APPENDIX A AIR QUALITY

Class I areas: all units of Theodore Roosevelt National Park, North Dakota; Lostwood National Wildlife Area, North Dakota; both units of Badlands National Park, South Dakota; Wind Cave National Park, Fort Peck Indian Reservation, Montana, and Northern Cheyenne Indian Reservation, Montana

Class II areas: National Forest System lands in the planning area.

Allowable Psd Increments

micrograms/meter^3 (ug/m^3)

		Maximum Allowable Increase Over Baseline		
Pollutant	**Period**	**Class I**	**Class II**	**Class III****
PM-10	Annual	4	17	34
	24-Hour	8	30	60
Sulfur Dioxide	Annual	2	20	40
	24-Hour*	5	91	182
	3-Hour*	25	512	700
Total Suspended Particulates (TSP)	Annual	5	19	37
	24-Hour*	10	37	75
Nitrogen Oxides	Annual	2.5	25	50

* Not to be exceeded more than once a year.
** No Class III Areas have yet been designated.

Sources: 40 *Code of Federal Regulations* 52.21 (c) and Clean Air Act (as amended through December, 1990), section 163B.

APPENDIX B RECOMMENDED FENCE SPECIFICATIONS FOR BIG GAME MOVEMENT[1]

Kind of Livestock[2]	Big Game Species	Number of Wires	Maximum Height (in)	Wire Spacing (from ground up)	Wire Type[3,4]
Cattle only	Deer, Elk, Pronghorn	3	38	16, 10, 12	Bottom smooth
Cattle and Sheep	Deer, Elk, Pronghorn	4	40	16, 6, 6, 12	Bottom smooth
Sheep only	Deer, Elk, Pronghorn	4	32	12, 6, 6, 8	Bottom smooth
Cattle only	Bighorn Sheep	3	39	20, 15, 4	Barbed

[1] These recommendations are designed for facilitating movement of both young and adult big game animals during all seasons including winter and spring when snow drifting can be expected.

[2] No standards are available for bison, but provisions for big game movement should be considered when building bison fences.

[3] Woven (net) wire fences are not recommended.

[4] One or more of the top wires may also be electrified.

References Consulted

Bear, G.D. 1969. Antelope and net-wire fences. Colorado Division of Game, Fish and Parks, Game Information Leaflet No. 71. 3pp.

Kie, J.G., V.C. Bleich, A.L. Medina, J.D. Yoakum, and J.W. Thomas. 1994. Managing rangelands for wildlife. Pages 663-688 in T.A. Bookout, ed. Research and management techniques for wildlife and habitats. The Wildlife Society, Bethesda, Md. 740pp.

Kindschy, R.R. 1996. Fences, waterholes, and other range improvements. Pages 369-382 in P.R. Krausman, ed. Rangeland wildlife. The Society for Range Management, Denver, Colorado. 440pp.

Lee, R.M., J.D. Yoakum, B.W. O'Gara, T.M. Pojar, and R.A. Ockenfels, eds. 1998. Pronghorn management guides. Pronghorn Antelope Workshop, Arizona Game and Fish Dept. and Arizona Antelope Foundation, Inc. 85pp.

O'Gara, B.W. and J.D. Yoakum. 1992. Pronghorn management guides. Pronghorn Antelope Workshop, Rock Springs, Wyoming. 101pp.

Sanderson, H.R., T.M. Quigley, E.E. Swan, and L.R. Spink. 1990. Specifications for structural range improvements. U.S.D.A. Forest Service, Gen. Tech. Rep. PNW-GTR-250, 120pp.

Spillett, J.J., J.B. Low and D. Sill. 1967. Livestock fences - how they influence pronghorn antelope movements. Utah State Univ. Bull. No. 470. 79pp.

USDI, Bureau of Land Management. 1989. BLM fence standards for livestock and wildlife. BLM Manual 1-1572.

Yoakum, J. 1980. Habitat management guides for the American pronghorn antelope. Bureau of Land Management, Tech. Note 347. 77pp.

APPENDIX C DETERMINING ANIMAL UNIT EQUIVALENT BASED ON LIVESTOCK WEIGHT

Livestock body size affects the quantity of dry matter consumed. Not all livestock are the same size or weight, and weight variations require adjustments in animal unit equivalents. The University of Nebraska defines an animal unit equivalent as *a 1,000-pound cow of above average milking ability with a calf less than 3 to 4 months postpartum*. The Society for Range Management defines an animal unit as *one mature cow approximately 1,000 pounds, either dry or with a calf up to 6 months of age*. In either case, the animal unit equivalent is equal to 1 animal unit, which has a daily dry matter allocation of 26 pounds of forage.

Following are several methods to determine animal unit equivalents based on livestock weight:

1. Holecheck et al. 1989, uses a rough guideline by using 2 percent of the body weight to determine daily dry matter intake per day when values for different seasons are averaged across the year.
2. University of Nebraska, *A Guide For Planning And Analyzing A Year-Round Forage Program*, Nebraska Cooperative Extension EC 86-113, suggests animal weight variations require adjustments in animal unit equivalent values equal to 0.1 animal units for every 100 pounds of liveweight that the animal differs from the standard 1,000 pound animal unit equivalent of 1. Thus, a cow with calf less than 3 to 4 months postpartum that weighs 1,200 pounds would have an animal unit equivalent of 1.2.
3. North Dakota State University, *Animal Unit Equivalent for Beef Cattle*, DREC 98-1020, suggests using the metabolic weight to estimate the daily or monthly forage demand. Metabolic weight is the liveweight to the 0.75 power. Beef cattle animal unit equivalents can be determined for animals of different sizes by calculating their metabolic weight as a percentage of the metabolic weight of a 1,000 pound cow. The following formula would be used:

$$\frac{(\text{Live animal weight})^{0.75}}{1000^{0.75}} = \text{Animal Unit Equivalent}$$

APPENDIX D OIL AND GAS STIPULATIONS OGLALA AND BUFFALO GAP NATIONAL GRASSLANDS

INTRODUCTION

This appendix displays the stipulations applied to oil and gas leases to be consistent with Forest Plan Standards and Guidelines, and a short explanation of the reasons for the stipulations. This is mandated by the oil and gas regulations found in 36 CFR 228 102 (c)(1)(ii). This section also discusses the guidelines by which waivers, exceptions, or modifications may be granted.

Waivers, exceptions, or modifications will be considered in accordance with the requirements of 36 CFR 228.104. Environmental analysis meeting NEPA requirements will be conducted in considering a request for a waiver, exception or modification. The Deciding Officer will make a determination based on this information.

All the following stipulations are consistent with and necessary to implement the land and resource management plan.

DEFINITION OF TERMS

- **Stipulation:** A provision that modifies standard lease rights and is attached to and made a part of the lease. Stipulations have been developed for the categories of: 1) No Surface Occupancy, 2) Timing Limitations or seasonal restrictions, and 3) Controlled Surface Use.
- **No Surface Occupancy (NSO)**: Use or occupancy of the land surface for fluid mineral exploration or development is prohibited to protect identified resource values.
- **Timing Limitation (TL) (Seasonal Restriction):** Prohibits surface use during specified time periods to protect identified resource values. This stipulation does not apply to the operation and maintenance of production facilities unless the findings of analysis demonstrate the continued need for such mitigation and that less stringent, project-specific mitigation measures would be insufficient.
- **Controlled Surface Use (CSU):** Use and occupancy is allowed (unless restricted by another stipulation), but identified resource values require special operational constraints that may modify the lease rights. CSU is used for operating guidance, not as a substitute for NSO or Timing stipulations.
- **Lease Notice:** Provides more detailed information concerning limitations that already exist in law, lease terms, regulations, or operational orders. A Lease Notice also addresses special items the lessee should consider when planning operations, but does not impose new or additional restrictions.
- **Waiver (oil and gas leasing)**: Permanent exemption from a lease stipulation. Waivers can be granted if the condition described in the stipulation no longer applies anywhere in the leasehold.

Definition of Terms, cont.

- **Exception (oil and gas leasing)**: Case-by-case exemption from a lease stipulation. The stipulation continues to apply to all other sites within the leasehold to which the restrictive criteria apply.
- **Modification (oil and gas leasing)**: Modifications are similar to exceptions, but broader in scope, and involve a fundamental change to the provisions of the stipulation. They can be granted either temporarily or for the duration of the lease. A modification may, therefore, include an exemption from or alteration to a stipulated requirement. Depending on the specific modification, the stipulation may or may not apply to all other sites within the leasehold to which the restrictive criteria applied.

WATER, WETLANDS, WOODY DRAWS, RIPARIAN, AND FLOODPLAINS

Controlled Surface Use (CSU)

Resource: Water, Wetlands, Woody Draws, Riparian, and Floodplains (CSU)(see Appendix G for definitions)

Stipulation

Try to locate activities and facilities away from the water's edge and outside the riparian areas, woody draws, wetlands, and floodplains. If necessary to locate facilities in these areas, then:

- Deposit no waste material (silt, sand, gravel, soil, slash, debris, chemical or other material) below high water lines, in riparian areas, in the areas immediately adjacent to riparian areas or in natural drainageways (draws, land surface depressions or other areas where overland flow concentrates and flows directly into streams or lakes).
- Deposit no soil material in natural drainageways.
- Locate the lower edge of disturbed or deposited soil banks outside the active floodplain.
- Stockpile no topsoil or any other disturbed soil in the active floodplain.
- Locate drilling mud pits outside riparian areas, wetlands and floodplains. If location is unavoidable in these areas, seal and dike all pits to prevent leakage or use containerized mud systems.

