sage grouse densities.

This species historically occurred in at least 14 states and 3 provinces in western North America (Braun 1993). They are now extirpated from Arizona, Oklahoma, New Mexico, Kansas, Nebraska, and British Columbia. Populations in North and South Dakota are probably marginal, as are those in Colorado, California, Utah, and Washington. Secure statewide populations now occur only in Idaho, Montana, Nevada, Oregon, and Wyoming, although small population extinctions are probably occurring in those states (Braun 1993). Long-term trends in 5 states that monitor sage grouse production indicate that productivity has fallen 26% over the last 10 years (Connelly and Braun 1996).

Organization Rankings

The greater sage grouse is classified as a sensitive species in Region 1 of the Forest Service and is ranked as a G5 species, meaning "secure." The Partners in Flight program Watch List identifies the greater sage grouse as a "high priority" in South Dakota.

Habitat

Sagebrush shrubland is the habitat of the greater sage grouse. Sagebrush is the primary food of sage grouse during the summer and is almost the exclusive diet during winter. Almost all sage grouse activity occurs in sagebrush or in meadows or openings adjacent to sagebrush. Because of this, they are considered habitat specialists. Studies in Wyoming and other states have demonstrated that nesting sage grouse select for areas with > 20% canopy cover of big sagebrush and typically nest where the tallest sagebrush and tallest and densest grass occurs (Heath et al. 1996, Wakkinen 1992, Webb 1993, Sveum et al. 1998). Having tall and dense residual herbaceous cover left over from the previous growing and grazing season appears to be a critical habitat component since nest construction and egg-laying begins in April before spring growth. Young broods are typically found in areas with less canopy cover and more forbs but move to sagebrush in the fall. Optimum winter habitat includes areas with the tallest sagebrush where grouse can still find and forage on sagebrush during periods of deep snow. The sagebrush habitat for this species on the national grasslands is much less varied than is typical for montane populations of sage grouse, due to the flat to gently rolling topography and other factors. This may make the species and it's habitat on the northern plains more vulnerable.

Paige and Ritter (1999) provide a more detailed description of sage grouse habitat.

Conservation Planning

Connelly et al. (2000) developed guidelines for management of sage grouse populations and habitats. Peterson (1995) and Paige and Ritter (1999) also provide guidelines and recommendations for managing sagebrush habitat.

Direct and Indirect Effects on NFS Lands

Spraying sagebrush with herbicides can reduce habitat suitability for sage grouse due to loss of sagebrush and reduced abundance of preferred forb species (Paige and Ritter 1999).

Livestock grazing can cause unfavorable changes in plant species composition and structure on sagebrush dominated shrublands (Connelly et al. 2000, Heath et al. 1996, Wakkinen 1992, Webb 1993, Sveum et al. 1998, Paige and Ritter 1999).

Expanding prairie dog populations could reduce the amount of suitable nesting, brooding, and roosting habitat for sage grouse as the result of the additional prairie dog foraging and clipping.

Disturbance can cause disruption of breeding or abandonment of display grounds and impacts to nesting (Connelly et al. 2000, Joslins and Youmans 1999).

Since grasshoppers and other insects are important foods for sage grouse broods, grasshopper spraying on rangelands can negatively impact sage grouse populations (Arenz and Joern 1996, Ostlie et al. 1997, Johnson 1987).

Cumulative Effects

Sagebrush control, livestock grazing, and disturbance are also occurring on private and state lands in the planning area. Other cumulative effects include hunting, habitat loss, habitat fragmentation, and exotic species invasion. Grasshopper spraying on large blocks of private and state lands could also result in additional threats to sage grouse populations (Johnson 1987).

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD) and eventual on-site development and additional roads, traffic and pipelines.

Conservation Measures and Mitigation

Connelly et al. (2000) developed guidelines for management of sage grouse populations and habitats. Those most relevant to planning area National Grasslands include:

- Viewing sage grouse on display grounds should be done in a manner that minimizes disturbance to birds.
- Use appropriate vegetative management techniques (such as mechanical methods or fire) to remove junipers and other conifers invading sage grouse habitat.
- Avoid building tall structures within 2 miles of sage grouse habitats.
- Manage breeding habitat to support 15-25% canopy cover of sagebrush, 15% canopy cover of grasses, and >10% canopy cover for forbs. Perennial herbaceous cover should average >7 inches. Management should also focus on providing a diversity of forbs.

Conservation Measures and Mitigation, cont.

- Protect suitable habitats within 3 miles of occupied display grounds.
- During drought, reduce stocking rates or change management practices for livestock if nesting and brood rearing cover requirements are not being met.
- Suppress wildfires in all breeding habitats.
- Adjust timing of energy exploration, development, and construction to minimize disturbance to breeding sage grouse.
- Avoid removing sagebrush within 325 yards (300 m) of sage grouse foraging areas.
- Discourage use of highly toxic organophosphorus and carbamate insecticides in sage grouse brood-rearing habitat.
- Avoid developing springs for livestock water.
- Use brush beating, fire, or herbicides to create a mosaic of opening in areas with >35% total shrub cover, to improve brood-rearing habitat.
- Wherever possible, modify developed springs and other water sources to restore natural free-flowing water.

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

LMNG, TBNG

- Modify livestock grazing practices as needed to reduce adverse impacts of drought to food and cover for prairie grouse and other wildlife. (Objective and Standard)
- Delay mowing of grasslands until July 15 or later to protect ground-nesting birds, including their nests and young broods (Guideline).
- Manage for native forb abundance and diversity to provide foraging habitat for big game, grassland birds, and other grassland wildlife (Guideline).
- Manage for high structure habitat in large blocks to provide habitat for waterfowl, prairie grouse, and other ground-nesting birds (Guideline).
- Prohibit construction of new oil and gas facilities within 1/4 mile of active sage and sharp-tailed grouse display grounds (Standard).
- Limit construction or placement of non-oil and gas structures or facilities within 1/4 mile of active prairie grouse display ground if structures are likely to adversely affect reproductive success (Guideline).
- Limit activities within 2.0 miles of active sage grouse display grounds from March 1 to June 15 if they are likely to adversely affect the reproductive success (Guideline).
- Manage prairie grouse display ground viewing activities to reduce disturbances and adverse impacts to the birds on the display grounds (Guideline).
- Emphasize quality nesting and brooding habitat, consistent with GA objectives within 3 miles of active sage grouse display grounds (Guideline).

- Manage for late seral condition sagebrush in selected sagebrush stands to provide quality wintering habitat for sage grouse (Standard).
- Manage wet and sub-irrigated meadows, seeps, riparian habitats, and other wetland areas that occur in or adjacent to sage grouse habitat as key foraging areas during the spring, summer, and fall (Standard).
- Avoid prescribed burning in Wyoming big sagebrush habitat and in sage grouse wintering habitat unless it can be demonstrated to be beneficial for local sage grouse populations (Guideline).
- In sage grouse habitat, maintain small openings within larger sagebrush stands at a ratio of approximately 1 acre of openings to 3 acres of sagebrush (Guideline).
- Identify or establish reference areas to help determine local habitat potential for this species (management indicator species) (Objective).

LMNG

- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

BGNG

- Manage for native forb abundance and diversity to provide foraging habitat for big game, grassland birds, and other grassland wildlife (Guideline).
- Identify or establish reference areas to help determine local habitat potential for this species (management indicator species) (Objective).
- Modify livestock grazing practices as needed to reduce adverse impacts of drought to food and cover for prairie grouse and other wildlife. (Objective and Standard)

Geographic Area Direction (Chapter 2)

LMNG, BGNG, TBNG

- Objectives call for specified levels of ungrazed habitat and a more diverse grassland vegetation mosaic through desired levels of rest, seral stages and vegetation structure (see tables in Section 5).
- Manage for high vegetative structure in areas where it would enhance sage grouse nesting habitat (Guideline).
- Objectives are provided for sage grouse habitats and to maintain stable to increasing population trends for this species.

BGNG

- At the onset of drought evaluate the need to modify livestock grazing practices to reduce adverse impacts of drought on food and cover for prairie grouse and other wildlife (Standard).
- Delay mowing of grasslands until July 15 or later to protect ground-nesting birds, including their nests and young broods (Guideline).

BGNG, cont.

- Manage for high structure habitat in large blocks to provide habitat for waterfowl, prairie grouse, and other ground-nesting birds (Guideline).
- Prohibit construction of new oil and gas facilities within 1/4 mile of active sage and sharp-tailed grouse display grounds (Standard).
- Limit construction or placement of non-oil and gas structures or facilities within 1/4 mile of active prairie grouse display ground if structures are likely to adversely affect reproductive success (Guideline).
- Limit activities within 2.0 miles of active sage grouse display grounds from March 1 to June 15 if they are likely to adversely affect the reproductive success (Guideline).
- Manage prairie grouse display ground viewing activities to reduce disturbances and adverse impacts to the birds on the display grounds (Guideline).
- Emphasize quality nesting and brooding habitat, consistent with GA objectives within 3 miles of active sage grouse display grounds (Guideline).
- Manage for late seral condition sagebrush in selected sagebrush stands to provide quality wintering habitat for sage grouse (Standard).
- Manage wet and sub-irrigated meadows, seeps, riparian habitats, and other wetland areas that occur in or adjacent to sage grouse habitat as key foraging areas during the spring, summer, and fall (Standard).
- Avoid prescribed burning in Wyoming big sagebrush habitat and in sage grouse wintering habitat unless it can be demonstrated to be beneficial for local sage grouse populations (Guideline).
- In sage grouse habitat, maintain small openings within larger sagebrush stands at a ratio of approximately 1 acre of openings to 3 acres of sagebrush (Guideline).

TBNG

- At the onset of drought evaluate the need to modify livestock grazing practices to reduce adverse impacts of drought on food and cover for prairie grouse and other wildlife. (Objective and Standard)

Management Area Direction (Chapter 3)

LMNG (MA 3.65)

- Most of the sage grouse habitat is allocated to MA 3.65 that emphasizes maintaining and restoring a diversity of vegetation conditions through uneven livestock grazing distribution; maintaining existing secondary and inaccessible rangelands; different livestock grazing intensities; and limiting further development of livestock grazing improvements (fence and water).

BGNG (MA 3.64)

- Most all of the sagebrush habitat (over 45,000 acres) are allocated to MA 3.64 to prioritize management of the sagebrush community for sage grouse, big game and other wildlife species. Numerous standards and guidelines emphasize the ecological and biological diversity values in this area.

TBNG (MA 3.65)

- Some of the primary sage grouse habitat is allocated to MA 3.65 that emphasizes maintaining and restoring a diversity of vegetation conditions through uneven livestock grazing distribution, different livestock grazing intensities, and limiting further development of livestock grazing improvements (fence and water).

Monitoring Direction (Chapter 4)

LMNG, BGNG, TBNG

- Monitor populations and habitat.
- Monitor reference areas to help determine potential habitat capability at the local level.
- Monitor the effectiveness of oil and gas stipulations in protecting this species and its habitat.
- Monitor the effectiveness of the suggested stocking rates in Appendix I in meeting desired vegetation composition and vegetation structure levels.

Appendices

LMNG, BGNG, TBNG

- Oil and gas stipulations in Appendix D are provided to reduce adverse effects to the species.
- Appendix H provides a description of quality habitat for this species. This appendix is referenced by a standard under unit-wide direction (Chapter 1) to provide quality habitat for management indicator species.
- Appendix I provides suggested stocking rates for livestock grazing to provide quality habitat for management indicator species and other wildlife. This appendix is referenced by a standard under geographic area direction (Chapter 2) to use this appendix to help develop and implement range management practices for meeting vegetation objectives.

Biological Determinations, Risk Assessments, and Rationale

LMNG

Management actions prescribed under Alternative 3 will result in added protection and improved sage grouse habitat. In addition, stricter regulation of disturbance-causing activities would occur. The emphasis on increasing forb diversity and high vegetative structure will be especially beneficial. Considering the likely effects of Alternative 3, the biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

Outcome IV is the selected risk assessment for the sage grouse in this area. The rationale for this outcome is the very limited extent of suitable potential and suitable habitat on this unit. Also, this population is on the edge of the species' range and somewhat isolated due to permanent habitat gaps. Habitat enhancement, both on and off the planning units, is likely needed. Successful reintroductions have not been demonstrated for this species.

The amount of prairie dog colony expansion expected on the Little Missouri National Grassland over the next 10 years (see prairie dog evaluation in Section 3 of this document) is not expected to have an adverse impact on sage grouse populations on the planning unit. In fact, it is possible that up to some point, additional prairie dog colony expansion and the resulting enhanced habitat diversity could possibly be beneficial to sage grouse. Even after 10 years of expected colony expansion, less than 1 percent of the potential sage grouse habitat on the planning unit will likely be affected by prairie dog foraging and clipping. However, it is acknowledged that continued colony expansion over the next several decades could begin having adverse impacts on sage grouse habitat and populations on the national grassland.

TBNG AND BGNG

Biological determinations are not made for this species on these areas since it is not listed as sensitive by Region 2 of the Forest Service. The conservation measures listed above are expected to enhance its habitat and/or protect the species and its habitat from possible adverse effects of Forest Service authorized activities and allocations. Additional management direction also applies to this species since it is also a management indicator species.

Ferruginous Hawk (*Buteo regalis*)

Species Description

The ferruginous hawk is a large buteo, averaging about 23 inches long with a 53-inch wingspan. It has a rusty back and shoulders, a pale head, and a white tail washed with pale red. Two subpopulations of ferruginous hawk are recognized (Bechard and Schmutz 1995). The focus of this summary is the "central" population, found east of the Rocky Mountains.

Ferruginous hawks are opportunistic nesters in the planning area (Phillips and Beske 1990). Historically, the majority of nests were on or near the ground (dirt/rock/chalk outcrops, riverbed mounds, mud buttes, and rock piles); more recently, many nests have been built in trees and large shrubs, on utility structures, artificial platforms, roofs of abandoned buildings, and vertical river banks. Territory and nest site re-occupancy is common for ferruginous hawks, and one of several nests within a territory may be used in alternate years. Clutch size usually is two to four eggs. Incubation lasts about 32-33 days and is done mostly by the female, while the male provides food. Young fledge in 35-50 days, but the young depend on their parents for several weeks more.

Mammals are the primary prey during the breeding season, although birds, amphibians, reptiles, and insects also are taken (Dechant, et al. 1999, NatureServe 2000). Primary prey in central grasslands are ground squirrels, followed by pocket gophers and white-tailed jackrabbits (Bechard and Schmutz 1995). Primary prey in western shrub steppe is jackrabbits, followed by ground squirrels and pocket gophers (Smith and Murphy 1978, Bechard and Schmutz 1995). White-tailed and black-tailed prairie dogs also serve as prey items (Powers and Craig 1976, MacLaren et al. 1988). Black-tailed prairie dogs are active yearlong and where available, provide a reasonably stable food source throughout the year for raptors (Phillips et al. 1990).

Distribution and Status

Distribution

Ferruginous hawks breed from northeastern Washington, southern Alberta, and southern Saskatchewan, south to eastern Oregon, western Nevada, southern California, and northern Arizona, and east through northern Texas, western Oklahoma, and eastern North Dakota (National Geographic Society 1987). The species winters from the central and southern parts of its breeding range, into Mexico.

Ferruginous hawks occur on breeding areas from late February through early October (Weston 1968, Smith and Murphy 1978, Gilmer and Stewart 1983, Schmutz and Fyfe 1987, Bechard and Schmutz 1995). Adults depart the northern end of their breeding range by late October; young depart in August. Wintering areas of grassland and desert shrub breeders are mainly separate (Schmutz and Fyfe 1987).

Table H-6 summarizes species occurrence and status in the planning area. Ferruginous hawks occur on all planning units, except the Sheyenne National Grassland.

Status

The range-wide population trend for ferruginous hawk is probably stable. Local declines have been noted (e.g., Woffinden and Murphy 1989), but a widespread decline was not evident as of the early-1990s (USFWS 1992, Olendorff 1993). North American Breeding Bird Survey (BBS) data for the U.S. and Canada indicate an average annual 0.5 percent increase for 1966-1989 (Droege and Sauer 1990). Wintering data from Christmas Bird Counts also indicate an increase in numbers from 1952-1984 (USFWS 1992).

The most recent population estimate is 5,842-11,330 birds (Olendorff 1993). However, Schmutz et al. (1992) estimated 14,000 birds for the Great Plains alone. Estimated population in Canada in the early 1990s was 2,000-4,000 breeding pairs (Schmutz 1994, COSEWIC report, cited by Jensen 1995). Between year movements of population centers and individuals makes estimation of actual abundance difficult.

Threats to ferruginous hawk include: habitat loss and fragmentation, competition from other raptors, shooting, loss of prey due to poisoning, and disturbance to nesting birds.

Organization Rankings

The ferruginous hawk has a global conservation rank of G4, and a similar rating (N4), in the United States. The Partners in Flight Watch List identifies ferruginous hawk as a "High Priority" species for the Wyoming, North Dakota, South Dakota, and Nebraska. This species was formally considered a sensitive species in Region 1 of the Forest Service and is still classified as a sensitive species in Region 2. The Committee on Environmental Cooperation, established under the North American Free Trade Act, has identified the ferruginous hawk as a priority grassland species for conservation action.

Habitat

General

Ferruginous hawks prefer open grasslands and shrub steppe communities (Gillihan and Hutchings 2000). They use native and tame grasslands, pastures, hayland, cropland, and shrub steppe. Ferruginous hawks usually occupy rolling or rugged terrain (Black 1992). High elevations, forest interiors, narrow canyons, and cliff areas are avoided (Janes 1985, Black 1992).

Nesting

Landscapes with moderate coverage (<50%) of cropland and hayland are used for nesting and foraging (NatureServe 2000). Nest site selection depends upon available substrates and surrounding land use (Dechant et al. 1999). Lone or peripheral trees are preferred over densely wooded areas when trees are selected for nesting (Dechant et al. 1999).

Foraging

Ferruginous hawks hunt in open habitats, including pastures, haylands, croplands and prairie dog colonies. Prey vulnerability is an important factor in habitat suitability, such that ferruginous hawks avoid dense vegetation that reduces their ability to see prey (Howard and Wolfe 1976, Wakeley 1978, Schmutz 1987). In the planning area, prairie dogs provide an important and stable food source through the year. In North Dakota, hayfields and native pastures were the habitats most often used by both fledglings and adults, whereas cultivated fields rarely were used (Konrad and Gilmer 1986). Fledglings in South Dakota hunted in an area where native hay recently had been cut. When prey densities were low in big sagebrush / grassland habitat, agricultural fields served as important foraging areas (Leary et al. 1998).

Conservation Planning

There is no conservation plan for ferruginous hawks.

Direct and Indirect Effects on NFS Lands

Ferruginous hawks could be affected by proposed management activities in one of three ways:

- Changes in habitat resulting from vegetative management (particularly grazing) and increases in prairie dog towns,
- Changes in nest site availability due to changes in tree recruitment, and
- Disturbance to nesting birds resulting from land management activities such as energy development.

Changes in Prey Availability

Livestock grazing benefits ferruginous hawks by reducing vegetative cover and making prey more visible (Wakeley 1978, Konrad and Gilmer 1986). Kantrud and Kologiski (1982) found the highest densities of ferruginous hawks in heavily grazed areas. These areas provided a combination of grazing and soil type (typic borolls) that resulted in abundant prey populations (Kantrud and Kologiski 1982). In Saskatchewan, preferred grassland habitat exists in large blocks of government pastures located along the Montana and Alberta borders (Houston and Bechard 1984). These habitat blocks are the only remaining areas with stable ferruginous hawk populations in Saskatchewan (Houston and Bechard 1984). Bock et al. (1993) suggested that

ferruginous hawks would respond negatively to grazing in shrub steppe habitats, based on the ground cover requirements of their prey. Because prairie dogs are an important prey item for some ferruginous hawks, proposed increases in black-tailed prairie dog colonies on many of the planning units would be beneficial. Prescribed burning would be expected to benefit ferruginous prey diversity.

Nest Site Availability

Livestock grazing can decrease ferruginous hawk nesting habitat. In South Dakota, ferruginous hawks preferentially placed ground nests in lightly grazed pasture or idle areas (Blair and Schitoskey 1982). Livestock can weaken nest trees by excessive rubbing or trampling (Houston 1982, Olendorff 1993).

Disturbance

The ferruginous hawk is easily disturbed during the breeding season (Gilmer and Stewart 1983, Schmutz 1984, White and Thurow 1985, Bechard et al. 1990). Abandonment of nests occurs particularly in the early stages of nesting (Davy 1930, Weston 1968, Fitzner et al. 1977, Gilmer and Stewart 1983, White and Thurow 1985). In eastern Colorado, nests in remote locations had greater productivity compared to more accessible nests (Olendorff 1973 in DeChant et al. 1999). In South Dakota, the probability of fledging young was 11.4 percent greater in more remote nests than in nests within 1.5 miles (2.5 kilometers) of occupied buildings (Blair and Schitoskey 1982). In North Dakota, ferruginous hawks avoided nesting within 1 mile (0.7 kilometer) of occupied buildings (Gaines 1985 in DeChant et al. 1999). In other instances, the species is more tolerant of human disturbance. Nesting has occurred near active railroads and gravel roads (Rolfe 1896, Gilmer and Stewart 1983, MacLaren et al. 1988), and near petroleum development with no adverse effect (Zeenak and Rotella 1997 and Van Horn 1993 cited in Dechant et al. 1999). Sensitivity to disturbance may be heightened in years of low prey abundance (White and Thurow 1985).

Cumulative Effects

Continued livestock grazing, energy development, and conversion of rangeland to croplands can be expected to occur on private lands throughout the planning area (Ostlie et al. 1997, USDA Forest Service 2000, Commission on Environmental Cooperation 2000).

The Conservation Reserve Program (CRP) promotes dense grassland cover and reduces the low vegetative structure habitats preferred by ferruginous hawks.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement. These agreements are long term and collectively cover virtually all land suitable for grazing which are also the lands suitable for the ferruginous hawk. Grazing can be beneficial to ferruginous hawks as can prescribed fire. The extensive areas under grazing permits reduces the opportunities for prescribe burning large areas because of the lack of alternative forage.

Conservation Measures and Mitigation

Keys to management are providing suitable nest sites, protecting active nest areas from disturbance, and improving habitat for prey. The U.S. Geological Survey has developed several management recommendations for the ferruginous hawk (Dechant et al. 1999). Those most relevant to the planning units are:

- Maintain ownership of public lands that have substantial numbers of ferruginous hawks (Olendorff 1993).
- Do not disturb nest sites from 15 March to 15 July (Howard and Wolfe 1976, Bechard and Schmutz 1995). Close public areas near nest sites to recreation during the breeding season and close public land to firearms where dense populations of ferruginous hawks are particularly susceptible to shooting (Olendorff 1993). Establish buffer zones around nest sites (Leslie 1992 in DeChant et al. 1999) and delay energy development until 45 days after fledging (Konrad and Gilmer 1986). Generally, avoid treatments between 1 March and 1 August each year, especially during the incubation period when ferruginous hawks are more prone to abandon nests if disturbed. Mitigate development impacts from mining, pipeline construction, and urbanization (Bechard and Schmutz 1995).
- Enhance, protect, and create nest substrates through fencing of nest trees, supporting heavy tree nests that are at risk of toppling, and building artificial nesting structures where nest sites are otherwise lacking (Smith and Murphy 1978, Houston 1985, Bechard and Schmutz 1995, Leary et al. 1998). Other successful nest structure management techniques are to remove some of the previous year's nesting material to reduce the chance of toppling, realign the nest over a vertical axis, widen the base of the nest, reinforce the base of the nest using wire netting or other materials, move the nest to a safer location, or provide protection from predators by nailing tin sheathing around the tree base (Craig and Anderson 1979).
- Encourage rest-rotation or deferred-rotation grazing systems (Olendorff 1993). Delay grazing to allow for the completion of incubation (Atkinson 1992).

Gillihan and Hutchings (2000) also provide recommendations for managing this species and its habitat.

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

All Planning Units Except SNG

- Prohibit above ground oil and gas facilities within 0.5 mile of an active raptor nest (Standard).
- Restrict activities (seismic, construction, etc.) within 0.5 mile of active raptor nests from 3/1 to 7/31 (Guideline).
- Objectives prescribe increasing population trends for black-tailed prairie dogs.
- Several standards and guidelines restrict the use of rodenticides to reduce prairie dog populations.

- Restrict prairie dog shooting where significant risks have been identified for other wildlife species or where shooting is preventing or slowing a desired prairie dog population expansions (Guideline).
- Prohibit changes in existing water flow regimes due to oil and gas activities that would flood prairie dog burrows (Standard).
- Use livestock and prescribed fire to enhance habitat suitability for prairie dogs where prairie dog expansion is desired (Standard).

All Planning Units Except SNG, cont.

- Manage for low vegetative structure in areas where prairie dog expansion is desired (Standard).
- An objective and numerous standards and guidelines provide direction to manage at least 80% of the riparian and wooded draw habitats for regeneration.

Geographic Area Direction (Chapter 2)

All Planning Units Except SNG

- Objectives call for specified levels of ungrazed habitat and a more diverse grassland vegetation mosaic through desired levels of rest, seral stages and vegetation structure (see tables in Section 5).
- Establish new prairie dog complexes (see prairie dog evaluation in Section 3). Objective.

Management Area Direction (Chapter 3)

LMNG, BGNG, TBNG (MA 3.63)

- Maintaining or establishing large prairie dog complexes is emphasized in several areas allocated to MA 3.63.

Monitoring Direction (Chapter 4)

BGNG, TBNG

- Monitor populations and habitat.

LMNG, BGNG, TBNG

- Monitor the effectiveness of oil and gas stipulations in protecting this species and its habitat.

Appendices

LMNG, BGNG, TBNG

- Oil and gas stipulations in Appendix D are provided to reduce adverse effects to the species.

Biological Determinations, Risk Assessments, and Rationale

FPNG, BGNG, ONG, TBNG, NNF (PRRD), NNF (BRD), SRMNF

Management activities would have mixed impacts on ferruginous hawk and their habitat. Potential adverse effects include avoidance of grazed areas by nesting birds, disturbance of nesting birds by management activities such as energy development, and loss of nest trees due to livestock grazing or rubbing. Mitigation for these impacts include increasing the use of rest, using spatial and temporal buffers to reduce disturbance, and increasing direction for protection and restoration of woody habitats. Prey species availability would improve under Alternative 3, due both to the increased diversity of vegetative composition and structure, and the expected increase in black-tailed prairie dogs. Overall, habitat conditions are expected to improve over current conditions, though some adverse impacts would still occur. The biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

Outcome I is selected as the risk assessment for the species on these areas. Ferruginous hawks have great dispersal abilities and use a variety of habitats. Also, there is no need for transplants or reintroductions of this species.

LMNG, GR/CRNG

Biological determinations are not made for this species on these areas since it is not listed as sensitive by Region 1 of the Forest Service. The conservation measures listed above are expected to enhance its habitat and/or protect the species and its habitat from possible adverse effects of Forest Service authorized activities and allocations.

Merlin (*Falco columbarius*)

Species Description

The merlin is a small (about 12 inches long) falcon found throughout much of the Northern hemisphere. In size, the merlin resembles the slightly smaller and more familiar American kestrel. In both plumage and behavior however, the merlin is distinct. Merlin are less boldy marked than kestrels, with the main field marks being a light supercilium, blue-gray (male) or brownish (female) dorsum, and a streaked ventrum. The relatively long, straight tail is slaty gray with 2-5 narrow light bands. In flight, this raptor is sometimes mistaken for a pigeon, giving rise to its former name of “pigeon hawk.”

Across its broad range, the merlin comprises 10 subspecies. Three of these, the black, taiga, and prairie merlins, are found in North America. The black merlin (*F. c. suckleyi*) breeds in the Pacific Northwest, and might occur in the planning area as a vagrant migrant. The taiga subspecies (*F. c. columbarius*) nests across most of Canada and portions of the adjacent United States, and is a regular migrant through the Great Plains, as well as an occasional winter visitor. The prairie, or Richardson's, merlin (*F. c. richardsonii*) breeds and regularly winters in south central Canada and the northern prairie states. It is the only subspecies which nests in the planning area and will be the focus of the following discussion.

The merlin's breeding cycle starts with pair formation in early spring. In the planning area, most egg-laying occurs in April and May, with an average of about 4 eggs (Stewart 1975, Becker and Sieg 1985). The species typically nests in an old corvid or hawk nest in a conifer or deciduous trees. Incubation and nestling stages last about 30 days each. Fledglings are dependent upon the adults and remain in the nest area for up to a month (Sodhi et al. 1993).

Merlin prey on birds, mammals, insects, and reptiles, but the bulk of their diet is comprised of small birds < 1.75 ounces (50 grams) in weight (Sodhi et al. 1993).

Distribution and Status

The prairie merlin breeds from southern Alberta, southern Saskatchewan, and southwestern Manitoba south to northern Montana and western North and South Dakota. It winters in or near its breeding range, as well as moving south into the southern Great Plains, southwestern United States, California, and northern Mexico.

Table H-6 summarizes species occurrence and status in the planning area. The merlin is known to or may possibly occur on all units. Nesting is known to occur on the Little Missouri National Grassland (Stewart 1975), and Thunder Basin National Grassland (Tim Byer pers. comm.) and fledglings have been observed on the Nebraska National Forest (Ross Silcock pers. comm.).

Organization Rankings

The merlin has been assigned G5 by the International Network of Natural Heritage programs and Conservation Data Centeres. A G5 rank is for taxa that are demonstrably widespread, abundant, and secure globally. The merlin's rankings in the United States are N4B and N4N, meaning that both the breeding and non-breeding populations of merlin are "apparently secure, uncommon but not rare, and usually widespread; possible cause for long-term concern". The species is classified as sensitive by Region 2 of the Forest Service.

Habitat

Merlin use a variety of habitats. Nesting occurs in both rural and urban areas in the planning area (R. Martin pers. comm.). Based on research in nearby southeast Montana (Becker and Sieg 1987), preferred nesting habitats in the planning area could be characterized as the ecotone between wooded and grassland or shrubland sites. Suitable woodlands include ponderosa pine stands, woody draws, and riparian areas.

On the planning units, suitable nesting habitat occurs on the Little Missouri, Thunder Basin, and Nebraska National Forest (Pine Ridge). There are approximately 123,000, 24,000, and 29,000 acres of deciduous and coniferous forests on the Little Missouri National Grassland, Nebraska National Forest (Pine Ridge Ranger District) and Thunder Basin National Grassland, respectively. Only a small portion of these forested acres may be suitable habitat and used by nesting merlin. Adjoining shrubland and grassland habitats are used for foraging. Because migrant and wintering merlin make use of an even greater variety of habitats, the majority of the lands considered by this evaluation are likely suitable habitat for merlin.

Conservation Planning

Statewide or regional habitat conservation strategies have not been prepared for this species.

Direct and Indirect Effects on NFS Lands

Management has the potential to impact merlin by changing prey availability, or changing nest site availability or quality (Becker and Sieg 1987, Becker 1984).

Small birds comprise the bulk of the merlin's diet. Management that leads to a simplification of habitat diversity would likely decrease merlin prey availability. Of the types of management proposed in this document, livestock grazing has the greatest potential to have this type of impact. Grasshopper spraying might reduce the availability of this prey for merlin, although this is not expected to be a very large impact in the planning area. Conversely, management that resulted in increased habitat diversity would benefit foraging merlin.

Merlin nest sites are most likely to be affected in two ways: 1) by the loss of suitable nest trees due to logging and the prevention of tree recruitment because of livestock grazing, and 2) from disturbance associated with land management activities such as oil and gas exploration (Richardson and Miller 1997, Romin and Muck 1999, Joslin and Youmans 1999). Efforts to improve tree recruitment in woody draws and riparian areas, and the maintenance of minimum mature tree stocking levels in ponderosa pine stands would benefit merlin nest site availability. Use of spatial and temporal buffers would reduce the potential impact of disturbance to nesting birds.

Cumulative Effects

All of the activities listed above under direct and indirect effects are likely occurring on private lands in the planning area, without the mitigation measures of spatial and temporal buffers and objectives, standards, and guidelines to specifically increase habitat diversity (USDA Forest Service 2000).

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD) and eventual on-site development and additional roads, traffic and pipelines.

Determining ponderosa pine forests to be within the suitable timber base can result in pre-commercial thinning and commercial timber sales.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

All Planning Units

- Prohibit above-ground oil and gas facilities within 0.5 mile of active raptor nests (Standard).
- Restrict activities (seismic, construction, timber harvest, thinning, etc.) within 0.5 miles of active raptor nests from 4/1 to 8/15. (Standard and Guideline)
- Design activities to protect and manage the riparian ecosystem (Standard).

- Locate activities and facilities away from riparian areas unless alternatives have been assessed and determined to be more environmentally damaging (Guideline).
- Design and construct all stream crossing and other in-stream structures to provide for sufficient passage of flow and sediment, withstand expected flood flows, and allow free movement of aquatic life (Standard).
- Manage livestock grazing to maintain or improve riparian areas (Guideline).
- An objective and numerous standards and guidelines provide direction to manage at least 80% of the riparian and wooded draw habitats for regeneration.
- Use prescribed burning to improve or maintain habitats of desired plant and animal species (Guideline).

FPNG, BGNG, ONG, NNF (PRRD), NNF (BRD), SRMNG, TBNG

- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

All Planning Units

- Objectives call for specified levels of ungrazed habitat and a more diverse grassland vegetation mosaic through desired levels of rest, seral stages and vegetation structure (see tables in Section 5).

NNF (PRRD)

- Initiate forest management practices that emphasize structural stages 4a (mature open) and 5 (old growth / late successional). Long-term objectives are 40% of the forest cover in structural stage 4 and 20% in structural stage 5.
- Objectives also exist for using prescribed burning and other methods to help achieve desired vegetation conditions including ponderosa pine savannah.

TBNG

- During vegetation management projects, use methods that emphasize development of structural stages 4 and 5. The longterm objective is to have approximately 40% of the forest cover in structural stage 4 and 20% in structural stage 5 (Objective).
- Fire will be reintroduced as determined by project specific resource needs (Objective).
- Management activities should replicate natural biological processes and vegetative patterns and patch sizes (Guideline).
- During vegetation management projects, maintain an average of 4 snags per forested acre (Standard).
- Retain all soft snags unless they are a safety hazard (Guideline).
- When necessary to meet the minimum snag standard, create snags from live tree replacement (Guideline).

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

FPNG, BGNG, ONG, NNF (PRRD), NNF (BRD), SRMNG, TBNG

- Monitor populations and habitat.

All Planning Units

- Monitor the effectiveness of oil and gas stipulations in protecting this species and its habitat.

Appendices

All Planning Units

- Oil and gas stipulations in Appendix D are provided to reduce adverse effects to the species.

Biological Determinations, Risk Assessments, and Rationale

FPNG, BGNG, ONG, NNF (PRRD), NNF (BRD), SRMNG, TBNG

Management activities have the potential to impact nesting, migrating, or wintering merlin on all units. Potential impacts would most likely result from a change in prey availability or nesting habitat suitability. These potential impacts will be mitigated with the use of spatial and temporal buffers for merlin nests and nesting habitat. Foraging and nesting habitat will be enhanced through vegetation management including livestock grazing management, prescribed burning and other methods. The biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

Outcome I is selected as the risk assessment for this species on these areas. Ferruginous hawks have great dispersal abilities and use a variety of habitats. Also, there is no need for transplants or reintroductions of this species.

LMNG, GR/CRNG, SNG

Biological determinations are not made for this species on these areas since it is not listed as sensitive by Region 1 of the Forest Service. The conservation measures listed above are expected to enhance its habitat and/or protect the species and its habitat from possible adverse effects of Forest Service authorized activities and allocations.

Pygmy Nuthatch *(Sitta pygmaea)*

Species Description

The pygmy nuthatch is the smallest of the three nuthatch species found in the planning area. It is about 4 inches long, with a gray-brown crown, blue-gray back, cream-colored underparts, and a white face. This species excavates its nest cavity in dead wood, often more than 20 feet above ground. Up to 10 white eggs are laid, hatching in about 2 weeks. After a nestling period of 3 weeks, the young fledge and are then attended by the adults for up to an additional month (Baicich and Harrison 1997). Interestingly, non-parent adult nuthatches (called “helpers”) may assist with nest excavation and feeding the young. After the breeding season, pygmy nuthatches form small flocks, often associating with chickadees, brown creepers, kinglets, or

woodpeckers. The pygmy nuthatch feeds on insects and spiders gleaned from needles and bark, as well as pine seeds.

Distribution and Status

The pygmy nuthatch is resident from southern British Columbia to western Montana, and south through the Rocky Mountain states into Mexico. In the Great Plains, this species is restricted to the "sky island" outcroppings of ponderosa pine forest.

Pygmy nuthatch are considered uncommon in the Black Hills of South Dakota and Wyoming (South Dakota Ornithologists' Union 1991), rare in the rest of Wyoming (Dorn and Dorn 1990), and uncommon in the Pine Ridge area of northwest Nebraska. The pygmy nuthatch is a year-round resident, though some flocks wander in winter when food supplies are particularly low.

Table H-6 summarizes species occurrence and status in the planning area. It is known to occur on the Nebraska National Forest (Pine Ridge) and may occur on the Thunder Basin National Grassland. Breeding Bird Survey (BBS) data do not show any statistically significant changes in abundance over the last several decades.