Objective (Justification)

For justification refer to the Land and Resource Management Plan Grassland-wide Direction, Water, number 14. This stipulation is to protect the biological and hydrologic features of riparian areas, woody draws, wetlands, and floodplains.

Application Methodology,

Use this stipulation in riparian areas, woody draws, wetlands, and floodplains that are greater than 400 meters wide. 43 CFR 3101.1-2 includes measures to relocate operations up to 200 meters and to delay operations up to 60 days in any lease year. Therefore use Standard Lease Terms for areas less than 200 meters from edge.

Waivers

This stipulation may be waived if the authorized officer determines the entire leasehold no longer contains any riparian areas, woody draws, wetlands, or floodplains.

Exceptions

The authorizing officer may grant an exception to this stipulation if the operator submits a plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated.

Modifications

The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area do not include riparian areas, woody draws, wetlands, and floodplains.

SOILS

No Surface Occupancy (NSO)

Resource: Slopes Greater than 40 Percent (NSO)

Stipulation

Surface occupancy and use is prohibited on slopes greater than 40 percent.

Objective (Justification)

For justification refer to the Land and Resource Management Plan Grassland-wide Direction, Soils, number 4. The objective of this stipulation is to protect soil resources from loss of productivity, prevent erosion on steep slopes, soil mass movement, and resultant sedimentation.

Application Methodology

Use this stipulation on slopes greater than 40 percent.

Waivers

This stipulation may be waived if the authorized officer determines conditions have changed and the entire leasehold no longer contains any slopes greater than 40 percent.

Exceptions

The authorizing officer may grant an exception to this stipulation if the operator submits a plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated.

Modifications

The boundaries of the stipulated area may be modified if the authorizing officer determines that portions of the area do not include slopes greater than 40 percent.

Resource: Slopes Between 25 - 40 Percent (NSO)

Stipulation

Surface occupancy and use is prohibited on slopes between 25 - 40 percent with either highly erodible soils or soils susceptible to mass failure.

Objective (Justification)

For justification refer to the Land and Resource Management Plan Grassland-wide Direction, Soils, Number 4. The objective of this stipulation is to protect soil resources from loss of productivity, prevent erosion on steep slopes, soil mass movement, and resultant sedimentation.

Application Methodology

This stipulation applies to slopes between 25 and 40 percent with either highly erodible soils or soils susceptible to mass movement. This stipulation will not apply to those areas of slopes between 25 - 40 percent where it is determined there are no highly erodible soils, or soils susceptible to mass failure.

Waivers

This stipulation may be waived if the authorized officer determines conditions have changed and the entire leasehold no longer contains any highly erodible soils or soils susceptible to mass failure on slopes between 25 to 40 percent in the leasehold.

Exceptions

The authorizing officer may grant an exception to this stipulation if the operator submits a plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated.

Modifications

The boundaries of the stipulated area may be modified if the authorizing officer determines that portions of the area do not include slopes between 25 to 40 percent with highly erodible soils or soils susceptible to mass failure.

RECREATION

No Surface Occupancy (NSO)

Resource: Developed Recreation Sites (NSO)

Stipulation

No surface occupancy or use is allowed within developed recreation sites.

Objective (Justification)

For justification refer to the Land and Resource Management Plan Grassland-wide Direction, Recreation, Developed Recreation Sites, Number 9. The objective is to maintain the recreation opportunities and settings within developed recreation sites

Application Methodology

Use this stipulation in developed recreation sites.

Waivers

This stipulation may be waived if the authorized officer determines conditions have changed and the entire leasehold no longer contains developed recreation sites.

Exceptions

The authorizing officer may grant an exception to this stipulation if the operator submits a plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated.

Modifications

The boundaries of the stipulated area may be modified if the authorizing officer determines that portions of the area do not include developed recreation sites.

PALEONTOLOGY

Controlled Surface Use (CSU)

Resource: Fossils (CSU)

Stipulation

Prior to undertaking any surface-disturbing activities on the lands covered by this lease, the lessee or operator, unless notified to the contrary by the Forest Service, shall:

- Contact the Forest Service to determine if a site-specific vertebrate paleontological inventory is required. The Forest Service will conduct inventories and surveys as part of the field review for the proposed activity on the lease. The operator my voluntarily engage the services of a qualified paleontologist to conduct the inventory.
- Implement mitigation measures required by the Forest Service and Bureau of Land Management to preserve or avoid destruction of vertebrate paleontological resources. Mitigation may include relocation of proposed facilities or other protective measures.
- The lessee or operator shall bring to the attention of the Forest Service any vertebrate paleontologic resources discovered as a result of surface operation under this lease, and shall leave such discoveries intact until directed to proceed by the Forest Service.

Objective (Justification)

For justification refer to the Land and Resource Management Plan Grassland-wide Direction, Paleontological Resources, numbers 1 and 3. The objective is to protect fossils and immediate environment of the site, including inherent scientific, natural historic, interpretive, educational, and recreational values for the area potentially impacted.

Application Methodology

Use this stipulation for Class 3, 4, and 5 formations as described in Appendix J. The predevelopment survey protocol is described in Appendix J.

Waivers

No conditions for a waiver are anticipated, and approval of a waiver would be unlikely.

Exceptions

The authorizing officer may grant an exception to this stipulation if the operator submits a plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated.

Modifications

The boundaries of the stipulated area may be modified if the authorizing officer determines that portions of the area do not include significant fossils as described in Appendix J and FSM 2883.

WILDLIFE

Wildlife stipulations are listed in the order of Timing Limitations, Controlled Surface Use, and No Surface Occupancy.

Wildlife - Timing Limitations (TL)

Resource: Ferruginous Hawk and Swainson's Hawk Nests (TL)

Stipulation

Surface use is prohibited from March 1 through July 31 within 0.50 miles (line of sight) of ferruginous and Swainson's hawk nests.

Objective (Justification)

For justification refer to the Land and Resource Management Plan Grassland-wide Direction, Fish, Wildlife and Rare Plants, number 52. The objective is to prevent reduced reproductive success.

Application Methodology

This stipulation applies to active ferruginous and Swainson's hawk nest. This stipulation applies to drilling, testing, new construction projects, and to workover operations. This does not apply to emergency repairs.

Waiver

This stipulation may be waived if the authorized officer determines conditions have changed and all nests within the leasehold or within the stipulated distance from the leasehold are known to have been unoccupied during each of the previous 7 years.

Exceptions

The authorizing officer may grant an exception to this stipulation if the operator submits a plan that demonstrates impacts from the proposed action are acceptable, can be adequately mitigated, or if all nests within the leasehold or within the stipulated distance from the leasehold are known to have been unoccupied during each of the previous 7 years.

Modifications

The boundaries of the stipulated area may be modified if the authorizing officer determines that portions of the area include nests or nest site(s) known to have been unoccupied during each of the previous 7 years.

Resource: Golden Eagle Nests (TL)

Stipulation

Surface use is prohibited from February 1 through July 31 within 0.50 miles (line of sight) of golden eagle nests.

Objective (Justification)

For justification refer to the Land and Resource Management Plan Grassland-wide Direction, Fish, Wildlife and Rare Plants, number 52. The objective is to prevent reduced reproductive success.

Application Methodology

This stipulation applies to active golden eagle nest. This stipulation applies to drilling, testing, new construction projects, and to workover operations. This does not apply to emergency repairs.

Waiver

This stipulation may be waived if the authorized officer determines conditions have changed and all nests within the leasehold or within the stipulated distance from the leasehold are known to have been unoccupied during each of the previous 7 years.

Exceptions

The authorizing officer may grant an exception to this stipulation if the operator submits a plan that demonstrates impacts from the proposed action are acceptable, can be adequately mitigated, or if all nests within the leasehold or within the stipulated distance from the leasehold are known to have been unoccupied during each of the previous 7 years.

Modifications

The boundaries of the stipulated area may be modified if the authorizing officer determines that portions of the area include nests or nest site(s) known to have been unoccupied during each of the previous 7 years.

Resource: Merlin Nests (TL)

Stipulation

Surface use is prohibited from April 1 through August 15 within 0.50 miles (line of sight) of merlin nests.

Objective (Justification)

For justification refer to the Land and Resource Management Plan Grassland-wide Direction, Fish, Wildlife and Rare Plants, number 52. The objective is to prevent reduced reproductive success.

Application Methodology

This stipulation applies to active merlin nests. This stipulation applies to drilling, testing, new construction projects, and to workover operations. This does not apply to emergency repairs.

Waivers

This stipulation may be waived if the authorized officer determines conditions have changed and all nests within the leasehold or within the stipulated distance from the leasehold are known to have been unoccupied during each of the previous 7 years.

Exceptions

The authorizing officer may grant an exception to this stipulation if the operator submits a plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated. An exception may be granted for periodic maintenance including work-over rigs if a nest is unoccupied within the current year after May 30.

Modifications

The boundaries of the stipulated area may be modified if the authorizing officer determines that portions of the area include nests or nest site(s) known to have been unoccupied during each of the previous 7 years.

Resource: Sharp-tailed Grouse Display Grounds (TL)

Stipulation

Surface use is prohibited from March 1 through June 15 within 1 mile (line of sight) of a sharp-tailed grouse display ground.

Objective (Justification)

For justification refer to the Land and Resource Management Plan Grassland-wide Direction, Fish, Wildlife and Rare Plants, number 15. The objective is to prevent abandonment of display grounds and reduced reproductive success.

Application Methodology

This stipulation applies to active sharp-tailed grouse display grounds. The 1 mile radius extends outward from the center of a display ground. This stipulation applies to drilling, testing, new construction projects, and to workover operations. This does not apply to emergency repairs.

Waivers

This stipulation may be waived if the authorized officer determines conditions have changed and all display grounds within the leasehold or within the stipulated distance from the leasehold have not been used during the past 2 breeding seasons.

Exceptions

The authorizing officer may grant an exception to this stipulation if the operator submits a plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated. An exception may be granted if the display ground has not been used by May 1 of the current year.

Modifications

The boundaries of the stipulated area may be modified if the authorizing officer determines that portions of the area do not include display grounds that have been used during the last 2 breeding seasons.

Resource: Sage Grouse Display Grounds (TL)

Stipulation

Surface use is prohibited from March 1 through June 15 within 2 miles (line of sight) of a sage grouse display ground, and noise from production facilities must not exceed 49 decibels (10 dBA above background noise) at the display ground.

Objective (Justification)

For justification refer to the Land and Resource Management Plan Fall River West Geographic Areas, Wildlife, Fish and Rare Plants, number 1. The objective is to prevent abandonment of display grounds and reduced reproductive success.

Application Methodology

This stipulation applies to active sage grouse display grounds. The 2 mile radius extends outward from the center of a display ground. This stipulation applies to drilling, testing, new construction projects, and to workover operations. This does not apply to emergency repairs.

Waivers

This stipulation may be waived if the authorized officer determines conditions have changed and all display grounds within the leasehold or within the stipulated distance from the leasehold have not been used during the past 5 breeding seasons.

Exceptions

The authorizing officer may grant an exception to this stipulation if the operator submits a plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated. An exception may be granted if the display ground has not been used by May 1 of the current year.

Modifications

The boundaries of the stipulated area may be modified if the authorizing officer determines that portions of the area do not include any display grounds that have been used during the past 5 breeding seasons.

Resource: Mountain Plover (TL)

Stipulation

Surface use is prohibited from March 15 through July 31 within 0.25 miles (line of sight) of a mountain plover nests or nest aggregation areas.

Objective (Justification)

For justification refer to the Land and Resource Management Plan, Fall River West Geographic Area Direction, Wildlife, Fish and Rare Plants, number 2. The objective is to prevent reduced reproductive success.

Application Methodology

This stipulation applies to mountain plover nests and nest aggregation areas, if mountain plovers begin nesting on the Buffalo Gap or Oglala National Grasslands. This stipulation applies to drilling, testing, new construction projects, and to workover operations. This does not apply to emergency repairs.

Waivers

This stipulation may be waived if the authorized officer determines conditions have changed and there are no nests or nest aggregation areas within the leasehold or within the stipulated distance from the leasehold.

Exceptions

The authorizing officer may grant an exception to this stipulation if the operator submits a plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated. An exception may be granted if the nest or nest aggregation area has not been used by June 10 of the current year.

Modifications

The boundaries of the stipulated area may be modified if the authorizing officer determines that portions of the area do not include mountain plover nests and nesting areas.

Resource: Black-footed Ferret Habitat (TL)

Stipulation

Surface use is prohibited from March 1 through August 31 within 0.125 mile (line of sight) of prairie dog colonies occupied or thought to be occupied by black-footed ferrets.

Objective (Justification)

For justification refer to the Land and Resource Management Plan Grassland-wide Direction, Fish, Wildlife and Rare Plants, number 19. The objective is to protect ferrets when breeding and rearing young.

Application Methodology

This stipulation applies to prairie dog colonies occupied by black-footed ferrets. The spatial buffer extends out from the outer boundary of a prairie dog colony occupied by black-footed ferrets. This stipulation applies to drilling and testing and new construction projects, not to operation or maintenance of production facilities.

Waivers

The authorized officer may grant a waiver if ferret surveys, following protocol approved by the U.S. Fish, Wildlife and Rare Plants Service, indicate a low probability that ferrets occur in prairie dog colonies located in the leasehold, or if the U.S. Fish, Wildlife and Rare Plants Service determines that black-footed ferrets do not occur in the area. Currently, there are no prairie dog colonies occupied by black-footed ferrets that are outside MA 3.63. This stipulation will be applied if black-footed ferret populations expand outside MA 3.63.

Exceptions

The authorizing officer may grant an exception to this stipulation if the operator submits a plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated. An exception may be granted if surveys indicate a low probability that ferrets occur in a prairie dog colony where drilling, testing or new construction is proposed.

Modifications

The boundaries of the stipulated area may be modified if the authorizing officer determines that black-footed ferrets do not occur in portions of the area.

Resource: Swift Fox Dens (TL)

Stipulation

Surface use is prohibited from March 1 through July 31 within 0.25 mile (line of sight) of swift fox dens.

Objective (Justification)

For justification refer to the Land and Resource Management Plan Grassland-wide Direction, Fish, Wildlife and Rare Plants, number 45. The objective is to prevent den abandonment and reduced reproductive.

Application Methodology

This stipulation applies to swift fox den sites. This stipulation applies to drilling and testing and new construction projects, not to operation or maintenance of production facilities.

Waivers

This stipulation may be waived if the authorized officer determines conditions have changed and there are no dens within the leasehold or within the stipulated distance from the leasehold.

Exceptions

The authorizing officer may grant an exception to this stipulation if the operator submits a plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated.

Modifications

The boundaries of the stipulated area may be modified if the authorizing officer determines that portions of the area do not include swift fox dens.

Wildlife - Controlled Surface Use (CSU)

Resource: Black-footed Ferret Habitat (CSU)

Stipulation

Operations in prairie dog colonies known or thought to be occupied by black-footed ferrets are subject to the following constraints:

- Limit oil and gas development to no more than one location per 80 acres.
- Suitable black-footed ferret habitat lost as a result of new facilities within prairie dog colonies must be replaced within 1 year.
- Access for routine maintenance of oil and gas facilities in prairie dog colonies is limited to daylight hours. This does not apply to emergency repairs.
- If it's necessary to place a new road in a prairie dog colony, align the road to minimize habitat loss.

Objective (Justification)

For justification refer to the Land and Resource Management Plan Grassland-wide Direction, Fish, Wildlife and Rare Plants, number 18, 21, and 22, and Management Area 3.63, General, number 1, and 2. The objective is to protect against activities that could result in adverse impacts on black-footed ferrets or ferret recovery objectives.

Application Methodology

This stipulation applies to prairie dog colonies occupied by black-footed ferrets outside Management Area 3.63. Currently, there are no prairie dog colonies occupied by black-footed ferrets that are outside MA 3.63. This stipulation will be applied if black-footed ferret populations expand outside MA 3.63.

Waivers

The authorized officer may waive this stipulation if black-footed ferrets are released under an experimental non-essential population status; this stipulation may be waived for areas inside the experimental population area but outside Management Area 3.63.

Exceptions

No conditions for an exception are anticipated, and approval of an exception is unlikely.

Modifications

No conditions for a modification are anticipated, and approval of a modification is unlikely.

Resource: Mountain Plover Habitat (CSU)

Stipulation

Operations in mountain plover nesting and brooding habitat are subject to the following constraints:

- Limit oil and gas development to no more than one location per 80 acres.
- Suitable mountain plover habitat lost as a result of new facilities must be replaced within 1 year.
- Access for routine maintenance of oil and gas facilities in mountain plover nesting and brooding habitat will be between 9 am and 5 pm. This does not apply to emergency repairs.
- If it's necessary to place a new road in a prairie dog colony, align the road to minimize habitat loss.

Objective (Justification)

For justification refer to the Land and Resource Management Plan, Geographic Area Direction, Fall River West, Wildlife Fish and Rare Plants, number 2. The objective is to prevent reductions in reproductive success.

Application Methodology

This stipulation applies to mountain plover nesting and brooding habitat, if mountain plovers begin nesting and brooding on the Buffalo Gap or Oglala National Grasslands. Multiple facilities concentrated at a site are allowed.

Waivers

No conditions for a waiver are anticipated, and approval of a waiver would be unlikely.

Exceptions

No conditions for an exception are anticipated, and approval of an exception would be unlikely.

Modifications

The boundary of the stipulated area may be modified if the authorizing officer determines that portions or the area do not contain active prairie-dog colonies.

Wildlife - No Surface Occupancy (NSO)

Resource: Mountain Plover Nests and Nesting Areas (NSO)

Stipulation

No surface occupancy or use is allowed within 0.25 miles of known mountain plover nests or nesting areas.

Objective (Justification)

For justification refer to the Land and Resource Management Plan, Fall River West, Wildlife, Fish and Rare Plants, number 2. The objective is to prevent reduced reproductive success and adverse habitat loss.