Organization Rankings

The pygmy nuthatch is classified as sensitive in Region 2 of the Forest Service. This species has been assigned a rank of G5 by the International Network of Natural Heritage programs and Conservation Data Centeres. A G5 rank is for taxa that are demonstrably widespread, abundant, and secure globally. The ranking in the United States is similar (N5).

Habitat

Pine forests, particularly open (<70% canopy closure), park-like forests, are favored by the pygmy nuthatch. In the eastern portion of its range, it is closely associated with ponderosa pine. Because pygmy nuthatch are weak excavators, they require forests with some trees that offer relatively soft, decayed wood (DeGraaf et al. 1991). Cavities in larger (>18 inches dbh) snags are preferred for nesting, as well as roosting (Cunningham 1980). A more detailed description of the habitat of this species is presented in the biological assessment and evaluation for the Black Hills National Forest Land and Resource Management Plan (USDA Forest Service 1996).

There are approximately 22,000 and 10,000 acres of ponderosa pine forests on the Nebraska National Forest (Pine Ridge Ranger District) and Thunder Basin National Grassland, respectively. Because of a lack of current forest inventories, the amount of this area that is suitable for pygmy nuthatches (structural stages 4a, 4b and 5) is unknown, but it's reasonably safe to assume that most of this acreage is currently unsuitable or marginal for pygmy nuthatches.

Conservation Planning

A statewide or regional habitat conservation strategy has not been prepared for this species.

Direct and Indirect Effects on NFS Lands

The most common threats to pygmy nuthatch habitat are certain types of timber harvest, and fire suppression. Limited timber harvest is anticipated in this document**.** In ponderosa pine habitat throughout the planning area however, fire suppression is a common threat to this species. Long-term fire suppression has resulted in much higher tree stocking density in ponderosa pine stands than what occurred historically. These dense stands are unsuitable for pygmy nuthatch. Fire suppression will continue.

Cumulative Effects

Timber harvest is occurring on large acreages of private land within the Nebraska pine ridge area. It's estimated that timber sales have occurred on approximately 42,000 acres of forested private lands since the early 1990s (John Overstreet, personal comm.). This acreage includes inaccessible pine stands. The primary silvicultural harvest method used on private lands is to selectively cut all merchantable mature trees in a ponderosa pine stand. The number of mature but non-merchantable mature trees left after harvest is highly variable between stands. Therefore, it is difficult to characterize the over all effects of this management on pygmy nuthatches and their habitat. Fire suppression will also continue on private lands, and this will perpetuate the continuing development of thick ponderosa pine stands in inaccessible areas. This will reduce the suitability of these areas for this species.

Interrelated and Interdependent Actions

Determining ponderosa pine forests to be within the suitable timber base can result in pre-commercial thinning and commercial timber sales.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

NNF (PRRD), TBNG

- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

NNF (PRRD)

- Use silvicultural methods to emphasize development of structural stages 4a and 5 (Objective).
- Manage for 40% and 20%of the forest cover to be in structural stages 4 and 5 over the long-term (Objective).
- Use prescribed burning to achieve desired vegetation conditions including ponderosa pine savannah (Objective)
- Design vegetative treatments to maintain an average of 4 snags per forested acre (Standard).

- Retain all soft snags unless they are a safety hazard (Guideline).
- When necessary to meet the minimum snag standard, create snags from live tree replacement (Guideline).

TBNG

- During vegetation management projects, use methods that emphasize development of structural stages 4 and 5. The longterm objective is to have approximately 40% of the forest cover in structural stage 4 and 20% in structural stage 5 (Objective).
- Fire will be reintroduced as determined by project specific resource needs (Objective).
- Management activities should replicate natural biological processes and vegetative patterns and patch sizes (Guideline).
- During vegetation management projects, maintain an average of 4 snags per forested acre (Standard).
- Retain all soft snags unless they are a safety hazard (Guideline).
- When necessary to meet the minimum snag standard, create snags from live tree replacement (Guideline).

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

NNF (PRRD), TBNG

- Monitor populations and habitat.

Appendices

NNF (PRRD), TBNG

- Appendix H provides a description of quality habitat for this species. This appendix is referenced by a standard under unit-wide direction (Chapter 1) to provide quality habitat for management indicator species.

Biological Determinations, Risk Assessments, and Rationale

NNF (PPRD)

The biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide". Continued fire suppression in these areas will further exacerbate the loss of pygmy nuthatch habitat quantity and quality. Some of this loss however, will be offset by forest management activities to emphasize structural stages 4 and 5.

Little is currently known about the populations of this species in this area so a risk assessment was not attempted. However, the species has been selected as a management indicator species and monitoring will be a high priority to determine distribution and to obtain baseline population information.

TBNG

Determination is "no impact." The species presence on these areas has not been confirmed and documented. However, management direction is provided for this species and potential habitat on these areas.

Western Burrowing Owl (*Athene cunicularia*)

Species Description

The burrowing owl is a small round-headed owl with no ear tufts, a poorly developed facial disc, long, slim, legs, and a short tail. Adults are greyish brown overall, and are thickly spotted with white and buff. Their breast and abdomen are whitish and barred with brown.

Two subspecies of burrowing owl breed in North America: the western burrowing owl (*A. c. hypugaea*) and the Florida burrowing owl (*A. c. floridana*). The western burrowing owl is the subspecies that occurs in the planning area, and is the focus of the following discussion.

Burrowing owls nest in underground burrows. Clutch sizes range from 3 to 12 eggs. Incubation lasts 27-30 days, with the young hatching asynchronously. Beginning at about 14 days of age, the young spend increasing time at the mouth of the burrow, retreating into it when alarmed. Young fledge in about 40-45 days.

Burrowing owl prey consists primarily of small mammals and invertebrates, but they also consume small birds, reptiles, and amphibians. They tend to be opportunistic feeders. Owls concentrate nocturnal foraging effort in areas with high small mammal abundance (e.g. deer mice and meadows voles), which account for the bulk of their caloric intake (Wellicome 1997b). Diurnal foraging is chiefly for invertebrates and is concentrated around the vicinity of the nest burrow (Haug and Oliphant 1990, Haug et al. 1993).

Distribution and Status

Distribution

Western burrowing owls breed from southern Alberta to southwestern Saskatchewan, south through east-central Washington, central Oregon, and southern California, and east to eastern North Dakota, westcentral Kansas, and Texas. Populations in the northern part of this range are migratory (National Geographic Society 1987), apparently wintering in dispersed locations including Arkansas, Missouri, Oklahoma, Texas, and Mexico (Haug et al. 1993).

Burrowing owls occupy their breeding grounds within the Great Plains from about early April until September (Grant 1965, Ratcliff 1986, Haug and Oliphant 1990).

Table H-6 summarizes species occurrence and status in the planning area. They are known to occur on all of the planning units except the Sheyenne National Grassland where their presence or use of the area has not been confirmed. Burrowing owls occur at 90% of active prairie dog colonies on Great Plains National Grasslands, although their occupancy is considerably lower at Little Missouri and Thunder Basin National Grasslands (Sidle et al. *in press).* Recent research on the large prairie dog colony complex on the Buffalo Gap National Grassland has identified one of the highest nesting densities of burrowing owls in the Great Plains.

Status

Burrowing owls have declined overall in the Great Plains, where the species is closely associated with prairie dog colonies. Prairie dogs have been greatly reduced by cultivation, poisoning, and plague. In North Dakota, the owl is nearly extirpated east of the Missouri River; west of the Missouri, occupancy dropped 30% to 50% on prairie dog towns between 1991 and 1996 (Murphy et al. 1998). Populations in western Nebraska declined 58% (91 to 38 nesting pairs), 1990-1996 (Desmond and Savidge 1998). In Wyoming, only 11% of 86 historical sites were occupied in 1998; 12% of the sites had been lost to land conversion (Korfanta et al. 1998). No complete survey has been completed in Canada, but various studies show widespread range contraction and declining density (Hjertaas et al. 1995). If present trends continue, extirpation from Manitoba will occur within a few years and extirpation from all of Canada may occur within a few decades (Wellicome and Haug 1995).

North American Breeding Bird Survey (BBS) and Christmas Bird Counts (CBC) show stable trends survey-wide from 1966-1996 and 1959-1988, respectively (Sauer et al. 1996, 1997). BBS data, 1966 to 1996, show a significant decline in the Central BBS Region, a stable trend in the Western BBS Region, and non-significant declines in Colorado, New Mexico, South Dakota, and Texas. Mapped BBS counts show higher relative abundances in the national grasslands of the central Great Plains (Sauer et al. 1997). James and Ethier's (1989) analysis of CBC data also shows a stable North American population, 1954 to 1986, but with an overall decline from the mid-1970s to the mid-1980s, and a significant decline in California. The BBS and CBC, however, may not track trends with much sensitivity due to low sample sizes. These surveys do not adequately sample species occurring in small, disjunct groups.

Primary threats across the North American range, including Mexico, are habitat loss and fragmentation due to intensive agricultural and urban land conversion, and habitat degradation due to control and extermination of colonial burrowing mammals (Haug et al. 1993, Sheffield 1997). The dramatic 98% reduction of prairie dogs has been linked to reduction of owl populations (Evans 1982, Sheffield 1997). Fragmentation and isolation are threats to small and localized populations that may be more prone to extinction. Johnson (1997) observed a wild population of < 50 owls go extinct in half the time predicted by a deterministic model. Scarcity of nesting habitat may reduce opportunities for unpaired owls to find mates (Sheffield 1997).

Organization Rankings

Burrowing owls are classified as sensitive in Regions 1 and 2 of the Forest Service. The global conservation rank for this species is G4. Burrowing owls are considered a “High Priority” Watch List species in Wyoming and Nebraska. The specie’s status in Canada was changed from threatened to endangered in 1995 (COSEWIC 1998). The Committee on Environmental Cooperation, established under the North American Free Trade Act, has identified the burrowing owl as a priority grassland species for conservation action.

Habitat

General

Burrowing owls use well-drained, level to gently sloping grassland habitats characterized by sparse vegetation and bare ground, such as moderately or heavily grazed pasture. Burrowing owls breed in native prairie, as well as in tame pasture and hayland.

Nesting

Burrowing owls on the Great Plains do not dig their own burrows, and usually rely on burrowing mammals to excavate nest sites. They often use black-tailed prairie dog or Richardson's ground squirrel colonies. Burrow availability may be limiting in areas lacking colonial burrowing rodents (Desmond and Savidge 1996); in these areas, burrowing owls frequently use American badger excavations.

Prairie dog colonies are the preferred habitat of burrowing owls in the majority of the planning area, and all prairie dog colonies are considered potential burrowing owl habitat. Prairie dog colonies provide burrows and the early successional grasslands with low structure that burrowing owls prefer. The size of prairie dog colonies in western Nebraska was positively correlated with fledging success rates (Desmond 1991). Reproductive success improved with increasing colony size on the Buffalo Gap National Grassland (Griebel 2000).

Foraging

Burrowing owls forage in a variety of habitats, including cropland, pasture, prairie dog colonies, fallow fields, and sparsely vegetated areas (Butts and Lewis 1982, Thompson and Anderson 1988, Desmond 1991, Haug et al. 1993, Wellicome 1994). In southeastern Saskatchewan, prey abundance and species richness were evaluated in native grassland, road rights-of-way, cropland, summer fallow, pasture, and hayland (Wellicome 1994). Habitats that were associated with periodic plowing (cropland and fallow fields) have a lower prey-species richness than does native grasslands, road rights-of-ways, pastures, or haylands. Habitats with tall (12-24 inches, 30-60 cm) vegetative cover (road rights-of-way, native grassland, and mature cropland) had more abundant prey than hayland, pasture, or fallow fields (Wellicome 1994, Wellicome and Haug 1995). However, vegetation >3.3 ft (1 m) tall may be too tall for burrowing owls to locate or catch prey.

In western Nebraska, burrowing owls nesting in black-tailed prairie dog colonies took foraging trips of longer duration than owls nesting in American badger excavations within pastures, suggesting that prey was more limiting to owls nesting in prairie dog colonies than to owls nesting in American badger excavations (Desmond 1991). Increased competition for prey may explain the difference in duration of foraging trips. Burrowing owls nested at higher densities in the prairie dog colonies..

Conservation Planning

Canada’s recent national recovery plan for the species (Canadian Burrowing Owl Recovery Team 1995) focuses on the conservation of Richardson’s ground squirrel whose burrows provide habitat for burrowing owls, and restricting grasshopper spraying.

Direct and Indirect Effects on NFS Lands

Prairie Dog Poisoning

As previously mentioned, active prairie dog colonies are prime burrowing owl habitat. Elimination of burrowing rodents with rodenticides has been identified as the primary factor in the recent and historical decline of burrowing owl populations (Dechant et al. 1999, NatureServe 2000). In particular, preservation of black-tailed prairie dogs and Richardson's ground squirrels may be essential to the conservation of burrowing owls. Declines of burrowing owl populations north and east of the Missouri River in North Dakota may be

related to declines in Richardson's ground squirrel populations (Murphy et al. *in press*). South and west of the Missouri River, burrowing owl population declines may be related to reductions in populations of black-tailed prairie dogs

Grazing

Burrowing owls prefer grasslands grazed heavily by cattle or prairie dogs (James and Seabloom 1968, Butts 1973, MacCracken et al. 1985*a*, Bock et al. 1993). Cessation of grazing negatively impacts burrowing owl populations. In southcentral Saskatchewan, heavily grazed, poor soils were used frequently by burrowing owls, and moderate to heavy grazing on good soils reduced lush vegetative growth and provided suitable habitat. Owls in Saskatchewan and Alberta nested in pastures with shorter vegetation than occurred in randomly chosen pastures (Clayton 1997 in DeChant et al. 1999). Burrowing owls in North Dakota nested in moderately or heavily grazed mixed-grass pastures, but not in hayed or lightly grazed mixed-grass (Kantrud 1981). Declines in owl populations north and east of the Missouri River in North Dakota may be due to a reduction over the past 20 years in the sheep grazing that occurs in the region (Murphy et al. *in press*). In the Platte River Valley of Nebraska, preferred nest sites were in heavily grazed or mowed native grasslands (Faanes and Lingle 1995). Optimal breeding habitat in portions of Colorado, Montana, Nebraska, North Dakota, South Dakota, and Wyoming occurred in heavily grazed areas with aridic ustoll soils and grazed areas with typic boroll soils (Kantrud and Kologiski 1982). Burrowing owl habitat quality is expected to increase as a result of proposed creation and maintenance of low seral and low structure vegetation.

Burning

Little information exists on the response of burrowing owls to burning. In northcentral Oregon, Burrowing owls were observed nesting in American badger excavations in previously unused areas that recently had been burned, suggesting that fire may create suitable habitat by reducing vegetation around potential nest sites (Green and Anthony 1989). Additionally, in northwestern North Dakota, post-settlement fire suppression may be responsible for the development of a taller, denser, and woodier plant community than previously existed (Murphy 1993). These vegetational shifts may have been responsible for the local extirpation of burrowing owls. Overall, burrowing owls would be expected to benefit from prescribed burning.

Mowing

In northcentral Colorado, mowing may be used to control growth of grasses and woody vegetation in areas where black-tailed prairie dogs have been eliminated; abandoned black-tailed prairie dog colonies that were not mowed were not used by owls (Plumpton 1992). Mowing also may enhance the attractiveness of nest sites for burrowing owls returning from the wintering grounds (Plumpton and Lutz 1993). Mowing throughout the breeding season apparently does not adversely affect nesting burrowing owls. However, burrows may require maintenance by prairie dogs in order to ensure their long-term suitability for owls; it may be necessary to release prairie dogs into inactive colonies (MacCracken et al. 1985*a*; Desmond and Savidge 1999).

Pesticides

Use of insecticides and rodenticides in burrowing owl habitat can be especially detrimental; pesticides not only reduce the owl's food supply and the number of burrowing mammals, but these chemicals also may be toxic to the owl (Ratcliff 1986, James and Fox 1987, James et al. 1990, Berkey et al. 1993, PMRA 1995, Wellicome 1997*b*). Burrowing owls have been noted to ingest poisoned rodents and to forage on the ground for insects in areas littered with poison grains (Butts 1973, James et al. 1990). In southern Saskatchewan, owls in pastures treated with strychnine-coated grain weighed less than owls in control pastures, suggesting a sublethal effect or a reduction in small-rodent prey (James et al. 1990). A breeding population in the Oklahoma Panhandle declined by 71% within 1 year after sodium fluoroacetate was applied to the prairie dog colony in which the owls were nesting (Butts 1973). By the end of the breeding season, no owls remained at the site. Owl burrows occasionally are fumigated and sealed in the course of rodent-control programs (Butts 1973).

Disturbance

Disturbances associated with recreation or other land management activities could result in impacts on burrowing owl reproduction (Plumpton and Lutz 1997).

Cumulative Effects

The cumulative effects area for the burrowing owl analysis was defined as the entire planning area. Continued use of insecticides and conversion of rangeland to croplands can be expected to occur on private lands (Finch 1991, Ostlie et al. 1997, USDA Forest Service 2000). Approximately 55% of all prairie dog colonies occur on private and state lands (Mulhern and Knowles 1995). It is likely that reductions in prairie dog populations on private lands will continue through poisoning, loss of habitat (cultivation), and shooting. It is also likely that prairie dog colonies on private land will remain small and thus lower quality nesting habitat than larger prairie dog towns and complexes. Urban development (Zarn 1974, Konrad and Gilmer 1984), conversion of pastures to cropland (Grant 1965, Konrad and Gilmer 1984, Ratcliff 1986), and cultivation of grasslands (Grant 1965, Faanes and Lingle 1995) limit burrowing owl populations through the destruction of nesting habitat. The extirpation of gray wolves and increased tree cover on the prairie have allowed populations of other mammalian and avian predators to increase, probably to the detriment of burrowing owl populations (Wellicome and Haug 1995). It's also possible that burrowing owls are experiencing increased competition on a shrinking habitat base (Commission on Environmental Cooperation 2000).

Interrelated and Interdependent Actions

Decisions to make NFS lands available for oil and gas leasing can result in an application for permit to drill (APD) and eventual on-site development.

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement. Livestock grazing permittees or grazing associations commonly request prairie dog poisoning on NFS lands to reduce forage consumption and clipping by prairie dogs.

Conservation Measures and Mitigation

Although there is not yet a conservation strategy for the burrowing owl, there are several avenues open to improve conditions for the species. Keys to management include providing areas of short, sparse vegetation and maintaining populations of prey species and of burrowing mammals to ensure availability of burrows as nest sites. In particular, the conservation of black-tailed prairie dog and Richardson's ground squirrel colonies appears to be vital to the preservation of burrowing owls on the Great Plains. The U.S. Geological Survey has developed the following relevant management recommendations (Dechant et al. 1999):

- In the United States, government agencies should shift from subsidizing prairie dog reduction to leadership in finding workable alternatives that maintain viable prairie dog communities and ranching systems (Benedict et al. 1996; Desmond and Savidge 1999, *in prep*.). Recognize that the eradication of prairie dogs may be economically costly, agriculturally unnecessary, and ecologically detrimental (Benedict et al. 1996).
- Preserve traditional nesting sites (Butts 1973, Zarn 1974, Ratcliff 1986, Warnock 1997). Burrowing owls often reuse nesting sites occupied in previous years (Butts 1973; Rich 1984; Haug and Oliphant 1990; Plumpton 1992; Plumpton and Lutz 1993).
- Maintain large, contiguous areas of native grassland (Benedict et al. 1996; Warnock 1997; Warnock and James 1997) including areas of treeless plains (Clayton and Schmutz 1999).
- Create a patchwork of reserves with sustainable land uses in surrounding buffer areas (Clayton and Schmutz 1999). Because owls forage over tall grass and nest and roost in short grass, a mosaic of habitats may be important in conserving habitat.
- Allow heavy grazing on saline, gravelly, stony, or sandy areas, because these areas are used frequently by burrowing owls in Saskatchewan (Wedgwood 1976). Allow moderate to intense grazing on good soils that otherwise would support tall vegetation.
- If insect control is necessary, choose insecticides with the lowest toxicity to nontarget organisms (James and Fox 1987).
- Do not spray pesticides within 0.25-0.4 mile (400-600 m) of owl nest burrows during the breeding season (1990; James and Fox 1987).
- Regulate poisoning and shooting of prairie dogs, particularly on public lands (Benedict et al. 1996, Toombs 1997).
- If lethal control of burrowing mammals is necessary, restrict the timing of control activities to avoid the period when burrowing owls choose nest sites or are nesting (Butts 1973). Do not use traps, poisoned meat, or poisoned grain for rodent control when burrowing owls are present, but rather fumigate burrows unoccupied by owls (Butts 1973). However, be aware that it is difficult to determine which burrows are unoccupied once fledglings begin to use satellite burrows.
- Increase the area of prairie dog colonies, possibly by reintroducing prairie dogs where they have been eliminated, or by releasing additional prairie dogs into active colonies to promote colony expansion (Pezzolesi 1994; Toombs 1997). Colonies $\geq$86 acres (35 ha) in area appeared to provide adequate space for nesting burrowing owls in Nebraska (Desmond et al. 1995).

Conservation Measures and Mitigation, cont.

- Maintain abandoned prairie dog colonies at an early successional stage, with short vegetation (<3 inches). Mowing can accomplish this, and would be critical around mid-March to improve nest-site attractiveness during nest initiation (Plumpton 1992, Plumpton and Lutz 1993). Mowing in mid- to late summer appears not to be detrimental to nesting owls. However, mowing abandoned colonies may be effective only in the short term; burrows may require maintenance by prairie dogs to remain suitable for owls (MacCracken et al. 1985*a*, Desmond and Savidge 1999).
- Implement rotational grazing in heavily grazed areas to increase prey populations (Wellicome et al. 1997).

Gillihan and Hutchings (2000) also provide recommendations for managing this species and its habitat.

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

FPNG, BGNG, ONG, NNF (BRD), TBNG

- Do not spray grasshoppers within 1/4 mile of known burrowing owl nests (Standard).
- Manage for active prairie dog colonies that are larger than 80 acres (Guideline).
- Restrict prairie dog shooting where significant risks have been identified for other wildlife species or where shooting is preventing or slowing a desired prairie dog population expansions (Guideline).
- Prohibit changes in existing water flow regimes due to oil and gas activities that would flood prairie dog burrows (Standard).
- Prohibit above-ground oil and gas facilities within 0.25 mile of an active nest (Standard).
- Restrict activities (i.e. seismic, construction, etc.) within 0.25 mile of an active raptor nest from 4/15 to 8/31 (Guideline).
- Align new roads to avoid prairie dog colonies (Guideline).
- Limit the use of rodenticides for reducing prairie dog populations to public health and safety risks and damage to private and public infra-structure (Standard).
- Consult with U.S. Fish and Wildlife Service approved, state-wide prairie dog conservation strategies for guidance on poisoning prairie dogs in response to complaints about agricultural damage on adjoining private lands (Guideline).
- Prohibit use of rodenticides for reducing prairie dog populations outside the period October 1 to December 31 (Standard).
- Do not use burrow fumigants in prairie dog colonies (Standard).
- Prohibit control of native insects until an evaluation of impacts to other resources is made (Guideline).

- Reduce conflicts with adjacent landowners over prairie dog management through an active landownership adjustment program (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

LMNG, GR/CRNG, SNG

- Do not spray grasshoppers within 1/4 mile of known burrowing owl nests (Standard).
- Manage for active prairie dog colonies that are larger than 80 acres (Guideline).
- Restrict prairie dog shooting where significant risks have been identified for other wildlife species or where shooting is preventing or slowing a desired prairie dog population expansions (Guideline).
- Prohibit changes in existing water flow regimes due to oil and gas activities that would flood prairie dog burrows (Standard).
- Prohibit above-ground oil and gas facilities within 0.25 mile of an active nest (Standard).
- Restrict activities (i.e. seismic, construction, etc.) within 0.25 mile of an active raptor nest from 4/15 to 8/31 (Guideline).
- Align new roads to avoid prairie dog colonies (Guideline).
- Limit the use of rodenticides for reducing prairie dog populations to public health and safety risks, damage to private and public infra-structure (Standard).
- Consult with U.S. Fish and Wildlife Service approved, state-wide prairie dog conservation strategies for guidance on poisoning prairie dogs in response to complaints about agricultural damage on adjoining private lands (Standard).
- Prohibit use of rodenticides for reducing prairie dog populations outside the period October 1 to December 31 (Standard).
- Do not use burrow fumigants in prairie dog colonies (Standard).
- Prohibit control of native insects until an evaluation of impacts to other resources is made (Guideline).
- Reduce conflicts with adjacent landowners over prairie dog management through an active landownership adjustment program (Guideline).
- Use livestock and prescribed fire to enhance habitat suitability for prairie dogs where prairie dog expansion is desired (Standard).
- Manage for low vegetative structure in areas where prairie dog expansion is desired (Standard).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

All Planning Units

- Objectives call for specified levels of ungrazed habitat and a more diverse grassland vegetation mosaic through desired levels of rest, seral stages and vegetation structure (see tables in Section 5).
- Establish new prairie dog colony complexes (see prairie dog evaluation in Section #) (Objective).

Management Area Direction (Chapter 3)

LMNG, BGNG, TBNG (MA 3.63)

- Large acreages are allocated at four locations as black-footed ferret reintroduction habitat (MA 3.63). Black-tailed prairie dog colony complexes are actively and intensively managed at these locations, and prairie dog population expansion at two locations will be accelerated through management. See the black-footed ferret assessment in Section 2 of this document for more detail.

Monitoring Direction (Chapter 4)

- Monitor populations and habitat.
- Monitor the effectiveness of oil and gas stipulations in protecting this species and its habitat.

Appendices

LMNG, BGNG, TBNG

- Oil and gas stipulations in Appendix D are provided to reduce adverse effects to the species.

Biological Determinations, Risk Assessments, and Rationale

All Planning Units Except SNG

The biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." The rationale for this determination is that management direction provides for a significant increase in prairie dog populations on each planning unit and additional direction to reduce direct threats to burrowing owls. The scrutiny of proposed grasshopper spraying projects should also provide extra safeguards for the species. It is acknowledged that the prairie dog populations on the Nebraska National Forest (BRD) may not be viable because of marginal habitat (loose sandy soils and other unfavorable habitat characteristics). This puts burrowing owls at risk on this unit, but this appears not to be the result of Forest Service actions.

The selected risk assessment for this species on the Little Missouri, Buffalo Gap, and Thunder Basin National Grasslands is outcome II or III. Prairie dog populations are undoubtedly reduced from what occurred historically on these areas, but colonies are still widely distributed across these large national grasslands. Because of this, it is likely that any future plague epizootics would likely be localized, and unaffected habitat would remain elsewhere on the national grassland (USDA Forest Service 2000). Repopulation of any suitable but unoccupied

habitat would likely occur naturally through dispersal.

The selected risk assessment for this species on the Grand River, Fort Pierre, and Oglala National Grasslands is outcome III, in the absence of any future plague epizootics. Outcome V is the selected risk assessment if plague epizootics occur in the future on these relatively small national grasslands and limited prairie dog populations.

SNG

Determination is "no impact." The species presence on these areas has not been confirmed and documented.

Sprague's Pipit (Anthus spragueii)

Species Description

The Sprague's pipit is a pale, slender, sparrow-sized bird with white outer tail feathers, a thin bill, pale legs, and a heavily-streaked back.

Sprague's pipit nests are placed on the ground and concealed in grass clumps (Terres 1980). Some are partially or completely arched over with dead grasses anchored to the surrounding vegetation. Clutch size is usually four or five eggs. The breeding season begins in late April (Stewart 1975). In North Dakota, clutches have been found June 7 -30. Incubation lasts about 13 days, with the young leaving the nest about 10 days post-hatching (Baicich and Harrison 1997).

Sprague's pipits can be heard singing from late April to early June, and again from mid-July through early September (Stewart 1975). Based on this behavior, the species is suspected of being double-brooded, but this has not yet been confirmed.

The only known records of brood parasitism by brown-headed cowbirds have been reported from the Canadian provinces of Saskatchewan and Manitoba.

Distribution and Status

Distribution

Sprague's pipits breed from northcentral Alberta to central Manitoba, south to Montana and northcentral South Dakota, and east to northwestern Minnesota (National Geographic Society 1987). The species winters from the southern tier of the Great Plains states south through Mexico (DeGraaf et al. 1991). Sprague's pipits arrive on the breeding grounds in April and depart for the wintering grounds in September and October (Stewart 1975).

Table H-6 summarizes species occurrence and status in the planning area. The species is known to nest on the Grand River, Cedar River, and Little Missouri National Grasslands, and has been found as a migrant on the Thunder Basin (Tim Byer pers. comm.), and Buffalo Gap (Ron Martin pers. comm.) National Grasslands.

Status

Sprague's pipit is apparently globally secure, although populations are declining, especially on the eastern edge of its range (see Martin and Boczkiewicz 1993). In Minnesota, it formally occurred throughout northwest and west-central Minnesota, but by 1932, Roberts (1932) reported that the bird was common only in the Red River Valley. The only recent Minnesota records are from Clay County (Green and Janssen 1975). Breeding Bird Surveys show a significant (-4.5%/year, P=0.0) decline for Sprague's pipit rangewide, as well as significant declines in the planning area.

Organization Rankings

The Sprague's pipit is classified as a sensitive species in Region 1 of the Forest Service. It has been assigned a ranking of G4 by the International Network of Natural Heritage Programs and Conservation Data Centeres. A G4 rank is for taxa that are "apparently globally secure." Its United States ranking is similar (i.e. a "N4"). The species is threatened in Canada and considered Moderately High Priority on the 1998 Watch List (Carter et al. 1998), and a high priority species in Wyoming, North and South Dakota, and Nebraska.

Habitat

Sprague's pipits use grasslands of intermediate height and sparse to intermediate vegetation density (Madden 1996, Sutter 1996 in DeChant et al. 1999, Sutter and Brigham 1996). Although they will use tame pasture, they are significantly more abundant in native prairie (Wilson and Belcher 1989, Dale 1992, Hartley 1994, Anstey et al. 1995, Madden 1996, Prescott and Wagner 1996, Sutter 1996, Davis and Duncan 1999). The species has been found to be area-sensitive in Saskatchewan, with the minimum area requirement being 470 acres (SWCC 1997).

Important nesting habitat features include low visual obstruction, moderate litter cover, and little or no woody vegetation (Dale 1992, Anstey et al. 1995, Madden 1996, Sutter 1996, Davis and Duncan 1999). Within grazed mixed-grass areas in North Dakota, abundance of Sprague's pipits was positively associated with percent clubmoss cover and plant communities dominated by native grass (*Stipa, Bouteloua, Koeleria,* and *Schizachyrium*) (Schneider 1998). Abundance was negatively associated with percent grass cover, litter depth, density of low-growing shrubs, vegetation density, and with plant communities dominated by Kentucky bluegrass and native grass. In areas not occupied by Sprague's pipits, percent grass cover, litter depth, and vegetation density were greater than in areas where the species was present.

The acres of grassland habitat (<25% slope) on each of the planning units are as follows:

Planning Unit	Acres of Potential Grassland Habitat
LMNG	730,900
GR/CRNG	145,600
FPNG	106,400
BGNG	530,100
NNF (BRD)	unknown
SRMNF	unknown
TBNG	unknown

The amount of this habitat that is currently suitable for this species on each area is unknown.

Conservation Planning

There are no conservation plans for this species.

Direct and Indirect Effects on NFS Lands

Sprague's pipits are most likely affected by livestock grazing and prescribed burning.

Grazing

Grazed grasslands generally support fewer Sprague's pipits than ungrazed grasslands. Heavy grazing is often detrimental as it reduces vegetation height below levels acceptable to Sprague's pipits (Owens and Myres 1973, Dale 1984, Bock et al. 1993, Sutter 1996; but see Kantrud 1981 for Sprague's pipit use of heavily grazed pastures). However, lightly to moderately grazed grasslands are used throughout the breeding range (Owens and Myres 1973, Kantrud and Kologiski 1982, Bock et al. 1993, Anstey et al. 1995). In Alberta, Sprague's pipits preferred early-season native pastures (grazed in early summer), infrequently occupied early-season tame pasture (grazed from late April to mid-June) and continuously grazed native pastures, and were fairly common in deferred-grazed native pastures (grazed after 15 July) (Prescott and Wagner 1996).

Burning

Little information is available regarding effects of prescribed burning on Sprague's pipit populations, although the use of fire to retard shrubs would be ultimately beneficial. In North Dakota, Sprague's pipits were absent from unburned, idle grasslands; highest abundance was reached in areas 2 years after burns (Madden 1996). At one Saskatchewan site, Sprague's pipit populations declined the first 2 years following fall burns and then recovered to densities similar to those in unburned areas (Pylypec 1991).

Cumulative Effects

Continued conversion of rangeland to croplands can be expected to occur on private lands across the planning area (Ostlie et al. 1997, USDA Forest Service 2000), with those occurring in North Dakota being especially relevant to the viability of Sprague's pipit. The absence of prescribed fire on private land is likely to continue, thereby reducing long-term nesting habitat quality for this species, as shrub encroachment proceeds.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement. These agreements are long term and collectively cover virtually all land suitable for grazing. The extensive areas under grazing permits limits management ability to prescribe burn large areas because of limited availability of alternative forage.

Conservation Measures and Mitigation

Keys to management include providing suitable grassland habitat, especially native prairie, with intermediate vegetation height and low visual obstruction. The U.S. Geological Survey has developed several management recommendations for Sprague's pipit (Dechant et al. 1999). Those most relevant to the types of management discussed in this document are:

- Maintain grasslands free of woody vegetation (Berkey et al. 1993, Anstey et al. 1995, Madden 1996).
- Burn grassland once every 2-4 years (Madden 1996). Populations can be expected to decline immediately after burning; vegetation must recover before Sprague's pipit will re-colonize areas.
- Avoid heavy grazing; throughout the breeding range, light to moderate grazing may be beneficial (Bock et al. 1993, Sutter 1996). Grazing tame pastures in spring allows native pastures to be deferred, which improves habitat in the native pastures for Sprague's pipits (Prescott and Wagner 1996).
- Convert non-native uplands, including hayland and pasture, to native vegetation (Berkey et al. 1993, Sutter 1996, Dale et al. 1997).

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

LMNG, GR/CRNG, SNG, FPNG, BGNG, NNF (BRD), SRMNF, TBNG

- Modify livestock grazing practices as needed to reduce adverse impacts of drought to food and cover for prairie grouse and other wildlife (Standard).
- Manage for native forb abundance and diversity to provide foraging habitat for big game, grassland birds, and other grassland wildlife (Guideline).
- Manage for high structure habitat in large blocks to provide habitat for waterfowl, prairie grouse, and other ground-nesting birds (Guideline).
- Where technically and economically feasible, use genetically local native plant species in revegetation efforts (Guideline).

LMNG, GR/CRNG, SNG

- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

LMNG, GR/CRNG, SNG, FPNG, BGNG, NNF (BRD), SRMNF, TBNG

- Objectives call for specified levels of ungrazed habitat and a more diverse grassland vegetation mosaic through desired levels of rest, seral stages and vegetation structure (see tables in Section 5).
- Objectives are established for prescribe burning.

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

LMNG, GR/CRNG, SNG

- Continue monitoring populations and habitat.

LMNG, GR/CRNG, SNG, FPNG, BGNG, NNF (BRD), SRMNF, TBNG

- Monitor the effectiveness of the suggested stocking rates in Appendix I in meeting desired vegetation composition and grassland structure levels.

Appendices

LMNG, GR/CRNG, SNG, FPNG, BGNG, NNF (BRD), SRMNF, TBNG

- Appendix I provides suggested stocking rates for livestock grazing to provide quality habitat for management indicator species and other wildlife. This appendix is referenced by a standard under geographic area direction (Chapter 2) to use this appendix to help develop and implement range management practices for meeting vegetation objectives.

Biological Determinations, Risk Assessments, and Rationale

LMNG, GR/CRNG

Livestock grazing and prescribed burning are compatible with this species, as long as resulting vegetation and litter remain in suitable amounts. Because of the new direction on increasing prescribed burns, adding rest pastures, and increasing vegetative structural diversity and composition, overall habitat quality is expected to increase as a result of implementing Alternative 3. Therefore, the biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

Outcome II is selected as the risk assessment for this species. In and near the Grand River, Cedar River, and Little Missouri National Grasslands, habitat is of sufficient quality, distribution, and abundance to allow the species to maintain populations across the units. There is no need for reintroductions or transplants.

SNG

Determination is “no impact.” The species presence on this national grassland has not been confirmed and documented. However, management direction is provided for this species and potential habitat on these areas.

BGNG, TBNG

Biological determinations are not made for this species on these areas since it is not listed as sensitive by Region 2 of the Forest Service. The conservation measures listed above are expected to enhance its habitat and/or protect the species and its habitat from possible adverse effects of Forest Service authorized activities and allocations.

FPNG, NNF (BRD), SRMNF

Determination is "no impact." The species is not a sensitive species in Region 2 of the Forest Service, and the species presence on this national grassland has not been confirmed and documented. However, management direction is provided for this species and potential habitat on these areas.

Upland Sandpiper (*Bartramia longicauda*)

Species Description

The upland sandpiper ranges from 11 to 13 inches in size. It is the most terrestrial of North American shorebirds. The sexes look alike. Breeding adults are scaly-brown above and light tan below, with a long slender neck, small rounded head, and a relatively long tail.