Application Methodology

This stipulation applies to mountain plover nests or nesting areas if nests or nesting areas are established on the Oglala or Buffalo Gap National Grasslands.

Waivers

No conditions for a waiver are anticipated, and approval of a waiver would be unlikely.

Exceptions

No conditions for an exception are anticipated, and approval of an exception would be unlikely.

Modifications

The boundary of the stipulated area may be modified if the authorizing officer determines that portions or the area do not contain mountain plover nests or nesting areas.

Resource: Bald Eagle Nests (NSO)

Stipulation

No surface occupancy or use is allowed within 1.0 mile (line of sight) of bald eagle nests.

Objective (Justification)

For justification refer to the Land and Resource Management Plan Grassland-wide Direction, Fish, Wildlife and Rare Plants, number 51. The objective is to prevent reduced reproductive success and adverse habitat loss.

Application Methodology

This stipulation applies to active bald eagle nests.

Waivers

This stipulation may be waived if the authorized officer determines conditions have changed and all nests within the leasehold or within the stipulated distance from the leasehold are known to have been unoccupied during each of the previous 7 years.

Exceptions

The authorizing officer may grant an exception to this stipulation if the operator submits a plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated.

Modifications

The boundaries of the stipulated area may be modified if the authorizing officer determines that portions of the area include nests or nest site(s) known to have been unoccupied during each of the previous 7 years. The boundary of the stipulated area may also be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the eagles.

Resource: Bald Eagle Winter Roosts (NSO)

Stipulation

No surface occupancy or use is allowed within 1.0 mile (line of sight) of bald eagle roosting areas.

Objective (Justification)

For justification refer to the Land and Resource Management Plan Grassland-wide Direction, Fish, Wildlife and Rare Plants, number 51. The objective is to prevent adverse impacts on wintering and migrating bald eagles.

Application Methodology

This stipulation applies to bald eagle roosting areas.

Waivers

This stipulation may be waived if the authorized officer determines conditions have changed and winter roosting areas are no longer used within the leasehold or within the stipulated distance from the leasehold.

Exceptions

The authorizing officer may grant an exception to this stipulation if the operator submits a plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated.

Modifications

The boundaries of the stipulated area may be modified if the authorizing officer determines that portions of the area do not include winter roosting areas. The boundary of the stipulated area may also be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the eagles.

Resource: Golden Eagle, Merlin, Ferruginous Hawk, Swainson's Hawk, and Burrowing Owl Nests (NSO)

Stipulation

No surface occupancy or use is allowed within 0.25 mile (line of sight) of golden eagle, merlin, ferruginous hawk, Swainson's hawk, or burrowing owl nests.

Objective (Justification)

For justification refer to the Land and Resource Management Plan Grassland-wide Direction, Fish, Wildlife and Rare Plants, number 51. The objective is to prevent reduced reproductive success and adverse habitat loss.

Application Methodology

This stipulation applies to active golden eagle, merlin, ferruginous hawk, Swainson's hawk, or burrowing owl nests.

Waivers

This stipulation may be waived if the authorized officer determines conditions have changed and all nests within the leasehold or within the stipulated distance from the leasehold are known to have been unoccupied during each of the previous 7 years.

Exceptions

The authorizing officer may grant an exception to this stipulation if the operator submits a plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated.

Modifications

The boundaries of the stipulated area may be modified if the authorizing officer determines that portions of the area include nests or nest site(s) known to have been unoccupied during each of the previous 7 years. The boundary of the stipulated area may also be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting these raptors.

Resource: Sharp-tailed Grouse and Sage Grouse Display Grounds (NSO)

Stipulation

No surface occupancy or use is allowed within 0.25 mile (line of sight) of a sharp-tailed grouse or sage grouse display ground.

Objective (Justification)

For justification refer to the Land and Resource Management Plan Grassland-wide Direction Fish, Wildlife and Rare Plants, number 14. The objective is to prevent abandonment of display grounds, reduced reproductive success, and adverse habitat loss.

Application Methodology

This stipulation applies to active sharp-tailed grouse or sage grouse display grounds. The 0.25-mile radius extends outward from the center of a display ground.

Waivers

This stipulation may be waived if the authorized officer determines conditions have changed and all display grounds within the leasehold or within the stipulated distance of the leasehold have not been used during the last 2 breeding seasons (sharp-tailed grouse) or 5 breeding seasons (sage grouse).

Exceptions

The authorizing officer may grant an exception to this stipulation if the operator submits a plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated.

Modifications

The boundaries of the stipulated area may be modified if the authorizing officer determines that portions of the area do not include any display grounds that have been used during the last 2 breeding seasons (sharp-tailed grouse) or 5 breeding seasons (sage grouse). The boundary of the stipulated area may also be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting sage grouse and the display grounds.

SCENERY MANAGEMENT

High Scenic Integrity Objective (SIO) Areas

Controlled Surface Use (CSU)

Resource: Scenery (CSU)

Stipulation

Surface occupancy and use is subject to operational constraints to maintain the landscape character intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and to such scale that they are not evident.

Objective (Justification)

For justification refer to the Land and Resource Management Plan Grassland-wide Direction, Scenery Management, number 1. The objective is to maintain the Scenic Integrity Objective (SIO) for areas identified as high.

Application Methodology

Use this stipulation on areas identified as high on the adopted SIO map. Operational constraints may include utilizing topographic/vegetative screening, matching color tones of facilities with surrounding topographic features, orienting the well pad/facilities, redesigning production facilities to such scale that they may not be evident, or placing facilities outside the high SIO area.

Waivers

No conditions for a waiver are anticipated, and approval of a waiver is unlikely.

Exceptions

No conditions for an exception are anticipated, and approval of an exception is unlikely.

Modifications

The boundaries of the stipulated area may be modified if the authorizing officer determines that portions of the area do not include high SIO areas.

Moderate Scenic Integrity Objective (SIO) Areas

Controlled Surface Use (CSU)

Resource: Scenery (CSU)

Stipulation

Surface occupancy and use is subject to operational constraints to maintain a landscape character that is no more than slightly altered. Noticeable deviations must remain visually subordinate to the landscape character being viewed.

Objective (Justification)

For justification refer to the Land and Resource Management Plan Grassland-wide Direction, Scenery Management, number 1. The objective is to maintain the scenic integrity objective (SIO) for areas identified as moderate.

Application Methodology

Use this stipulation on areas identified as moderate on the adopted SIO map. Operational constraints may include utilizing vegetative/vegetative screening, matching color tones of facilities with surrounding topographic features, orienting the well pad/facilities, redesigning production facilities to such scale that they are visually subordinate to the landscape, or placing facilities outside the moderate SIO area.

Waivers

No conditions for a waiver are anticipated, and approval of a waiver is unlikely.

Exceptions

No conditions for an exception are anticipated, and approval of an exception is unlikely.

Modifications

The boundaries of the stipulated area may be modified if the authorizing officer determines that portions of the area do not include moderate SIO areas.

MANAGEMENT AREA PRESCRIPTIONS

MA 2.1 Special Interest Area – Archeological Resources

No Surface Occupancy (NSO)

Resource: Hudson-Meng Bison Bonebed and Warbonnet/Yellowhand Archeological Sites (NSO)

Stipulation

No surface occupancy or use is allowed within the boundaries of Hudson-Meng Bison Bonebed and Warbonnet/Yellowhand SIAs

Objective (Justification)

For justification refer to the Land and Resource Management Plan Management Area Direction, MA 2.1, Hudson-Meng Bison Bonebed (2.1i) and Warbonnet/Yellowhand (2.1m) Special Interest Areas (SIAs). The objective is to protect the heritage resources .

Application Methodology

Use this stipulation in Management Area 2.1 SIAs, Hudson-Meng Bison Bonebed and Warbonnet/Yellowhand.

Waivers

No conditions for a waiver are anticipated, and approval of a waiver would be unlikely.

Exceptions

No conditions for an exception are anticipated, and approval of an exception would be unlikely.

Modifications

No conditions for a modification are anticipated, and approval of a modification would be unlikely.

MA 2.1 Special Interest Area – Paleontology and Geological Resources

Controlled Surface Use (CSU)

Resource: Edgemont Shark Locality, Marietta South, One-Mile Hill, and Wallace Ranch Localities (CSU)

Stipulation

Operations may be moved or modified to avoid disturbance to significant fossil resources.

Objective (Justification)

For justification refer to the Land and Resource Management Plan Management Area Direction, MA 2.1, Edgemont Shark Locality (2.1c), Marietta South (2.1d), One-Mile Hill (2.1d), and Wallace Ranch Localities (2.1f) Special Interest Areas (SIAs). The objective is to protect fossils and immediate environment of the site, including inherent scientific, natural historic, interpretive, educational, and recreational values for the area potentially impacted.

Application Methodology

Use this stipulation in Management Area 2.1 SIAs, Edgemont Shark Locality, Marietta South, One-Mile Hill, Wallace Ranch Localities, and Indian Creek.

Waivers

No conditions for a waiver are anticipated, and approval of a waiver would be unlikely.

Exceptions

No conditions for an exception are anticipated, and approval of an exception would be unlikely.

Modifications

No conditions for a modification are anticipated, and approval of a modification would be unlikely.

No Surface Occupancy (NSO)

Resource: Toadstool Park Paleontological and Geological Area (NSO)

Stipulation

No surface occupancy or use is allowed within the boundaries of Toadstool Park SIA

Objective (Justification)

For justification refer to the Land and Resource Management Plan Management Area Direction, MA 2.1, Toadstool Park (2.1l) Special Interest Area (SIA). The objective is to protect fossils, geologic and biostratigraphic type sections, and immediate environment of the site, including inherent scientific, natural historic, interpretive, educational, and recreational values for the area potentially impacted.

Application Methodology

Use this stipulation in Management Area 2.1 SIA, Toadstool Park.

Waivers

No conditions for a waiver are anticipated, and approval of a waiver would be unlikely.

Exceptions

No conditions for an exception are anticipated, and approval of a exception would be unlikely.

Modifications

No conditions for a modification are anticipated, and approval of a modification would be unlikely.

LEASE NOTICES TO BE APPLIED TO ALL LEASES

Lease Notices are attached to leases to transmit information at the time of lease issuance to assist the lessee in submitting acceptable plans of operation, or to assist in administration of leases. Lease Notices are attached to leases in the same manner as stipulations, however, there is an important distinction between Lease Notices and Stipulations. Lease Notices do not involve new restrictions or requirements. Any requirements contained in a Lease Notice must be fully supported in a law, regulations, standard lease terms, or onshore oil and gas orders. The lessee does not sign a Lease Notice. Guidance in the use of Lease Notices is found in Bureau of Land Management Manual 3101 and 43 CFR 3101.1-3. Lease Notices for Cultural and Paleontological Resources, and for Endangered or Threatened Species, which are to be attached to all leases on the Nebraska National Forest can be found in Region 2 supplement to FSM 2820.

APPENDIX E GUIDELINE FOR CONSTRUCTING USER-FRIENDLY GATES

The gate closure consists of a length of chain, one end of which permanently attaches to the inside of the stationary gate post in line with the closed gate and no more than 3 inches above the top wire using a minimum of 1 3/4 inches of barbed and cement-coated fence staple. A spike at least 1/4 inch in diameter is driven into the stationary gate post horizontally at the same height as the chain attachment and 180 degrees from it. The spike head is removed if it interferes with placing the chain link over the spike. No less than 1 1/2 inches nor more than 2 1/2 inches of spike is to protrude from the gate post. When the gate is in the closed and tight position, a minimum of 12 inches of excess chain extends from the spike. The recommended chain is zinc-coated, 3/16 inch, straight-link-proof, coil chain.

OR

Specifications for gates depend on the location and use of the gate. Gates on roads must be large enough to allow passage of vehicles and heavy equipment expected on the road and are generally slightly wider than the road. Gates for livestock range from 8 to 16 feet, generally whatever is convenient to construct. Gates at trail junctions and on trails must be wide enough to allow horses to pass safely.

Gates that will be used frequently should swing and be constructed of metal, poles, or boards. Gates used less frequently may be constructed with barbed wire and wooden or wire stays. Pole-wing gates provide easy access because the gate can be swung in either direction and from either end depending on the end the panel is pivoted on and the direction the panel is swung. Gate closure devices should be a wire loop that is twisted together or length of chain attached to the permanent gate post that can be wrapped around the non-stationary gate post. In using a chain as a closure device, a spike needs to be driven into the permanent gate post to attach the chain to once it has been wrapped around the non-stationary gate post. To facilitate the opening and closing of the gate, the use of a chain binder system will be used to remove the slack in the gate.

APPENDIX F GEOLOGY AND MINERALS

General

Contact and coordination will be made with mining and oil and gas interest groups, such as the American Mining Congress, Northwest Mining Association, Rocky Mountain Oil and Gas Association, Independent Petroleum Association of Mountain States, and International Association of Geophysical Contractors, to investigate procedures and processes that will facilitate the exploration and development of energy and non-energy mineral resources occurring beneath the lands administered by the Forest Service, with the least impacts to surface resources.

The heritage resource value of historic mineral properties will be considered prior to approval of new mineral operations.

Reclamation will be considered satisfactory when the disturbed area has been reclaimed in accordance with surface use or operating plan requirements.

Oil and Gas Operations

All trash will be dumped into a screened trash container and hauled way to an approved landfill.

Rig stacking and storage of equipment not being used is not allowed on Federal land.

The siting of oil and gas facilities and developments in sensitive areas identified in an environmental analysis will be discouraged and possibly prohibited, especially in areas of mass failure hazard, along river bottoms or areas subject to high flooding hazard.

Avoid administrative, research, and study areas in locating oil and gas operations.

Drilling pads will be designed to divert surface water off or away from the pad to minimize erosion and water accumulation.

Closed circulation systems will be encouraged. In cases where open reserve pits for drilling operations are justified, the pits will be designed and construction to minimize potential for leakage and structural failure (including pit solidification). Reserve pit residues will be contained or removed.

Production pits are prohibited. Produced water tanks will be located to minimize the potential for contamination due to a produced water spill.

Oil and gas production facilities will be designed to contain potential oil and produced water spills.

Surface and subsurface developments will be sited, constructed, painted, and maintained to achieve minimum visual impact. Surface developments will be earth tone colors.

Fencing may be required to exclude livestock from portions of the drilling/production/reclamation areas.

If a well is a producer, all site rehabilitations (dirt moving work, seeding and fencing) shall be completed within six months. As a general guideline under normal weather conditions, the timetable for rehabilitation will allow two months for the mud to settle in the reserve pit, two

months for backfill settling upon pit closures, and two months to complete the final contouring of the land and applying topsoil. Before any production facilities are constructed, the operator will prepare site reclamation plan and Forest Service for all disturbed areas not required for production facilities. In the event of winter a freeze-up, reclamation will be put on hold as determined by the Forest Service.

If a well is a not producing, the entire location and access road (if the access is not to be retained) will be rehabilitated (dirt moving work, seeding and fencing) within six months from the date the well is plugged. The rehabilitation timetable will be the same as above.

Energy and Mineral Related Special Uses

Do not charge additional fees on permits for off-lease activities necessary to mitigate Forest Service issues when such activities are directly related to administration of a drilling permit.

Facilities including roads for development and production of mineral rights outstanding under Federal surface will be authorized under a plan of operations when located on the mineral deed, but will require a special use permit when located off the mineral patent. Appropriate charges will be made unless the road is needed as part of the Grassland's planned transportation system.

Roads built on leases being developed are considered a lease right and authorized through the drilling permit. When located off the lease, new road construction will require a special use permit and appropriate fees will be charged unless the road is needed as part of the planned Grassland transportation system.

On reserved mineral rights, a reserved minerals permit authorizes the road and pad within the boundaries of the reservation and a special use permit authorizes the off lease portion of the road. Charges for the well pad and for the portion of the road within the boundaries of the private mineral estate will be as stated in the applicable deed and Federal rules and regulations.

Noncommercial disposal of produced water from a private mineral estate under either Federal or private surface may utilize Federal surface outside the mineral patent, if it minimized overall surface or subsurface impacts on Federal land and demonstrates sound land management. No disposal fee will be charged for noncommercial produced water disposal in these cases.

Pipelines and related facilities for disposal of produced water from mineral rights reserved by Federal surface will be authorized under special use permit and the fee collection will be according to the provision in the mineral deed.

Produced Water Spills

Industry will be encouraged to prevent future produced water spills through facility design, maintenance, self-regulation and self-policing, and through the education of employees and subcontractors on the nature and severity of the problem. The Forest Service will encourage and pursue research to help mitigate this problem.

All instances of damage to Forest Service System lands from produced water generated through gas and oil exploration and production will be investigated in coordination with other appropriate Federal and State agencies.

The short-term goal of treatment will consist of establishing a grass cover within three growing season. The long-term goal will be the restoration of the area to the condition that existed prior to damage. Treatment of the contaminated soil in place is the generally preferred method.

Resource Damage from Toxic Drilling Fluids

The Grassland will coordinate investigative and corrective actions with appropriate Federal and State agencies, industry and with private consultants as needed for all cases of suspected resource damage involving the release of toxic materials from existing or abandoned drilling sites.

The Grassland will attempt to identify the cause of toxic release damage, will require correction of existing problems where feasible and will work with industry to develop methods to reduce the likelihood of future occurrence of toxic materials damage.

Mineral Rights Reserved or Outstanding

Where National Forest System surface ownership overlies mineral rights outstanding or where the mineral estate is otherwise in non-federal ownership, Forest Service land management practices and guidelines for oil and gas exploration and development will be applied to the extent allowed by deeded rights, through the application of law, and by negotiation.

In order to better facilitate mineral development activities and to minimize resource damage to NFS lands, the Grassland will, through negotiation, develop a memorandum of understanding with large holders of mineral rights outstanding.

Pipelines and related facilities for disposal of produced water from outstanding private minerals under Federal surface will be authorized by an operating plan within the boundaries of the mineral patent. No fee will be charged.

Coal development management practices and guidelines will be applied within the intent of the Surface Mining Control and Reclamation Act of 1977 and applicable State government regulations.