Initial nesting activity, which is thought to be somewhat synchronous, begins two to three weeks after spring arrival in breeding areas. The upland sandpiper's nest is a shallow depression in the ground approximately 4 inches in diameter and 2-inches deep, and is lined with dry grass. Nests are usually well hidden (Johnsgard 1981). Clutch size is normally four eggs. Incubation lasts an average of 24 days. Chicks are precocial and leave the nest within 24 hours after hatching (Ailes 1980). Broods are tended by one or both adults until the young attain adult weight and are capable of flight at 30-34 days (Buss and Hawkins 1939, Ailes 1980). Family groups tend to stay together at least until post-breeding migration.

Upland sandpipers feed almost exclusively on insects, especially grasshoppers and crickets (Orthoptera), weevils (Coleoptera), and other small invertebrates gathered from or close to the ground (Terres 1980). Occasional seeds of weeds, grasses and waste grains, including wheat, are also consumed (McAtee and Beal 1912).

Distribution and Status

Distribution

Upland sandpipers breed locally from north-central Alaska eastward across central Canada and through the Great Lakes region to southern New Brunswick, south in the interior to eastern Washington, northeastern Oregon, Idaho, Colorado, northwestern Oklahoma, Texas, central Missouri, southern Illinois, northern Kentucky, southern Ohio, West Virginia, central Virginia, and Maryland; formerly farther south. Populations are small and widely scattered in the northeastern U.S.

The species winters in South America from Surinam and northern Brazil south to central Argentina and Uruguay; the largest concentrations occur in Argentina and Uruguay.

Upland sandpipers arrive on their breeding grounds in mid-April to early May (Buss and Hawkins 1939, Ailes 1980). The time elapsed between arrival and departure from breeding areas has been observed to be as brief as 100 days and as long as 165 days (Buss and Hawkins 1939). Higgins and Kirsch (1975) correlated the average, frost-free period with dates of first nest initiation and final departure from breeding areas in North Dakota and Wisconsin, and suggested that some breeding ground activities may be directly or indirectly related to temperature at northern latitudes.

Table H-6 summarizes species occurrence and status in the planning area. It is known to occur on all planning units.

Status

Although declining in much of the Midwest and northeast, Breeding Bird Survey (BBS) data indicate a significant increase in central North America in recent decades (Droege and Sauer 1990). Rangewide, areas exhibiting increases far outnumber those showing declines and the BBS trend for 1966-1993 was a significant increase averaging 2.41% per year (Peterjohn et al. 1994).

In North Dakota, Montana, and Ontario, the upland sandpiper appears to be maintaining its numbers or increasing (Cadman et al. 1987). In Minnesota, Montana, and North and South Dakota, the 1985 Farm Bill has idled millions of acres of croplands through the Agriculture Conservation Reserve Program, potentially creating new habitat. Statistically significant annual increases in relative abundance have been registered in the High Plains Border (8.5%, P <= to 0.05) and Missouri Plateau-Glaciated (11.8%, P <= 0.05) strata of the Great Plains Physiographic Region.

Initial declines were due largely to market hunting. The species has disappeared or declined in portions of the eastern U.S. due to destruction (urban sprawl) and natural succession of habitat, and, probably, frequent disturbance of pastures and hayfields (cut too often to allow breeding). Extensive row-cropping and early crop-cutting probably pose threats to breeders. Some western populations may have declined due to overgrazing. Much of the wintering habitat has been usurped by agriculture. Loss and fragmentation of habitat due to increased urbanization, changes in farming practices and natural forest succession pose the most serious threats to populations.

Organization Rankings

Upland sandpipers have a global conservation rank of G5. The upland sandpiper is classified as a sensitive species by Region 2 of the Forest Service.

Habitat

General

In general, nesting upland sandpipers use grassland areas with low to moderate forb cover, low woody cover, moderate grass cover, moderate to high litter cover, and little bare ground (Buss and Hawkins 1939, Rotenberry and Wiens 1980, Renken 1983, Skinner et al. 1984, Kantrud and Higgins 1992, Hull et al. 1996). Fence posts or other display perches may be important components of suitable habitat (White 1983). Suitable habitat includes native and tame grasslands, wet meadows, hayland, pastures, planted cover, cropland, highway, and railroad rights-of-way, and grassy areas of airports (Dechant et al. 1999).

In North Dakota, South Dakota, Montana, Wyoming, Colorado, and Nebraska, densities of upland sandpipers were highest in areas with moderately grazed typic ustoll soils (Kantrud and Kologiski 1982). Upland sandpipers were associated with silty range and thin upland range sites in North Dakota; these sites were characterized by thin topsoil, loamy soil, 1-25% slope, grassy cover, low shrub cover, and moderate to high litter cover (Messmer 1990). Maximum vegetation height ranged from 20 to 28 inches (50 to 70 cm) and average litter depth ranged from 1.50 to 3.6 inches (3.8 to 9.1 cm). Sedivec (1994), however, in the same study area found that upland sandpipers preferred overflow range sites (areas receiving more than normal soil moisture because of run-off from higher land or from flooding) to silty range sites.

No clear pattern of preference for native versus tame vegetation over the breeding range of the upland sandpiper is discernible. In a study encompassing Great Plains grasslands, areas considered to be the best habitat for upland sandpipers were dominated by wheatgrass and Kentucky bluegrass, followed by green needlegrass, buffalo grass, western snowberry, and slimspike three-awn (Kantrud and Kologiski 1982). Dominant vegetation at nest sites in North Dakota, South Dakota, Montana, and Manitoba were Kentucky bluegrass, smooth brome, needle-and-thread, and quackgrass; although most nests were located within mixed-grass, upland sandpipers readily nested in stands of tame grasses (Kantrud and Higgins 1992). King and Savidge (1995) observed upland sandpipers in CRP fields seeded with warm-season grasses and native tallgrass in Nebraska. Within ungrazed grasslands in North Dakota and South Dakota, 38 of 41 nests were in either native or tame grasses located in idle fields or in rights-of-way. One of these nests was in alfalfa and brome (Higgins et al. 1969). The other three nests were in pasture. Within grazed grasslands in North Dakota, vegetation within 3.3 feet (1 m) of nests was composed of native grasses and small amounts of tame grasses such as Kentucky bluegrass and smooth brome (Bowen and Kruse 1993). In South Dakota, upland sandpipers nested only in native prairie; 32 of the 33 nests were in prairie classified as in good or excellent range condition (Kaiser 1979). In Manitoba, numbers of upland sandpipers were positively correlated with presence of native vegetation and negatively correlated with presence of tame vegetation (Wilson and Belcher 1989). In Saskatchewan, upland sandpipers were present in low abundance in both native mixed-grass and tame grasslands dominated by crested wheatgrass (Sutter and Brigham 1998).

Nest

Upland sandpipers nest in a variety of habitats and vegetation heights and densities, from idle prairie with dense, homogeneous vegetation to wet meadows, oldfields, pastures, hayland, cropland, tame vegetation, burned areas, and sandy areas with sparse vegetation NatureServe 2000). Nests may occur in depressions covered by grass arching over the top, in grass clumps, in dense vegetation, or at the base of forbs or shrubs (Lindmeier 1960, Skinner et al. 1984).

Vegetation height around the majority of nests ranges from 4 to 25 inches (10.2 to 63.5 cm) (Lindmeier 1960, Higgins et al. 1969, Kaiser 1979, Buhnerkempe and Westemeier 1988, Eldridge 1992). In North Dakota, South Dakota, Montana, and Manitoba, nests were located in grass-dominated sites with 100% visual obstruction at <5.9 inches (15 cm), effective vegetation height <11.8 inches (30 cm), and 30-99% litter cover (Kantrud and Higgins 1992). Upland sandpipers avoided nesting where visual obstruction was >15.7 inches (40 cm) or vegetation height was >33.5 inches (85 cm). In South Dakota, nest concealment for nests in grazed prairie was measured from various angles: all nests had $\geq$50% vertical concealment by residual and living vegetation, 33% of nests were concealed on all sides, 55% were concealed on two sides, and 12% had no side concealment (Kaiser 1979). In North Dakota, upland sandpipers most commonly nested in areas where grass accounted for $\geq$50% canopy cover and forbs for <50% canopy cover (Bowen and Kruse 1993). Other habitats used for nesting were as follows:

- Those in which forbs accounted for $\geq$50% canopy cover and grass for <50% canopy cover.
- Those in which western snowberry with a grass understory accounted for <50% canopy cover.
- Those in which grass accounted for $\geq$50% canopy cover and forbs for <50% canopy cover.

Habitats in which western snowberry with a grass understory accounted for ≥50% canopy cover were avoided.

Moderate amounts of forbs may be an important component in suitable nesting habitat (Skinner 1975, Renken 1983, Buhnerkempe and Westemeier 1988, Hull et al. 1996, Klute et al. 1997). Upland sandpipers require grasslands of various heights for rearing broods.

Forage

In general, upland sandpipers forage within short vegetation and nest and rear broods within taller vegetation. However, time of day, daily activities, and phase of nesting cycle also influence habitat use (Dorio and Grewe 1979 in DeChant et al. 1998). Upland sandpipers prefer vegetation less than 12 inches (<30 cm) tall for foraging, and make use of a variety of habitats, including heavily grazed pastures, mowed hayfields, fallow and cultivated fields, and burned areas. In Minnesota, both young and adults preferred to feed in vegetation <4 inches (10 cm) high (Dorio 1977, Dorio and Grewe 1979). In Nebraska, upland sandpipers foraged in wheat stubble (Bates 1907).

The acres of grassland habitat (<25% slope) on each of the planning units are as follows:

Planning Unit	Acres of Potential Grassland Habitat
LMNG	730,900
GR/CRNG	145,600
FPNG	106,400
BGNG	530,100
NNF (BRD)	unknown
SRMNF	unknown
TBNG	unknown

The amount of this habitat that is currently suitable for this species on each area is unknown.

Direct and Indirect Effects on NFS Lands

Livestock grazing, burning and mowing can alter the suitability of grassland habitat for nesting, brooding and foraging (Kirsch and Higgins 1976, Ailes 1980, Higgins, et al. 1969).

Grazing

It is difficult to give a general statement on effects of grazing on upland sandpipers. Upland sandpipers use grazed areas for nesting, foraging and brood rearing (Dorio 1977). Nest loss occasionally occurs as a result of trampling by cattle (Buss and Hawkins 1939; Ailes1980; Dorio 1977; Bowen and Kruse 1993). Four studies were designed to determine the effect of grazing on productivity. Messmer (1990) and Sedivec (1994) compared rotational grazing systems, specifically short-duration grazing and twice-over rotation grazing, to season-long grazing and to idle grasslands. Short-duration grazing involves a system of pastures rotated through a grazing schedule of about 1 week grazed and 1 month ungrazed, repeated throughout the season (usually late May or early June until October). Twice-over rotation involves grazing a number of pastures twice per season, with about a 2-month rest in between grazing. Season-long grazing involves leaving cattle on the same pasture all growing season. Bowen and Kruse (1993) and Kirsch and Higgins (1976) examined seasonality and intensity of grazing, respectively. All four studies were conducted in southcentral North Dakota in mixed-grass prairie.

Research by Messmer (1985, 1990) revealed that nest density and nest success were higher with twice-over deferred and season-long grazing systems than on idle pastures, but that average density of breeding sandpipers was highest on the short-duration grazing system. In a continuation of Messmer's study, Sedivec (1994) reported that nest density was significantly higher on grazed than on idle grasslands. Both authors concluded that grazing is compatible with breeding needs of upland sandpipers

Bowen and Kruse (1993) compared nest density between the four grazing practices of autumn grazing, autumn-and-spring grazing, season-long grazing, and spring grazing to non-grazed areas. Nest densities were lower in pastures subjected to grazing during the nesting season (autumn-and-spring grazing, season-long grazing, and spring grazing) than in control fields or fields with autumn grazing. Nest densities did not differ between spring grazing with high stocking density to that of season-long grazing with low stocking density. Nest densities were significantly lower in years after pastures had been subjected to season-long and autumn-and-spring grazing than in the year before grazing treatments occurred (Bowen and Kruse 1993).

Within mixed-grass and tallgrass prairie in South Dakota, nest densities did not differ between idle sites and sites that were grazed in May at a grazing rate that resulted in 20-80% of the current year's growth being removed (Kaiser 1979). Fourteen nests were found within a 650-acre fragment of moderately grazed prairie in South Dakota (Lokemoen and Duebbert 1974 in DeChant et al. 1999). In North Dakota, South Dakota, Montana, and Manitoba, nest success was higher in idle grasslands than in grazed pastures (Kantrud and Higgins 1992).

The following researchers looked only at presence or density of upland sandpipers on grazed areas, but not specifically at productivity. Kantrud (1981) found that upland sandpipers were more attracted to heavily grazed native grasslands in North Dakota than either lightly or moderately grazed, or mowed grasslands, although densities were relatively high in all habitats compared to other bird species. Over a broader range (North Dakota, South Dakota, Montana, Wyoming, Colorado, Nebraska), however, sandpiper densities were highest on moderately grazed typic ustoll soils, and no relationship between density and grazing intensity was found (Kantrud and Kologiski 1982). Upland sandpiper densities were significantly higher in idle and grazed mixed-grass than in tame dense nesting cover (DNC); they also occurred in areas 1 year post-grazing (Renken 1983, Renken and Dinsmore 1987). In Nebraska, upland sandpipers were present on areas grazed by cattle and areas that were both grazed by American bison and burned (Griebel et al. 1998).

In Nebraska, avian diversity and density were higher on grazed than ungrazed areas because of the presence of upland sandpipers; sandpipers were not present on ungrazed areas (Cole and Sharpe 1976).

Bowen and Kruse (1993) found that allowing mixed-grass prairie to remain idle for 2-3 year between grazing treatments was not detrimental to breeding upland sandpipers.

Burning

Prescribed burning is likely to have both beneficial and detrimental impacts on upland sandpiper breeding habitat. In general, habitat burned before the nesting season is not used for nesting that year. Displaced birds may then be forced to nest in less favorable habitat, such as cultivated fields. In subsequent years however, areas previously treated with fire are preferred. In mixed-grass prairie, upland sandpipers were most abundant immediately following a burn and 1 year post-burn, as compared to 2-15 years after the burn (Johnson 1997). In Saskatchewan, upland sandpipers used a burned plot 2-3 years after a burn but were not

observed on an unburned plot (Pylypec 1991).

Kirsch and Higgins (1976) reported that mean nest productivity was lowest on tilled areas (where no nests were observed), higher on grazed and idle areas, and highest on burned areas. The highest nest density of 6.8 nests / 100.1 acres (40.5 ha) was on a grassland burned 2 years previously. Upland sandpipers used a burned native pasture in South Dakota significantly more than an unburned pasture (Huber and Steuter 1984).

Mowing

Upland sandpipers occurred at higher densities in hayland than pasture and wet prairie in Wisconsin, although differences in densities were not statistically significant (DeChant et al. 1999). However, mowing may cause nest failure: three destroyed nests were found in a Nebraska alfalfa field following mowing (Ducey and Miller 1980). In North Dakota, upland sandpipers used previously idled areas only after mowing (Messmer 1990). Upland sandpipers were located in annually mowed native prairie in Iowa (Kendeigh 1941).

Cumulative Effects

In addition to livestock grazing, mowing, and haying, continued conversion of rangeland to croplands could be expected to occur on private lands throughout Wyoming, the Dakotas, and Nebraska (Ostlie et al. 1997, USDA Forest Service 2000). Prescribed fire will be minimal on those lands.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

Key to management is providing grasslands of various heights with few shrubs. Upland Sandpipers require short vegetation for foraging, taller vegetation for nesting, and short to medium vegetation for brood cover. The U.S. Geological Survey (Dechant et al. 1999) made several management recommendations relevant to the planning units:

- Maintain large (>250 acres), contiguous tracts of prairie to reduce edge, provide habitat heterogeneity, and to decrease nest depredation (Herkert 1994). Blocks should be within 1 mile (1.6 km) of each other and be contiguous with grassy habitats (e.g., pasture, hayfields).
- Maintain native prairie by implementing burning, grazing, or haying treatments, or leaving idle, every 2-3 year (Kaiser 1979, Kantrud 1981). In North Dakota, spring-burning at 3 year intervals provided habitat conditions needed by upland sandpipers for nesting; grazing did to a lesser extent, but was more compatible than cropland or seeding tame grasses (Kirsch and Higgins 1976).
- Allow some blocks of grassland to be undisturbed to serve as nesting cover (Lindmeier 1960, Bowen and Kruse 1993).

Conservation Measures and Mitigation, cont.

- Avoid burning, mowing, or plowing during the nesting season (Buss and Hawkins 1939, Lokemoen and Beiser 1997). Mowing of nesting and brooding habitat should be delayed until 1 July or later (Buhnerkempe and Westemeier 1988).
- Provide display perches, such as fence posts, rock piles, or tree stumps (White 1983).
- Prevent encroachment of woody vegetation.
- A complex of fields of different management practices may be necessary to meet upland sandpiper needs during the breeding season. Grazed, burned, and hayed fields provide suitable habitat for feeding, loafing, and brood rearing, but undisturbed fields are needed for nesting (Bowen and Kruse 1993). Provide a mosaic of habitat types, such as grassland of various heights and densities as well as cropland, to provide for the needs of upland sandpiper throughout the breeding season (Bolster 1990 in Dechant et al. 1999).
- Annually burn 20-30% of grassland fragments <198 acres (80 ha) (Herkert 1994). Small fragments should have <50% of their area burned at a time, and, if next to other fragments, should be burned in a rotating manner that allows unburned fragments to be next to burned fragments. Burns should occur from March to early April or October to November.
- Graze at moderate levels to provide diverse grass heights and densities (Skinner 1975).
- Graze using a rotational system of two or more grazing units to increase grass heights and densities within and among units.
- Avoid season-long grazing; where grazing is necessary, delay grazing until mid- to late June to maintain nest densities (Bowen and Kruse 1993, Sedivec 1994). Choose rotational grazing over season-long grazing to provide more undisturbed cover during the nesting season by deferring two or more pastures until mid- to late June (Sedivec 1994). With rotational grazing systems, delay grazing until late May to early June to benefit nesting sandpipers as well as to optimize calf performance. Follow stocking rates as outlined by the U.S. Soil Conservation Service (1984); rates may be slightly higher for rotational grazing (Sedivec 1994).
- Moderate grazing may provide suitable habitat in both native and tame grasses, but more research needs to be done.

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

All Planning Units

- Modify livestock grazing practices as needed to reduce adverse impacts of drought to food and cover for prairie grouse and other wildlife (Standard).
- Delay mowing of grasslands until July 15 or later to protect ground-nesting birds, including their nests and young broods (Guideline).
- Manage for high structure habitat in large blocks to provide habitat for waterfowl, prairie grouse, and other ground-nesting birds (Guideline).

- Design and implement range management strategies for meeting desired vegetation objectives using existing monitoring information and suggested stocking rates (Appendix I) (Standard).
- Delay livestock turn-on dates until June 15 or later in areas grazed in the previous grazing season to provide quality nesting cover for upland game birds (Guideline).
- Manage for native forb abundance and diversity to provide foraging habitat for big game, grassland birds, and other grassland wildlife. Guideline

FPNG, BGNG, ONG, NNF (PRRD), NNF (BRD), SRMNF, TBNG

- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

All Planning Units

- Objectives call for specified levels of ungrazed habitat and a more diverse grassland vegetation mosaic through desired levels of rest, seral stages and vegetation structure (see tables in Section 5).
- Objectives are established for prescribe burning.

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

FPNG, BGNG, ONG, NNF (PRRD), NNF (BRD), SRMNF, TBNG

- Continue monitoring populations and habitat.

All Planning Units

- Monitor the effectiveness of the suggested stocking rates in Appendix I in meeting desired vegetation composition and grassland structure levels.

Appendices

All Planning Units

- Appendix I provides suggested stocking rates for livestock grazing to provide quality habitat for management indicator species and other wildlife. This appendix is referenced by a standard under geographic area direction (Chapter 2) to use this appendix to help develop and implement range management practices for meeting vegetation objectives.

Biological Determinations, Risk Assessments, and Rationale

FPNG, BGNG, ONG, NNF (PRRD), NNF (BRD), SRMNF, TBNG

Upland sandpipers will be affected by livestock grazing and prescribed burning. Both of these activities are compatible with this species, as long as resulting vegetation and litter remain in suitable amounts. Because of the new direction on increasing prescribed burns, adding rest pastures, and increasing vegetative structural diversity and composition, overall habitat quality is expected to increase as a result of implementing Alternative 3. Therefore, the biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide".

Outcome I is selected as the risk assessments for this species on each planning unit. Habitat is well distributed and of sufficient quality to maintain the species' presence. The upland sandpiper has excellent dispersal capabilities, and no active population management in terms of reintroductions or transplants is necessary.

Loggerhead Shrike (*Lanius ludovicianus*)

Species Description

The loggerhead shrike is slightly smaller than the American robin; total length averages about 9 inches (23 cm). The loggerhead shrike has a stout, hooked, all-dark bill, bluish-gray head and back, white underparts, a broad black mask extending above the eyes, a gray to whitish rump, a black tail with white tip, and large white patches in the black wings.

In the planning area, the loggerhead shrike's breeding season begins in April. It builds a bulky nest of coarse twigs in a small tree or large shrub. Clutch size usually averages 4-5 eggs. Incubation lasts 14-16 days. The male feeds the female during incubation. Young are tended by both adults, fledge in about 17-21 days, and are independent in 40-45 days (Baicich and Harrison 1997).

The loggerhead shrike feeds primarily on large insects (especially crickets, beetles and grasshoppers), but also preys on other invertebrates, small birds, lizards, frogs, and rodents (Fraser and Luukkonen 1986, Gillihan and Hutchings 2000). Its diet varies with season and location; in parts of the range, most of the food eaten in winter may be vertebrates. The species captures prey usually via a short flight from a perch; sometimes hovers kestrel-like or walks when foraging (Luukkonen 1987). The loggerhead shrike sometimes impales food items on a plant thorn or on barbed wire (Fraser and Luukkonen 1986); such items may be eaten later or fed to young (Applegate 1977).

Distribution and Status

Distribution

Loggerhead shrikes breed from Washington, northern Alberta, central Saskatchewan, and southern Manitoba, south to California and Florida, and east to southwestern Minnesota, southern Wisconsin, southern Michigan, and Maryland (National Geographic Society 1987). They winter in the southern half of their breeding range, south to the Gulf Coast, southern Florida, and into Mexico (NatureServe 2000).

Loggerhead shrikes return from their wintering grounds from mid-February to early May. Fall migration stretches from about August to late October, with some stragglers leaving the breeding grounds in November (Stewart 1975, Janssen 1987, Yosef 1996).

Table H-6 summarizes species occurrence and status in the planning area. The species is known to occur on all planning units.

Status

Although the loggerhead shrike is still widespread and common in some areas, it has been declining throughout North America since the 1960s, and perhaps earlier. The decline is particularly severe in the northeastern and north-central regions. The species is now extirpated from most of the Northeast, and is nearly extirpated from Minnesota, Wisconsin, and Michigan. Part of the decline can be attributed to reforestation and loss of open habitat and thus represents a return to pre-settlement conditions when shrikes were probably absent from much of the heavily forested northern states. However, the decline has proceeded beyond what can be explained by habitat loss, as much suitable habitat remains unoccupied in most northern states. Further, decline has been recorded in all regions of the country, even those with much open habitat. The decline remains unexplained. Pesticides, loss of wintering habitat quality, and/or dependency on roadside habitat with high predation pressure have been suggested as possible causes.

The loggerhead shrike has declined significantly nearly rangewide (Robbins et al. 1986). A slow decline began in the 1930s and continued until the late 1960s and 1970s when the decline accelerated (Fruth 1988). Breeding Bird Survey (BBS) data for the period 1966-1989 indicate a 55% population decline nationally, 47% in the central states, and 59% in the western states. Since shrike declines began before 1966, these are conservative figures for overall declines during the past century. Christmas Bird Count data for 1961-1978 documented a 22% decline in winter sightings nationwide (Morrison 1981).

Robbins et al. (1986) summarized the BBS data from 1965 to 1979 and gave a more detailed look at the geographic pattern of decline. The loggerhead shrike was one of the few species that showed a significant decrease in all three regions (Eastern, Central, Western). Significant declines were recorded in four out of seven subregions (Southwestern States, Northern Plains States, Canada, and the Southeastern States). Eleven strata widely distributed across the country had significant decreases, and none had increases in shrikes counted. Of the states, only South Dakota showed a significant increase, while the following states and provinces had large enough samples to show significant declines: Nevada, Texas, Oklahoma, Kansas, North Dakota, Saskatchewan, Ontario, Iowa, Missouri, Arkansas, Mississippi, Tennessee, Kentucky, Georgia, North Carolina, and Virginia. As of 1979, the largest populations were on the Florida Peninsula, in New Mexico, and in Oklahoma (Robbins et al. 1986) (but outlook for survival in southwestern Oklahoma is not good--Tyler 1992).

The Commission for Environmental Cooperation (2000) provides additional detailed information on the status of this species across its range.

Organization Rankings

Loggerhead shrikes have a global conservation rank of G5 and are classified as a sensitive species by Regions 1 and 2 of the Forest Service. The Committee on Environmental Cooperation, established under the North American Free Trade Act, has identified the loggerhead shrike as a priority grassland species for conservation action.

Habitat

Loggerhead shrikes prefer open habitat characterized by grasses and forbs of low stature interspersed with bare ground and shrubs or low trees. Loggerhead shrikes use prairies, pastures, sagebrush desert, and fencerows or shelterbelts of agricultural fields, as well as old orchards, riparian areas, open woodlands, farmsteads, suburban areas, mowed road rights-of-way, abandoned railroad rights-of-way, cemeteries, golf courses, and reclaimed strip mines (Dechant et al. 1998, NatureServe 2000). Scattered shrubs or trees, particularly thick or thorny species, serve as nesting substrates and hunting perches (Porter et al. 1975, 1994, Woods 1995*a*, Yosef 1996). Thorny shrubs or trees also serve as impaling stations. In the upper Midwest, abundance of open habitat, foraging areas, and elevated perch sites were considered the most important factors in habitat suitability (Brooks and Temple 1990*a*).

In Canada, loggerhead shrikes breed in pastures with isolated trees and shrubs, thickets, or hedgerows, and in thorny bushes along railroad rights-of-way. In southeastern Manitoba, willow shrubs growing alone or in clumps and deciduous trees growing in shelterbelts were preferred as nesting sites; these sites contained significantly more pasture, fewer trees, and longer fencerows than randomly selected sites. In southeastern Alberta, breeding habitat had more buffaloberry shrubs, higher percentage of grass $\geq$8 inches (20 cm), and taller mean height of grass and forbs than heavily grazed unoccupied habitat (Prescott and Collister 1993).

Foraging

Loggerhead shrikes usually forage over areas of shorter grass, probably because prey is easier to detect in shorter vegetation. However, in Canada's shortgrass habitat, loggerhead shrikes preferred to forage in tall (> 8 inches) grass of ungrazed areas (Prescott and Collister 1993). In southeastern Alberta, foraging loggerhead shrikes preferred native pasture and pastures of forage crops, avoided cereal crops and native and introduced vegetation within railroad rights-of-way, and used fallow fields in proportion to their availability. However, foraging success was found to be highest in railroad rights-of-way. The tall and dense vegetation in rights-of-way may be important for vertebrate prey during times when arthropod prey is scarce.

Conservation Planning

A conservation strategy has not been prepared for this species. The need for a range-wide comprehensive management plan for the species has been identified by the Committee on Environmental Cooperation (2000).

Direct and Indirect Effects on NFS Lands

Loggerhead shrikes can be affected by livestock grazing, mowing, burning, and pesticides.

Grazing/Mowing

Grazing can provide preferred foraging habitat by shortening vegetation in taller grassland areas, such as might exist on the Sheyenne National Grassland. Trees and shrubs used for nesting and perches can be impacted by cattle grazing and rubbing (Yosef 1996). Loggerhead shrike in Alberta preferred to forage in ungrazed areas, which provided taller ($\geq$8 inches) grass (Prescott and Collister 1993). Light grazing to reduce vegetation height may be beneficial to shrikes in the upper midwest. Moderate haying or grazing in Manitoba may increase loggerhead shrike productivity.

Burning

To maintain loggerhead shrike habitat, burning may be used to provide dense herbaceous cover and prevent woody vegetation from dominating an area, but cautioned against burning too frequently and eliminating all trees and shrubs. Patchily burning late seral big sagebrush and antelope bitterbrush communities may provide the high horizontal and vertical structural diversity preferred by breeding loggerhead shrikes in shrub steppe communities.

Pesticides

Little information is available concerning the effects of pesticides on loggerhead shrike populations breeding in the Great Plains. However, it's suspected that broad-scale grasshopper spraying projects could impact this species.

Cumulative Effects

Loss of grasslands on private lands throughout the planning area and lack of management involving prescribed fire and grazing to promote adequate vegetative structure diversity are likely to continue (Ostlie et al. 1997, USDA Forest Service 2000). Additional threats that may be affecting this species in the planning area and across its range include habitat fragmentation, vehicle collisions, pesticides, increased human disturbance, climate change, and interspecific competition (Commission on Environmental Cooperation 2000).

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement. These agreements are long term and collectively cover virtually all land suitable for grazing which are also the lands suitable for the loggerhead shrike. Consequently, there is little to no land left idle. The extensive area under grazing permits reduces the opportunity to burn large areas, since few areas are available for alternative forage

Conservation Measures and Mitigation

Key to management for the loggerhead shrike is providing grassland with scattered trees and shrubs for foraging, nesting, and perching. The U.S. Geological Survey has developed several management recommendations for the loggerhead shrike (Dechant et al. 1998). Those most relevant to the types of activities outlined in this document are:

- Provide areas that are large enough to support several average-sized territories (about 1-60 acres / territory) of asymmetrical shape (Yosef 1996).
- Maintain low, thick shrubs and trees along fence lines and throughout otherwise open pastures and fields (Kridelbaugh 1982, Yosef 1996).
- In areas with taller vegetation, implement grazing where pastures provide suitably short vegetation for loggerhead shrike foraging. Pastures often are preferred habitat in Missouri (Kridelbaugh 1983), Illinois (Smith and Kruse 1992), and Kansas (Eddleman 1974 in DeChant et al. 1999). However, a few areas of tall grass should be maintained within pastures as they serve as food reserves for small mammals, which are potential loggerhead shrike prey.

Conservation Measures and Mitigation, cont.

- In areas with naturally short vegetation, control grazing and mowing to increase areas of taller grass (≥8 inches) (Prescott and Collister 1993, Yosef 1996). Although loggerhead shrikes prefer to forage in short grass, foraging success may be higher in tall grass areas, where vertebrate prey abundance is higher (Collister 1994 in DeChant et al 1998).
- Maintain herbaceous cover by burning at a frequency that will prevent woody vegetation from dominating the area, but not completely eliminate it. Yosef (1996) suggested that trimming or manual removal of shrubs and trees might be used to manage woody vegetation, in place of herbicides or frequent mowing.
- Use fencing or other methods to protect old shelterbelts and nesting bushes from cattle grazing and rubbing (Yosef 1996). Linear habitats may be improved by manipulating cover density, planting multiple rows of trees in shelterbelts, adding larger blocks of habitat adjacent to strips of woody vegetation, or planting thorny, native vegetation in fencerows (Kridelbaugh 1982).

Gillihan and Hutchings (2000) also provide management recommendations for this species and its habitat.

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

All Planning Units

- Design and implement livestock grazing strategies to provide for thick and brushy understories and multi-story and multi-age structure in riparian habitats, wooded draws, and woody thickets, contingent on local site potential (Guideline).
- Manage livestock grazing to maintain or improve riparian / woody draw areas (Guideline).
- Implement management practices that will move at least 80% of riparian and wooded draw areas toward self-perpetuating tree and shrub regeneration (Objective).
- Conduct actions so that habitats are maintained or improved toward robust stream health (Standard).
- Prohibit control of native insects until an evaluation of impacts to other resources is made (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

All Planning Units

- Objectives call for specified levels of ungrazed habitat and a more diverse grassland vegetation mosaic through desired levels of rest, seral stages and vegetation structure (see tables in Section 5).
- Objectives are established for prescribe burning.

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

All Planning Units

- Monitor populations and habitat.
- Monitor the extent that riparian area vegetation is regenerating.
- Monitor the effectiveness of the suggested stocking rates in Appendix I in meeting desired vegetation composition and grassland structure levels.

Appendices

All Planning Units

- Appendix I provides suggested stocking rates for livestock grazing to provide quality habitat for management indicator species and other wildlife. This appendix is referenced by a standard under geographic area direction (Chapter 2) to use this appendix to help develop and implement range management practices for meeting vegetation objectives.

Biological Determinations, Risk Assessments, and Rationale

All Planning Units

Loggerhead shrikes will be affected by livestock grazing and prescribed burning. Both of these activities, as well as mowing, are compatible with loggerhead shrike, as long as resulting vegetation remains in suitable amounts to support prey populations. Because of the new direction on increasing prescribed burns, protecting woody habitats from livestock grazing, adding rest pastures, and increasing vegetative structural diversity and composition, overall habitat quality is expected to increase as a result of implementing Alternative 3. Therefore, the biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide".

Outcome II is selected as the risk assessment for this species these areas. There are no significant gaps in the species historic distribution, either on the planning units or in the planning area (there are significant gaps in the species' historic range outside the planning area). Habitat quality on the planning units is of sufficient quality and distribution to allow the species to persist.

Baird's Sparrow (*Ammodramus bairdii*)

Species Description

The Baird's sparrow is a small (5 inch long) grassland sparrow, similar in appearance to the savannah sparrow. The Baird's strong buffy coloration of crown and nape however, and much sparser breast streaking distinguish it from the savannah sparrow.

Nesting occurs from late May through mid-August, with some evidence that the species may be double-brooded (Johnson et al. 1998). Baird's sparrows nest on the ground, typically under a grass tuft or low shrub, and lay 3-6 eggs. Incubation lasts about 11 days and is done by the female alone. The young stay in the nest for 8-10 days, fledge at 13 days, and wander at 19 days (Baicich and Harrison 1997).

Brown-headed cowbirds will parasitize Baird's sparrow nests, the incidence of which may be increasing. In the past, anecdotal observations indicated that Baird's sparrows were rare cowbird hosts apparently because nests placed in open grasslands were inconspicuous to female brown-headed cowbirds (Lane 1968). More recent studies in Canada, however, indicated that parasitism rates varied from 0% of 11 nests to 36% of 76 nests (Davis and Sealy 1998).

During the breeding season, Baird's sparrows rely mostly on small insects for food. Grasshoppers and spiders are particularly important as food for nestlings. During winter, their diet consists primarily of seeds.

Distribution and Status

Distribution

Breeding Baird's sparrows are endemic to the northern Great Plains, nesting from southern Alberta to southern Manitoba, and from northern and eastern Montana through western Minnesota (National Geographic Society 1987). Within this range, birds may change their breeding areas, and even the types of habitat preferred, between years in response to environmental conditions. In general, the species is most abundant in the western part of its range when wet cycles produce dense vegetation in the more productive portions of the eastern mixed grass prairie. During droughts, this pattern is reversed. The species winters in southeastern Arizona, southwestern New Mexico, western Texas, and northern Mexico (Goossen et al. 1992). Baird's sparrows may arrive on the breeding grounds as early as late April, with peak arrival occurring in early to mid-May. The species departs its breeding grounds from mid-September to October.

Table H-6 summarizes species occurrence and status in the planning area. Baird's sparrows are known to nest on the Little Missouri and Grand River / Cedar River National Grasslands. During dry years, they may nest on the Sheyenne National Grassland. They are rare migrants on the Fort Pierre and Thunder Basin National Grasslands and may also be present on the Buffalo Gap National Grassland.

Status

Although estimated occurrence and population numbers still appear substantial, conservation concern for Baird's sparrows is high. This is due to the species' restricted range, spotty distribution and habitat selectivity, along with both recent and long-term population and range declines, and the fact that little of the species' range is protected. The decline of the species is related to agricultural impacts (Kantrud 1981), such as heavy grazing and the conversion of habitat to agriculture (Sutter and Brigham 1998)

The North American Breeding Bird Survey (BBS) indicates a non-significant decline for 1966-1996 (-1.6 percent annual change, $P = 0.29$; $n = 115$; Sauer et al. 1997). A significant decline, however, was recorded survey-wide for 1966-1979 (-4.7 percent annual change; $P = 0.02$; $n = 52$). This is added to apparent historical declines of habitat: 80 percent of short-grass and 75 percent

of mixed grass prairie. From 1970-1985, the species declined 35-55 percent in Canadian prairie provinces (De Smet and Miller 1989).

In some areas of North Dakota, the Baird's sparrow was so common historically that it outnumbered all other birds combined (Lane 1968). Since the 1880's, 75 percent of the virgin prairie in North Dakota has been lost, and numbers of Baird's sparrow have been drastically reduced (Stewart 1975).

In 1967, the Baird's sparrow population in North Dakota was estimated at 369,000 pairs (Stewart and Kantrud 1972). However, BBS data indicate a 2.58 percent annual decline from 1966-1990 (Johnson and Schwartz 1993). A recent estimate is 224,700 breeding pairs in North Dakota for 1992-1993 (Johnson and Igl 1995).