Locatable

Development of locatable minerals will occur according to the provisions of 36 CFR 228 Subpart A. Requirements for environmental protection will be made part of plans of operation or other approval documents.

Mineral Materials

Grassland aggregate resources may be made available for free use on the following allocation priority: Forest Service, other federal agencies, State and local agencies (36 CFR 228 Subpart C).

Mineral materials on lands managed under Bankhead-Jones may be disposed of only to public authorities and agencies (36 CFR 228 Subpart C).

Mineral material removal sites will be managed encourage safe operations, to achieve minimal environmental impacts, and to meet all the stipulations of the plans and permits/contracts. To meet this mineral material removal sites will:

- Be located so as to create the least visual impact.
- Follow the following safety provisions:
    - No vertical walls over ten (10) feet in height will be left at the end of each day's operation.
    - During periods of nonuse, including weekends, pit walls of active sites will be reduced to minimum slope of 1:1.
    - Fencing may be substituted for the above requirement.
    - Warning signs around the margins of the pit will be required when deemed necessary by the responsible Forest Officer.
- Be contoured and sloped during the period of nonuse so as to prevent soil erosion and siltation of nearby water sources.
- Be rehabilitated within 6 months of the termination of use.

Annual production reports will be required for all permits issued for a term exceeding 1 year.

APPENDIX G GLOSSARY

Abiotic - Nonliving, not associated with life. Although the term does refer to nonliving, it may still be associated with life.

Access - The opportunity to approach, enter, and make use of public or private land.

Acre-Foot - The amount of water covering an area of one acre to a depth of one foot (43,560 cubic feet or 325,851 gallons).

Active Nest – A nest that is still structurally sound and could reasonably be expected to be occupied in the future; the period of time that a nest can be unoccupied but still classified as active varies and is dependent on the characteristics of the species most likely to use the nest in the future.

Active Prairie Dog Colony - A prairie dog colony that supports a prairie dog density that has not been noticeably reduced by poisoning, plague, or shooting and that is essentially at its carrying capacity.

Activity - A measure, course of action, or treatment that is undertaken to directly or indirectly produce, enhance, or maintain forest and rangeland outputs or achieve administrative or environmental quality objectives.

Activity Area - An area of land impacted by a management activity or activities. An activity area can range from a few acres to an entire watershed depending on the type of monitoring being conducted.

Activity Fuels - Debris generated by an activity that increases fire potential, such as firewood gathering, pre-commercial thinning, timber harvesting, and road construction.

Adaptation - A genetically determined characteristic that enhances an organism's chances for survival and reproduction.

Adaptive Management - A type of natural resource management in which decisions are made as part of an ongoing process. Adaptive management involves testing, monitoring, evaluating, and incorporating new knowledge into management approaches based on scientific findings and the needs of society. Results are used to modify management policy.

Adjustment - Change in animal numbers, seasons of use, kinds or classes of animals, or management practices as warranted by specific conditions.

Administrative Facilities - Those facilities, such as a ranger station or work center, that are used by the Forest Service in management of a national forest or national grassland.

Administrative Site - Work center or other area reserved for administrative purposes.

Administrative Unit - All the National Forest System lands, including national grasslands, for which one forest supervisor is responsible.

Administrative Use - Use authorized by Forest Service officials to complete management functions and activities.

Adverse Determinations - Please refer to the definition as found in the Biological Assessment and Evaluation appendix.

Adverse Effects (Heritage Resources) - Any effect on a heritage resource that would be considered harmful to those characteristics that qualify the property for inclusion in the National Register of Historic Places.

Aesthetics - Pertaining to the quality of human perception of natural beauty (including sight, sound, smell, touch, taste, and movement).

Affected Environment - The biological and physical environment that will or may be changed by actions proposed and the relationship of people to that environment.

Afforestation - To establish forest cover on a nonforested land type, such as a grassland.

Agricultural Commodity - A product of agriculture.

Air Pollution - Any substance or energy (heat, light, noise, etc.) that alters the state of the air from what would naturally occur.

Air-Dry Weight - The weight of a substance after it has been allowed to dry to equilibrium with the atmosphere.

Airshed - A geographical area which, because of topography, meteorology, and climate, routinely shares the same air mass.

Alienated Land - Land of one ownership enclosed within boundaries of another ownership. Often refers to privately owned land within the boundaries of public land.

Allocation - The assignment of a land area to a particular use or uses to achieve management goals and objectives.

Allotment - A designated area of land available for livestock grazing upon which a specified number and kind of livestock may be grazed under a range allotment management plan. It is the basic land unit used to facilitate management of the range resource on National Forest System lands, including national grasslands.

Allotment Management Plan (AMP) - The document containing the action program needed to manage the range resource for livestock utilization, and possibly wildlife utilization, while considering the soil, watershed, wildlife, recreation, timber, and other resources in a range allotment.

Allowable Sale Quantity (ASQ) - The quantity of timber that may be sold from the area of suitable land covered by the Forest Plan for a time period specified by the plan. This quantity is usually expressed on an annual basis as the average annual allowable sale quantity.

Allowable Use – 1) The degree of utilization considered desirable and attainable on various parts of a ranch or allotment considering the present nature and condition of the resource, management objectives, and levels of management. 2) The amount of forage planned to be used to accelerate range improvement.

Alluvium - Sediments deposited by streams, rivers, and moving waters.

All-weather Road - A road capable of being utilized during all weather conditions with only minor or short-term restrictions.

Alternative - A combination of management prescriptions applied in specific amounts and locations to achieve a desired management emphasis as expressed in goals and objectives. One of several policies, plans, or projects proposed for decision-making. An alternative need not substitute for another in all respects.

Amenity Values - Resource use for which market values (or proxy values) are not or cannot be established.

American Indian - A member of any tribe, band, nation, or other organized group or community of Indians recognized by the United States.

Analysis Area - One or more capability areas combined for the purpose of analysis in formulating alternatives and establishing various impacts and effects.

Analysis of the Management Situation (AMS) - A determination of the ability of a planning area to supply goods and services in response to society's demands for those goods and services.

Animal Unit Month (AUM) - The amount of feed or forage required by an animal-unit for one month.

Animal-Month - A month's tenure upon the rangeland by one animal. Must specify kind and class of animal. Note: This term is not synonymous with animal unit month (AUM).

Animal-Unit - Considered to be a mature 1,000-pound cow or the equivalent, based on an average daily forage consumption of 26 pounds dry matter per day.

Annual Plant - A plant that completes its life cycle and dies in one year or less.

Application (Oil and Gas) - A written request, petition, or offer to lease lands for the purpose of oil and gas exploration and/or the right of extraction.

Application for Permit to Drill (APD) - An application to drill a well, submitted by a lessee or operator to the BLM. The APD consists of a Drilling Plan, reviewed by the BLM and a Surface Use Plan of Operation (SUPO), reviewed by the Forest Service. The Drilling Plan discusses down hole drilling specifications and procedures. The Surface Use Plan of Operation examines surface uses, including access roads, well-site layout, cut/fill diagrams, reclamation procedures, production facility locations, etc. The approved APD is a contract between the operator and the federal government and cannot be changed or modified unless authorized by the BLM and Forest Service.

Aquatic Ecosystem - An ecosystem (biological and physical components and their interactions) in which water is the principal medium. Examples include wetlands, streams, reservoirs, and areas with plants or animals characteristic of either permanently or seasonally inundated soils.

Aquifer - A geologic formation capable of transmitting water through its pores at a rate sufficient for water-supply purposes. The term water-bearing is sometimes used synonymously with aquifer when a stratum furnishes water for a specific use. Aquifers are usually saturated sands, gravel, fractures, caverns, or vesicular rock (rock with cavities).

Archeological Resource - Any physical remains of past human life or activities.

Area of Potential Effects - The geographic area or areas within which an undertaking may cause changes in the character or use of historic properties, if any such properties exist.

Areas of Critical Environmental Concern - Areas within the public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values; wildlife resources; or other natural systems or processes or to protect life from natural hazards.

Arterial Road - See Road Functional Classification.

Aspect – 1) The visual first impression of vegetation or a landscape at a particular time or as seen from a specific point. 2) The predominant direction of slope of the land. 3) The seasonal changes in the appearance of vegetation.

Authorized Forest Officer - The Forest Service employee delegated the authority to perform specific duties: generally a regional forester, forest supervisor, district ranger, or minerals staff officer.

Availability (Oil and Gas) **-** Availability of National Forest System lands, including national grasslands, for oil and gas leasing. Availability refers to lands that have not been formally prohibited from oil and gas leasing activities.

Available Forage - That portion of the forage production that is accessible for use by a specified kind or class of grazing animal.

Available Lands - Those portions of the national forest or national grassland not administratively excluded from timber harvest or livestock grazing.

Available Lands (Oil and Gas) - Any lands subject to oil and gas leasing under the Minerals Leasing Act.

Background - See Distance Zones.

Badlands - A land type that consists mainly of exposed siltstone or silty and clay shale. Vegetation is limited to nonexistent.

Bank Stability Criteria - Factors used in determining bank stability. Such factors may include vegetation density and vigor, evidence of past or current gullying or slumping, presence of objects that may deflect water into the banks, presence and size of rocks, and distance to break in slope.

Barriers (Soils and Watershed) - Temporary structures used to control erosion, such as silt fences, straw bales, rock check dams, and felled logs.

Basal Area - The cross-sectional area of the stem or stems of a plant or of all plants in a stand. Herbaceous and small woody plants are measured at or near the ground level. Larger woody plants are measured at breast or other designated height. The area is expressed in square feet per acre.

Base Property - Those lands in a ranching enterprise that are owned and required to hold a term grazing permit.

Bedload (Watershed and Fisheries) - Sand, silt and gravel, or soil and rock debris rolled along the bottom of a stream by the moving water. The particles of this material have a density or grain size that prevents movement far above or for a long distance out of contact with the stream bed under natural flow conditions.

Benchmark - Reference points that define the bounds within which feasible management alternatives can be developed. Benchmarks may be defined by resource output or economic measures.

Benefit-Cost Ratio - Measure of economic efficiency, computed by dividing the total discounted primary benefits by the total discounted economic costs.

Bentonite - A natural clay deposit that has high swelling capabilities when saturated. Used to seal earthen stock ponds.

Best Management Practices (BMPs) - Land management methods, measures or practices intended to minimize or reduce water pollution as well as practices that result in healthy ecosystems. Usually, BMPs are applied as a system of practices rather than a single practice. BMPs are selected based on site-specific conditions that reflect natural background conditions and political, social, economic, and technical feasibility.

Biennial Plant - A plant that lives for two years, usually flowering and fruiting only in the second year and then dying.

Big Game - Certain wildlife that may be hunted for sport under state laws and regulations, including elk, pronghorn antelope, mule and white-tail deer, turkey, and bighorn sheep.

Big Game Security - Protection that allows an animal to remain in a defined area despite increases in stress and disturbance associated with hunting seasons or other human activities.

Biocide - A chemical toxin that is lethal to living organisms.

Biogeography - The study of the geographic distribution of plants and animals.

Biological Control Agents - Natural organisms, such as animals, insects, diseases, parasites and predators, that reduce pest populations of insects, diseases, and noxious weeds.

Biological Control Methods - Use of natural organisms, such as insects, diseases, parasites, and predators to reduce pest populations of insects or weeds or to control diseases. Methods may include importation and release, conservation of native natural-enemy species, and augmentation (supplementation through rearing and release or genetic improvement) of biological control agents.

Biological Diversity - The full variety of life in an area, including the ecosystems, plant and animal communities, species and genes, and the processes through which individual organisms interact with one another and their environments. Emphasis is on the diversity of native or endemic species.

Biological Resource - Plants and animals of direct or indirect value to human beings.

Biomass - The total amount of living plants and animals above and below ground in an area at a given time.

Biome - A major biotic unit consisting of plant and animal communities having similarities in form and environmental conditions, but not including the abiotic portion of the environment.

Bioregion - A territory defined by a combination of biological, social, and geographic criteria rather than geopolitical considerations. Generally, a system of related interconnected ecosystems.

Biosphere - That portion of earth and atmosphere in which life can exist.

Biota - All the species of plants and animals occurring within an area or region.

Bird Ladders - A floating platform placed in water tanks and troughs to provide a means for birds and small animals to drink and escape from the water should they fall in.

Blowout - An excavation in areas of loose soil, usually sand, produced by wind.

Board Foot - A unit of timber measurement equaling the amount of wood contained in a board 1 inch thick, 12 inches long, and 12 inches wide.

Botanical Area - A unit of land that contains plant specimens, plant groups, or plant communities that are significant because of their form, color, occurrence, habitat, location, life history, arrangement, ecology, rarity, or other features.

Broadcast Burning - A fire ignited under specific conditions (prescriptions) and within established boundaries to achieve some land management objective.

Broadcast Seeding - Process of scattering seed on the surface of the soil prior to natural or artificial means of covering the seed with soil.

Broadcast Treatments (Pest Management) - The uniform application of pesticide over an entire area.

Browse - Twigs, leaves, and young shoots of trees and shrubs upon which animals feed: in particular, those shrubs that are utilized by some livestock and big game animals for food.

BTU - British Thermal Unit. The quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit at or near its maximum density.

Buck-Fence - A fence constructed of wooden poles fastened horizontally to wooden cross-members. Such fences withstand heavy snows in mountainous regions and eliminate the need for digging holes for posts in rocky terrain. Also called buck-pole fence.

Buffalo Wallow - A small natural depression of prairie occasionally containing standing water and having vegetation different from that of the surrounding area.

Buffer Zone - An area on the edge of protected areas with restrictive land-use controls allowing only activities compatible with protection of the core area, such as research, environmental education, recreation, and tourism.

Bureau of Land Management (BLM) - An agency in the U.S. Department of the Interior.

Butte - An isolated hill with relatively steep sides. A mesa.

Cabling - The use of a large cable pulled between two large crawler tractors to pull down or uproot brush. Also called chaining.

Cactus - A spiny, succulent plant of the Cactaceae family.

Candidate Species – Species for which the U.S. Fish and Wildlife Service has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposed rule to list the species for protection un the Endangered Species Act.

Capable Rangeland - The potential of an area of land to produce resources, supply goods and services and allow resource uses under an assumed set of management practices and at given levels of management intensity. Capability depends on 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.

Capital Investment - Investments in facilities, such as roads and structures, with specially appropriated funds.

Captive Breeding - The propagation of animals outside their natural habitat, in which humans choose the individuals which will make up the population, as well as their mates within that population.

Carrying Capacity - The maximum possible stocking rate that is consistent with maintaining or improving vegetation or related resources. It may vary from year to year in the same area due to fluctuating forage production. Also called grazing capacity.

Carrying Capacity (Wildlife and Livestock Grazing) - The maximum number of animals that can be supported in a given environment without deteriorating that environment.

Casual Use - Activities occurring by chance or taking place at irregular intervals without ceremony or formality.

Cattleguard - A device or structure, at points where roads or railroads cross a fence line, that is so designed that vehicular travel is uninterrupted but crossing by all kinds of livestock is restricted.

Cavity - A hollow in a tree that is used by birds or mammals for roosting and reproduction.

CFR - Code of Federal Regulations.

Channel (Watershed) - A passage, either naturally or artificially created, that periodically or continuously contains moving water or that forms a connecting link between two bodies of water. River, creek, run, branch, and tributary are some of the terms used to describe natural channels. Natural channels may be single or braided. Canal and floodway are some of the terms used to describe artificial channels.

Channel Capacity - The ability of the channel flow to carry sediment downstream and through the system so that no net aggradation (buildup) of sediment in the channel results.

Channel Classification Criteria - Criteria used to determine stream type. For example, the Rosgen Classification System (1985) classifies streams based on channel slope (Type A through D) and dominant particle size of channel materials (sizes 1 through 6). Other factors considered include channel entrenchment, valley confinement, sinuosity, width/depth ratio, and whether channels are single- or multiple-thread. Using this information, it is possible to assess current channel condition.

Channel Condition - Refers to the stability of the channel determined through field observation of several factors. Channel condition is not set in time or place. It changes in response to climatic events as well as land management activities. To be meaningful, the condition must be considered over time.

Chemical Agent - A manufactured chemical compound.

Chiseling - Breaking or loosening the soil, without inversion, with a chisel cultivator or chisel plow. A practice used for grassland or pasture renovation. Also called ripping.

Class I Area (Air Quality) - Under the 1977 Clean Air Act amendments, all international parks, National Parks greater than 6,000 acres, and national Wilderness areas greater than 5,000 acres that existed on August 7, 1977. This class provides the most protection to pristine lands; it severely limits the amount of air pollution that can be added to these areas.

Class II Area (Air Quality) - All Wilderness areas designated after August 7, 1977 and all other National Forest System lands. This class provides a moderate degree of protection to lands by allowing a moderate increase in air pollution in these areas.

Class of Animal - Description of age and/or sex-group for a particular kind of animal. Example: cow, calf, yearling, ewe, doe, fawn, etc.

Classified Lands - Lands classified by laws or regulations. For example, Wilderness areas and Wild and Scenic Rivers.

Classified Roads - A road that is constructed or maintained for long-term highway vehicle use. Classified roads may be public, private, or forest development.

Climax - 1) The final or stable biotic community in a successional series that is self-perpetuating and in dynamic equilibrium with the physical habitat. 2) The assumed end point in succession.

Closed Circulation System - A system of equipment for drilling oil and gas wells that uses tanks instead of surface pits to contain all drilling fluids and cuttings. The fluid and cuttings are disposed of off-site in a manner consistent with state law.

Closed Range - Any range on which livestock grazing or other specified use is prohibited. Also called livestock exclusion.

Cold-water Fishery - Steam and lake waters that support predominately cold-water species of game or food fishes, which have maximum, sustained water-temperature tolerances of about 70 degrees Fahrenheit in the summer.

Collectors - See Road Functional Classification.

Commercial Timber Sales - The selling of timber from National Forest System lands, including national grasslands, for the manufacture of commercial products, such as lumber, plywood, etc.

Common Variety Minerals - Deposits that do not possess a distinct, special economic value, although they may have value for use in trade or manufacture. These minerals include sand, stone, gravel, pumicite, cinders and pumice.

Community (Biological) - Any assembly of organisms living together.