Organization Rankings

The Baird's sparrow is classified as a sensitive species in Regions 1 and 2 of the Forest Service and has a global conservation rank of G4. It was petitioned for listing as threatened under the Endangered Species Act in July 1997; listing was found to be not warranted in May 1999 (Federal Register 64:27747-27749). The species is given a ranking of extremely high priority on the 1998 Watch List, and a high priority ranking on the 1996 WatchList (Carter et al. 1996). It is also listed as a "High Priority" species on the North and South Dakota Watch Lists.

Habitat

The Baird's sparrow is a grassland specialist, preferring idle native or idle tame grasslands, and lightly to moderately grazed pastures (Owens and Myers 1973, Stewart 1975, Kantrud and Kologiski 1982, Sutter 1996, Davis and Duncan 1999). They sometimes use planted cover (e.g., Conservation Reserve Program and dense nesting cover), dry wetland basins, wet meadows, and dense stands of grass within hayland and cropland (Lane 1968, Stewart 1975, Renken 1983, Johnson and Schwartz 1993, Davis et al. 1996). General habitat requirements include moderately deep litter and vegetation height of >8 inches (20 cm) (De Smet and Conrad 1991 in DeChant et al. 1998). Areas with dense shrub patches are avoided.

Native prairie traditionally is regarded as optimal breeding habitat. Some studies have shown that Baird's sparrows exhibit a preference for native grasses (Winter 1994, Madden 1996). However, some studies in Canada have found no preference between native and tame grasslands and suggest that Baird's sparrows respond more strongly to vegetative structure than to species composition (Anstey et al. 1995, Davis et al. 1996). Tame stands of smooth brome and other broad-leaved grasses may be avoided, while stands of tame, narrow-leaved grasses (e.g., crested wheatgrass) are readily used (Dale 1992, Anstey et al. 1995, Madden 1996).

Within grazed mixed-grass areas in North Dakota, abundance of Baird's sparrows was positively associated with percent club moss cover and plant communities dominated solely by native grass (*Stipa, Bouteloua, Koeleria,* and *Schizachyrium*) (Schneider 1998). Abundance was negatively associated with percent grass cover, litter depth, visual obstruction (vegetation height / density), vegetation density, density of low-growing shrubs (western snowberry and silverberry), plant communities dominated by Kentucky bluegrass and native grass, and plant communities dominated by wet-meadow vegetation. Strongest vegetation predictors of the presence of Baird's sparrows were increasing clubmoss cover, decreasing bare ground, and decreasing litter depth.

The acres of grassland habitat (<25% slope) on each of the planning units are as follows:

Planning Unit	Acres of Potential Grassland Habitat
LMNG	730,900
GR/CRNG	145,600
FPNG	106,400
BGNG	530,100
ONG	83,839
NNF (BRD)	unknown
SRMNF	unknown
TBNG	unknown

The amount of this habitat that is currently suitable for this species on each area is unknown.

Conservation Planning

Goossen et al. (1992) prepared a Recovery Plan for the species in Canada. The USDI Fish and Wildlife Service (Jones and Green 1998) prepared a status assessment and conservation plan for Baird's sparrow.

Direct and Indirect Effects on NFS Lands

Baird's sparrow habitat is most likely to be affected by livestock grazing, burning, and mowing. In order to remain suitable for Baird's sparrows, grasslands need periodic disturbances such as these; the optimal frequency of which varies regionally and by vegetative composition (Renken 1983, Dale et al. 1997). Generally, long-term idled habitats with thick vegetation and dense litter are avoided by Baird's sparrows (Renken 1983, Johnson and Schwartz 1993, Hartley 1994, Winter 1994, Madden 1996). However, in drier portions of the species' range, such as the Little Missouri National Grassland, idle grasslands with moderate litter and minimal shrub cover can support high densities of breeding Baird's sparrows (Owens and Myres 1973, Renken 1983, Dale et al. 1997).

Grazing

Heavy or continuous grazing that reduces residual vegetation and litter is detrimental in both moist and dry parts of the species' breeding range (Owens and Myres 1973, Kantrud 1981, Anstey et al. 1995). Grazing systems that provide range in good (moderate vegetative and litter cover) condition provide suitable habitat (Anstey et al. 1995).

Rotational grazing systems in North Dakota seem to support higher numbers of Baird's sparrow than other (e.g., continuously grazed, short-duration) grazing systems (Messmer 1990). However, in Alberta, Baird's sparrow frequency of occurrence did not significantly differ between four grazing treatments: early-season tame (grazed from late April to mid-June), early-season native (grazed in early summer), deferred-grazed native (grazed after 15 July), and continuously grazed native (Prescott and Wagner 1996).

In denser, taller habitats (such as moist mixed-grass prairie), or during wet years, light to moderate grazing can improve habitat by providing shorter, sparser vegetation (Kantrud 1981, Renken 1983, Messmer 1990, Anstey et al. 1995).

Burning

Prescribed burns can improve Baird's sparrow habitat by reducing excess litter, decreasing shrub encroachment, and maintaining native grass communities. Baird's sparrows typically experience population declines during the first growing season post-fire (Pylypec 1991, Madden 1996, Johnson 1997), with populations recovering to or exceeding pre-fire levels in 1-5 year (Pylypec 1991, Winter 1994, Madden 1996, Johnson 1997). In North Dakota, Baird's sparrow densities were highest on areas burned four times during the previous 24 years (four-burn), compared to areas left idle (zero-burn) or burned twice during the same period (two-burn) (Winter 1999). They were absent from zero-burn areas and had lower numbers and larger territories in two-burn areas than in four-burn areas. Within four-burn areas, Baird's sparrows were absent from areas where there was no litter. Density of Baird's sparrows in two- and four-burn plots was positively related to maximum and mean vegetation height.

Mowing

Effects of mowing on Baird's sparrows depend on the timing, frequency, vegetation type (native vs. exotic), and amount of cover removed. Native hayland seems to be preferred to tame hayland (Kantrud 1981, De Smet and Conrad 1991 (in DeChant et al. 1998). Native hayland may be preferable to tame hayland because native grasslands usually are cut later in the season, and often only the densest portions of the field are cut, leaving some areas uncut each year. Baird's sparrows used hayland at least as often as pasture in North Dakota, Manitoba, and Saskatchewan (Kantrud 1981, Davis et al. 1996).

Cumulative Effects

Continued conversion of rangeland to croplands can be expected to occur on private lands across the planning area (Ostlie et al. 1997, USDA Forest Service 2000), with those occurring in North Dakota being especially relevent to the viability of Baird's sparrow. The absence of prescribed fire on private land is likely to continue, thereby reducing long-term nesting habitat quality for Baird's sparrow. Suitable idle grassland on private land is also uncommon.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement. These agreements are long term and collectively cover virtually all lands suitable for grazing and for Baird's sparrow. Consequently, there is little or no land left idle. The extensive area under livestock grazing permits limits the opportunity for burning large areas because of the lack of alternative forage areas.

Conservation Measures and Mitigation

Keys to management are providing areas of native or tame grassland with moderately deep litter, controlling excessive grazing, and curtailing shrub encroachment. The U.S. Geological Survey (1998) developed several management recommendations for the conservation of the species. Those most relevant to the management practices proposed in this document are:

- Timing and type of management must be adjusted according to local and regional differences (soil types, climate, vegetation types) and annual precipitation (Madden 1996).

Conservation Measures and Mitigation, cont.

- Protect native grasslands that support breeding populations of Baird's sparrows, and establish additional suitable grasslands where possible (Winter 1994, Anstey et al. 1995). Protect both wet and dry habitats (e.g., wet meadows and mesic grasslands). Even if not used every year, these habitats may be essential as alternative breeding sites during drought or wet periods (Johnson 1996).
- Prevent encroachment of woody vegetation. Prescribed burning, mowing, and grazing can be used to maintain the early successional stage preferred by Baird's sparrows, including moderate litter and low shrub cover (Berkey et al. 1993, Winter 1994, Madden 1996, Johnson 1997).
- Encourage vegetative diversity within grasslands; scattered forbs, a mixture of grass heights, and patches of litter-covered ground are important to Baird's sparrows (Winter 1994).
- Provide large tracts of grassland, with at least enough area to support multiple Baird's sparrow territories (Berkey et al. 1993, Winter 1994). Large areas also may decrease rates of nest depredation and brown-headed cowbird parasitism (Johnson and Temple 1990, Davis and Sealy 1998).
- Burn large areas on a rotational basis, burning portions of the total area each year; burn small areas periodically (Renken 1983, Renken and Dinsmore 1987, Johnson 1997). Ensure that adjacent areas are burned in different years to create a variety of successional stages (Madden 1996, Johnson 1997). Treat small, isolated areas as part of a larger mosaic, ensuring a variety of successional stages (Renken 1983, Renken and Dinsmore 1987, Madden 1996, Johnson 1997). Use treatment intervals that approximate the historic fire return intervals for the region (i.e., 3-4 year intervals in tallgrass prairie, 4 year in sandhill prairie, 6 year in northern mixed-grass prairie, 5-10 year in shortgrass prairie, and up to 25 years in dry, western mixed-grass prairie) (Madden 1996).
- Whereas use of prescribed burns may be necessary to sustain Baird's sparrow populations in the eastern part of its range in the mixed-grass prairie, exercise caution in use of burning in the western portion of the breeding range where burning may not be necessary (Winter 1999).
- Delay mowing of hayfields until mid-July or August, which would allow many birds to raise at least one brood in years with normal breeding phenology; mowing should be delayed further if nesting is delayed by inclement spring weather (Dale et al. 1997). When mowing must be done during the breeding season, divide large fields, mowing only half each year, or mow individual fields every other year to provide refuge for fledglings (Dale et al. 1997).
- Prevent overgrazing in pastures utilized by Baird's sparrows. Graze using a deferred rotational system to ensure that only part of the range is grazed during the growing season (Messmer, 1990, Berkey et al. 1993). Use a complementary system when grazing cannot be restricted to winter, i.e., graze seeded range during the growing season, and native grasses in fall or winter. Grazing tame pastures in spring allows native pastures to be deferred, which improves habitat in the native pastures for Baird's sparrows (Prescott and Wagner 1996).

- When re-seeding public lands, or private pasture and haylands, use native grasses where possible to benefit grassland birds (Berkey et al. 1993, Dale et al. 1997).

Gillihan and Hutchings (2000) also provide management recommendations for this species and its habitat.

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

LMNG, GR/CRNG, SNG, FPNG, TBNG

- Modify livestock grazing practices as needed to reduce adverse impacts of drought to food and cover for prairie grouse and other wildlife (Standard).
- Delay mowing of grasslands until July 15 or later to protect ground-nesting birds, including their nests and young broods (Guideline).
- Manage for native forb abundance and diversity to provide foraging habitat for big game, grassland birds, and other grassland wildlife (Guideline).
- Manage for high structure habitat in large blocks to provide habitat for waterfowl, prairie grouse, and other ground-nesting birds (Guideline).
- Where technically and economically feasible, use genetically local native plant species in revegetation efforts (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

LMNG, GR/CRNG, SNG, FPNG, TBNG

- Objectives call for specified levels of ungrazed habitat and a more diverse grassland vegetation mosaic through desired levels of rest, seral stages and vegetation structure (see tables in Section 5).
- Objectives are established for prescribe burning.

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

LMNG, GR/CRNG, SNG, FPNG, TBNG

- Monitor populations and habitat.
- Monitor the effectiveness of the suggested stocking rates in Appendix I in meeting desired vegetation composition and grassland structure levels.

Appendices

LMNG, GR/CRNG, SNG, FPNG, TBNG

- Appendix I provides suggested stocking rates for livestock grazing to provide quality habitat for management indicator species and other wildlife. This appendix is referenced by a standard under geographic area direction (Chapter 2) to use this appendix to help develop and implement range management practices for meeting vegetation objectives.

Biological Determinations, Risk Assessments, and Rationale

LMNG, GR/CRNG, SNG, FPNG, TBNG

Baird's sparrows will be affected by livestock grazing, mowing, and prescribed burning. These activities are compatible with this species, as long as resulting vegetation and litter remain in suitable amounts. Because of the new direction on increasing prescribed burning, adding rest pastures, and increasing grassland structural diversity and composition, overall habitat quality is expected to increase as a result of implementing Alternative 3. Therefore, the biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." It's important to point out that the Little Missouri National Grassland is the largest tract of public land within the core breeding range of Baird's sparrow and will play a leading role in the species' conservation.

Outcome II is the selected risk assessments for this species on the Grand River, Cedar River, and Little Missouri National Grasslands, where the core breeding area overlaps these areas. A risk assessment was not completed for this species for the Thunder Basin and Fort Pierre National Grasslands where the species is an uncommon migrant through the area. It is acknowledged that some breeding may occur by this species on these areas but at an extremely low frequency.

SNG, FPNG

Determination is "no impact." The species presence on these national grasslands has not been confirmed and documented. However, management direction is provided for this species and potential habitat on these areas.

Fox Sparrow (*Passerella iliaca*)

Species Description

Fox sparrows are relatively large for a sparrow, being about 7 inches long. Their overall color ranges from gray to red to almost black, with all forms have the same general pattern of a monochromatic dorsum, and heavily streaked ventrum. This species is known for its complicated taxonomy. More than a dozen races have been described, with some researchers recommending that the fox sparrow be split into 3 or 4 separate species (Rising 1996). The status of the various subspecies in the planning area is unknown, but the bulk are attributable to the "red fox-sparrow" group in Nebraska and the Dakotas, and either the red or "slate-colored sparrow" group in Wyoming (Rising 1996).

The nesting season for fox sparrows is early April through early July. They build a bulky nest of twigs and grass, and place it in a low shrub or on the ground. Usually 3-5 eggs are laid, hatching in 12-14 days. The young fledge 9-10 days of age. Nest parasitism by brown-headed cowbirds is rare (Rising 1996).

Seeds form the bulk of the fox sparrows diet, although insects and other invertebrates are important food for nestlings.

Distribution and Status

Fox sparrows are widespread in North America, breeding from the Aleutians to Labrador, south through much of Canada, and extending into the Central Rocky Mountains. Wintering birds are found throughout much of the southern United States.

In the planning area, the fox sparrow is an uncommon to rare migrant. It is a very rare to irregular winter visitor. It does not nest in the planning area. During migration (typically April / early May and late September / October), the fox sparrow might be found in suitable habitat on any of the units, though it is most likely to be present on those with heavier forest cover, such as the Sheyenne National Grassland and portions of the Nebraska National Forest. Wintering in the planning area occurs in heavily forested areas, with the majority of birds being found in urban areas, many of them at bird feeders.

Table H-6 summarizes species occurrence and status in the planning area.

Organization Rankings

The fox sparrow is classified as a sensitive species in Region 2 of the Forest Service. It has been assigned a rank of G5 by the International Network of Natural Heritage programs and Conservation Data Centeres. A G5 rank is for taxa that have been demonstrated to be widespread, abundant, and secure globally.

Habitat

Fox sparrows use a variety of wooded habitats, particularly in migration. The most important habitat requirement seems to the presence of dense shrubby undergrowth (DeGraaf et al. 1991).

Conservation Planning

Statewide or regional habitat conservation strategies have not been prepared for this species.

Direct and Indirect Effects on NFS Lands

The most significant threat to habitat used during migration through the planning area is the potential for livestock grazing to degrade riparian or upland thickets.

Cumulative Effects

Impacts to fox sparrow migration habitats also occur on non-National Forest System lands in the planning area, and are largely due to grazing, agricultural development, dam construction, road construction, and urban sprawl (Ostlie et al. 1997, USDA Forest Service 2000).

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

All Planning Units

- Manage for native forb abundance and diversity to provide foraging habitat for big game, grassland birds, and other grassland wildlife. (Guideline)
- Design and implement livestock grazing strategies to provide for thick and brushy understories and multi-story and multi-age structure in riparian habitats, wooded draws, and woody thickets, contingent on local site potential. (Guideline)
- Manage livestock grazing to maintain or improve riparian / woody draw areas. (Guideline)
- Implement management practices that will move at least 80% of riparian and wooded draw areas toward self-perpetuating tree and shrub regeneration (Objective).
- Conduct actions so that habitats are maintained or improved toward robust stream health (Standard).

Geographic Area Direction (Chapter 2)

All Planning Units

- Objectives call for specified levels of ungrazed habitat and a more diverse grassland vegetation mosaic through desired levels of rest, seral stages and vegetation structure (see tables in Section 5).
- Objectives are established for prescribe burning.

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

All Planning Units

- Monitor populations and habitat.
- Monitor the extent that riparian area vegetation is regenerating.

Biological Determinations, Risk Assessments, and Rationale

FPNG, BGNG, ONG, NNF (PRRD), NNF (BRD), SRMNF, TBNG

The biological determination is “no impact.” The occurrence of this species on these planning units has not been confirmed and documented. However, management direction is provided for this species and potential habitat on these areas. If their occurrence was confirmed, the

biological determination would be "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." Management activities on these planning units have minimal potential to affect fox sparrows as they migrate through these areas. Fox sparrows are also adaptable to a variety of habitats and habitat conditions. It's acknowledged that the condition of the understories and midstories of riparian areas, wooded draws and upland shrub thickets could influence use by this species, and management direction is provided to promote regeneration of shrubs.

A risk assessment was not conducted for this species due to its incidental, rare and transient nature on these planning units.

LMNG, GR/CRNG, SNG

Biological determinations are not made for this species on these areas since it is not listed as sensitive by Region 1 of the Forest Service. The conservation measures listed above are expected to enhance its habitat and/or protect the species and its habitat from possible adverse effects of Forest Service authorized activities and allocations.

Trumpeter Swan (*Cygnus buccinator*)

Bellrose (1978), Mitchell (1994), Biodiversity Legal Foundation (2000), and USDA Forest Service (1975 and 1995) were primary references consulted for this evaluation. Information on the NatureServe website for this species was also consulted. Harold Burgess from the Trumpeter Swan Society and retired U.S. Fish and Wildlife Service refuge manager and biologist graciously shared his lifetime of experience, knowledge, and unpublished data on the trumpeter swan.

Species Description

This is the largest species of North American waterfowl with wing spans and weight up to 8 feet and 30 pounds, respectively. It is one of two swan species native to this continent and is similar in appearance but larger than the tundra (whistling) swan. Fossils of the trumpeter swan date back to the Pleistocene. Generally, trumpeter swans in the northern Great Plains, considered part of the "Interior" population, do not migrate outside the region but instead remain yearlong in the vicinity of the LaCreek National Wildlife Refuge along the border of South Dakota and Nebraska or move only short distances to nest or winter. However, some movements outside this region by marked swans have been documented (Harold Burgess, unpublished data). The swan population in the northern plains and sandhills of Nebraska and South Dakota is now estimated to exceed 480 swans (Burgess, personal comm.).

Breeding pairs remain together year-round, and most swans do not nest until 4 years of age. Nest-building usually begins in late April to early May, sometimes before ice-melt. Both sexes may incubate. Clutch size is usually 5 to 7 eggs and 2 to 3 young per nest commonly survive to flight stage. Population growth for this species is slow because of delayed maturation (3 to 4 years), single annual brood, highly variable production and high winter mortality. Flooding of nests periodically occurs (Burgess 2000). Swans do not re-nest if their nest, eggs, or cygnets are destroyed.

Adult trumpeter swans require as much as 20 pounds of forage daily of submerged and emergent vegetation (Burgess 2000). Cygnets require high quality food with lots of protein, and in southwestern South Dakota, trumpeters with young seek out wetlands where alkali shrimp are plentiful.

Distribution and Status

With the exception of the Nebraska sandhills, the northern Great Plains planning area was of minor importance historically as breeding range for the trumpeter swan. However, it was important to migrating and wintering swans. The last historical observation of migrating swans in this area was in 1956 when a family of five swans was shot in northern Nebraska (U.S. Forest Service 1975).

Table H-6 summarizes the species occurrence in the planning area. Trumpeter swans nest on constructed ponds on and near the Buffalo Gap National Grassland and some winter on the Snake River just south of the Samuel R. McKelvie National Forest. Records of a nesting pair on Weta Pond on the Buffalo Gap National Grassland date back to 1964, and this pond continues to be used by nesting swans. Weta Pond is now cooperatively managed by the Forest Service and Ducks Unlimited as wetlands and waterfowl habitat. Swan pairs have also nested on at least 3 other ponds on private lands within the boundary of the Buffalo Gap National Grassland. It is unknown if trumpeter swans periodically utilize the ponds and wetlands habitats on the Samuel R. McKelvie National Forest. Although swans have been observed on Whitney Reservoir, none have been observed on the nearby Oglala National Grassland. The Oglala National Grassland has several ponds, including Meng Dam, that appear to be suitable habitat for nesting swans. Although trumpeter swans have also been observed on ponds near Upton and Oshoto, Wyoming, none have been observed on the nearby Thunder Basin National Grassland, and it's unlikely that suitable nesting habitat occurs on the national grassland.

Organization Rankings

TNC / NHP G4; FS Sensitive (R2)

This species was taken off the endangered species list in 1968.

Habitat

Trumpeter swans use constructed ponds on the Buffalo Gap National Grassland for nesting, brooding, foraging and loafing. They use the larger and shallower (< 4 feet) ponds and require large amounts of emergent cover (bulrush, cat-tail) through the nesting and brooding seasons. To facilitate flight from wetlands, swans need a low and clear flight path of at least 300 feet. Presence of muskrats usually indicates suitable swan habitat. They like to nest on islands or muskrat houses but will nest on shorelines if well concealed by emergent vegetation.

Arrowhead and smartweed are important foraging species during the summer along with alkali shrimp during brooding.

Conservation Planning

A conservation strategy has not been prepared for this species

Direct and Indirect Effects on NFS Lands

Livestock grazing that removes or reduces emergent vegetation around natural or constructed wetlands reduces or eliminates suitability for nesting.

Although nearby vehicle traffic seems to be tolerated, disturbance by people outside vehicles could discourage swan nesting or cause nest abandonment (Joslin and Youmans 1999).

Cumulative Effects

The effects listed above are likely occurring on adjoining lands in the planning area and in the vicinity of the individual planning units. Although there has been some drainage of wetlands on private lands in the western portion of the Nebraska sandhills, it is believed that destruction of natural wetlands has not significantly reduced potential nesting habitat for this species in this area. In fact, the nesting habitat on and near the Buffalo Gap National Grassland consists of constructed wetlands.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in the revised LRMPs (Alternative 3):

Unit-wide Direction (Chapter 1)

BGNG

- Design new water impoundments to provide new recreational fisheries and/or waterfowl and wetlands habitat (Guideline).
- Design and implement livestock grazing strategies to provide well-developed emergent vegetation on 30 to 50% of the wetlands (Guideline).
- In the water influence zone of wetlands, allow only those actions that maintain or improve long-term health (Standard).
- Locate new facilities outside wetland areas (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

- None

Management Area Direction (Chapter 3)

BGNG (MA 3.64)

- Approximately 1,160 acres including Weta Pond (nesting habitat) and Kadoka Lake (potential nesting habitat) is allocated to MA 3.64 that emphasizes management for wetlands and waterfowl.

Monitoring Direction (Chapter 4)

BGNG

- Continue monitoring populations and habitats.

Biological Determinations, Risk Assessments, and Rationale

BGNG

The biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." The rationale for the biological determination is that the MA 3.64 allocation under Alternative 3 gives the existing nesting habitat (Weta Pond) and nearby potential nesting habitat (Kadoka Lake) additional protection. There's also additional direction to maintain well-developed emergent vegetation on many wetlands. Both of these areas are already managed cooperatively with Ducks Unlimited as wetlands and waterfowl habitat and have well-developed emergent zones.

Since this area is expansion habitat rather than historic breeding habitat, the risk assessment criteria are inappropriate, and a risk assessment was not done for this species. However, the management direction is still in place and this species remains a high priority for monitoring by the Forest Service and the U.S. Fish and Wildlife Service.

Black Tern (*Chlidonias niger*)

Species Description

The black tern is a small, light-bodied tern typically seen foraging in groups. In breeding plumage, the upper surface of the wings and slightly forked tail are dark gray, while the wing and tail undersides are whitish. The head, neck, breast, and belly are black. Juveniles and winter birds are dark gray on the upper surface, and whitish below, with a dark ear patch being the most distinctive feature.

In mid-May to early June, this species builds its nests on floating vegetation mats, old muskrat houses, old coot or grebe nests, floating driftwood, or on firm ground among marsh vegetation (Dunn and Agro 1995). Reproductive success is highly variable with adaptations to marsh nesting that includes re-nesting, low site tenacity and eggs suited to damp conditions. A typical clutch has 3 eggs, which are incubated by both parents for 20-22 days. The young remain on the nest for about 2 weeks, start to fly when they are approximately 3 weeks old, and are fully fledged by 4 weeks of age (Baicich and Harrison 1997).

Black terns feed primarily on insects, though some amphibians and small fish are also taken.

Distribution and Status

Black terns are widespread throughout the temperate areas of North America and Eurasia. In North America, black terns nest at prairie wetlands in southern Canada, and at prairie wetlands, taiga bogs, and marshes throughout most of the northcentral, central and western United States. Black terns leave Canada and the United States for winter.

Table H-6 summarizes species occurrence and status in the planning area. The black tern might occur as a migrant on any of the units except the Nebraska National Forest (Pine Ridge Ranger District). It is known to nest on the Sheyenne National Grassland, where it is typically present, late May through early September.

The black tern is relatively abundant, but declining rapidly (NatureServe 2000). Breeding Bird Survey (BBS) data, show an annual decline of 5.6% per year, for the period 1966-1989 (NatureServe 2000). Significant declines were noted in North Dakota, while sample sizes elsewhere in the planning area were insufficient (NatureServe 2000). The most likely causes of these declines are loss of marsh habitat, human disturbance at nesting sites, pesticide use, and problems along the migration route or in the winter range (NatureServe 2000, Dunn and Agro 1995)).

Organization Rankings

The black tern is classified as sensitive in Region 2 of the Forest Service. It has been assigned a G4 rank by the International Network of Natural Heritage programs and Conservation Data Centeres. A G4 rank is for taxa that are "apparently secure, uncommon but not rare, and usually widespread; possible cause for long-term concern". The black tern's rankings in the United States are similar (i.e. N4B). It was listed as a "moderate priority species" on the 1996 Partners in Flight Watchlist (Carter et al. 1996).

Habitat

Black terns are wetland obligates. During the breeding season, black terns in the planning area use relatively large marshes or marsh complexes (>50 acres) that contain extensive emergent vegetation adjacent to areas of open water (Dunn and Agro 1995). Smallest marsh reported to be used was approximately 13 acres. Suitable sites might be natural ponds, lakes, shallow river impoundments, or even stock ponds (Stewart 1975). They frequently nest on muskrat houses (Oakleaf et al. 1996). Nest success fluctuates widely from year to year, depending on weather and water levels. During migration, a variety of wetlands types, including rivers, lakes, reservoirs, and seacoasts are used.

The number and total acreage of the larger natural and constructed wetlands with open water on each of the planning units as determined by the National Wetlands Inventory are as follows:

Planning Unit	Greater Than 13 Acres	
	Number	Acres
LMNG	0	0
SNG	0	0
GR/CRNG	3	136
FPNG	1	16
BGNG	4	281
ONG	2	124
NNF(PPRD)	0	0
NNF (BRD)	0	0
SRMNF	1	292
TBNG	Not Available	

The data in the above table for the Samuel R. McKelvie National Forest does not include the large wetlands complexes associated with those portions of Merritt Reservoir located on the national forest.

Conservation Planning

The U.S. Fish and Wildlife Service (2000) prepared a status assessment and conservation plan for black tern.

Direct and Indirect Effects on NFS Lands

Livestock grazing could reduce the emergent vegetation around wetlands.

Lack of emergent vegetation management in some wetlands could result in the loss of open water habitat. Fire and livestock grazing can be used to help control emergents in some wetlands.

Any project that results in lowered water tables and the loss of wetland habitat could impact black terns and their habitat.

Cumulative Effects

Black terns may be affected by management activities in Wyoming, the Dakotas, and Nebraska on private, state, and other federal lands that impact wetland habitat quality. The loss of wetlands through drainage and filling (Ostlie et al. 1997, USDA Forest Service 2000, Johnson 1998, Abell et al. 2000, Pederson et al. 1989, Davis 2000, Natural Resource Conservation Service 1996) are undoubtedly important threats to the species through the planning area.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in the revised LRMPs (Alternative 3):

Unit-wide Direction (Chapter 1)

All Planning Units

- Manage land treatments to conserve site moisture and to protect long-term stream, wetland, and riparian health from damage by increased runoff (Standard).
- Allow only those actions next to perennial and intermittent streams, seeps, springs, lakes, and wetlands that maintain or improve long-term proper functioning of riparian ecosystem conditions (Standard).
- Design activities to protect and manage the riparian ecosystem. Maintain the integrity of the ecosystem, including quantity and quality of surface and ground water (Standard).
- Maintain and protect the hydrologic regime that supplies ground water to the wetlands so as to support species and habitats dependent on the existing water table and its natural variations (Standard).

- To provide protection for riparian areas, locate activities and facilities away from the water's edge or outside the riparian areas, woody draws, wetlands, and floodplains unless alternatives have been assessed and determined to be more environmentally damaging (Guideline).
- Do not deposit waste material below high water lines, in riparian areas, in areas immediately adjacent to riparian areas, or in natural drainage-ways (Guideline).
- Maintain long-term ground cover, soil structure, water budgets, and flow patterns of wetlands to sustain their ecological function and meet regulations found in Section 404(b)(1) of the Clean Water Act (Standard).
- Design and implement livestock grazing strategies to provide well-developed emergent vegetation through the growing season on 30-50% of the wetlands distributed across watersheds and landscapes (Guideline).

FPNG, BGNG, ONG, NNF (BRD), SRMNF, TBNG

- Design and implement livestock grazing strategies to provide well-developed emergent vegetation on 30 to 50% of the wetlands (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

SNG

- Prohibit additional draining of the Sheyenne National Grassland (Standard).

Management Area Direction (Chapter 3)

BGNG (MA 3.64)

- Approximately 1,160 acres including Weta Pond and Kadoka Lake is allocated to MA 3.64 that emphasizes management for wetlands and waterfowl.

Monitoring Direction (Chapter 4)

FPNG, BGNG, ONG, NNF (BRD), SRMNF, TBNG

- Monitor populations and habitat.

All Planning Units (except NNF-PRRD)

- Monitor restoration of waterbodies that have been degraded by Forest Service permitted or management actions?

LMNG, GR/CRNG, SNG

- Monitor the extent that surface water, sub-surface flows, and aquifers have been protected from contamination by management actions.

Biological Determinations, Risk Assessments, and Rationale

FPNG, BGNG, ONG, NNF (BRD), SRMNF, TBNG

The biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide". There is no wetlands drainage prescribed under Alternative 3, and direction is provided to maintain the health and vegetation around wetlands. Under the prescribed burning objectives, fire could be used to help maintain open water within some of the wetlands that have a tendency to become choked with emergent vegetation.

Much of the potential and suitable nesting habitat on these units is constructed wetlands (small impoundments), and historic breeding habitat was limited or nonexistent. Therefore, the risk assessment criteria are inappropriate, and a risk assessment was not done for this species.

ONG, NNF (BRD), SRMNF

The biological determination is “no impact.” The species presence on these areas has not been confirmed and documented. However, management direction is provided for wetlands habitat on these areas. If the species occurrence was confirmed, the biological determination would be "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide".

LMNG, GR/CRNG, SNG

Biological determinations are not made for this species on these areas since it is not listed as sensitive by Region 1 of the Forest Service. The conservation measures listed above are expected to protect its habitat from possible adverse effects of Forest Service authorized activities and allocations.

Black-backed Woodpecker (*Picoides arcticus*)

Species Description

This robin-sized woodpecker resembles the slightly smaller three-toed woodpecker in both plumage and behavior. The black-backed woodpecker has a solid black back where the back of the three-toed woodpeckers back is barred black and white. The male of the black-backed woodpecker has a yellow crown, where the female’s crown is solid black.

The breeding season for this species begins with increased territorial activity in April, with most nesting activity occurring in May. Nests are placed in tree cavities. The black-backed woodpecker usually lays 4-5 eggs, which are incubated by both parents for 13 days. The young fledge at about 24 days of age (Baicich and Harrison 1997).

Wood-boring beetles, such as those in the Cerambycidae and Buprestridae families, are the primary food for the black-backed woodpecker. Insects are retrieved from dead or live trees by scaling (Bull et al. 1986). They also use pecking and gleaning strategies to feed.

Distribution and Status

This species ranges from Alaska, across Canada to Newfoundland, and south to the northern United States, extending into the Southern Rocky Mountains.

Table H-6 summarizes species occurrence and status in the planning area. The black-backed woodpecker may possibly occur on the Thunder Basin National Grassland, and nesting is also possible (Wyoming Game and Fish Department 1997). This species has occurred as a vagrant on the Dakota Prairie Grasslands (Denbigh Experimental Forest).

The black-backed woodpecker has likely undergone significant declines during the 20th century, due to fire suppression and logging. Little information is actually known however, since Breeding Bird Surveys (BBS) and Christmas Bird Counts (CBC) do not adequately monitor this species. Based on the limited BBS data that is available, the species showed generally stable trends 1966-1996, with statistically non-significant declines in recent years (i.e. 1980-1996) (NatureServe 2000).

Organization Rankings

The black-backed woodpecker is classified as a sensitive species in Regions 1 and 2 of the Forest Service. The International Network of Natural Heritage programs and Conservation Data Centeres has assigned it a global ranking of G5, meaning "secure." The ranking in the United States (N4), indicates "apparently secure." Partners In Flight has identified the black-backed woodpecker as a "High Priority" species in Wyoming.

Habitat

Black-backed woodpeckers are habitat specialists. They are permanent residents of suitable woodlands which include mature and over-mature ponderosa pine, lodgepole pine, larch, Douglas fir, and spruce stands. This nomadic bird appears in large concentrations of burned or old forests where there are lots of dead or dying trees.

The black-backed nests in a tree cavity, which it excavates itself. Nests have been found in lodgepole, ponderosa pine and western larch trees with heart rot in Oregon (Bull 1986, Goggan et al.) and Douglas fir, western larch, and ponderosa pine in Montana (Harris 1982). On the average, nest trees are greater than 20 inches dbh and have been dead less than 5 years.

A more detailed account of their habitat is presented in the biological assessment and evaluation for the Black Hills National Forest Land and Resource Management Plan (USDA Forest Service 1996).

There are approximately 10,000 acres of ponderosa pine forests on the Thunder Basin National Grassland, respectively. Because of a lack of forest inventories, the amount of this area that is suitable for this species (primarily structural stages 4a, 4b and 5) is unknown, but it's reasonably safe to assume that most of this acreage is currently unsuitable or marginal for black-backed woodpeckers.

Conservation Planning

State-wide or regional habitat conservation strategies have not been prepared for this species.

Direct and Indirect Effects on NFS Lands

It is likely that fire suppression is resulting in incremental changes in forest stocking and structure and reduced levels of habitat suitability for this species.

Fuelwood cutting that reduces the number of snags would result in reduced levels of habitat suitability for this species.

Cumulative Effects

All of the activities listed above under direct and indirect effects are likely occurring on private lands throughout the forested areas on and in the vicinity of the Thunder Basin National Grassland.

Interrelated and Interdependent Actions

Determining ponderosa pine forests to be within the suitable timber base can result in pre-commercial thinning and commercial timber sales.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

TBNG

- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

TBNG

- During vegetation management projects, use methods that emphasize development of structural stages 4 and 5. The longterm objective is to have approximately 40% of the forest cover in structural stage 4 and 20% in structural stage 5 (Objective).
- Fire will be reintroduced as determined by project specific resource needs (Objective).
- Management activities should replicate natural biological processes and vegetative patterns and patch sizes (Guideline).
- During vegetation management projects, maintain an average of 4 snags per forested acre (Standard).
- Retain all soft snags unless they are a safety hazard (Guideline).
- When necessary to meet the minimum snag standard, create snags from live tree replacement (Guideline).

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

NNF (PRRD), TBNG

- Monitor populations and habitat.

Biological Determinations, Risk Assessments, and Rationale

TBNG

The biological determination is “no impact.” The species presence on this area has not been confirmed and documented. However, management direction is provided for this species and its habitat. If the species occurrence was confirmed, the biological determination would be "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide".

Lewis' Woodpecker (*Melanerpes lewis*)

Species Description

The Lewis’ woodpecker is approximately 11 inches long, with a greenish-black head and back, which contrasts with the pink-red belly and gray breast and collar.

This species’ breeding season begins in mid-April to late May. It nests in natural cavities and cavities excavated by other woodpeckers, as well as digging its own. A typical clutch is 6-7 eggs, which are incubated by both parents for 12-14 days. The young remain in the nest for 31 days and are tended by the parent for at least 10 days post-fledgling (Baicich and Harrison 1997).

Lewis’ woodpeckers eat insects during the spring and summer, and are often seen catching flying insects in mid-air. During fall, fruits and berries are preferred, while wintering birds eat acorns and other mast (DeGraaf et al. 1991).

Distribution and Status

Lewis’ woodpeckers breed from southern British Columbia to southwestern South Dakota, and northwestern Nebraska south to California. Populations in the northern half of the breeding range move southward for winter, while other populations may be resident. The species winters from northern Oregon, southern Idaho, central Colorado, and south-central Nebraska into northern Mexico (DeGraaf et al. 1991).

Table H-6 summarizes species occurrence and status in the planning area. Lewis’ woodpeckers are known to occur on the Thunder Basin and Oglala National Grasslands and on the Nebraska National Forest (Pine Ridge Ranger District).

Based on Breeding Bird Surveys, Lewis’ woodpecker populations have declined by more than 60% between the 1960s and mid-1990s (NatureServe 2000). The most likely causes are due to habitat loss from timber harvest, fire suppression, and riparian grazing by livestock.

Organization Rankings

The Lewis’ woodpecker is classified as a sensitive species in Region 2 of the Forest Service. It has a global conservation rank of G5. It is on Partners in Flight’s Watch List for Wyoming and South Dakota, as well as being on their national list.

Habitat

The Lewis' woodpecker occurs in open country with scattered trees. Favored habitats include open, park-like ponderosa pine savannahs, burned-over conifer stands, pinyon-juniper stands, oak savannah, and riparian areas with numerous large cottonwoods (DeGraaf et al. 1991). Preferred areas have understories of grasses and shrub that support abundant insect prey populations. The presence of suitable nest trees is an important habitat requirement.

A more detailed account of their habitat is presented in the biological assessment and evaluation for the Black Hills National Forest Land and Resource Management Plan (USDA Forest Service 1996).

There are approximately 22,000 and 10,000 acres of ponderosa pine forests on the Nebraska National Forest (Pine Ridge Ranger District) and Thunder Basin National Grassland, respectively. Because of a lack of current forest inventories, the amount of this area that is suitable for this species (structural stages 4a, 4b and 5) is unknown. In addition to the forested acres listed above on the Nebraska National Forest, there are over 10,000 acres of additional ponderosa pine forests that have been intensively burned over the last 3 decades. These areas provided suitable short-term habitat for Lewis' woodpecker.

Conservation Planning

State-wide or regional habitat conservation strategies have not been developed for Lewis' woodpecker in the planning area.

Direct and Indirect Effects on NFS Lands

Fire suppression in ponderosa pine woodlands can result in long-term incremental decline in habitat suitability for this species. Prescribed burns can help maintain ponderosa pine savannah and preferred habitat for Lewis' woodpecker. Lack of silvicultural treatments to maintain ponderosa pine savannah can result in long-term incremental decline in habitat suitability for the species.

Riparian grazing can decrease the ability of cottonwoods to regenerate, decreasing long-term habitat quality for this woodpecker.

Cumulative Effects

Timber harvest is occurring on large acreages of private land within the Nebraska pine ridge area. It's estimated that timber sales have occurred on approximately 42,000 acres of forested private lands since the early 1990s (John Overstreet, personal comm.). This acreage includes inaccessible pine stands. The primary silvicultural harvest method used on private lands is to selectively cut all merchantable mature trees in a ponderosa pine stand. Assuming snags and nest trees are retained, this activity is probably having a beneficial affect on this species.

Fire suppression will also continue on private lands, and this will perpetuate the continuing development of thick ponderosa pine stands in inaccessible areas (Ostlie et al. 1997, USDA Forest Service 2000). This will temporarily reduce the suitability of these areas for this species until these areas eventually burn.

Competition with nesting Europeon starlings may be another cumulative effect impacting Lewis' woodpecker populations.

Interrelated and Interdependent Actions

Determining and classifying timber lands as suitable for commercial harvests can result in additional acres of ponderosa pine thinning and improved habitat conditions for the Lewis' woodpecker, assuming snags and nest trees are retained.

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in the revised LRMPs (Alternative 3):

Unit-wide Direction (Chapter 1)

BGNG, ONG, NNF (PRRD), TBNG

- Design and implement livestock grazing strategies to provide for thick and brushy understories and multi-story and multi-age structure in riparian habitats, wooded draws, and woody thickets, contingent on local site potential (Guideline).
- Manage livestock grazing to maintain or improve riparian / woody draw areas (Guideline).
- Implement management practices that will move at least 80% of riparian and wooded draw areas toward self-perpetuating tree and shrub regeneration (Objective).

BGNG, ONG, NNF (PRRD), TBNG, cont.

- Conduct actions so that habitats are maintained or improved toward robust stream health (Standard).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

NNF (PRRD)

- Use silvicultural methods to emphasize development of structural stages 4a and 5 (Objective).
- Manage for 40%and 20%of the forest cover to be in structural stages 4 and 5 over the long-term (Objective).
- Use prescribed burning to achieve desired vegetation conditions including ponderosa pine savannah (Objective)
- Design vegetative treatments to maintain an average of 4 snags per forested acre (Standard).
- Retain all soft snags unless they are a safety hazard (Guideline).
- When necessary to meet the minimum snag standard, create snags from live tree replacement (Guideline).

TBNG

- During vegetation management projects, use methods that emphasize development of structural stages 4 and 5. The longterm objective is to have approximately 40% of the forest cover in structural stage 4 and 20% in structural stage 5 (Objective).
- Fire will be reintroduced as determined by project specific resource needs (Objective).
- Management activities should replicate natural biological processes and vegetative patterns and patch sizes (Guideline).
- During vegetation management projects, maintain an average of 4 snags per forested acre (Standard).
- Retain all soft snags unless they are a safety hazard (Guideline).
- When necessary to meet the minimum snag standard, create snags from live tree replacement (Guideline).

Management Area Direction (Chapter 3)

TBNG

- The 5,980-acre Cheyenne River Zoological Special Interest Area (MA 2.1) provides a management emphasis on riparian habitats. This area may provide potential habitat for this species.

Monitoring Direction (Chapter 4)

BGNG, ONG, NNF (PRRD), TBNG

- Monitor populations and habitat.
- Monitor the extent that riparian area vegetation is regenerating.

Biological Determinations, Risk Assessments, and Rationale

TBNG, NNF (PRRD), ONG

Determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." Management activities that promote more ponderosa pine stands with silvicultural techniques such as thinning or prescribed fire will benefit Lewis' woodpeckers. Management direction is also in place to promote regeneration of cottonwood riparian woodlands.

Outcome II is selected as the risk assessment for this species on these areas. Habitat is of sufficient quality, distribution, and abundance to allow the species to maintain populations. There is no need for reintroductions or transplants.

BGNG

The biological determination is "no impact." The species presence on this area has not been confirmed and documented. However, management direction is provided for riparian regeneration on these areas. If the species occurrence was confirmed, the biological determination would be "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

Fringe-tailed myotis (*Myotis thysanodes pahasapensis*)

Species Description

The fringe-tailed myotis is distinguished from other *Myotis* by the conspicuous fringe of hairs located along the back edge of the interfemoral membrane (Aston and Dowd 1991). This fringe is actually distinct clumps of up to 15 hairs each (Lechleitner 1969). *M. thysanodes* is 80-95 mm (3 1/8-3 ¾ inches) in length and has a wingspread of 265-300 mm (10.4-11.8 inches). Ashton and Dowd (1991) described the species as having reddish to dark brown fur on its back and paler underneath. The ears are large, and when laid forward, extend 3-5 mm beyond the nose.

The subspecies, *M. t. pahasapensis* represents a geographically isolated population, and is the taxa found in western Nebraska, the Black Hills and Badlands of South Dakota, and adjacent areas of Wyoming. It is distinguished by its larger ears, shorter forearms, and smaller, narrower skull (Ashton and Dowd 1991, Jones, Jr. et al. 1983), and is the focus of this account.

Fringe-tailed myotis breed in the fall. The sperm is stored in the uterus of the female over the winter. In spring, ovulation, fertilization and implantation takes place. They have one young per year, in June or July. The period of gestation is 59-60 days, which takes place in maternity colonies in caves, mines, or buildings (Ashton and Dowd 1991). In western South Dakota, pregnant females have been observed in June. Lactating females were reported in late July and August (Czaplewski et al.1983). This species is generally solitary, but may be found in clusters with other species at day roosts. Females form maternity colonies that may number several hundred mothers and young (Jones, Jr. et al. 1983).

The fringe-tailed myotis feeds largely on arthropods such as moths and beetles. They emerge to feed about 2 hours after sunset, and forage over and along water courses, or above the canopy of shrub lands and woodlands (Colorado Division Wildlife 1984).

Distribution and Status

Myotis thysanodes ranges from British Columbia through the western states, skirting much of Wyoming, to southern Mexico.

Table H-6 summarizes species occurrence and status in the planning area. It is known to occur on the Buffalo Gap, Oglala, and Thunder Basin National Grasslands and on the Nebraska National Forest (PRRD).

Specific population trend information is not available (NatureServe 2000). Indications are that the species is stable or declining.

Organization Rankings

The fringe-tailed myotis is classified as a sensitive species in Region 2 of the Forest Service, and has a global conservation rank of G4. The fringe-tailed myotis is listed as a priority species in Wyoming. It has a Natural Heritage status as critically imperiled in Nebraska and Wyoming, and rare and endemic in South Dakota.

Habitat

Myotis thysanodes inhabits mid-elevation grasslands, deserts, and oak and pinyon woodlands. They have also been detected in high elevation spruce-fir forests (Finch 1992).

In Nebraska, the subspecies, *M. t. pahasapensis*, has been found in riparian deciduous growth along creeks, below pine-clad buttes, and near spring fed ravines and ponds (Czaplewski et al. 1979). In the Black Hills of South Dakota, it has been observed roosting during the day in caves, mines, and buildings (Ashton and Dowd 1991).

On the Pine Ridge District, the species occurs in riparian habitat along the Pine Ridge from Bordeaux Creek, west to Highway 2. They roost in buildings, rock crevices, and possibly large cottonwood trees.

Conservation Planning

There is no conservation strategy for this subspecies.

Direct and Indirect Effects on NFS Lands

Human disturbance at roosts sites, cave destruction, and habitat loss are the main factors affecting this bat (Finch 1992).

Insecticide poisoning can also have a detrimental effect on the fringed-tailed myotis (Ashton and Dowd 1991).

Druecker (personal communication) believes that current grazing practices in many areas are detrimental to bat habitat. Bats feed on insects over calm water pools. The cattle tend to congregate along riparian habitat, resulting in trampling of the adjacent vegetation. This loss of vegetation leads to a decrease in cottonwood regeneration and growth. On the Pine Ridge Ranger District, Druecker believes that large cottonwoods play an important role in providing roosts for many bat species including the fringe-tailed myotis. On the Pine Ridge, the majority of cottonwoods are mature, with very little evidence of regeneration due primarily to livestock grazing.

Cumulative Effects

On non-National Forest System lands in the planning area, riparian vegetation loss continues, to the detriment of this species (Ostlie et al. 1997). It should be noted however, that since the time of European settlement the extent of riparian forest and other vegetation is believed to have increased dramatically in many areas. In addition, shelterbelts and other structures on the Great Plains must have played a role in increasing fringe-tailed myotis habitat. Other likely cumulative effects include disturbance to roosting bats by cave recreationists, and loss of habitat due to collapsing mines.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

BGNG, ONG, NNF (PRRD), TBNG

- Protect all known day roost areas and wintering sites used by bats.
- Numerous standards and guidelines provide direction for managing for riparian and wetlands heath and vegetation regeneration.
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

- None

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

BGNG, ONG, NNF (PRRD), TBNG

- Monitor populations and habitat.

Biological Determinations, Risk Assessment, and Rationale

BGPN, ONG, NNF (PRD), TBNG

Management activities will have limited impact on this species. Significant human disturbance at roost sites and cave destruction are not prescribed or expected. Riparian management direction that promotes regeneration and health of riparian and wetland habitats should benefit the species. The biological determination is:"may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range wide."

Outcome II is selected as the risk assessment for this species on these areas. Because no major habitat losses are expected and since riparian conditions are expected to improve, populations should be fairly secure in these areas.

California Bighorn Sheep (*Ovis canadensis californiana*)

Species Description

Bighorn sheep are relatively small-sized members of the Bovidae, which includes bison, mountain goats, muskox, and domestic cattle, among others. The bighorn is about 3 feet high at the shoulder, and weighs 125-275 (males) or 75-150 (females) pounds. Its overall color is brownish or grayish-brown, with a creamy white sump. The head is adorned with massive horns, which are particularly large in the male (Burt and Grossenheider 1976).

The subspecies, *O. c. audubonì*, originally occupied the northern plains, including the eastern portions of Wyoming and Montana and western North Dakota, South Dakota and Nebraska (Jones et al. 1983). The last known survivors in western North Dakota, Nebraska, and South Dakota were recorded in 1905, 1918 and 1924, respectively (Jones et al. 1983). The last known Audubon's was shot in eastern Pennington County, South Dakota, not too far from the present day Buffalo Gap National Grassland. In addition to hunting, disease associated with domestic

and feral livestock probably also contributed to the demise of this subspecies (Knue 1991). The subspecies, *O. c. californiana* and *canadensis*, have been reintroduced in an effort to return bighorn sheep to the badlands and grasslands of this region. It is important to note that some taxonomists believe the evidence to recognize the Audubon's bighorn as a subspecies, is very weak (Jones et al. 1983). The focus of this account is *O. c. californiana*.

Bighorns are highly social animals that usually separate into ram bands, and nursery bands comprised of ewes, lambs, and subadults. After 2 years of age, young rams leave the nursery herd to join a ram band. The bands are organized into social hierarchies where rank is determined by strength and horn size, which are related to age. Adult bighorns reach sexual maturity at about 2-3 years of age. Breeding season occurs in November and December when rams aggressively compete for females. Bighorns are promiscuous, but most of the breeding is performed by dominant rams. Lambing occurs in May and June.

Distribution and Status

Bighorn sheep can be found in suitable montane habitat from southwestern Canada south through the Rocky Mountains, Sierra Nevada, and desert ranges of the southwestern United States, and into Mexico (NatureServe 2000).

Table H-6 summarizes species occurrence and status in the planning area. Distribution of California bighorn sheep on NFS lands in the planning area is limited to the Little Missouri National Grassland. In 1956, 18 California bighorn sheep from British Columbia were reintroduced to the North Dakota badlands along Magpie Creek. A number of additional transplants have occurred since then (Jensen 1992). The most recent population estimate for the North Dakota badlands is approximately 150 sheep. A different subspecies, the Rocky Mountain bighorn sheep (*O. c. nelsoni*), occur on portions of the Buffalo Gap National Grassland and the Nebraska National Forest (Pine Ridge Ranger District).

Four potential bighorn sheep metapopulations that utilize substantial portions of the Little Missouri National Grassland have been identified by the North Dakota Game and Fish Department (Jensen 1992). For long-term viability (>100 years), at least 125 bighorns are needed in each of these metapopulations (Smith et al. 1991, Jensen 1992). None of the four metapopulations is currently at this level. Until recently, the Southern Badlands metapopulation came close to meeting this guideline but die-offs in the late 1990s, most likely from Pasteurellosis, have almost eliminated this herd (Stillings 2000). Additional protected areas (MA 3.51) allocated in the revised Land and Resource Management Plan and supplemental releases will be necessary.

The North Dakota Game and Fish Department in cooperation with the Forest Service has identified the additional portions of the Little Missouri National Grassland needed to help increase the individual metapopulations and overall population on the National Grassland and adjoining areas. It's estimated that the total sheep population could increase to over 400 animals with additional releases and protected habitat on the national grassland.

Organization Rankings

The California bighorn sheep has sensitive species status in Region 1 of the Forest Service. This species has been assigned a rank of G4/G5 by the International Network of Natural Heritage programs and Conservation Data Centeres. A G4 indicates species that are apparently secure, while a G5 rank is for taxa that are demonstrably widespread, abundant, and secure globally. The ranking in the United States is similar (N4).

Habitat

Bighorn sheep are well-adapted to a wide variety of habitats. In the planning area, they use badlands and other steep grassland topography as their primary escape cover. Sheep in North Dakota are primarily browsers with buffaloberry being an important diet component (Jones et al. 1983). They also feed on grasses, sedges, and forbs.

Conservation Planning

Jensen (1992) presents a conservation strategy for *O. c. californiana* on the Little Missouri National Grassland and vicinity.

Direct and Indirect Effects on NFS Lands

Bighorn sheep are sensitive to disturbance (Feist 1997, Knue 1988, Joslin and Youmans 1999, McCarthy et al. 1998). Management activities that displace or disturb bighorn, especially when lambing, can negatively affect reproduction. Sayre (1996) concluded that the most significant disturbance to bighorns in North Dakota was the vehicle traffic and activity associated with oil well maintenance.

Bighorn sheep are susceptible to disease spread by domestic sheep and goats.

Fences, if improperly constructed, could interfere with bighorn movements and could also result in direct mortality.

Fire suppression can result in increased juniper cover that reduces habitat suitability for bighorns.

Livestock grazing could either enhance or degrade forage availability and quality for bighorn sheep, depending primarily on the timing and intensity of the grazing.

Cumulative Effects

Oil and gas development activities are occurring on adjoining private lands within the administrative boundary of the Little Missouri National Grassland. Coyote predation on lambs may be an important additional factor in low recruitment. The North Dakota Game and Fish Department plans to transplant bighorns in the Little Missouri National Grassland to bolster the viability of the species in this area.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD) and eventual on-site development and additional roads, traffic and pipelines.

Conservation Measures and Mitigation

Feist (1997) recommended the following for bighorn sheep on the Little Missouri National Grassland:

- Encourage augmentation of the existing herds.
- Identify high use areas, paying particular attention to lambing areas.
- Prevent human activity mid-April to early July near escape terrain used by ewes and lambs.
- Minimize human disturbance on bighorn range throughout the year.
- Keep new roads to a minimum in bighorn sheep habitat.
- Remove woody vegetation that reduces bighorn sheep habitat quality.

Sayre (1996) suggested:

- Schedule vehicle disturbance to coincide with periods when the sheep are already on escape terrain.
- Follow a regular schedule of oil well maintenance so that bighorn sheep are accustomed to disturbance at particular times of the day.
- Clear encroaching juniper from bighorn sheep habitat.
- Document bighorn sheep distribution.
- Limit oil well construction and maintenance during the lambing season.

The following conservation measures are presented as management direction in Alternative 3 in the revised LRMPs:

Unit-wide Direction (Chapter 1)

LMNG

- Design and build new structures, including fences, to reduce hazards to big game and to allow big game movement throughout the year (Guideline).
- Protect bighorn sheep lambing areas from activities and land use disturbances if adverse impacts to the survival or reproductive success of bighorn sheep or abandonment of the lambing area are likely (Standard).
- Within 5 years, develop prescribed fire plans in support of habitat improvement for bighorn sheep (Objective).
- Do not authorize domestic sheep grazing within ten miles of bighorn sheep management areas (MA 3.51 and 3.51a) (Guideline).

- Domestic sheep and goats may be permitted as part of an integrated pest management control program if they do not conflict with bighorn sheep management objectives (Guideline).
- Discourage recreational activities in bighorn sheep lambing areas, April 1 through June 15 (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Management Area Direction (Chapter 3)

LMNG (MA 3.51 and 3.51a)

- Approximately 55,130 acres are allocated to MA 3.51 and 3.51a that emphasize bighorn sheep restoration.
- Resolve conflicts in favor of maintaining bighorn sheep habitat (Standard).
- Implement habitat enhancement projects that improve sheep foraging habitat and provide connectivity of foraging areas with escape terrain (Guideline).
- Allow new oil and gas leasing, however no ground-disturbing activities are permitted (Standard).
- As funding allows, identify and implement surface and minerals estate land exchanges that contribute to bighorn sheep management objectives (Guideline).
- Do not convert existing livestock allotments to domestic sheep allotments in or adjoining this management area (Standard).
- Limit livestock forage allocation based on bighorn sheep needs (Guideline).
- Domestic sheep may be permitted as part of an integrated pest management control program if the do not conflict with bighorn sheep management objectives (Guideline).
- Snowmobile use is prohibited in the management area (Standard).
- Restrict travel to protect sheep concentrations during lambing, breeding, and winter use (Guideline).
- Allow construction of new utility corridors only if they do not degrade the characteristics for which the area was designated (Standard).
- Prohibit construction of new travel routes across bighorn sheep habitat. However, honor valid existing rights such as oil and gas leases (Guideline).
- Leasing of federal mineral parcels will not occur until there is development of a well on an adjacent spacing unit or an access road is built across the management area to access existing rights. Once development on an adjacent spacing unit or adjacent non-federal mineral estate occurs, the adjacent federal minerals may be leased using Controlled Surface Use stipulations if no additional significant adverse impacts to bighorn sheep would occur. If the adjacent federal minerals parcel is leased, subsequent surface operations may be modified or moved to minimize the additional impacts on bighorn sheep habitat. (Standard - MA 3.51a only)

Monitoring Direction (Chapter 4)

- Monitor populations and habitat.

Biological Determinations, Risk Assessments, and Rationale

LMNG

The biological determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

Under this alternative, areas used by bighorn sheep will be designated as Management Area 3.51 or 3.51a (some of these acres are incorporated into other management areas such as 1.2a). This designation is designed specifically to highlight bighorn sheep and their habitat, and represents a substantial commitment to an intensive bighorn sheep restoration and management program. Areas designated as 3.51 or 3.51a were identified by referencing bighorn sheep distribution maps and Jensen's 1992 report, and consulting with the North Dakota Game and Fish Department (2000) on anticipated reintroductions. As an additional mitigation measure, any bighorn sheep found lambing outside of management area 3.51 or 3.51a would also be protected (see Grassland Wide Direction, Section F., Bighorn Sheep).

Although bighorn sheep would benefit from the management direction outlined above, an overall determination of "may adversely affect" is still warranted. Impacts will still result from an overall increase in human disturbance associated primarily with oil and gas development and recreation (Dan Svingen, Grassland Biologist, prof. opin.).

As discussed above, bighorn sheep populations on the Little Missouri National Grasslands will need augmentation (supplemental stocking). Such efforts have been successful with the species elsewhere. Based on these considerations, outcome V is selected as the risk assessment.

Evaluations for Plant Guilds

Eastern Prairie Boggy Wetlands Guild

Plant species in this guild include:

Bog willow	Buckbean
Crested shield fern	Delicate sedge
Labrador bedstraw	Loesel's twayblade
Marsh bellflower	Marsh fern
Marsh horsetail	Meadow horsetail
Sensitive fern	Shining flatsedge
Showy lady's slipper	Slender cottongrass
Spinulose woodfern	Umbrella flatsedge

Table H-6 summarizes species occurrence and status in the planning area. Each of these species is classified as sensitive by Region 1 of the Forest Service.

Guild Description

This plant group includes plant species found in habitats associated with bogs, calcareous fens, springs, boggy woodlands, and the green ash / basswood deciduous hardwoods found predominately within the tallgrass prairie regions of the planning area. All of the species have

known occurrences on the Sheyenne National Grassland and several species are known or suspected of occurring on the Samuel R. McKelvie and Nebraska National Forests in the Nebraska sandhills. This group contains the largest number of Region 1 sensitive plant species with 16 of the 42 species represented.

Most of the currently known populations of these species are found along the Sheyenne River corridor in eastern North Dakota. Many of the species are hydrophylic and wetland obligate species with habitats that are dependent upon the interaction of hydrologic regimes within the riverine and upland landscape (ND Parks and Recreation Dept. 1990, Seiler 1973, North Dakota Natural Heritage database 2000). In addition to the boggy seeps found along this drainage, this plant group includes the river gallery forests of elm and basswood. The majority of the species in this plant group are primarily restricted to a narrow range of habitats, i.e. they are species with either a narrow range or mid-range of versatility (USDA Forest Service 2000). The list includes one shrub, eight forbs, several sedges, and numerous fern species.

Within the Northern Great Plains planning area, the habitat components captured by this plant group are uncommon and occupy a very small percentage of the total land base (Seiler 1973, ND Parks and Recreation Dept. 1990). The large complex of bogs/fens, flowing springs, and boggy woodlands on the Sheyenne National Grassland in eastern North Dakota are a landscape feature resulting from upland drainage patterns into the Sheyenne River (Seiler 1973). Wetlands that provide habitat on other portions of the planning area may differ in habitat, soils, and hydrologic regime from those described for the Sheyenne National Grassland, however these other habitats share the common feature of containing perennially wet soils within the tallgrass prairie.

Slender cottongrass (*Eriophorum gracile*)

The distribution of slender cottongrass is circumboreal, south in North America to Maryland, Indiana, Iowa, Nebraska, Colorado, Idaho, and California (NatureServe 2000). Global rank of slender cottongrass is "G5" meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). Within the planning area, slender cottongrass is known from very limited occurrences in Nebraska and South Dakota, and two populations in North Dakota (North Dakota Natural Heritage database 2000; Larson 1993).

Of the two populations in North Dakota, one of the populations is very small consisting of 10-20 individuals. The public land portion of one of the populations is fenced and the other population is on private land.

Habitat includes open fens, seeps, and springs (Heidel et al. 1992, North Dakota Natural Heritage database 2000). Habitat is dependent upon maintenance of the hydrologic regime.

Shining flatsedge (*Cyperus bipartitus Torr.*)

This is a widely distributed species, with a range encompassing much of the United States, although it is peripheral within the planning area. The global rank of this species is "G5" meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). In the planning area, this species is rare in North Dakota and Wyoming and has been reported from South Dakota and Nebraska (NatureServe 2000).

Shining flatsedge is known from seven populations in North Dakota, several of them either historical records or older records not recently confirmed (North Dakota Natural Heritage database 2000). The populations range in size from two individuals to locally abundant. Ownership is mixed between the U.S. Forest Service, private, and Nature Conservancy lands. The species has limited distribution in South Dakota and is more widespread in Nebraska (Larson 1993).

Habitat includes wet sandy areas, especially shores of ponds and streams (Seiler 1973, Barker et al. 1977). Habitat is dependent upon maintenance of the hydrologic regime.

Marsh horsetail (*Equisetum palustre*)

The distribution of this species is circumboreal, south in North America to Ohio, Nebraska, and California. The global rank of this species is "G5" meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). Within the planning area, marsh horsetail is known from nine populations in North Dakota, including historical records and several records not recently confirmed. It is also recorded from South Dakota and Nebraska. In the northern Great Plains, it occurs on the periphery of its natural range (NatureServe 2000).

North Dakota populations range in size from 20 individuals to 500 individuals (North Dakota Natural Heritage database 2000). Ownership includes Forest Service System lands, private, state, and Nature Conservancy lands. Some of the current populations are impacted by grazing, streambank erosion, and alteration of hydrologic regimes (North Dakota Natural Heritage database 2000). Habitat threats include livestock grazing, invasive plant species, and alteration of the hydrologic regime.

Habitat includes wetland edges in oxbow swamps along the Sheyenne River, as well as occurring on moist sandy streambanks and boggy areas (Larson 1979, Seiler 1973, Barker et al. 1977).

Meadow horsetail (*Equisetum pratense*)

The distribution of this species is circumboreal, south in North America to New Jersey, Iowa, Colorado, and British Columbia (NatureServe 2000). The global rank of this species is "G5" meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). Within the planning area, meadow horsetail is known from 11 populations in North Dakota (North Dakota Natural Heritage database 2000). In addition, the species is known from very limited distribution in South Dakota (Great Plains Flora Association 1977). In the northern Great Plains, it occurs on the periphery of its natural range.

The populations in North Dakota range in size from three to 100 individuals. Some of the known populations in North Dakota are currently grazed. Habitat threats include grazing, alteration of the hydrologic regime and competition from invasive species including smooth brome and Kentucky bluegrass (North Dakota Natural Heritage database 2000). Ownership of the North Dakota populations is mixed between Forest Service System lands, state, and private land.

Habitat for meadow horsetail includes boggy banks, lowland woodlands, and wooded riparian banks usually along the Sheyenne River (ND Parks and Recreation Dept. 1990, Seiler 1973, Barker et al. 1977).

Loesel's Twayblade (*Liparis loeselii*)

The distribution of Loesel's twayblade includes Quebec south to North Carolina, west to Kansas, and northwest to the Northwest Territories (NatureServe 2000). The global rank of this species is "G5" meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). Within the planning area, this species is known from 11 populations in North Dakota and very limited representation in Nebraska and South Dakota (North Dakota Natural Heritage database 2000; Great Plains Flora Association 1977, NatureServe 2000). Although this species is relatively widespread in the eastern United States, it is generally considered rare throughout its range.

In North Dakota, the populations range in size from two individuals to 50 individuals. Some of the known populations are threatened by altered site hydrology due to dugouts and roads. In addition, grazing, livestock trampling, and cow trails threaten some populations (North Dakota Natural Heritage database 2000). Habitat threats include alteration of the hydrologic regime, competition from invasive species, and livestock grazing and trampling. In North Dakota, ownership is a mix between U.S Forest System lands, private, state, and Nature Conservancy lands.

In Nebraska, Loesel's twayblade has recently been found on the Samuel R. McKelvie National Forest (Rolfsmeier 1995; Nebraska Natural Heritage Program 2000).

Habitat includes marl pools, fens, lowland swales, and bottomlands (North Dakota Natural Heritage database 2000, ND Parks and Recreation Dept. 1990) as well as wet wooded areas (Barker et al. 1977).

Sensitive fern (*Onoclea sensibilis*)

Distribution of sensitive fern includes Newfoundland south to Florida, west to Texas, and north to Saskatchewan (NatureServe 2000). The global rank of this species is "G5" meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). Sensitive fern is known from only 11 populations in North Dakota where the species is on the edge of its distributional range (North Dakota Natural Heritage database 2000). However, within the planning area, the species is more represented in southern South Dakota and north central and northeastern Nebraska (Great Plains Flora Association 1977).

In North Dakota, some of the records are historical and several records have not been recently confirmed. Populations range in size from six to several hundred individuals. Some of the populations have been reported to be declining (North Dakota Natural Heritage database 2000). Threats to habitat include livestock grazing, trampling, and trailing; alteration of the hydrologic regime; and competition from invasive species. Most of the populations lie on private land, with only two populations known from USFS lands. The North Dakota Heritage Program Element Occurrence Ranks for known occurrences of this species include fair to marginal viability (North Dakota Natural Heritage database 2000).

Habitat includes moist open woodland (Barker et al. 1977). In addition, habitat in North Dakota is described as alder thickets, wet hardwood forest, wetland thicket-forest ecotones, and seep and spring areas (North Dakota Natural Heritage database 2000).

Crested woodfern (*Dryopteris cristata*) and Spinulose woodfern (*Dryopteris carthusiana*)

Distribution of crested woodfern includes Quebec south to Georgia, west to Nebraska and north to British Columbia (NatureServe 2000). The global rank of this species is "G5" meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). Within the planning area, the species is on the edge of its range in North Dakota where it is only known to occur in six counties in the eastern and northern portions of the state. Crested woodfern is also known from limited occurrences in Nebraska where it is also peripheral to its main range (Nebraska Natural Heritage Program 2000; Great Plains Flora Association 1977).

Distribution of spinulose woodfern includes Newfoundland south to Georgia, west to Nebraska and Oregon, and north to Yukon Territory (NatureServe 2000). The global rank of this species is "G5" meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). Within the planning area, the species is on the edge of its range in North Dakota where it is only known to occur in four counties in southeastern and northeastern portions of the state. Spinulose woodfern is also known from limited occurrences in Nebraska where it is also peripheral to its main range (Nebraska Natural Heritage Program 2000; Great Plains Flora Association 1977).

Crested woodfern and spinulose woodfern are both ranked as S3 species in North Dakota (North Dakota Natural Heritage Inventory 1999), known in the state from 20 to 30 populations. However, threats to known populations and habitats are very high and many of the known populations contain few individuals. In addition, some of the known populations are from historical records or records that have not been recently confirmed (North Dakota Natural Heritage database 2000).

Current threats to spinulose and crested woodfern populations include degraded habitat, livestock grazing and trailing, alteration of the hydrologic regime, and invasive plant species (North Dakota Natural Heritage database 2000). In North Dakota, ownership of the known populations is a mix of U.S. Forest Service, private, state, and Nature Conservancy lands. For spinulose woodfern, ten of the known populations are on USFS administered lands (North Dakota Natural Heritage database 2000). For crested woodfern, eight populations are found on USFS lands.

Habitat of spinulose woodfern includes low hummocks, ravines, streambanks, moist woods, river terrace seeps, and wetland thickets (North Dakota Natural Heritage database 2000, North Dakota Parks and Recreation 1990, Seiler 1973; Barker et al. 1977). Crested woodfern is found growing in similar habitat, often in conjunction with spinulose woodfern (North Dakota Natural Heritage database 2000, ND Parks and Recreation 1990).

Buckbean (*Menyanthes trifoliata*)

The distribution of buckbean is circumboreal, extending south in North America to North Carolina, west to Missouri, Colorado, Arizona, and California (NatureServe 2000). The global rank of this species is "G5" meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). Within the planning area, buckbean is ranked as S3 in North Dakota (North Dakota Natural Heritage Inventory 1999) where it is considered locally abundant. The species is also known from very limited occurrences in South Dakota and northern Nebraska (Larson 1993).

In North Dakota, buckbean is known from several large populations of over 10,000 individuals in the eastern part of the state (North Dakota Natural Heritage database 2000). However, threats to some of the known populations include wetland drainage and habitat degradation from livestock grazing and trampling. Habitat is documented as being in declining condition in several of the known populations (North Dakota Natural Heritage database 2000). A few populations receive protection from grazing by fencing, especially on USFS land. Fewer than four populations are known to be on land administered by the U.S. Forest Service with the majority of the populations on private land.

Habitat for buckbean includes bogs and swamps (Great Plains Flora Association 1986). In North Dakota, buckbean is found in sphagnum bogs, rich fens, bog birch fens, and calcareous fens (North Dakota Natural Heritage database 2000).

Bog willow (*Salix pedicellaris*)

Delicate sedge (*Carex leptalea*)

Labrador bedstraw (*Galium labradoricum*)

Marsh bellflower (*Campanula aparinoides*)

Marsh fern (*Thelypteris palustris*)

Showy lady's slipper (*Cypripedium reginae*)

Umbrella flatsedge (*Cyperus diandrus*)

The above species are also considered rare within parts of the planning area and their distributional ranges are varied across the northern Great Plains. These species may be either scarce or locally abundant within the planning area. For example, bog willow and delicate sedge are known only from eastern North Dakota in the planning region. Marsh bellflower is known from limited occurrences in South Dakota and north central Nebraska as well as eastern North Dakota (Great Plains Flora Association 1977). Marsh fern is well distributed throughout Nebraska and is known from a few populations in South Dakota, but the species is on the edge of its range in eastern North Dakota. Showy lady's slipper is not known in the planning area except for the eastern North Dakota populations that are on the distributional edge of the species. Umbrella flatsedge is well distributed in the eastern portions of Nebraska within the planning area, however the North Dakota populations are on the peripheral edge of the species range (Great Plains Flora Association 1977). Some of the species known only from eastern North Dakota may have the potential to occur on the Samuel R. McKelvie and Nebraska National Forests in the Nebraska sandhills.

The global rank of showy lady's slipper is "G4" meaning uncommon but not rare (although it may be rare in parts of its range, particularly on the periphery), and usually widespread. It is apparently not vulnerable in most of its range, but possibly cause for long-term concern. The other species within this guild are ranked as "G5" meaning common, widespread, and abundant (although they may be rare in parts of their range, particularly on the periphery). All of the above species are ranked as either S2/S3 or S3 species in North Dakota (North Dakota Natural Heritage Inventory 1999).

Within North Dakota, these seven species may have larger population sizes, greater protections to habitat, or larger numbers of known populations than some of the other species within the Eastern Prairie Boggy Wetland plant group (North Dakota Natural Heritage database 2000). North Dakota Heritage Program Element Occurrence rankings for these species range from excellent to fair for viability based upon population size, population condition, and landscape context (North Dakota Natural Heritage database 2000).

For these seven species, threats to populations on the Sheyenne National Grassland include reduced spring and seep flow, livestock grazing and trampling, streambank erosion, and invasive plant species (North Dakota Natural Heritage database 2000). Threats to habitat include alteration of the hydrologic regime, invasive plant species, and livestock grazing and trailing.

Conservation Planning

A state-wide or regional conservation plan has not been prepared for species within this guild.

Direct and Indirect Effects on NFS Lands

Noxious weeds such as leafy spurge occur in scattered populations throughout the tallgrass prairie. Noxious weeds such as leafy spurge and Canada thistle reduce the quality of sensitive species habitat but at the same time, efforts to control spurge and other invasive species with chemicals can pose a direct threat to sensitive species. Noxious weed control could affect the forbs, ferns, and willow species in this plant group. In addition, many chemicals are restricted for use within riparian areas. Chemical treatment of noxious weeds is not recommended in the habitats supporting this plant group.

Competition from other non-native invasive plants (exotics) can be a threat. Invasive species such as Kentucky bluegrass and smooth brome can compete with native species for habitat, significantly reducing the diversity of native species.

Livestock trampling can be a problem for the sensitive species within this guild. Trampling may be detrimental to delicate plants such as showy lady's slipper, sensitive fern, marsh bellflower, and others. In addition, excessive and repeated soil compaction from trampling may result in reduced plant vigor.

On the Sheyenne National Grassland, some of the habitat where this plant group occurs has been excluded from grazing allotments through fencing. In allotments where grazing is occurring, habitat disturbance occurs from trailing and trampling by livestock. These areas are typically very shaded and livestock use these areas for shade in the heat of the summer, if accessible.

Livestock grazing can prevent sensitive plants from completing their life cycles and producing seeds or spores. In addition, excessive and continuous livestock grazing on sensitive plants can lead to impacts on plant regrowth, thereby reducing the vigor of plants within the population. However, there is typically little livestock forage produced in most of these habitats. Some of the species in this plant group that are palatable to cattle include delicate sedge, the two species of cottongrass, and the two species of flatsedge. Even though these particular species are considered grasslike, livestock graze on them on a limited basis. Early season grazing of flatsedge, an annual species, would be detrimental and not allow completion of its life cycle. Sheep and goats used for leafy spurge control would graze on some the plant species in this group if they have accessibility to their habitats.

Burning may directly impact sensitive plant species by causing mortality or indirectly impact these species and communities through effects on the habitat. The riparian zones currently supporting this plant group may not have been exposed to as frequent a fire regime as other parts of the tallgrass prairie.

Recreational river use may increase in these habitats as users explore shorelines from the river. While these habitats are not conducive to camping due to their wet nature, they are easily disturbed by trampling and root shearing.

Recreation can have effects on sensitive plants or plant populations, depending on types of recreational use, road and trail use patterns and intensities, rate of spread of invasive, non-native plant species along recreational routes, and other factors.

Roads can negatively affect sensitive plant populations by introducing non-native plant species along travel routes, through habitat fragmentation, and by loss of suitable habitat to disturbance.

Increased rates of channelization in drainages can result in a lowered water table. Activities that lower water tables below the root zone of some sensitive plant species may place individual or populations of sensitive plant species at risk.

Cumulative Effects

Noxious weeds will likely remain a threat in the habitats of these species on private and public lands in and around the administrative units containing these species.

At one time the wetlands of the tallgrass prairie were more plentiful, but many wetlands have been drained for agriculture purposes (Gantt 1980, Burgess 1964, Ostlie et al. 1997, Batt 1996, Johnson 1998). Current management practices that may affect plant community viability include drainage ditches and center-pivot irrigation systems, non-native plant species, lack of fire, and livestock grazing.

Continued loss of suitable habitat through conversion of rangelands to croplands and draining of croplands can be expected to occur on private lands (Ostlie et al. 1997, USDA Forest Service 2000).

Livestock grazing practices that are unfavorable for the conservation of sensitive plant species are likely to continue on some private lands.

Chemical treatment of noxious weeds on adjacent uplands poses the threat of groundwater contamination to the surface aquifer that feeds the seepage areas found in this guild. This could put the ferns, forbs, and shrubs found in this plant group at risk.

Drainage ditches on adjacent private land may lower water table levels below the root zone of some sensitive plant species, putting individuals or populations at risk. In addition, cumulative effects from altering the hydrologic regime of the area from drainage ditches and irrigation could induce relative drought on these areas, possibly preventing the plants from completing their life cycle and / or killing the plants.

Development activities such as road and building construction on private lands will continue, resulting in some loss of suitable habitat for sensitive plant species and possible mortality of sensitive plants and population loss.

Interrelated and Interdependent Actions

Determining federal range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement. Detrimental grazing activities on private land may increase the importance of the existing populations of sensitive species on federal land.

Conservation Measures

The following conservation measures are presented as management direction under Alternative 3 in the revised LRMP:

Unit-wide Direction (Chapter 1)

SNG

- Avoid placing new facilities and other developments such as water tanks and impoundments, in habitat occupied by sensitive plants species (Guideline).
- Identify sensitive plant habitats and rare plant communities as priorities for noxious weed and invasive plant monitoring and control (Guideline).
- Avoid the use of noxious weed and invasive plant control methods that may negatively impact sensitive plants (Guideline).
- Design timing, intensity, and frequency of mowing, burning and livestock grazing to maintain or increase sensitive plant species populations (Standard).
- Do not authorize vegetation management and construction projects that would further isolate or prevent re-colonization of sensitive plant populations from adjacent populations (Standard).
- Maintain hydrological regimes and protect and restore developed springs and seeps where habitat for sensitive plant species would be enhanced (Guideline).
- Ensure that management actions do not contribute to loss of population viability for Forest Service sensitive plant species (Standard).
- Protect known sensitive plant populations from land use activities that cause increased trampling or soil compaction within key habitats (Guideline).
- Enhance and improve habitat for known sensitive plant populations through restoration programs (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

SNG, SRMNF, NNF (BRD)

- Manage land treatments to conserve site moisture and to protect long-term stream, wetland, and riparian health from damage by increased runoff (Standard).
- Allow only those actions next to wetlands that maintain or improve long-term proper functioning of riparian ecosystem conditions (Standard).
- Design activities to protect and manage the riparian ecosystem and its integrity (Standard).

- Maintain and protect the hydrologic regime that supplies ground water to the wetlands (Standard).
- Locate activities and facilities away from riparian areas and wetlands unless alternatives have been assessed and determined to be more environmentally damaging (Guideline).
- Do not deposit waste material below high water lines, in riparian areas, in areas immediately adjacent to riparian areas, or in natural drainage-ways (Guideline).
- Maintain long-term ground cover, soil structure, water budgets, and flow patterns of wetlands to sustain their ecological function and meet regulations found in Section 404(b)(1) of the Clean Water Act (Standard).

Geographic Area Direction (Chapter 2)

SNG

- Develop and initiate implementation of conservation strategies plants within this guild (Guideline).
- Conduct target plant surveys or baseline assessments for species within this guild (Guideline).
- Avoid activities that would negatively impact the hydrologic regime of the Sheyenne River and the Sheyenne aquifer (Guideline).
- Protect habitat supporting this guild from livestock grazing (Guideline).
- Avoid use of goats or sheep for noxious weed control in habitats supporting this guild (Guideline).
- Avoid placing water developments, oilers, livestock salt, or mineral near or in habitats supporting this guild (Guideline).
- Designate and sign recreation trails in areas adjacent to or within the wetland habitats of this guild in order to encourage users to remain on designated trails (Guideline).

SNG, SRMNF, NNF (BRD)

- Objectives call for specified levels of ungrazed habitat and a more diverse grassland vegetation mosaic through desired levels of rest, seral stages and vegetation structure (see tables in Section 5).

Management Area Direction (Chapter 3)

SNG (MA 3.64)

- Limit all motorized use to administrative use (Standard).
- Protect wetlands habitats to maintain their hydrologic regimes (Standard).
- Maintain disturbance processes if required for habitat enhancement, restoration or species viability (Standard).
- Allow no new road or trail construction except when necessary to correct resource damage occurring from existing sites (Standard).

SNG (MA 3.64), cont.

- Conflicts that cannot be mitigated are resolved in favor of specific plant and wildlife species and communities (Standard).
- Prohibit removal of mineral material (Standard).
- Do not include this management are in any grazing allotment. However, livestock grazing may be used as a tool to achieve desired conditions (Guideline).
- No new utility corridors or additional development within existing corridors will be permitted. Existing corridors may be maintained until they are abandoned (Standard).
- Prohibit new special-use facilities except for valid existing rights (Guideline).

Monitoring Direction (Chapter 4)

SNG

- Monitor populations of these species.

SNG, SRMNF, NNF (BRD)

- Monitor the effectiveness of the suggested stocking rates in Appendix I in meeting desired vegetation composition and grassland structure levels.

Appendices

SNG, SRMNF, NNF (BRD)

- Appendix I provides suggested stocking rates for various livestock grazing intensities. This appendix is referenced by a standard under geographic area direction (Chapter 2) to use this appendix to help develop and implement range management practices for meeting vegetation objectives.

Biological Determinations, Risk Assessments, and Rationale

SNG (all species in this plant group)

Determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

Habitat enhancement and restoration of natural processes are proposed that should benefit species in this guild (USDA Forest Service 2000). In addition, some of the proposed management activities should provide additional specific protection measures for known populations of the species.

Many of the known populations of species in this guild are known from habitats associated with the Sheyenne River corridor. Therefore, the Sheyenne River has been placed under 3.64 management area direction for special plant and wildlife habitat. The objective of this management area is to maintain and enhance specific plant and wildlife species of concern and plant and wildlife communities with additional emphasis on habitat improvement.

Some of the sensitive plant species populations for these species are protected within livestock exclosures and are not accessible to livestock grazing or trampling. For example, all known sites of buckbean and bog willow are currently in areas excluded from grazing by fencing. On the Sheyenne National Grassland, some populations of other species in this plant group are currently protected through fencing or modified grazing strategies. The analysis for these species assumes that these exclosures will remain in place and will be maintained.

The existing Sheyenne Springs RNA offers some protection for some of the species and their habitats. Protection for a few of the species is also provided by The Nature Conservancy's Pigeon Point Preserve and the ND State Game and Fish Department Mirror Pool Wildlife Management Area.

Alternative 3 provides direction to restore fire, rest, and herbivory as natural ecological processes to varying levels. Under the management activities proposed by these alternatives, habitats should be enhanced for the species within this plant group. Known populations should receive adequate protection. Some losses may occur within populations to individuals. However, populations should remain viable throughout the planning unit, planning area, and rangewide.

Outcome IV is selected as the risk assessment for marsh bellflower, crested shield fern, buckbean, marsh fern, bog willow, spinulose woodfern, delicate sedge, umbrella flatsedge, Labrador bedstraw, and showy lady's slipper. Habitat is limited to wetland refugia in the vicinity of the planning unit. Much of the wetland habitat for these species on other land jurisdictions in the planning area has been lost. Habitat enhancement will be needed in some areas. Re-introductions of these species should not be necessary.

Outcome VI is selected as the risk assessment for slender cottongrass, shining flatsedge, Loesel's twayblade, meadow horsetail, marsh horsetail, and sensitive fern. These species are considered extremely rare on the planning unit and in the planning area and habitat is limited to wetland refugia. Much of the wetland habitat for these species on other land jurisdictions has been lost. Re-introductions or population augmentation may be required for these species.

SRMNF, NNF (BRD)

Biological determinations are not made for these species on these areas since they are not listed as sensitive by Region 2 of the Forest Service. The conservation measures listed above are expected to enhance habitat and/or protect these habitats and species from possible adverse effects of Forest Service authorized activities and allocations.

Tallgrass Prairie Wetlands Guild

Plant species in this guild include:

Little grapefern

Small white lady's slipper

Adder's tongue fern

Table H-6 summarizes species occurrence and status in the planning area. Each of these species is classified as sensitive by Region 1 of the Forest Service.

Guild Description

This plant group includes species found in habitats associated with lowland swales, wetland depressions, marshes, and the sedge / willow complexes found predominately within the tallgrass prairie regions of the planning area. All the currently known populations of species associated with this group occur in habitats of the Sheyenne National Grassland of eastern North Dakota (North Dakota Natural Heritage database 2000). Adder's tongue fern is also known to occur on the Samuel R. McKelvie NF in Nebraska and could occur on the Nebraska National Forest (BRD).

Two of the species, adders's tongue and small white lady's slipper, occur in the mid-range of versatility, i.e. they are associated primarily with one habitat type but may also be found in other habitat types (North Dakota Natural Heritage database 2000, Bowles 1983, ND Parks and Recreation Dept. 1990, USDA Forest Service 2000). On the Sheyenne National Grassland, little grapefern occurs in the narrow range of versatility based upon current habitat information (North Dakota Natural Heritage database 2000). In addition, the western prairie fringed orchid (*Platanthera praeclara*), a threatened plant species, also occurs within habitats associated with this plant group.

Within the Northern Great Plains planning area, the habitat components captured by this plant group are uncommon and occupy a very small percentage of the total land base (ND Parks and Recreation 1990, Seiler 1973). Mesic areas that provide habitat on other portions of the planning area may differ in habitat, soils, and hydrologic regime from those described for the Sheyenne National Grassland, however these other habitats share the common feature of having a moisture regime which may vary annually or seasonally.

Very little private, state, or other federal lands exist within the planning unit that would provide habitats contained within this guild. In addition, the small fragments of tallgrass prairie on private land may be unoccupied habitat and seed sources may not be present for colonization of the species in this plant group.

On the Sheyenne National Grassland, the habitats associated with this plant group have developed under broad landscape disturbance processes. However, they are primarily distinguished by their high groundwater tables. In addition, these areas collect runoff that often remains for considerable periods (Seiler 1973). For example, the lowland swales found within the Sheyenne National Grassland tallgrass prairie experience seasonal fluctuations of the water table as well as widely varying annual fluctuations. During high precipitation climate cycles, the swales may be inundated with water for most of the growing season, whereas during drier years the swales may lose their standing water (Seiler 1973).

In the tallgrass prairie of North Dakota, temporarily flooded lowland swales are frequently dominated by wooly sedge (Seiler 1973). The wetter lowland marshes are dominated by emergent aquatics such as sedges, bulrushes, rushes, spikerushes, common cattail and other tall graminoid species (Gantt 1980). Gantt (1980) notes that early historical records describe bluejoint and red top as the primary marsh species.

At one time, the wetlands of the tallgrass prairie were more plentiful, however much of the tallgrass prairie has been converted for agriculture purposes (Ostlie et al. 1997, Chuluun et al. 1997). According to Gantt (1980) the tallgrass prairie as it existed almost 100 years ago is virtually non-existent today. Studies of vegetation change by Burgess (1964) and others support this. Current management practices that may affect plant species and community viability

include drainage ditches that alter hydrologic regimes, competition to native flora from non-native plant species, insufficient fire regime, and grazing.

Information on Individual Plant Species:

Little Grapefern (*Botrychium simplex*)

Distribution of little grapefern includes Newfoundland and Quebec, south to North Carolina, west through Illinois, Mississippi, New Mexico, and California, and north to Alaska (NatureServe 2000). The global rank of this species is "G5" meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). In North Dakota, little grapefern is known from one verified population and an additional unverified population (North Dakota Natural Heritage database 2000). The size of the populations ranges from 10 to 30 individuals. Threats to the known population on USFS land includes livestock trampling and flooding from the recent wet climatic cycle (North Dakota Natural Heritage database 2000; K.Hansen, personal communication). It has also been found in South Dakota (NatureServe 2000).

North Dakota populations have been found in shaded swales in tallgrass prairie communities (North Dakota Natural Heritage database 2000).

Adder's tongue (*Ophioglossum pusillum*)

Adder tongue is found in Quebec, south to North Carolina; west though Missouri, Nebraska, Montana, and California; and north to Alaska (NatureServe 2000). Within the planning area, adder's tongue is known from 21 populations in North Dakota (North Dakota Natural Heritage database 2000) and has been reported from a limited number of populations in Nebraska and South Dakota. The global rank of this species is "G5" meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery) (NatureServe 2000).

Prior to 1993, many of the known North Dakota populations were small, however the recent wet climatic cycle has resulted in larger numbers of individuals and new populations (K.Hansen, personal communication). The 1993 U.S. Forest Service Rare Plant Survey Report for the Sheyenne National Grassland documents numerous new sites and larger population sizes. Since that time, some of these sites have become flooded with unknown effects upon the populations. Threats from management include livestock trampling and alteration to the hydrologic regime. Noxious weed spraying is restricted in wetland habitats and should not affect the species. New populations have been discovered for this species within recently burned areas, which suggests that the species may be dependent upon a burning regime (K.Hansen, personal communication).

Small white lady's slipper (*Cypripedium candidum*)

Distribution of small white lady's slipper includes Ontario south to Virginia, west to Missouri and Nebraska, and north to Saskatchewan (NatureServe 2000). Within the planning area, small white lady's slipper is known from eastern North Dakota and South Dakota, and eastern and central Nebraska (Great Plains Flora Association 1977). The global rank of small white lady's slipper is "G4" meaning uncommon but not rare (although it may be rare in parts of its range, particularly on the periphery), and usually widespread. It is apparently not vulnerable in most of its range, but possibly cause for long-term concern.

In North Dakota, small white lady's slipper 40 populations have been recorded (North Dakota Natural Heritage database 2000). The populations range in size from few individuals to very large (1000+ individuals) (North Dakota Natural Heritage database 2000). Some of the records are historic or have not been recently confirmed. Threats to known populations include competition from leafy spurge, livestock grazing and trampling, litter buildup from lack of fire, and altered hydrologic regime (North Dakota Natural Heritage database 2000, Bowles 1983). Ownership of many of the sites in North Dakota lies on private land with a few populations on Forest Service system lands.

Direct and Indirect Effects on NFS Lands

Noxious weeds such as leafy spurge occur in scattered populations throughout the tallgrass prairie. Noxious weeds reduce the quality of sensitive species habitat but at the same time, efforts to control spurge and other invasive species with chemicals can pose a direct threat to sensitive species.

Competition from other non-native invasive plants (exotics) can be a significant threat. Invasive species such as Kentucky bluegrass and smooth brome often form monocultures, significantly reducing the diversity of native species. Some types of livestock grazing seem to encourage spread of these invasive species while some grazing strategies can reduce rates of encroachment and spread.

Roads can negatively affect sensitive plant populations by introducing non-native plant species along travel routes, through habitat fragmentation, and by loss of suitable habitat to disturbance.

Recreation can have effects on sensitive plants or plant populations, depending on types of recreational use, road and trail use patterns and intensities, rate of spread of invasive, non-native plant species along recreational routes, and other factors.

Increased rates of channelization in drainages can result in lowered water tables. Activities that lower water tables below the root zone of some sensitive plant species may place individual plants or populations at risk.

Burning, livestock grazing, and mowing can have positive or negative effects on sensitive plant species, depending on frequency, intensity, and timing of disturbance and on the reproductive characteristics of the individual plant species. Properly timed grazing, burning, and mowing may be beneficial in maintaining the quality of native grassland habitats. Lack of disturbance can cause some sites to convert to shrub habitats dominated by willow species.

Burning may directly impact sensitive plant species by causing mortality or indirectly impact these species and communities through effects on the habitat. Mowing and summer burning may prevent a completion of the life cycle for the small white lady's slipper. Adder's tongue is too short structurally to be affected by mowing but would affected by summer burning. Little grape fern occurs in willow thickets which are not mowed but would be affected by summer burning. Early spring and late fall burning should have no effect on any of the species and may be beneficial.

Early season livestock grazing can prevent sensitive plants from completing their life cycles and producing seeds or spores. Excessive and continuous livestock grazing on sensitive plants can lead to impacts on plant regrowth, thereby reducing the vigor of plants within the population. The species within this plant group are not considered palatable to cattle but could be grazed by sheep or goats. However, grazing can also reduce dead material within plant communities and open up canopy layers of plants, allowing for the germination and establishment of new plants.

Livestock trampling can be a problem under some circumstances for the sensitive species within this plant group. Trampling could be detrimental to individual plants because all three species are delicate fleshy plants. In addition, excessive and repeated soil compaction from trampling may result in reduced plant vigor.

Repeated mowing may prevent some sensitive plant species from completing their life cycle and may also reduce carbohydrate reserves. Mowing should have no affect after seed set / spore dispersal.

Cumulative Effects

Continued loss of suitable habitat through conversion of rangelands to croplands can be expected to occur on private lands (Ostlie et al. 1997, USDA Forest Service 2000).

It is likely that noxious weeds will remain as threats in the habitats of these species on private and public lands in and around the project area (Ostlie et al. 1997).

Livestock grazing and mowing practices that are unfavorable for the conservation of sensitive plant species are likely to continue on some private lands.

Development activities such as road and building construction on private lands will continue, resulting in some loss of suitable habitat for sensitive plant species and some possible mortality of sensitive plants and population loss.

Drainage ditches on adjacent private land may lower water table levels below the root zone of some sensitive plant species, putting individuals or populations at risk.

Insecticide spraying on adjacent croplands may reduce or threaten insect pollinators for some sensitive plant species (Arenz and Joern 1996, Oslie et al. 1997).

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction under Alternative 3 in the revised LRMP:

Unit-wide Direction (Chapter 1)

SNG

- Avoid placing new facilities, other developments such as water tanks and impoundments, in habitat occupied by sensitive plant species (Guideline).
- Identify sensitive plant habitats and rare plant communities as priorities for noxious weed and invasive plant monitoring and control (Guideline).
- Avoid the use of noxious weed and invasive plant control methods that may negatively impact sensitive plants (Guideline).
- Design timing, intensity, and frequency of mowing, burning and livestock grazing to maintain or increase sensitive plant species populations (Standard).
- Do not authorize vegetation management and construction projects that would further isolate or prevent re-colonization of sensitive plant populations from adjacent populations (Standard).
- Maintain hydrological regimes and protect and restore developed springs and seeps where habitat for sensitive plant species would be enhanced (Guideline).
- Ensure that management actions do not contribute to loss of population viability for Forest Service sensitive plant species (Standard).
- Protect known sensitive plant populations from land use activities that cause increased trampling or soil compaction within key habitats (Guideline).
- Enhance and improve habitat for known sensitive plant populations through restoration programs (Guideline).
- Prohibit use of pesticides that would adversely affect species at risk (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

SNG, SRMNF, NNF (BRD)

- Manage land treatments to conserve site moisture and to protect long-term wetland health from damage by increased runoff (Standard).
- Allow only those actions next to wetlands that maintain or improve long-term proper functioning of ecosystem conditions (Standard).
- Design activities to protect and manage the riparian ecosystem. Maintain the integrity of the ecosystem, including quantity and quality of surface and ground water (Standard).
- Maintain and protect the hydrologic regime that supplies ground water to the wetlands (Standard).
- To provide protection for riparian areas, locate activities and facilities away from wetlands unless alternatives have been assessed and determined to be more environmentally damaging (Guideline).

- Do not deposit waste material below high water lines (Guideline).
- Maintain long-term ground cover, soil structure, water budgets, and flow patterns of wetlands to sustain their ecological function and meet regulations found in Section 404(b)(1) of the Clean Water Act (Standard).

Geographic Area Direction (Chapter 2)

SNG

- Burn approximately 40,000 acres per decade (Objective).
- Rest at least 5 percent of the suitable rangeland each year (Objective).
- Prohibit additional draining of the national grassland (Standard).
- Implement the most current Recovery Strategy for the Western Prairie Fringed Orchid covering land management activities for allotments containing orchids (Standard).
- Develop and implement conservation strategies for sensitive plants within this guild (Guideline).
- Conduct target plant surveys or baseline assessments for sensitive plants within this guild (Guideline).
- Avoid activities that would negatively impact the hydrologic regime of the Sheyenne River and Sheyenne aquifer (Guideline).

SNG, SRMNF, NNF (BRD)

- Objectives call for specified levels of ungrazed habitat and a more diverse grassland vegetation mosaic through desired levels of rest, seral stages and vegetation structure (see tables in Section 5).

Management Area Direction (Chapter 3)

SNG (MA 2.2 and 3.66)

- Initiate intensive restoration efforts (MA 3.66) to meet desired conditions that include active and passive methods (Guideline).
- Prevent new introduction of non-native plant species (MA 3.66) into known areas of sensitive plant species or guilds (Guideline).
- The proposed Fritillary Prairie and Platanthera Prairie RNAs include habitat for this plant guild. RNAs will be managed to protect their ecological values. Management plans will be completed within 5 years (Objective).

Monitoring Direction (Chapter 4)

SNG

- Monitor populations and habitat.

SNG, SRMNF, NNF (BRD)

- Monitor the effectiveness of the suggested stocking rates in Appendix I in meeting desired vegetation composition and grassland structure levels.

Appendices

SNG

- Conservation measures identified in Appendix N for western prairie fringed orchid will also benefit this plant guild.

SNG, SRMNF, NNF (BRD)

- Appendix I provides suggested stocking rates for various livestock grazing intensities. This appendix is referenced by a standard under geographic area direction (Chapter 2) to use this appendix to help develop and implement range management practices for meeting vegetation objectives.

Biological Determinations, Risk Assessments, and Rationale

SNG (all species in this plant group)

Determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

Within this plant group, species have state rankings of S1, S2, and S2/S3 and range from critically imperiled to rare in North Dakota (North Dakota Natural Heritage Program 1999). Known element occurrences range from 1 known populations to 40 known populations. The known populations contain widely varying numbers of individuals within populations, ranging from one individual to 1000+ (North Dakota Natural Heritage database 2000).

Habitat enhancement and restoration through natural processes such as fire and rest are proposed that should benefit species in this guild. In addition, some of the proposed management activities should provide additional specific protection measures for known populations of the species. For example, grazing management and rest in both occupied and unoccupied habitat will follow management prescriptions in the Recovery Strategy for the western prairie fringed orchid that will be implemented under the Grassland Plan.

Under the proposed management, two new Research Natural Areas (RNA) are proposed. These RNAs would provide management direction and protection for species or habitat found within this group. The Planthera Prairie and Fritillary Prairie proposed RNAs contain populations of some of the sensitive species in this group.

The acres of rangeland annually rested from livestock grazing will more closely approximate the conditions under which some of the species evolved as compared to current grazing conditions. In addition, the level of prescribed fire is a positive move towards restoring the fire regime (USDA Forest Service 2000). Alternatives 3 provides for no net increase (from current levels) of noxious weeds. The existence and spread of noxious and exotic species is one of the primary threats to the maintenance of high quality tallgrass prairie habitat (USDA Forest Service 2000).

Some of the populations for these species are not accessible to livestock grazing or trampling. Other protections exist from modified grazing strategies.

Under the management activities proposed, habitats should be enhanced for the species within this plant group. Known populations should receive adequate protection. Losses may occur to individual plants within populations due to non-native plant species, grazing, and trampling. However, populations should remain viable throughout the planning unit, planning area, and rangewide.

Outcome VI is selected as the risk assessment for little grapefern. Rationale for outcome VI is that this species is known from very limited populations within the vicinity of the planning unit. This will result in strong limitations on interactions among local populations, high potential for genetic isolation, and uncertainty about the species response to climatic stochasticity. Populations occur on the Sheyenne National Grassland where habitat is threatened by serious competition from invasive and noxious weeds.

For adder's tongue and small white lady's slipper, outcome II is selected as the risk assessment under Alternative 3. Rationale for outcome II is that habitat of sufficient quality, quantity, and abundance occurs in the vicinity of the planning unit. Both species are known from numerous populations within the planning area and reintroductions of the species are not considered necessary. Land uses are managed on the planning units to avoid most adverse direct threats to the species, however other factors such as encroachment and invasion of exotic plant species are a serious threat on the Sheyenne National Grassland.

SRMNF, NNF (BRD)

Biological determinations are not made for these species on these areas since they are not listed as sensitive by Region 2 of the Forest Service. The conservation measures listed above are expected to enhance their habitat and/or protect the habitat and species from possible adverse effects of Forest Service authorized activities and allocations.

Tallgrass Prairie Deciduous Hardwoods Guild

Plant species in this guild include:

Northern ladyfern	Dogberry
Oak fern	Leathery grapefern
Foxtail sedge	Broad-leaved goldenrod.

Table H-6 summarizes species occurrence and status in the planning area. Each of these species is classified as sensitive by Region 1 of the Forest Service.

Guild Description

This plant group includes species that occur in the hardwood forests and woodlands found predominately on the tallgrass prairie regions of the planning area. All currently known populations of species in this plant group occur in habitats of the Sheyenne National Grassland of eastern North Dakota (North Dakota Natural Heritage database 2000). The communities within this group are characterized by broadleaf deciduous trees.

This plant group includes the green ash-boxelder community although it also contains other broadleaf species such as American elm and plains cottonwood. These communities occur upslope from the river gallery forests and intergrade into savanna then graminoid communities with increasing distance and elevation above the river valleys (Gantt 1980). Green ash and boxelder dominates areas where moisture runoff into ravines, coulees, or draws is sufficient to support woodland vegetation (Seiler 1973).

Within the Northern Great Plains planning area, the habitat components associated with this plant group are uncommon and occupy a very small percentage of the total land base (Seiler 1973, ND Parks and Recreation Dept 1990, Nelson 1964). Mesic woodlands and moist areas which provide habitat on other portions of the planning area may differ in habitat, soils, and hydrologic regime from those described for the Sheyenne National Grassland. However, these other habitats share the common feature of rich loam soils and mesic conditions which are capable of supporting a wooded habitat dominated by eastern deciduous hardwood trees such as bur oak and aspen.

Six plant species, including one shrub, one forb, one sedge and three ferns, are found in these wooded habitats. All six species occur in the mid-range of versatility, i.e. they are associated primarily with one habitat type but may also be found in other habitat types.

This plant group does not include river gallery forests (elm-basswood communities) such as those found along the Sheyenne River as these habitats are included in the tall grass prairie boggy wetlands plant group. Many of the same herbaceous forbs that occur in the elm-basswood community are found along the margins of the green ash-boxelder community although this later community is characterized by an overall greater abundance of grasses and sedges (Seiler 1973).

Information on Individual Plant Species:

Broad-leaved goldenrod (*Solidago flexicaulis*)

Distribution of broad-leaved goldenrod includes Quebec south to Georgia, west to Oklahoma, and north to Ontario. Within the planning area, broad-leaved goldenrod has been documented from limited populations in South Dakota, North Dakota, and Nebraska. The global rank of this species is “G5” meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery) (NatureServe 2000).

Broad-leaved goldenrod is known from four populations in North Dakota. Population sizes range from very small (one individual) to large (200 individuals). Threats to populations include livestock grazing and trampling. Only one population is found on USFS land. Extreme habitat degradation is recorded for this site (North Dakota Natural Heritage database 2000).

Oak Fern (*Gymnocarpium dryopteris*)

Distribution of oak fern includes Newfoundland south to West Virginia, west to Illinois, South Dakota, New Mexico, and Arizona, and north to Alaska. Within the planning area, oakfern is recorded from North Dakota and South Dakota. The global rank of this species is “G5,” meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery) (NatureServe 2000). Oak fern is known from three populations in North Dakota (North Dakota Natural Heritage database 2000). Population sizes range from 50 individuals to several hundred, although reproduction is uncertain at one of the sites (North

Dakota Natural Heritage database 2000). Threats include livestock trampling to the fragile species and habitat degradation. Only one population is found on USFS land.

Leathery grapefern (*Botrychium multifidum*)

Distribution of leathery grapefern includes Newfoundland south to North Carolina, Illinois, Nebraska, New Mexico, and California, and north to Alaska. The global rank of this species is "G5" meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). Within the planning area, oakfern has been documented from limited populations in Nebraska, South Dakota, and North Dakota (NatureServe 2000). Leathery grapefern is known from two populations in North Dakota (North Dakota Natural Heritage database 2000). Each population contains less than ten individuals. Its habitat includes the margin of a pond associated with green ash and bur oak overstories (Heidel et al. 1992) and a mesic depression associated with bur oak / quaking aspen overstory (North Dakota Natural Heritage database 2000). Threats include livestock trampling to the fragile species. Only one population is found on USFS land.

Foxtail sedge (*Carex alopecoidea*)

Foxtail sedge distribution includes Quebec, south to Tennessee west to Wyoming, and north to Saskatchewan. The global rank of this species is "G5" meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). Within the planning area, it has been documented from South Dakota and North Dakota and is tracked as rare in both states (NatureServe 2000). Foxtail sedge is known from five populations in North Dakota (North Dakota Natural Heritage database 2000). It is considered locally abundant at some of the populations with 100+ individuals present. Threats include livestock grazing and trampling, alterations to the hydrologic regime, and invasive plant species (North Dakota Natural Heritage database 2000). Only two populations are found on USFS land.

Dogberry (*Ribes cynosbati*)

Dogberry distribution includes Quebec, south to Georgia, west to Oklahoma, and north to Manitoba. The global rank of this species is "G5" meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). Within the planning area, it occurs in North Dakota and South Dakota (NatureServe 2000). It is known from five populations in North Dakota (North Dakota Natural Heritage database 2000). The one known population on USFS land is large, containing over 1000+ individuals. Habitat includes river bottom woods (Barker et al. 1977). Threats include livestock trampling, alterations to habitat from livestock shading practices, alteration to the hydrologic regime, and invasive plant species (North Dakota Natural Heritage database 2000; K. Hansen, personal communication). All other populations are found on private land.

Northern lady fern (*Athyrium filix-femina*)

Distribution of northern lady fern includes all of North America (NatureServe 2000). Northern lady fern is known from 38 populations in North Dakota (North Dakota Natural Heritage database 2000). The global rank of this species is "G5" meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). In North Dakota, population sizes vary from very small (less than 10 individuals) to colonies of several thousand. Habitats include moist woods, meadows, and streambanks (Barker et al. 1977). Threats include livestock trampling, alterations to habitat from livestock grazing, alteration to seeps and slope habitat, and invasive plant species. Some of the habitat degradation is recorded

as severe (North Dakota Natural Heritage database 2000). Approximately ten of the populations are known from USFS lands with the majority of the populations found on private land.

Direct and Indirect Effects on NFS Lands

Noxious weeds, such as leafy spurge, occur in scattered populations throughout the tallgrass prairie. Noxious weeds reduce the quality of sensitive species habitat but at the same time, efforts to control spurge and other invasive species with chemicals can pose a direct threat to sensitive species.

Competition from other non-native invasive plants (exotics) can be a significant threat. Invasive species such as Kentucky bluegrass and smooth brome often form monocultures, significantly reducing the diversity of native species. Some types of livestock grazing seem to encourage spread of these invasive species while some grazing strategies can reduce rates of encroachment and spread.

Roads can negatively affect sensitive plant populations by introducing non-native plant species along travel routes, through habitat fragmentation, and by loss of suitable habitat to disturbance.

Recreation can have effects on sensitive plants or plant populations, depending on types of recreational use, road and trail use patterns and intensities, rate of spread of invasive, non-native plant species along recreational routes, and other factors.

Increased rates of channelization in drainages can result in lowered water tables. Any activities that lower water tables below the root zone of some sensitive plant species may place individual plants or populations at risk.

Burning, livestock grazing, and mowing can have positive or negative effects on sensitive plant species, depending on frequency, intensity, and timing of disturbance and on the reproductive characteristics of the individual plant species. Properly timed grazing, burning, and mowing may be beneficial in maintaining the quality of native grassland habitats. Lack of disturbance can cause some sites to convert to shrub habitats dominated by willow species.

Burning may directly impact sensitive plant species by causing mortality or indirectly impact these species and communities through effects on the habitat.

Livestock grazing can prevent sensitive plants from completing their life cycles and producing seeds or spores. Excessive and continuous livestock grazing on sensitive plants can lead to impacts on plant regrowth, thereby reducing the vigor of plants within the population. Some of the species within this plant group may be palatable to cattle as well as sheep or goats. However, there is typically little livestock forage produced in these habitats, and livestock use these areas mainly for shade.

Grazing can reduce dead material within plant communities and open up canopy layers of plants, allowing for the germination and establishment of new plants.

Livestock trampling can be a problem under some circumstances for the sensitive species in this plant group. Trampling could be detrimental to delicate plants such as lady fern, oak fern, and leathery grapefern. In addition, excessive and repeated soil compaction from trampling may result in reduced plant vigor.

Cumulative Effect

It is likely that noxious weeds will remain as threats to the habitats of these species on private and public lands in and around the administrative units containing these species.

Continued loss of suitable habitat through conversion of rangelands to croplands can be expected to occur on private lands (Ostlie et al. 1997, USDA Forest Service 2000).

Livestock grazing and mowing practices that are unfavorable for the conservation of sensitive plant species are likely to continue on some private lands.

Development activities such as road and building construction on private lands will continue, resulting in some loss of suitable habitat for sensitive plant species and some possible mortality of sensitive plants and population loss.

Insecticide spraying on adjacent croplands may reduce or threaten insect pollinators for some sensitive plant species (Arenz and Joern 1996, Ostlie et al. 1997).

Drainage ditches on adjacent private land may lower water table levels below the root zone of some sensitive plant species, putting individuals or populations at risk.

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction under Alternative 3 in the revised LRMP:

Unit-wide Direction (Chapter 1)

SNG

- Avoid placing new facilities and other developments such as water tanks and impoundments in habitat occupied by sensitive plant species (Guideline).
- Identify sensitive plant habitats and rare plant communities as priorities for noxious weed and invasive plant monitoring and control (Guideline).
- Avoid the use of noxious weed and invasive plant control methods that may negatively impact sensitive plants (Guideline).
- Design timing, intensity, and frequency of mowing, burning and livestock grazing to maintain or increase sensitive plant species populations (Standard).
- Do not authorize vegetation management and construction projects that would further isolate or prevent re-colonization of sensitive plant populations from adjacent populations (Standard).
- Maintain hydrological regimes and protect and restore developed springs and seeps where habitat for sensitive plant species would be enhanced (Guideline).
- Ensure that management actions do not contribute to loss of population viability for Forest Service sensitive plant species (Standard).

SNG, cont.

- Protect known sensitive plant populations from land use activities that cause increased trampling or soil compaction within key habitats (Guideline).
- Enhance and improve habitat for known sensitive plant populations through restoration programs (Guideline).
- Prohibit use of pesticides that would adversely affect species at risk (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

SNG

- Develop and initiate implementation of conservation strategies for plants within this guild (Guideline).
- Conduct target plant surveys or baseline assessments for species within this guild (Guideline)..
- Avoid activities that would negatively impact the hydrologic regime of the Sheyenne River and the Sheyenne aquifer (Guideline).

Management Area Direction (Chapter 3)

SNG (MA 3.64)

- Limit all motorized use to administrative use (Standard).
- Maintain disturbance processes if required for habitat enhancement, restoration or species viability (Standard).
- Allow no new road or trail construction except when necessary to correct resource damage occurring from existing sites (Standard).
- Conflicts that cannot be mitigated are resolved in favor of specific plant and wildlife species and communities (Standard).
- Prohibit removal of mineral material (Standard).
- Do not include this management are in any grazing allotment. However, livestock grazing may be used as a tool to achieve desired conditions (Guideline).
- No new utility corridors or additional development within existing corridors will be permitted. Existing corridors may be maintained until they are abandoned (Standard).
- Prohibit new special-use facilities except for valid existing rights (Guideline).

Monitoring Direction (Chapter 4)

SNG

- Monitor populations and habitat.

Biological Determinations, Risk Assessments, and Rationale

SNG (all members of plant group)

Determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

Within this plant group, species have state rankings of S1, S2, S2/S3, and S3 and range from critically imperiled to rare in the State of North Dakota (North Dakota Natural Heritage Program 1999). Known element occurrences range from less than two known populations to 30+ known populations (North Dakota Natural Heritage database 2000). The known populations contain widely varying numbers of individuals within populations.

Some of the species may be palatable for cattle as well as sheep or goats. However, livestock grazing is fairly limited since typically little livestock forage is produced in these woodland habitats. Livestock do use these areas for shade. The primary threat from livestock for these species is from trampling. Lady fern, oak fern, and leathery grapefern would be especially susceptible to trampling.

Habitat enhancement would occur under the proposed management through restoration of varying levels of natural disturbance processes. The levels of prescribed fire within alternative 3 are a positive move towards restoring the fire regime under which these species and their habitats evolved (USDA Forest Service 2000). Alternative 3 provides for no net increase (from current levels) of noxious. The existence and spread of noxious and exotic species are primary threats to the maintenance of high quality tallgrass prairie habitat (USDA Forest Service 2000).

Proposed management activities under all alternatives should provide adequate protection for known populations of species within this group. Populations should remain viable throughout the planning unit, planning area, and range-wide.

Outcome VI is selected as the risk assessment for oakfern, leathery grapefern, broadleaved goldenrod, foxtail sedge and dogberry. Rationale for outcome VI is that these species are known from very limited populations within the vicinity of the planning unit. This will result in strong limitations on interactions among local populations, high potential for genetic isolation, and uncertainty about the species response to climatic stochastic. Habitat enhancement and population augmentation may be required.

Outcome II is selected as risk assessment for northern lady fern. Habitat of suitable quality, quantity, and abundance will be maintained across the planning unit for this species. Some of the known populations of this species are large. Habitat enhancement may be needed, but population augmentation or re-introductions should not be required.

Tallgrass Prairie Choppy Sandhills Guild

Plant species in this guild include:

Beach heather	Purple sandgrass
Frostweed	Wahoo spindle-tree

Table H-6 summarizes species occurrence and status in the planning area. Each of these species is classified as sensitive by Region 1 of the Forest Service.

Guild Description

This plant group includes species found in the various components of the choppy sandhills land type found within the planning area on the Sheyenne National Grassland in eastern North Dakota. This land type consists of mixed grass prairie intermingled with bur oak savanna woodlands. The oak savanna woodland is a predominant vegetative feature in the sandy soils of the Sandhills Region along the Sheyenne River. Sand dunes and sand blowouts are other distinguishing features within this association. Bur oak seral stages such as aspen communities may also be present (Seiler 1973).

The sandhills are a unique geologic area formed by the Sheyenne River delta as it flowed into ancient Lake Agassiz. At one time, glacial Lake Agassiz formed the largest inland fresh water lake in North America. Where major tributaries entered the lake, deltas were built such as the Sheyenne River delta (Seiler 1973). The geologic origins of the sandhills are unique to the planning area as are the association of habitats found here.

Within the Northern Great Plains planning area, the habitat components captured by this group are uncommon and occupy a very small percentage of the total land base (Seiler 1973, ND Parks and Recreation Dept. 1990). Rolling sandy uplands, including sand dunes, that provide habitat on other portions of the planning area may differ in habitat types, soils, and moisture regime from those described for the Sheyenne National Grassland, however these other habitats share the common feature of having sandy soils.

Four species of concern occur in this group. Frostweed is found within the mixed grass component in the upland rolling prairie as well as intermittently in the bur oak habitat (ND Parks and Recreation Dept 1990, Barker et al. 1977). Sandgrass and beach heather are found in the sand dunes and sand blowouts of the choppy sandhills (Seiler 1973, ND Parks and Recreation Dept. 1990), as well as on upland prairie (Barker et al. 1977). The wahoo spindle tree is found in the bur oak habitat type (North Dakota Natural Heritage database 2000) as well as in wooded areas, bluffs, and along streambanks (Great Plains Flora Association 1986). In addition, several other species are known to occur in the bur oak habitat type although they may primarily use other habitat types. This would include the northern lady's fern that has been found in seral aspen communities associated with bur oak savanna (North Dakota Natural Heritage database 2000). Also, dogberry has been found under the hardwood canopy of the bur oak (North Dakota Natural Heritage database 2000).

Much of the choppy sandhills area in North Dakota has been altered extensively since pre-intensive settlement including past utilization as cropland that later returned to native grassland (Burgess 1964, Shunk 1917, Seiler 1973, and Gantt 1980). In the sand dune habitats, the soils have often been stabilized and the sites are affected by grazing and introduced plant species. The bur oak woodlands in this area of North Dakota have been extensively altered and reduced from pre-intensive settlement (Burgess 1964). According to Shunk (1917), bur oak formerly represented very extensive communities consisting of trees of large size. With the incoming of settlers and the scarcity of fuel and lumber, the trees were cut and utilized in a very short time. They were replaced by scrubby groves of oak that often reached only minimal size before they were also utilized for settlement purposes.

Information on Individual Plant Species

Frostweed (Helianthemum bicknellii)

Beach heather (Hudsonia tomentosa)

Purple sandgrass (Triplasis purpurea)

Distribution of frostweed includes Maine south to Georgia, west to Colorado and north to Manitoba. Beach heather distribution includes Newfoundland south to North Carolina, west to Iowa, and north to Alberta. Purple sandgrass is found from Maine south to Florida, west to New Mexico, and north to Ontario. The global rank of frostweed and beach heather is "G5" meaning common, widespread, and abundant (although they may be rare in parts of their range, particularly on the periphery) (NatureServe 2000). The global rank of purple sandgrass is "G4G5" meaning uncommon but not rare, and usually widespread to common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery).

In the planning area, frostweed has been documented from Nebraska, North Dakota, and South Dakota. Beach heather is known only from North Dakota in the planning area. Purple sandgrass has been documented from North Dakota, South Dakota, and Nebraska (NatureServe 2000). In North Dakota, frostweed, beach heather, and purple sandgrass are all known from very few populations. In addition, few individuals occur within these populations. Only two populations of beach heather are known in North Dakota. One of the populations is reported in poor condition and low vigor. Five populations of frostweed are found in North Dakota. Population threats to this species include competition from invasive plant species. Purple sandgrass is known from three populations in North Dakota. Some population sizes are small with one population containing 20 individuals (North Dakota Natural Heritage database 2000).

Wahoo spindle-tree (*Euonymus atropurpurea*)

Distribution of wahoo spindle-tree includes Maine south to Florida, west to Texas, and north to Montana and Ontario. The wahoo spindle-tree is known from 18 populations in North Dakota and is more widespread in Nebraska and South Dakota. The global rank of this species is "G5" meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery) (NatureServe 2000).

Some of the populations are reported to have disturbances from heavy browsing, herbicide spraying, and habitat alteration from logging. Most of the populations are known from very few individuals (less than five plants) although three populations do contain 100 or more plants (North Dakota Natural Heritage database 2000).

Direct and Indirect Effects on NFS Lands

Noxious weeds such as leafy spurge occur in scattered populations throughout the tallgrass prairie. Noxious weeds reduce the quality of sensitive species habitat but at the same time, efforts to control spurge and other invasive species with chemicals can pose a direct threat to sensitive species.

Competition from other non-native invasive plants can be a significant threat. Invasive species such as Kentucky bluegrass and smooth brome often form monocultures, significantly reducing the diversity of native species. Some types of livestock grazing seem to encourage spread of these invasive species while some grazing strategies can reduce rates of encroachment and spread.

Roads can negatively affect sensitive plant populations by introducing non-native plant species along travel routes, through habitat fragmentation, and by loss of suitable habitat to disturbance.

Recreation can have effects on sensitive plants or plant populations, depending on types of recreational use, road and trail use patterns and intensities, rate of spread of invasive, non-native plant species along recreational routes, and other factors.

Increased rates of channelization in drainages can result in lowered water tables. Activities that lower water tables below the root zone of some sensitive plant species may place individual plants or populations at risk.

Burning, livestock grazing, and mowing can have positive or negative effects on sensitive plant species, depending on frequency, intensity, and timing of disturbance and on the life history needs of the individual plant species. Properly timed grazing, burning, and mowing may be beneficial in maintaining the quality of native grassland habitats. Lack of disturbance can cause some sites to convert to shrub habitats or to become dominated by heavy vegetative cover.

Burning may directly impact sensitive plant species by causing mortality or indirectly impact these species and communities through effects on the habitat. Mowing and summer burning may prevent a completion of the life cycle for frostweed. Early spring and late fall burning should have no effect on any of the species and may be beneficial.

Fire suppression can contribute to stabilization and increased vegetative cover on the sandhills, thereby reducing the number and size of blowouts where occupied and potential habitats exist for several species in this group. This would particularly affect sandgrass, an annual species associated with primary succession on blowouts.

Early season livestock grazing can prevent sensitive plants from completing their life cycles and producing seeds. Excessive and continuous livestock grazing on sensitive plants can lead to impacts on plant regrowth, thereby reducing the vigor of plants within the population. The species in this plant group are not considered highly palatable to cattle but could be grazed by sheep or goats.

Grazing can also reduce dead material within plant communities and open up canopy layers of plants allowing for the germination and establishment of new plants. Livestock grazing can create conditions favorable for establishment of new plants of sensitive species such as beach heather and sandgrass that require disturbed areas for germination.

Livestock trampling can be a problem under some circumstances for the sensitive species in this plant group. Trampling could be detrimental to individual plants. In addition, excessive and repeated soil compaction from trampling may result in reduced plant vigor.

Repeated mowing may prevent some sensitive plant species from completing their life cycle and may also reduce carbohydrate reserves. Mowing should have no affect after seed set.

Cumulative Effects

Continued loss of suitable habitat through conversion of rangelands to croplands can be expected to occur on private lands (Ostlie et al. 1997, USDA Forest Service 2000).

It is likely that noxious weeds will remain as threats to the habitats of these species on private and public lands in and around the administrative units containing these species (Ostlie et al. 1997).

Livestock grazing and mowing practices that are unfavorable for the conservation of sensitive plant species are likely to continue on some private lands.

Grazing practices on private land may not be conducive to sustaining populations.

Stabilization of blowouts on private land may continue to decrease populations on private land.

Development activities such as road and building construction on private lands will continue, resulting in some loss of suitable habitat for sensitive plant species and some possible mortality of sensitive plants and population loss.

Drainage ditches on adjacent private land may lower water table levels below the root zone of some sensitive plant species, putting individuals or populations at risk.

Insecticide spraying on adjacent croplands may reduce or threaten insect pollinators for some sensitive plant species (Arenz and Joern 1996, USDA Forest Service 2000).

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction under Alternative 3 in the revised LRMP:

Unit-wide Direction (Chapter 1)

SNG

- Avoid placing new facilities and developments such as water tanks and impoundments in habitat occupied by sensitive plant species (Guideline).
- Identify sensitive plant habitats as priorities for noxious weed and invasive plant monitoring and control (Guideline).
- Avoid the use of noxious weed and invasive plant control methods that may negatively impact sensitive plants (Guideline).
- Design timing, intensity, and frequency of mowing, burning and livestock grazing to maintain or increase sensitive plant species populations and the health of rare plant communities (Standard).
- Do not authorize vegetation management and construction projects that would further isolate or prevent re-colonization of sensitive plant populations from adjacent populations (Standard).

SNG, cont.

- Manage for natural disturbance processes when necessary to maintain early seral habitat for these species. Do not initiate stabilization measures for habitats occupied by these species (Standard).
- Ensure that management actions do not contribute to loss of population viability for Forest Service sensitive plant species (Standard).
- Protect known sensitive plant populations from land use activities that cause increased trampling or soil compaction within key habitats (Guideline).
- Enhance and improve habitat for known sensitive plant populations through restoration programs (Guideline).
- Prohibit use of pesticides that would adversely affect species at risk (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

SNG

- Objectives call for specified levels of ungrazed habitat and a more diverse grassland vegetation mosaic through desired levels of rest, seral stages and vegetation structure (see tables in Section 5).
- Use disturbance processes (i.e. grazing, fire) to maintain habitat for dune dependant species (Guideline).
- Conserve rare plant communities through the use of ecological processes suited for those communities (Guideline).
- Develop and initiate implementation of conservation strategies plants within this guild (Guideline).
- Conduct target plant surveys or baseline assessments for species within this guild (Guideline).
- Maintain and enhance suitable occupied and unoccupied early seral habitats such as dunes and blowouts for sensitive plant species habitat (Guideline).

Management Area Direction (Chapter 3)

SNG (MA 2.2 and 3.66)

- The proposed Bear Den / Bur Oak RNA (MA 2.2) provides habitat for this plant guild. RNAs will be managed to protect their ecological values. Management plans will be completed within 5 years (Objective).
- Initiate intensive restoration efforts to meet desired conditions that include active and passive methods.
- Prevent new introductions of non-native plant species into known areas of sensitive plant species or guilds (Guideline).

Monitoring Direction (Chapter 4)

SNG

- Monitor populations and habitat.
- Monitor the effectiveness of the suggested stocking rates in Appendix I in meeting desired vegetation composition and grassland structure levels.

Appendices

SNG

- Appendix I provides suggested stocking rates for various livestock grazing intensities. This appendix is referenced by a standard under geographic area direction (Chapter 2) to use this appendix to help develop and implement range management practices for meeting vegetation objectives.

Biological Determinations, Risk Assessments, and Rationale

SNG (all species in this guild)

Determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

Under Alternative 3, specific mitigation measures have been incorporated into the geographic area and management area direction that will enhance habitat specifically for the species found in this guild. Under Alternative 3, the majority of the habitat in this guild will be managed under 1.31 Backcountry Nonmotorized and 3.66 Ecosystem Restoration management areas. Under 1.31 and geographic area direction, natural disturbances processes such as fire, rest, and grazing will contribute to a mosaic of vegetation composition and structure. Reclamation will also occur in areas of disturbed habitats. Under 3.66 direction, the emphasis will focus upon restoration of plant and animal species and communities with maintenance and restoration of natural disturbance processes.

Under Alternative 3, additional protection would be provided to the habitats in this plant group under the Oak Hills proposed Research Natural Area. A management plan will be developed and implemented for the RNA that will focus upon restoration of the ecological integrity of the vegetation communities of this guild. Another objective of the proposed RNA is the protection of important elements of biodiversity associated with oak communities including rare plant species.

In addition, the proposed levels of prescribed fire are a positive move towards restoring the natural fire regime. For example, frostweed seems to be positively correlated to a periodic fire regime (K. Hansen, personal communication). Alternatives 3 provides for no net increase (from current levels) of noxious weeds. The existence and spread of noxious and exotic species is one of the primary threats to the maintenance of high quality tallgrass prairie habitat (USDA Forest Service 2000). Alternative 3 would provide for 10% to 15% early seral conditions that will contribute to the maintenance of suitable habitat for some of the sensitive species in this group. The proposed reduction in grazing should also help reduce spread of noxious weeds into some areas as well as help reduce livestock trampling of sensitive species.

Outcome VI is selected as the risk assessment for beach heather, sandgrass, and frostweed. Rationale for outcome VI is that these species are known from very limited populations in the vicinity of the planning unit. This will result in strong limitations on interactions among local populations, high potential for genetic isolation, and uncertainty about the species response to climatic stochastic. Habitat enhancement and population augmentation may be required.

Outcome II is selected as the risk assessment for wahoo spindle tree. Habitat of suitable quality, quantity, and abundance will be maintained across the planning unit for this species. Some of the known populations of this species are large. Habitat enhancement may be needed, but population augmentation or re-introductions should not be required.

Western Plains Riparian Guild

Plant species in this guild include:

Lanceleaf cottonwood

Alkali sacaton

Blue lips

Table H-6 summarizes species occurrence and status in the planning area. Each of these species is classified as sensitive by Region 1 of the Forest Service.

Guild Description

This plant group contains species that are found across a wide variety of wetland/riparian habitat types found within the semi-arid mixed grass/shortgrass plains of the planning area. All currently known populations of these species occur on the Little Missouri National Grassland (North Dakota Natural Heritage database 2000). Some of the species within this guild may possibly occur on some of the other planning units. The habitat types of this plant group are areas of added moisture within a semi-arid mixed grass/shortgrass landscape. For example, they include the riparian cottonwood communities found along perennial and intermittent streams, sedge/juncus habitats found in conjunction with springs and seeps, mesic swales, saline subirrigated zones, wooded draws, and wet meadows.

Within the planning area, the habitat components associated with this plant group are uncommon and occupy a very small percentage of the total land base (USDA Forest Service 2000, Finch and Ruggiero 1993). Throughout the planning area, mesic habitat types may differ in vegetation type, soils, and hydrologic regime from those described for the Little Missouri National Grassland. However, these other habitats share the common feature of having a seasonally or perennially wet moisture regime within a semi-arid grassland landscape.

This plant group includes both narrow range and mid-range species (USDA Forest Service 2000). Lanceleaf cottonwood, a narrow range species restricted to a single habitat type, is known in the planning area from riparian zones along perennial creeks in western North Dakota (North Dakota Natural Heritage database 2000, Lenz 1993, Heidel 1990). Alkali sacaton and blue lips have a mid-range of versatility and are found primarily in one habitat type but can be found in other habitat types. Alkali sacaton is found within the subirrigated zone of saline drainageways (Stubbendieck et al. 1997) as well as being found on secondary successional habitat of clay outwashes in Theodore Roosevelt National Park (Heidel 1990). It is also recorded on depositional areas of sandy clay outwashes and alluvial deposits (Lenz 1993).

Blue lip occurs primarily in niches of low evapotranspiration rates, added moisture conditions, and limited sunlight reflectance in the mixed grass prairie (USFS ECODATA database 2000). Riparian areas, mesic swales, wooded draws, north-facing slopes, and escarpments can also provide suitable conditions (North Dakota Natural Heritage database 2000; Lenz 1993; S. Rinehart, personal observation). Other records place the species in upland prairie with rocky soil (Barker et al. 1977), and in grassy hillsides (Zaczkowski 1972).

Wetland and riparian areas within the mixed and shortgrass prairies vary from the "green zones" along rivers and drainageways to flowing springs and seeps. Their habitat types comprise a very small percentage of the total land base in the semi-arid plains and yet riparian habitats contribute disproportionately to the diversity of native vegetation (Finch and Ruggiero 1993). In addition, these riparian plant communities were some of the most heavily altered by historic settlement (Krueper 1994). Demands for water from settlers and livestock grazing resulted in many impacts on riparian plant communities. Hydrologic regimes and riparian vegetation were frequently altered by livestock grazing, roads, logging of cottonwoods, oil and gas, wetland drainage, conversion of riparian areas to cropland, and irrigation practices (Hansen et al. 1988, Krueper 1994). Currently many areas of added moisture faced habitat risk from introduced and noxious plant species.

Information on Individual Plant Species:

Lanceleaf cottonwood (*Populus x acuminata*)

Distribution of lanceleaf cottonwood includes North Dakota south to Texas, west to Arizona, and north to Alberta (NatureServe 2000). The global rank of this species is “Hybrid” meaning it is a hybrid between two species. In this case, lanceleaf cottonwood is a hybrid between *Populus deltoides* and *Populus angustifolia*. The latter species no longer occurs in the locality of the hybrid populations (Great Plains Flora Association 1986).

Within the planning area, this species is found in South Dakota and is considered rare in North Dakota and Nebraska (NatureServe 2000). Lanceleaf cottonwood is known from six populations in North Dakota (North Dakota Natural Heritage database 2000), including two populations on USFS land (Lenz 1993) and a population in Theodore Roosevelt National Park (Heidel 1990). Two of the populations are very small and contain only one tree. The largest population contains 30 trees. All populations contain mature individuals primarily. Regeneration is occurring at only one site and is very limited (North Dakota Natural Heritage database 2000; USFS ECODATA database 2000; S. Rinehart, personal observation). Threats to the populations are from habitat alteration, livestock browsing on cottonwood seedlings, and competition from non-native plant species (North Dakota Natural Heritage database 2000, Lenz 1993). Livestock use cottonwood groves for shade during the hot times of the year.

Blue lips (*Collinsia parviflora*)

The distribution of this species includes Ontario, south through North Dakota, Nebraska, and New Mexico, west to California, and north to Alaska. The global rank of this species is “G5,” meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery) (NatureServe 2000). Within the planning area, blue lip is found on periphery of its range.

Blue lips is known from seven populations in North Dakota (North Dakota Natural Heritage database 2000). Most of the populations are known from few individuals (20-30 plants) although one large population on the Little Missouri National Grassland contains several thousand plants (North Dakota Natural Heritage database 2000, Lenz 1993). Threats are livestock grazing, trampling, and trailing, and non-native plant species (North Dakota Natural Heritage database 2000; USFS ECODATA database 2000; Lenz 1993). A high buildup of litter may also be a threat to this species. The known populations occur on both USFS land (four populations) and private land.

Alkali sacaton (*Sporobolus airoides*)

Distribution of alkali sacaton includes North Dakota south to Missouri, Arkansas, and Texas, west to California, north to British Columbia, as well as outlying occurrences in New York and South Carolina (NatureServe 2000). The global rank of this species is "G5," meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery).

Within the planning area, alkali sacaton is on the edge of its range in North Dakota, where it is known from 12 populations (North Dakota Natural Heritage database 2000). Populations in North Dakota vary in size with the majority being fairly small (6 to 20 plants) although two of the populations contain several hundred individuals. Threats to the species include livestock grazing, trampling, competition from invasive plant species, and habitat alteration (North Dakota Natural Heritage database 2000; USFS ECODATA database 2000; S. Rinehart, personal observation). In North Dakota, four of the populations occur on USFS land and another five populations are found within Theodore Roosevelt National Park (North Dakota Natural Heritage database 2000, Heidel 1990).

In other parts of the planning area, alkali sacaton is known from limited occurrences in South Dakota, although it is more plentiful in Nebraska and Wyoming (Great Plains Flora Association 1977). It was described as uncommon during floristic surveys on the Oglala National Grasslands (Rolfsmeier 1996).

Direct and Indirect Effects on NFS Lands

Properly functioning riparian systems provide conditions favorable for establishment and maintenance of riparian-dependent species. Lanceleaf cottonwood species, in particular, depend upon flooding events, channel meander processes, and exposed mineral soil for establishment.

Management activities can cause a loss of equilibrium within riparian systems resulting in excessive flooding events along drainageways, excessive erosion, sedimentation, and/or channelization. This may reduce habitat for sensitive plant species in this group. Excessive removal of vegetation on uplands can result in rill, sheet, and gully erosion and excessive soil and water runoff. Increased rates of channelization can result in lowered water tables. Lanceleaf cottonwood can be come pedestaled by excessive rates of erosion with riparian channels. Alkali sacaton populations can be adversely affected by a lowering of the table within subirrigated habitat. Any activities that lower water tables below the root zone of sensitive plant species place individual plants or populations at risk.

Development of springs and seeps for livestock water can result in loss of sensitive species populations and loss of specialized habitat. Many springs have been developed in the past for livestock and the net loss of these habitat types is very high in many parts of the Grasslands.

Competition from non-native invasive plants can be a significant threat. Invasive species such as Kentucky bluegrass and smooth brome often form monocultures within riparian habitats, significantly reducing the diversity of native species.

Noxious weeds such as leafy spurge and Canadian thistle prefer riparian habitats and areas of added moisture. Noxious weeds reduce the quality of sensitive species habitat but at the same time, efforts to control spurge and other invasive species with chemicals can pose a direct threat to sensitive species. In addition, many chemicals are restricted for use within riparian zones.

Ground-disturbing activities associated with oil, gas, mineral, and other types of development could result in mortality of sensitive plants or place their populations at risk.

Roads can negatively affect sensitive plant populations by introducing non-native plant species along travel routes, through habitat fragmentation, and by loss of suitable habitat to disturbance.

Recreation can have effects on sensitive plants or plant populations, depending on types of recreational use, road and trail use patterns and intensities, rate of spread of invasive, non-native plant species along recreational routes, and other factors.

Grasshopper spraying has the potential to impact insect pollinator populations. Information is lacking about specific pollinators for many sensitive plant species.

Burning and livestock grazing can have positive or negative effects on sensitive plant species, depending on frequency, intensity, and timing of disturbance and on the life history characteristics of the individual plant species.

Burning may directly impact sensitive plant species by causing mortality or indirectly impact these species and communities through effects on the habitat. Burning may indirectly affect habitat for blue lips by removing shade and cover, and reducing moisture conditions needed for survival.

Livestock grazing within riparian areas can interfere with reproduction of sensitive plant species such as blue lips and alkali sacaton that reproduce by seed. Excessive livestock grazing in riparian areas can lead to livestock browsing of lanceleaf cottonwood seedlings and saplings, thereby reducing the recruitment of younger trees within the population.

Grazing can reduce dead material in plants and open up canopy layers of plants, allowing for the germination and establishment of new plants.

Livestock trampling in riparian areas and repeated visits to these areas for water can be a problem under some circumstances for some of the sensitive species within this group. Excessive and repeated soil compaction may result in reduced plant vigor. Individual plants may be directly affected by trampling.

Repeated mowing may prevent some sensitive plant species from completing their life cycle and may also reduce carbohydrate reserves.

Cumulative Effects

Continued loss of suitable habitat through conversion of rangelands to croplands can be expected to occur on private lands (Ostlie et al. 1997, USDA Forest Service 2000).

It is likely that noxious weeds will remain as threats in the habitats of these species on private and public lands in and around administrative units containing these species (Ostlie et al. 1997).

Development activities such as road and building construction on private lands will continue, resulting in some loss of suitable habitat for sensitive plant species and some possible mortality of sensitive plants and population loss.

Livestock grazing and mowing practices that are unfavorable for the conservation of sensitive plant species are likely to continue on some private lands (Ostlie et al. 1997).

Insecticide spraying on adjacent croplands may reduce or threaten insect pollinators for some sensitive plant species (Arenz and Joern 1996, Ostlie et al. 1997).

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD) and eventual on-site development and additional roads, traffic and pipelines.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction under Alternative 3 in the revised LRMP:

Unit-wide Direction (Chapter 1)

LMNG, GR/CRNG, BGNG, ONG, TBNG

- Design and implement livestock grazing strategies to provide for thick and brushy understories and multi-story and multi-age structure in riparian habitats, wooded draws, and woody thickets, contingent on local site potential (Guideline).
- Manage livestock grazing to maintain or improve riparian / woody draw areas (Guideline).
- Implement management practices that will move at least 80% of riparian and wooded draw areas toward self-perpetuating tree and shrub regeneration (Objective).
- Conduct actions so that habitats are maintained or improved toward robust stream health (Standard).
- Manage land treatments to conserve site moisture and to protect long-term stream, wetland, and riparian health from damage by increased runoff (Standard).
- Allow only those actions next to perennial and intermittent streams, seeps, springs, lakes, and wetlands that maintain or improve long-term proper functioning of riparian ecosystem conditions (Standard).
- Design activities to protect and manage the riparian ecosystem and maintain the integrity of the ecosystem (Standard).

- Maintain and protect hydrologic regimes (Standard).
- To provide protection for riparian areas, locate activities and facilities outside the riparian areas unless alternatives have been assessed and determined to be more environmentally damaging (Guideline).
- Do not deposit waste material below high water lines, in riparian areas, in areas immediately adjacent to riparian areas, or in natural drainage-ways (Guideline).
- Sustain wetland ecological functions and meet regulations found in Section 404(b)(1) of the Clean Water Act (Standard).

LMNG, GR/CRNG

- Avoid placing new facilities and developments such as water tanks and impoundments in habitat occupied by sensitive plant species (Guideline).
- Identify sensitive plant habitats as priorities for noxious weed and invasive plant monitoring and control (Guideline).
- Avoid the use of noxious weed and invasive plant control methods that may negatively impact sensitive plants (Guideline).
- Design timing, intensity, and frequency of mowing, burning and livestock grazing to maintain or increase sensitive plant species (Standard).
- Do not authorize vegetation management and construction projects that would further isolate or prevent re-colonization of sensitive plant populations from adjacent populations (Standard).
- Maintain hydrological regimes and protect and restore developed springs and seeps where habitat for sensitive plant species would be enhanced (Guideline).
- Ensure that management actions do not contribute to loss of population viability for Forest Service sensitive plant species (Standard).
- Protect known sensitive plant populations from land use activities that cause increased trampling or soil compaction within key habitats (Guideline).
- Enhance and improve habitat for known sensitive plant populations through restoration programs (Guideline).
- Prohibit use of pesticides that would adversely affect species at risk (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

LMNG, GR/CRNG

- Complete and implement a conservation strategy for sensitive plants within this guild (Guideline).
- Conduct target surveys or baseline assessments for high priority species within this guild (Guideline).

Management Area Direction (Chapter 3)

LMNG (MA 2.1 – Pretty Butte Special Interest Area)

- The proposed Pretty Butte Special Interest Area (MA 2.1) includes a population of blue lips. Management for unique resources and values, including plant and animal species viability, is prioritized in these areas.
- Allow uses and activities that maintain and enhance the characteristics for which the SIA was designated (Standard).
- Complete site-specific plans for managing the area prior to promoting public visits to a SIA or making significant changes to its land management (Standard).
- Restore natural ecological processes when needed to maintain or enhance the habitats or features for which the SIA was designated (Guideline).
- Reclaim disturbed lands to a condition suitable for the purposes for which the SIA was identified (Standard).
- Develop and initiate implementation of management plans for Pretty Butte SIA (Guideline).
- No ground disturbing mineral activities are permitted; however, existing valid rights will be honored (Standard).
- Prohibit removal of mineral material (Standard).
- Prohibit OHV trail construction (Standard).
- Existing utility corridors may be maintained until they are abandoned. New utility corridors or additional development within existing corridors will be permitted only where associated with valid existing rights (Standard).
- Prohibit new special-use facilities except for valid existing rights (Guideline).

Monitoring Direction (Chapter 4)

LMNG, GR/CRNG

- Monitor populations and habitat.

LMNG, GR/CRNG, BGNG, ONG, TBNG

- Monitor the extent that riparian area vegetation is regenerating.

Biological Determinations, Risk Assessments, and Rationale

LMNG (all species in this plant group)

Determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

Alternative 3 would restore fire, rest, and herbivory as natural ecological processes to varying levels. Species within this plant group need habitat conditions that include both early and mid-high seral conditions for establishment, maintenance, and survival. Alternative 3 would provide for a greater mosaic of habitat conditions across the landscape. The acres of rangeland annually rested from livestock grazing under Alternatives 3 also more closely approximate the conditions under which the species evolved as compared to current grazing conditions (USDA

Forest Service 2000). In addition, the levels of prescribed fire within Alternative 3 are a positive move towards restoring the natural fire regime. Alternatives 3 also provides for no net increase (from current levels) of noxious weeds, combined with decreases in grazing levels. The spread of noxious and exotic species is one of the primary threats to the maintenance of high quality native grassland riparian habitat (USDA Forest Service 2000).

One population of blue lips is protected within the proposed Pretty Butte Special Interest Area under Alternative 3.

Outcome VI is selected as the risk assessment for lanceleaf cottonwood. Rationale for outcome VI is that this species is known from very limited populations within the vicinity of the planning unit. The parent species of this hybrid no longer occurs within the vicinity of known populations. Only limited regeneration will occur. Habitat enhancement and population augmentation may be required.

Outcome II is selected as the risk assessment for blue lips and alkali sacaton. Habitat of suitable quality, quantity, and abundance will be maintained across the planning unit for this species. Some of the known populations of this species are large. Habitat enhancement may be needed, but population augmentation or re-introductions should not be required.

GR/CRNG

Determination is “no impact”. The species presence on this area has not been confirmed and documented. However, management direction is provided for this species and potential habitat on these areas. If the species presence had been confirmed, the determination would have been "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

BGNG, ONG, TBNG

Biological determinations are not made for these species on these areas since they are not listed as sensitive by Region 2 of the Forest Service. The conservation measures listed above are expected to enhance their habitat and / or protect the habitat and species from possible adverse effects of Forest Service authorized activities and allocations.

Sandy Guild

Plant species in this guild include:

Sand lily

Nodding buckwheat.

Upright pinweed and smooth goosefoot would also be considered members of this plant group. However, they were evaluated as individual species.

Table H-6 summarizes species occurrence and status in the planning area. Both of these species are classified as sensitive by Region 1 of the Forest Service.

Guild Description

This plant group includes species known from areas of sandy soils such as sand dunes, sand swales, sand blowouts, sandy terraces, and decomposing sandstone outcrops. These areas can often be characterized by low vegetative cover. Many times they are nutrient poor and contain poorly developed soil horizons. Some sites contain sandstone parent material occurring in various stages of decomposition. Sandstone may occur as fractured rock layers or it can be decomposed sand over sandy clay loam. All of the habitats are highly erosive by wind and water. These specialized habitats occur in limited quantity across the landscape, although they are widely dispersed in the mixed and shortgrass plains of the planning area. The sand influenced areas often represent microsites within the surrounding landscape.

More of these sandy habitats may have been available in early seral conditions prior to settlement (Smith and Bradley 1990). Ecological processes such as fire, rest, and herbivory patterns, and the combinations of these processes, may have combined to create more areas of active sand blowouts and open sandy swales (USDA Forest Service 2000, Smith and Bradley 1990). Stabilization of sandy soils results in loss of habitat for many of the members of this plant group.

Most of the known populations of these species occur on the Little Missouri National Grassland. Nodding buckwheat is a narrow range specialist found in soils dominated by sandy parent material in the upper horizon (Great Plains Flora Association 1986, Stephens 1963, L.Spencer personal communication). Sand lily is a mid-range specialist, found primarily in sandy soils, although it may also be found in mixed sandy loam soils and soils with a more developed soil horizon (Great Plains Flora Association 1986; North Dakota Natural Heritage database 2000; Barker et al. 1977; L. Spencer, personal communication).

Information on Individual Plant Species:

Sand lily (*Leucorinum montanum*)

Distribution of sand lily includes North Dakota south to Nebraska and New Mexico, west to California and north through Oregon and Montana (NatureServe 2000). The global rank of this species is “G5”, meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). Within the planning area, sand lily is known from western South Dakota, western and central Nebraska and the very southeastern edge of Wyoming. It may possibly occur on clay pan sites on the Oglala (Rolfsmeier 1996), Grand River / Cedar River, Thunder Basin, and Buffalo Gap National Grasslands.

It is a low growing perennial with deeply buried rootstocks (Great Plains Flora Association 1986). Sand lily is an early flowering species generally blooming in May.

This species is known in North Dakota from six populations (North Dakota Natural Heritage database 2000). However, several records are historical. Attempts to relocate several of the populations have not been successful (U.S Forest Service files, Medora Ranger District; S. Rinehart, personal observation). Population size varies from one individual to 20 individuals (North Dakota Natural Heritage database 2000). Only one population is known from USFS lands and it has not been re-located, despite annual monitoring (U.S. Forest Service files, Medora Ranger District).

Nodding buckwheat (*Eriogonum cernuum*)

Nodding buckwheat distribution includes Saskatchewan south through Nebraska to New Mexico, west to California, and north to Alberta (NatureServe 2000). The global rank of this species is "G5," meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). Within the planning area, nodding buckwheat is found in extreme western North Dakota and South Dakota, western Nebraska, and limited distribution in eastern Wyoming (Great Plains Flora Association 1977).

It is another early to mid blooming species, and is associated with decomposing sandstone outcrops (North Dakota Natural Heritage database 2000; USFS ECODATA database 2000; Lenz 1993). In North Dakota, nodding buckwheat is known from three populations (North Dakota Natural Heritage database 2000). Two populations are found on USFS land in the Little Missouri National Grassland and one population is found on private land. Population size varies from approximately 20 individuals to 50 individuals (North Dakota Natural Heritage database 2000). The habitat upon which these species depends is fragile and has a low tolerance to disturbance (North Dakota Natural Heritage database 2000; S. Rinehart, personal observation). Threats include competition from non-native plant species and livestock trampling (North Dakota Natural Heritage database 2000).

The North Dakota Natural Heritage Program has identified potential viability concerns for nodding buckwheat (Lenz 1993) based upon the few known populations and small size of known populations.

Direct and Indirect Effects on NFS Lands

Lack of natural processes such as fire, grazing and rest, and combinations of these processes, can reduce the available habitat for species in this plant group, resulting in the stabilization of sand dunes and mature vegetative cover on areas of sandy soils.

Competition from non-native invasive plants is one of the primary threats to the species in this plant group. Invasive species are spread by vehicles along road corridors and by OHVs, vehicles, and livestock in the backcountry.

Noxious weeds such as leafy spurge and Canadian thistle occur in scattered populations throughout the mixed grass and shortgrass plains. Noxious weeds reduce the quality of sensitive species habitat but at the same time, efforts to control spurge and other invasive species with chemicals can pose a direct threat to sensitive species.

Roads can negatively affect sensitive plant populations by introducing non-native plant species along travel routes, through habitat fragmentation, and by loss of suitable habitat to disturbance.

Ground-disturbing activities associated with oil and gas development, mineral exploration, and scoria pits could result in mortality of sensitive plants or place their populations at risk.

Recreation can have effects on sensitive plants or plant populations, depending on types of recreational use, road and trail use patterns and intensities, rate of spread of invasive, non-native plant species along recreational routes, and other factors.

Burning and livestock grazing can have positive or negative effects on sensitive plant species, depending on frequency, intensity, and timing of disturbance and on the life history characteristics of the individual plant species. Burning may directly impact the species by causing mortality or indirectly through modification of its habitat.

Grazing can reduce dead material within plant communities and open up canopy layers of plants, allowing for the germination and establishment of new plants. Excessive livestock grazing can interfere with reproduction of sand lily. Sand lily is considered palatable to livestock. Early season grazing can impact plant growth and flowering during its most vulnerable period.

Livestock trampling during wet times of year can be a problem under some circumstances. Excessive and repeated soil compaction may result in reduced plant vigor for the sand lily. Individual plants may be damaged by trampling.

Excessive removal of vegetation on uplands can result in rill, sheet, and gully erosion and excessive soil and water runoff. Increased erosion can result in lowered water tables. Any activities that lower water tables below the root zone of sensitive plant species may place individual plants or populations at risk.

Grasshopper spraying has the potential to impact insect pollinator populations. Information is lacking about specific pollinators for this sensitive plant species, however it is suspected to be insect pollinated.

Cumulative Effects

It is likely that noxious weeds will remain as threats in the habitats of these species on private and public lands in and around NFS lands containing these species (Ostlie et al. 1997).

Development activities such as road and building construction on private lands will continue, resulting in some loss of suitable habitat for sensitive plant species and some possible mortality of sensitive plants and population loss.

Livestock grazing practices that are unfavorable for the conservation of sensitive plant species are likely to continue on some private lands.

Continued loss of suitable habitat through conversion of rangelands to croplands can be expected to occur on private lands (Ostlie et al. 1997, USDA Forest Service 2000).

Insecticide spraying on adjacent croplands may reduce or threaten insect pollinators for some sensitive plant species (Arenz and Joern 1996, Ostlie et al. 1997).

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD) and eventual on-site development and additional roads, traffic and pipelines.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction under Alternative 3 in the revised LRMP:

Unit-wide Direction (Chapter 1)

LMNG

- Avoid placing new facilities and developments such as water tanks and impoundments in habitat occupied by sensitive plant species (Guideline).
- Identify sensitive plant habitats as priorities for noxious weed and invasive plant monitoring and control (Guideline).
- Avoid the use of noxious weed and invasive plant control methods that may negatively impact sensitive plants (Guideline).
- Design timing, intensity, and frequency of mowing, burning and livestock grazing to maintain or increase sensitive plant species populations and the health of rare plant communities (Standard).
- Do not authorize vegetation management and construction projects that would further isolate or prevent re-colonization of sensitive plant populations (Standard).
- Manage for natural disturbance processes when necessary to maintain early seral habitat. Do not initiate stabilization measures for these habitats (Standard).
- Ensure that management actions do not contribute to loss of population viability for Forest Service sensitive plant species (Standard).
- Protect known sensitive plant populations from land use activities that cause increased trampling or soil compaction within key habitats (Guideline).
- Enhance and improve habitat for known sensitive plant populations through restoration programs (Guideline).
- Prohibit use of pesticides that would adversely affect species at risk (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

GRNG, LMNG

- Complete and implement a conservation strategy for sensitive plants within this guild (Guideline).
- Conduct target surveys or baseline assessments for high priority species within this guild (Guideline).
- Control the timing of livestock grazing in riparian areas and on sandy soils to protect known sand lily populations (Guideline).

Management Area Direction (Chapter 3)

LMNG (MA 2.1 – Round Top Butte Special Interest Area)

- The Roundtop Butte Special Interest Area (MA 2.1) includes one of the two known populations of nodding buckwheat that occur on this national grassland. This area was allocated to help protect and conserve the unique botanical resources on this national grassland.

LMNG (MA 2.1 – Round Top Butte Special Interest Area), cont.

- Allow uses and activities that maintain and enhance the characteristics for which the SIA was designated (Standard).
- Complete site-specific plans for managing the area prior to promoting public visits to a SIA or making significant changes to its land management (Standard).
- Restore natural ecological processes when needed to maintain or enhance the habitats or features for which the SIA was designated (Guideline).
- Reclaim disturbed lands to a condition suitable for the purposes for which the SIA was identified (Standard).
- Develop and initiate implementation of management plans for Round Top Butte SIA (Guideline).
- No ground disturbing mineral activities are permitted; however, existing valid rights will be honored (Standard).
- Prohibit removal of mineral material (Standard).
- Prohibit OHV trail construction (Standard).
- Existing utility corridors may be maintained until they are abandoned. New utility corridors or additional development within existing corridors will be permitted only where associated with valid existing rights (Standard).
- Prohibit new special-use facilities except for valid existing rights (Guideline).

Monitoring Direction (Chapter 4)

- Monitor populations and habitat.

Biological Determinations, Risk Assessments, and Rationale

LMNG

Determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

Alternative 3 would restore fire, rest, and herbivory as natural ecological processes to varying levels and provide for a greater mosaic of habitat conditions across the landscape. The acres of rangeland annually rested from livestock grazing under these alternatives also more closely approximates the conditions under which the species evolved as compared to current grazing conditions (USDA Forest Service 2000). In addition, the levels of prescribed fire within Alternatives 3 are a positive move towards restoring the natural fire regime. Alternatives 3 also provides for no net increase (from current levels) of noxious weeds, combined with decreases in grazing levels. The spread of noxious and exotic species is one of the primary threats to the maintenance of high quality native grassland habitat (USDA Forest Service 2000).

Alternative 3 provides Special Interest Area (SIA) designation for Roundtop Butte that contains one of the two known populations of nodding buckwheat within the Little Missouri National Grassland. A management plan will be developed and implemented under Alternative 3 for the SIA, providing another level of management to enhance protection for this species.

Outcome VI is selected as the risk assessment for nodding buckwheat and sand lily. These species are known from very limited populations in the planning unit. This will result in strong limitations on interactions among local populations, high potential for genetic isolation, and uncertainty about the species response to climatic stochasticity. Habitat enhancement and population augmentation may be required.

Scoria Hills Guild

Plant species in this guild include:

Golden stickleaf

Limber pine

Table H-6 summarizes species occurrence and status in the planning area. Both of these species are classified as sensitive by Region 1 of the Forest Service.

Guild Description

This plant group includes species that occupy scoria hills, scoria knobs, and rocky outcrops. This habitat provides specialized niches within the surrounding landscape. Scoria hills and rock outcrops may be locally common yet widely dispersed across the mixed and shortgrass plains in the western portion of the planning area. The plant associations included with these habitats are predominately graminoids such as needlegrass and wheatgrass with a diverse forb community that is often very different from the forb mix in the surrounding landscape.

Two plant species, including one conifer and a forb, are associated with these scoria sites. Golden stickleaf is a narrow-range species while limber pine occurs in the mid-range of versatility, i.e. it is associated primarily with one habitat type but may also be found in other habitat types. Golden stickleaf is found on scoria breaks and rocky knobs in the mixed grass plains of western North Dakota (Great Plains Flora Association 1986, North Dakota Natural Heritage database 2000). Limber pine is found in scoria hills and dry hilltops above the Little Missouri River in North Dakota (North Dakota Natural Heritage database 2000, Barker et al. 1977).

These scoria hills and knobs represent microsites within the rolling grasslands and badlands. Some components of their plant communities may be similar to surrounding communities. However, the lithic soil horizon often favors droughty species, early seral species, and occasionally a shrub or tree species that may establish roots into rocky soil profile. These microsites are not defined by sandy or silty soils but by stony / gravelly rock fragments in the upper soil horizon and fine to medium textured soils (L.Spencer, personal communication).

The mixed grass plains surrounding these microsites evolved under a broad scale disturbance regime of herbivory, fire, and climatic fluctuations (USDA Forest Service 2000). Although Wright and Bailey (1980) describe climate as the dominant factor controlling the vegetation composition of North American grasslands, fire regimes and herbivory patterns have been the two processes most altered since settlement of the prairies. The periodic fires shaped the vegetation landscape and removed both green and dead plant material. In semi-arid regions, big prairie fires in the past usually occurred during drought years that followed one to three years of above-average precipitation that provided abundant and continuous fuel (Wright and Bailey 1980).

Information on Individual Plant Species:

Limber pine (*Pinus flexilis*)

Distribution of limber pine includes North Dakota south to Nebraska and New Mexico, west to California, and north to British Columbia. In the planning area, limber pine is rare in Nebraska, South Dakota, and North Dakota. It is more common in Wyoming (NatureServe 2000). The global rank of this species is "G5," meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery).

Limber pine is known from one population in North Dakota (North Dakota Natural Heritage database 2000). The population is large and self-regenerating (USFS ECODATA database 2000). Habitat includes slopes and summits of eroded scoria hills and scoria capped rocky ridges (Zaczkowski 1972, Lenz 1993). Most of the population occurs on USFS land. Threats to the species are prim4arily from porcupine damage (North Dakota Natural Heritage database 2000, USFS ECODATA database 2000).

Golden stickleaf (*Mentzelia pumila*)

Golden stickleaf distribution includes North Dakota south through Wyoming to Texas, west to Arizona, and north through Nevada, Utah, and Montana. The global rank of this species is "G4" meaning uncommon but not rare (although it may be rare in parts of its range, particularly on the periphery), and usually widespread. It is apparently not vulnerable in most of its range, but possibly cause for long-term concern (NatureServe 2000).

In the planning area, golden stickleaf is known from two populations in North Dakota (North Dakota Natural Heritage database 2000). Both populations are found on USFS land in the limber pine area of the Little Missouri National Grassland. Threats to habitat include trampling from livestock and invasive, non-native plants. Both populations contain few individuals.

Direct and Indirect Effects on NFS Lands

Primary threats to the limber pine population are from porcupine foraging that often kills individual trees by stripping the trunks of bark. Limber pine is also susceptible to the blister rust and an outbreak of this disease in this area may seriously impact the pine community. The alternate host for blister rust, *Ribes* spp., also occurs in this area.

Competition from non-native invasive plants can be a threat in reducing the diversity of native species.

Noxious weeds such as leafy spurge and Canadian thistle occur in scattered populations throughout the mixed grass plains. Noxious weeds reduce the quality of habitat but at the same time, efforts to control spurge and other invasive species with chemicals can pose a direct threat to sensitive species.

Burning and livestock grazing can have positive or negative effects on sensitive plant species depending on frequency, intensity, and timing of disturbance and on the reproductive characteristics of the individual plant species.

Burning may cause species mortality or indirectly impact species habitat. Burning would affect limber pine by causing tree mortality.

Grazing can reduce dead material within plant communities and open up canopy layers of plants, allowing for the germination and establishment of new plants. Neither of the species is considered palatable to livestock.

Livestock trampling during wet times of year can be a problem under some circumstances for golden stickleaf. Excessive and repeated soil compaction may result in reduced plant vigor. Individual plants may be directly affected by trampling.

Grasshopper spraying has the potential to impact insect pollinator populations (Arenz and Joern 1996). This may be of concern for golden stickleaf where information is lacking about specific pollinators.

Ground-disturbing activities associated with oil, gas, mineral, and other types of development could result in mortality of sensitive plants or place their populations at risk.

Roads can negatively affect sensitive plant populations by introducing non-native plant species along travel routes, through habitat fragmentation, and by loss of suitable habitat to disturbance.

Recreation can have effects on sensitive plants or plant populations, depending on types of recreational use, road and trail use patterns and intensities, rate of spread of non-native plant species along recreational routes, and other factors.

Cumulative Effects

Continued loss of suitable habitat through conversion of rangelands to croplands can be expected to occur on private lands within the planning area (Ostlie et al. 1997, USDA Forest Service 2000).

It is likely that noxious weeds will remain as threats in the habitats of these species on private and public lands in and around NFS lands (Ostlie et al. 1997).

Development activities such as road and building construction on private lands will continue, resulting in some loss of suitable habitat for sensitive plant species and some possible mortality of sensitive plants and population loss.

Livestock grazing practices that are unfavorable for the conservation of sensitive plant species are likely to continue on some private lands.

Insecticide spraying on adjacent croplands may reduce or threaten insect pollinators for some sensitive plant species (Arenz and Joern 1996, Ostlie et al. 1997).

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD) and eventual on-site development and additional roads, traffic and pipelines.

Wilderness designations may reduce the opportunity to prescribe burn specifically for enhancing sensitive plant species habitat.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction under Alternative 3 in the revised LRMP:

Unit-wide Direction (Chapter 1)

LMNG

- Avoid placing new facilities and developments such as water tanks and impoundments, in habitat occupied by sensitive plant species (Guideline).
- Identify sensitive plant habitats as priorities for noxious weed and invasive plant monitoring and control (Guideline).
- Avoid the use of noxious weed and invasive plant control methods that may negatively impact sensitive plants (Guideline).
- Design timing, intensity, and frequency of mowing, burning and livestock grazing to maintain or increase sensitive plant species populations and the health of rare plant communities (Standard).
- Do not authorize vegetation management and construction projects that would further isolate or prevent re-colonization of sensitive plant populations (Standard).
- Ensure that management actions do not contribute to loss of population viability for Forest Service sensitive plant species (Standard).
- Protect known sensitive plant populations from land use activities that cause increased trampling or soil compaction within key habitats (Guideline).
- Enhance and improve habitat for known sensitive plant populations through restoration programs (Guideline).
- Prohibit use of pesticides that would adversely affect species at risk (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

LMNG

- Complete and implement a conservation strategy for sensitive plants within this guild (Guideline).
- Conduct target surveys or baseline assessments for high priority species within this guild (Guideline).

Management Area Direction (Chapter 3)

- None

Monitoring Direction (Chapter 4)

LMNG

- Monitor populations.

Biological Determinations, Risk Assessments, and Rationale

LMNG

Determination is "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide." Both limber pine and golden stickleaf are ranked as S1 species by the State of North Dakota, meaning they are critically imperiled in the state because of extreme rarity (North Dakota Natural Heritage Program 1999).

Under the alternative, both species are protected within the Limber Pine Research Natural Area established in 1991. Specific management protections will be provided by the RNA management plan that will be completed within five years of implementation of the Dakota Prairie Grassland Plan. Annual monitoring of the limber pine population may be needed until the RNA plan is developed and implemented to address potential disease and predation problems.

The spread of noxious and exotic species is one of the primary threats to the maintenance of this habitat within the mixed grass plains (USDA Forest Service 2000). Alternative 3 provides for no net increase (from current levels) of noxious weeds. The acres of rangeland annually rested from livestock grazing under Alternatives 3 more closely approximate the conditions under which golden stickleaf evolved as compared to current grazing conditions (USDA Forest Service 2000). In addition, the levels of prescribed fire within Alternative 3 are a positive move towards restoring the natural fire regime.

Under the management activities proposed by these alternatives and the protection offered known populations through Research Natural Area status, population viability should be met for these two species.

Outcome II is selected as the risk assessment for limber pine. Habitat of suitable quality, quantity, and abundance will be maintained across the planning unit for this species. Habitat enhancement may be needed, however, population augmentation or re-introductions should not be required.

Outcome VI is selected as the risk assessment for golden stickleaf. Stickleaf is known from very limited populations in the vicinity of the planning unit. This will result in strong limitations on interactions among local populations, high potential for genetic isolation, and uncertainty about the species response to climatic stochasticity. Population augmentation may be required. Noxious weeds and exotics are not a threat however.

Buttes Guild

Plant species in this guild include:

Hooker's townsendia

Alyssum-leaved phlox

Torrey's cryptantha

Table H-6 summarizes species occurrence and status in the planning area. Each of these species is classified as sensitive by Region 1 of the Forest Service.

Guild Description

All currently known populations of the forb species in this group occur on the Little Missouri National Grassland (North Dakota Natural Heritage database 2000). Torrey's cryptantha and Hooker's townsendia are narrow range specialists on the Little Missouri National Grassland and are currently found growing on butte landforms and rocky ridges. Alyssum-leaved phlox is also associated with butte landforms but has limited occurrences in other habitats adjacent to buttes (North Dakota Natural Heritage database 2000). Hooker's townsendia is also found near the Buffalo Gap National Grassland.

Butte landforms occur as isolated and scattered topographic features within the surrounding landscape of rolling grasslands and badlands (Murphy et al. 1993). The buttes often contain elements of unique habitat different from habitat more commonly found in the surrounding grasslands. Buttes provide a diversity of specialized niche habitats such as rock cliffs, riparian springs and seeps, rock screen fields, and rimrock ledges. In addition, many of the buttes are capped by geologic formations uncommon for the area. Many of the buttes in North Dakota contain representative examples of the Chadron, Brule, and Arikaree formations that are more commonly found in Nebraska, Wyoming, Colorado, and South Dakota (Murphy et al. 1993). These geologic formations contain unusual edaphic conditions and topographic features contributing to the diversity of plant species and unique plant communities.

Butte landforms on the Little Missouri National Grassland are primarily found in the southern portion of the Grassland and include Black Butte, Bullion Butte, Pretty Butte, Square Butte, and Roundtop Butte.

Information on Individual Plant Species:

Torrey's cryptantha (*Cryptantha torreyana*)

Distribution of Torrey's cryptantha includes North Dakota south and west through Wyoming, Utah, and California, and north to Alaska. The global rank of this species is "G5," meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). In the planning area, this species is rare in North Dakota and Wyoming and has not been documented from South Dakota or Nebraska (NatureServe 2000).

Torrey's cryptantha is known from two populations in the Little Missouri National Grassland (North Dakota Natural Heritage database 2000). One of the populations is known from two individuals. The other population is has persisted and been observed over a 25 year period (North Dakota Natural Heritage database 2000) and occurs in a rock habitat with little associated vegetative cover. Other records place the species on scoria buttes (Barker et al. 1977).

Alyssum-leaved phlox (*Phlox aalyssifolia*)

Alyssum-leaved phlox distribution includes Saskatchewan south through Nebraska, west to Wyoming, and north to British Columbia. The global rank of this species is "G5", meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery) (NatureServe 2000). In the planning area, it is rare in North Dakota and Wyoming and has been reported from Nebraska and South Dakota.

It is known from seven populations in North Dakota with several populations found on the Little Missouri National Grassland. Population sizes vary from 50 to several hundred individuals. Habitat includes the rimrock on top of Bullion Butte and gravelly / pebbly ridge tops (North Dakota Natural Heritage database 2000), although it is also reported from upland prairie (Barker et al. 1977).

Hooker's townsendia (*Townsendia hookeri*)

Hooker's townsendia distribution includes Saskatchewan south through Nebraska, west to Utah, and north to Alaska. The global rank of this species is "G5," meaning common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). This species is considered rare in each state of the planning area (NatureServe 2000).

It is known from three populations in North Dakota, all from the Little Missouri National Grassland (North Dakota Natural Heritage database 2000). Populations range from 10 to 50 individuals (USFS ECODATA database 2000, S. Rinehart, personal observation). Habitat includes the rimrock on top of Bullion Butte and gravelly / pebbly ridge tops (North Dakota Natural Heritage database 2000) although it is also found on rocky ridges and hillsides (USFS ECODATA database 2000; S. Rinehart, personal observation). This species has also been found near the Buffalo Gap National Grassland.

Direct and Indirect Effects on NFS Lands

Livestock and recreation trampling can be a problem for some of the sensitive species within this plant group. Excessive and repeated soil compaction may result in reduced plant vigor. Populations of alyssum-leafed phlox, Torrey's cryptantha, and Hooker's townsendia grow in shallow soil on butte tops and rocky ridges and may be directly affected by trampling. In addition, rimrock plants are often stressed due to harsh growing conditions and are less resilient to disturbance.

Competition from non-native invasive plants can be a significant threat. Invasive species can often out compete native species and reduce their diversity. Recreation and livestock grazing can encourage spread of invasive species.

Noxious weeds such as leafy spurge and Canadian thistle are found in scattered populations throughout the mixed grass and shortgrass plains. Noxious weeds reduce the quality of habitat for these species but at the same time, efforts to control spurge and other invasive species with chemicals can pose a direct threat to sensitive species.

Ground-disturbing activities associated with oil, gas, mineral, and other types of development could result in mortality for these species or place their populations at risk.

Roads can negatively affect plant populations of these species by introducing non-native plant species along travel routes, by habitat fragmentation, and by loss of suitable habitat to disturbance.

Recreation can have effects depending on type of recreational use, road and trail use patterns and intensities, rate of spread of invasive, non-native plant species along recreational routes, and other factors. Even limited recreation use on fragile rimrock habitat may be detrimental to species found on these sites.

Grasshopper spraying has the potential to impact insect pollinator populations. Specific pollinator information for these plant species is not well known.

Excessive removal of vegetation on uplands and buttes can result in rill, sheet, and gully erosion and excessive soil and water runoff. Increased rates of channelization can result in lowered water tables. Any activities that lower water tables below the effective rooting zone of these species places individual plants or populations at risk.

Livestock grazing and burning can have positive, neutral, or negative effects on these species depending on frequency, intensity, and timing of disturbance and on the life history characteristics of the individual plant species.

Burning may invigorate species habitat and enhance nutrient cycling in the soil. Prairie species evolved under frequent fire events. Most perennial species are not permanently injured by burn events, however some species mortality may occur, especially during hot burn events.

Grazing can reduce dead material in plants and open up canopy layers of plants, allowing for the germination and establishment of new plants. Repeated grazing may prevent some sensitive plant species from completing their life cycle and may also reduce carbohydrate reserves.

Cumulative Effects

Continued loss of suitable habitat through conversion of rangelands to croplands can be expected to occur on private lands (Ostlie et al. 1997, USDA Forest Service 2000).

It is likely that noxious weeds will remain as threats in the habitats of these species on private and public lands in and around NFS lands (Ostlie et al. 1997).

Development activities such as road and building construction on private lands will continue, resulting in some loss of suitable habitat for sensitive plant species and some possible mortality of sensitive plants and population loss.

Livestock grazing and mowing practices that are unfavorable for the conservation of sensitive plant species are likely to continue on some private lands (Ostlie et al. 1997).

Insecticide spraying on adjacent croplands may reduce or threaten insect pollinators for some sensitive plant species (Arenz and Joern 1996, Ostlie et al. 1997).

Interrelated and Interdependent Actions

Determining range to be suitable for livestock grazing most often results in issuance of a livestock grazing permit for that area or inclusion of the area into a livestock grazing agreement.

Decisions to make NFS lands available for oil and gas leasing can result in an application permit to drill (APD) and eventual on-site development and additional roads, traffic and pipelines.

Conservation Measures and Mitigation

The following conservation measures are presented as management direction under Alternative 3 in the revised LRMP:

Unit-wide Direction (Chapter 1)

LMNG

- Avoid placing new facilities and developments such as water tanks and impoundments in habitat occupied by sensitive plant species (Guideline).
- Identify sensitive plant habitats as priorities for noxious weed and invasive plant monitoring and control (Guideline).
- Avoid the use of noxious weed and invasive plant control methods that may negatively impact sensitive plants (Guideline).
- Design timing, intensity, and frequency of mowing, burning and livestock grazing to maintain or increase sensitive plant species populations and the health of rare plant communities (Standard).
- Do not authorize vegetation management and construction projects that would further isolate or prevent re-colonization of sensitive plant populations (Standard).
- Maintain hydrological regimes and protect and restore developed springs and seeps where habitat for sensitive plant species would be enhanced (Guideline).
- Ensure that management actions do not contribute to loss of population viability for Forest Service sensitive plant species (Standard).
- Protect known sensitive plant populations from land use activities that cause increased trampling or soil compaction within key habitats (Guideline).
- Enhance and improve habitat for known sensitive plant populations through restoration programs (Guideline).
- Prohibit use of pesticides that would adversely affect species at risk (Guideline).
- Prioritize nearby lands with important or unique habitat for threatened, endangered and sensitive species habitat for acquisition (Guideline).

Geographic Area Direction (Chapter 2)

GRNG, LMNG

- Complete and initiate implementation of conservation strategies for sensitive plant species within this guild (Guideline).
- Conduct target surveys or baseline assessments for high priority species within this guild (Guideline).
- Ensure that timing, intensity and frequency of livestock grazing maintains and / or increases sensitive plant species populations and rare plant communities found on buttes (Guideline).
- Enhance conservation of sensitive plant species by developing educational and interpretive materials for buttes that receive high public use (Guideline).
- Protect springs and seeps found on buttes from livestock disturbance. Avoid placing new water developments on the tops and sides of buttes containing sensitive plant species or rare plant communities (Guideline).

Management Area Direction (Chapter 3)

LMNG (MA 2.1 – Pretty Butte, Black Butte and Round Top Butte Special Interest Areas)

- Allow uses and activities that maintain and enhance the characteristics for which the SIA was designated (Standard).
- Complete site-specific plans for managing the area prior to promoting public visits to a SIA or making significant changes to its land management (Standard).
- Restore natural ecological processes when needed to maintain or enhance the habitats or features for which the SIA was designated (Guideline).
- Reclaim disturbed lands to a condition suitable for the purposes for which the SIA was identified (Standard).
- Develop and initiate implementation of management plans for Pretty Butte, Black Butte, and Round Top Butte (Guideline).
- No ground disturbing mineral activities are permitted; however, existing valid rights will be honored (Standard).
- Prohibit removal of mineral material (Standard).
- Prohibit OHV trail construction (Standard).
- Existing utility corridors may be maintained until they are abandoned. New utility corridors or additional development within existing corridors will be permitted only where associated with valid existing rights (Standard).
- Prohibit new special-use facilities except for valid existing rights (Guideline).

Monitoring Direction (Chapter 4)

LMNG

- Monitor populations and habitat.

Biological Determinations, Risk Assessments, and Rationale

LMNG (all species in this group)

Determination is "may adversely impact individuals but are not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide."

Hooker's townsendia is ranked as critically imperiled in the state because of extreme rarity (North Dakota Natural Heritage Program 1999). Alyssum-leaved phlox is ranked as S1/S2, imperiled because of rarity. Both species are known from less than five populations each on the Little Missouri National Grassland.

Butte habitat upon which these species depend is uncommon within the planning area and planning unit. Suitable habitat is also limited on adjacent private, state, other federal, or tribal lands. In addition, seed sources may not be available for colonization into these habitats.

Threats to the species primarily include environmental stresses, disturbances from trampling, and competition from non-native species. The habitats upon which these species depend can be fragile and have a low tolerance to disturbance. Environmental stresses such as drought, high winds, and temperature extremes are common on butte tops. Rimrock in particular have low vegetative cover, less developed soil horizons, and an abbreviated growing season. Some plant populations associated with this habitat exhibit high ranges of plant mortality from year to year (USFS ECODATA database 2000; USFS files, Medora Ranger District; Susan Rinehart, personal observation).

Alternative 3 would restore fire, rest, and herbivory as natural ecological processes to varying levels. These alternatives would provide for a greater mosaic of habitat conditions across the landscape. In addition, livestock grazing and trampling on fragile environments may be reduced by the decreases in livestock levels under this alternative. The acres of rangeland annually rested from livestock grazing under this alternative also more closely approximates the conditions under which the species evolved as compared to current grazing conditions (USDA Forest Service 2000). The levels of prescribed fire within Alternative 3 are a positive move towards restoring the natural fire regime. Alternative 3 also provides for no net increase (from current levels) of noxious weeds, combined with decreases in grazing levels. The spread of noxious and exotic species is one of the primary threats to the maintenance of high quality native habitat on the Grasslands (USDA Forest Service 2000).

Under Alternative 3, Square Butte, Black Butte, Roundtop Butte, and Pretty Butte are allocated to Special Interest Area (SIA) management. These proposed SIAs may provide suitable, although currently unoccupied, habitat for species within this guild.

Under Alternative 3, concerns exist for protection of sensitive species and rare plant communities within 1.2a Suitable for Wilderness Management Area direction. Under most circumstances, such management may offer a degree of protection to TES species and habitats within the area. However, the number of rare species and unique habitat found on the Bullion Butte escarpment may not be compatible with large increases in recreational use.

The fragile rimrock habitat on top of the butte may become the destination point for recreational users. As the second highest point in North Dakota, Bullion Butte escarpment offers scenic vistas from the butte's flat top. There may be increases in recreation visits to the site.

Most recreational interest is likely to be focused upon the butte top and rock escarpment. These locations are also the most fragile and contain sensitive plant populations, rare plant communities, and the unique habitats upon which they depend. Grazing, livestock trampling and introduction of non-native plant species into sensitive plant habitat would also continue under this designation, increasing the likelihood of cumulative effects.

All of the species are peripheral species, on the edge of their range, so loss of individuals or populations would not lead to loss of species viability rangewide. However, peripheral populations are of value because they are often genetically different from populations that are more widespread within the common range of the species.

The low numbers of populations of Torrey’s cryptantha are a concern under this alternative and monitoring should be conducted for the species. Target floristic surveys during the appropriate time of year should be conducted.

Outcome VI is selected as the risk assessment for Torrey's cryptantha and Hooker's townsendia. Both species are known from very limited populations in the planning unit. This will result in strong limitations on interactions among local populations, high potential for genetic isolation, and uncertainty about the species response to climatic stochastic. Population augmentation may be required.

Outcome II is selected as the risk assessment for alyssum-leaved phlox. Habitat of sufficient quality and abundance will be maintained for this species. Numerous populations are known for this species and populations often consist of numerous individuals.

BGNG

Biological determinations are not made Hooker's townsendia because it is not listed as sensitive by Region 2 of the Forest Service. The species has not been found on the national grassland but has been found on nearby private lands.

Western Wooded Draw Guild

This plant group includes the habitat types found within the wooded draws in the western part of the planning area. The wooded draws are predominately green ash / chokecherry / snowberry habitat types. Only one Table H-3 plant species, blue lips, is identified as occurring in wooded draws. This species occurs primarily in niches of low evapotranspiration rates, added moisture conditions, and limited sunlight reflectance in the mixed grass prairie. This species has already been addressed as part of the western plains riparian plant group.

Section 5. Additional Supporting Information

Seral Stage and Vegetation Structure

Seral stage (successional status) and vegetation structure are important factors that influence habitat suitability for many wildlife species and the distribution of many plant species. Livestock grazing, prescribed burning, and rest are valuable tools that can be used to help manage for a desired vegetation mosaic. The ability to manage timing, intensity, frequency and duration of livestock grazing is critical if vegetation composition and structure objectives are to be met in a timely manner.

To provide expanded levels of suitable and quality habitat for a diversity of plant and animal species across the national grasslands and forests, the revised LRMPs provide direction to focus additional management on providing early and late seral stages and low and high vegetation structure. The desired mix of seral stages and vegetation structure levels prescribed in the revised LRMPs for grasslands and sagebrush habitats are summarized below in Table H-8. The information on seral stages and vegetation structure presented in these tables is based on the acres of suitable range and the midpoints of the ranges presented in the revised LRMPs for desired vegetation conditions. The biological determinations made in this biological assessment and evaluation assume that the midpoints of these ranges will be achieved over the next 10 to 15 years.

Table H-8. Seral Stages (acres and percent of area) – Dakota Prairie Grasslands

Planning Unit	Early	Mid	Late
LMNG	110,500 (12.5%)	619,100 (70%)	154,800 (17.5%)
Rolling Prairie	53,200 (12.5%)	298,100 (70%)	74,500 (17.5%)
Badlands	57,300 (12.5%)	321,000 (70%)	80,300 (17.5%)
GR/CRNG	19,900 (12.5%)	111,300 (70%)	27,800 (17.5%)
SNG	5,200 (7.5%)	40,000 (57.5%)	24,300 (35%)

Table H-9. Seral Stages (acres and percent of area) – All Other Planning Units

Planning Unit	Early	Early-Intermediate	Late-Intermediate	Late
FPNG	11,300 (10%)	22,500 (20%)	45,000 (40%)	33,800 (30%)
BGNG	52,000 (10%)	94,400 (17%)	252,000 (46%)	146,400 (27%)
Fall River Northeast	8,700 (10%)	8,700 (10%)	43,400 (50%)	26,000 (30%)
Fall River Southeast	5,000 (5%)	20,100 (20%)	50,200 (50%)	25,100 (25%)
Fall River West	6,000 (5%)	17,900 (15%)	71,500 (60%)	23,800 (20%)
Wall Northeast	6,900 (10%)	13,800 (20%)	27,500 (40%)	20,600 (30%)
Wall Southeast	8,400 (10%)	16,900 (20%)	33,800 (40%)	25,300 (30%)
Wall Southwest	17,000 (20%)	17,000 (20%)	25,600 (30%)	25,600 (30%)
ONG	4,000 (5%)	11,900 (15%)	47,600 (60%)	15,900 (20%)
NNF-Pine Ridge	3,100 (10%)	3,100 (10%)	18,900 (60%)	6,300 (20%)
NNF- Bessey	8,900 (10%)	8,900 (10%)	35,600 (40%)	35,600 (40%)
SRMNF	11,200 (10%)	11,200 (10%)	45,000 (40%)	45,000 (40%)
TBNG	97,900 (18%)	170,900 (32%)	174,200 (33%)	89,100 (17%)
Broken Hills	23,300 (15%)	46,700 (30%)	54,500 (35%)	31,100 (20%)
Cellars Rosecrans	36,200 (30%)	36,200 (30%)	30,200 (25%)	18,100 (15%)
Fairview Clareton	13,600 (15%)	31,700 (35%)	31,700 (35%)	13,600 (15%)
Hilight/Bill	12,900 (15%)	30,100 (35%)	30,100 (35%)	12,900 (15%)
Spring Creek	7,300 (15%)	17,000 (35%)	17,000 (35%)	7,300 (15%)
Upton/Osage	4,600 (15%)	9,200 (30%)	10,700 (35%)	6,100 (20%)

Table H-10. Vegetation Structure (acres and percent of area) – All Planning Units

Planning Unit	Low	Moderate	High
LMNG	132,700 (15%)	530,700 (60%)	221,000 (25%)
Rolling Prairie	63,900 (15%)	255,500 (60%)	106,400 (25%)
Badlands Prairie	68,800 (15%)	275,200 (60%)	114,600 (25%)
GR/CRNG	23,900 (15%)	95,400 (60%)	39,700 (25%)
SNG	5,200 (7%)	40,000 (58%)	24,300 (35%)
FPNG	22,500 (20%)	45,000 (40%)	45,100 (40%)
BGNG	118,500 (22%)	265,000 (49%)	161,500 (30%)
Fall River Northeast	9,100 (10%)	47,800 (55%)	29,900 (35%)
Fall River Southeast	25,100 (25%)	50,200 (50%)	25,100 (25%)
Fall River West	23,800 (20%)	71,500 (60%)	23,900 (20%)
Wall Northeast	13,800 (20%)	27,500 (40%)	27,500 (40%)
Wall Southeast	21,100 (25%)	33,800 (40%)	29,500 (35%)
Wall Southwest	25,600 (30%)	34,200 (40%)	25,600 (30%)
ONG	15,900 (20%)	47,600 (60%)	15,900 (20%)
NNF-Pine Ridge	3,100 (10%)	23,600 (75%)	4,700 (15%)
NNF- Bessey	2,200 (2%)	44,500 (50%)	42,300 (48%)
SRMNF	2,800 (2%)	56,200 (50%)	53,400 (48%)
TBNG	123,000 (23%)	229,200 (43%)	179,700 (34%)
Broken Hills	31,100 (20%)	70,000 (45%)	54,500 (35%)
Cellars Rosecrans	42,300 (35%)	36,200 (30%)	42,200 (35%)
Fairview Clareton	18,100 (20%)	45,300 (50%)	27,200 (30%)
Hilight/Bill	17,200 (20%)	43,000 (50%)	25,700 (30%)
Spring Creek	9,700 (20%)	19,400 (40%)	19,400 (40%)
Upton/Osage	4,600 (15%)	15,300 (50%)	10,700 (35%)

Ungrazed Habitats

The amount of habitat not grazed by livestock each year is also prescribed as broad-scale management direction in the revised LRMPs. These habitats commonly provide high vegetation structure and reduced levels of disturbance and are favored by some species at risk. The amount of ungrazed habitats prescribed for each national grassland and forest is presented below in Table H-11. This information is based on the midpoints of the ranges prescribed in the revised LRMPs, and the biological determinations made in this biological assessment and evaluation assume that the midpoints of these ranges will be achieved over the next 10 to 15 years.

Table H-11. Ungrazed Habitats (acres and percent of area) – All Planning Units

Planning Unit	Ungrazed Habitat	
	acres	percent
LMNG	51,300	5%
Rolling Prairie	22,600	5%
Badlands	28,700	5%
GR/CRNG	7,900	5%
SNG	3,500	5%
FPNG	11,200	10%
BGNG	27,200	5%
Fall River Northeast	4,300	5%
Fall River Southeast	5,000	5%
Fall River West	6,000	5%
Wall Northeast	3,400	5%
Wall Southeast	4,200	5%
Wall Southwest	4,300	5%
ONG	4,000	5%
NNF-Pine Ridge	1,600	5%
NNF- Bessey	4,900	5%
SRMNF	6,200	5%
TBNG	27,300	5%
Broken Hills	8,600	5%
Cellars Rosecrans	6,000	5%
Fairview Clareton	4,500	5%
Hilight/Bill	4,300	5%
Spring Creek	2,400	5%
Upton/Osage	1,500	5%

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