Community (Social) - The people who reside in one locality and are subject to the same laws or who have common interests, etc.

Community Allotment - An allotment upon which several permittees manage livestock in common.

Community Lifestyles - The ways in which residents conduct their everyday routines and how those routines are associated with the national forests or national grasslands.

Community Stability - The capacity of community to absorb and cope with change without major hardship to institutions or groups within the community.

Complementary Pasture - Short-term forage crop (not necessarily annual) planted for use by domestic stock to enhance the management and productivity of the ranch.

Concern Levels - A measure of the degree of public importance placed on landscapes viewed from travel ways and use areas. Concern levels are divided into categories 1, 2, and 3, with concern level 1 being the highest.

Condition of Approval (COA) - Conditions or provisions (requirements) under which an Application for a Permit to Drill or a Sundry Notice is approved for oil and gas leasing.

Confine (Fire Management) - To limit fire spread within a predetermined area principally by using natural or preconstructed barriers or environmental surveillance under appropriate conditions (FSM 5105).

Congressionally Designated Areas - Lands within the boundaries of a component of the National Wilderness Preservation System, the National Wild and Scenic River System, the National Trails System, the National Monuments and the Recreation and Scenic Areas within the National Forest System, including national grasslands, and similar areas designated by Congressional legislation.

Connectivity - The arrangement of habitats that allows organisms and ecological processes to move across the landscape. Patches of similar habitats are close together or linked by corridors of appropriate vegetation. The opposite of fragmentation.

Consent for Oil and Gas Leasing - A consent by the Forest Service for oil and gas leasing on a specified parcel of National Forest System lands, including national grasslands. It grants the right to explore, develop, extract and dispose of specific minerals in lands covered by the lease, subject to various terms and conditions.

Conservation - The aggregate of practices and customs to perpetuate sustained yield of renewable resources and prevent waste of nonrenewable resources.

Conservation Biology - A synthetic discipline, comprising both pure and applied science, concerned with preserving the existing variety of organisms and natural habitats and the global reservoir of genetic diversity they represent.

Conservation District - A public organization created under state enabling laws as a special-purpose district to develop and carry out a program of soil, water, and related resource conservation, use and development within its boundary. Usually a subdivision of state government with a local governing body and always with limited authorities. Often called a soil conservation district or a soil and water conservation district.

Conservation Practices - Required land use practices on the national grasslands that are imposed upon the persons or organizations holding grazing permits (including grazing agreements) in order to protect, improve, develop, and administer the land and thus assist in furthering the program of land conservation and good land utilization.

Consultation – 1) An active, affirmative process that (a) identifies issues and seeks input from appropriate American Indian governments, community groups, and individuals and (b) considers their interests as a necessary and integral part of the BLM and Forest Service decision-making process. 2) The legal obligation requiring the federal government, through consultation, to consider the interests of American Indian tribes and account for those interests in the decision-making process. This legal obligation is based in laws and numerous Executive Orders and statutes. 3) A process that involves discussions between a federal agency and the U.S. Fish and Wildlife Service or the National Marine Fisheries Service under Section 7(a)(2) of the Endangered Species Act of 1973, as amended, regarding potential impacts on a species or critical habitat listed under Section 4 of the act.

Consumptive Uses - Uses of a resource that reduce the supply. Examples include irrigation, domestic and industrial water use, grazing, and timber harvest.

Contact Herbicide - An herbicide that kills primarily by contact with plant tissue rather than as a result of translocation.

Contain (Fire Management) - To surround a fire, and any spots of fire, with a control line, as needed, which can reasonably be expected to check the fire's spread under prevailing conditions.

Continuous Fuel Concentrations (Fire Management) - An uninterrupted distribution of fuel particles (surface or aerial) in a fuel bed, which allows fire to sustain combustion and actively continue to spread.

Continuous Grazing - The grazing of a specific unit by livestock throughout a year.

Controlled Surface Use (CSU) - Allowed use and occupancy for oil and gas leasing, unless restricted by another stipulation, with identified resource values requiring special operational constraints that may modify the lease rights. CSU is used as an operating guideline, not as a substitute for No Surface Occupancy or a timing stipulation.

Conversion (Vegetation) - To change the dominant vegetative species or growth form, such as grass/forb, through vegetative management.

Cool-Season Plant - A plant that generally makes the major portion of its growth during the late fall, winter, and early spring. Cool-season species generally exhibit the C3 photosynthetic pathway.

Cooperating Agency - Any federal agency other than the lead agency that has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposal (or a reasonable alternative) for legislation or other major federal action significantly affecting the quality of the human environment.

Coordinated Resource Management Planning - The process whereby various user groups are involved in discussion of alternate resource uses and collectively diagnose management problems, establish goals and objectives, and evaluate multiple use resource management.

Corduroy - A method of sub grade reinforcement often used on trails and for some roads. Logs are placed perpendicular to the travel way to support a surfacing material.

Corridor (Utility or Rights-of-Way) - A linear strip of land defined for the present or future location of transportation or utility rights-of-way within its boundaries.

Cost - The negative or adverse effects or expenditures resulting from an action. Costs may be monetary, social, physical, or environmental in nature.

Cost Efficiency - The usefulness of specified inputs (costs) to produce specified outputs (benefits). In measuring cost efficiency, some outputs, including environmental, economic, or social impacts, are not assigned monetary values but are achieved at specific levels in the least-cost manner. Cost efficiency is usually measured using present net value, although use of benefit-cost ratios and rates of return may be appropriate.

Council on Environmental Quality (CEQ) - An advisory council to the President established by the National Environmental Policy Act of 1969.

Cover Type - The vegetative species that dominates a site. Cover types are named for one plant species or non-vegetative condition presently (not potentially) dominant, using canopy or foliage cover as the measure of dominance. In several cases, sites with more than one dominant species have been lumped together into one cover type. Co-dominance is not necessarily implied.

Cover/Forage Ratio - The ratio of tree cover (usually conifer types) to foraging areas, such as natural openings.

Created Opening - A treated forest area 10 basal area or less, which is designated to produce forage.

Cretaceous - The final period of the Mesozoic era (after the Jurassic and before the Tertiary period of the Cenozoic era), thought to have covered the span of time between 135 and 65 million years ago; also, the corresponding system of rocks. It is named after the Latin word for chalk (creta) because of the English chalk beds of this age.

Critical Habitat (Threatened, Endangered, and Proposed Species) - Habitat of federally listed threatened or endangered species where those physical and biological features essential to conservation of the species are found and which may require special management considerations or protection. This habitat may currently be occupied or may be determined by the Secretary of the interior to be essential for areas outside the species' current range.

Cropland - Land primarily used for the production of cultivated crops.

Cross Fence - A fence that divides an allotment or pasture into smaller units.

Cubic Foot - A unit of measure usually referring to wood volume (1 foot wide by 1 foot long by 1 foot thick).

Cultural Resources - See Heritage Resources.

Culture - That complex whole that includes knowledge, belief, art, morals, customs, and any other capabilities and habitats peculiar to a society.

Cumulative Impact - The impact on the environment that results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions regardless of the source (federal or nonfederal agencies, individuals). Cumulative effects can result from individually minor but collectively significant actions taking place over time.

Cured Forage - Forage, either standing or harvested, that has been naturally or artificially dried and preserved for future use.

Dead Fuels (Fuels Management) - Fuels, with no living tissue, in which moisture content is governed almost entirely by atmospheric moisture (relative humidity and precipitation), dry-bulb temperature, and solar radiation.

Decadence - A process, condition, or period of deterioration or decline. Deterioration of vigor, especially as related to a vegetative community.

Deciduous (Plant) - Plant parts, particularly leaves, that are shed at regular intervals or at a given stage of development; that is, a deciduous plant regularly loses or sheds its leaves.

Decision Documents - Documents that provide the criteria and information used in the formulation and evaluation of alternatives and the preferred alternative.

Decreaser (Plant) - Plant species of the original or climax vegetation that will decrease in relative amount with continued disturbance (heavy defoliation, fire, drought) to the norm. Some agencies use this only in relation to response to overgrazing.

Deferment - Delay of livestock grazing on an area for an adequate time to allow plant reproduction, establishment of new plants, or restoration of vigor of existing plants.

Deferred Rotation - To discontinue grazing on various parts of a range in succeeding years, allowing each part of the range to rest successively during the growing season to permit seed production, establishment of seedlings, or restoration of plant vigor. Each rested part of the range is grazed during the year. At least two, but usually three or more, separate grazing units are required.

Defoliation - The removal of plant leaves by grazing or browsing, cutting, chemical defoliant, or natural phenomena, such as hail, fire, or frost.

Degraded Water Body - Lakes and streams that show bank disturbance, sediment loads, channel modification, flow disruption, chemical contamination, and biological stress directly or indirectly caused by human activities.

Demand - The amount of output that users are willing to take at a specified price, time period, and conditions of sale.

Demand Analysis - A study of the factors affecting the schedule of demand for a good or service, including the price-quantity relationship, if applicable.

Deny Consent (Oil and Gas) - Not to consent as in denial of a proposed oil and gas lease.

Dependent Communities - Communities whose social, economic, or political life would become discernibly different in important respects if market or no market outputs from the national forest or national grasslands were significantly disrupted.

Desertification - The process by which an area or region becomes more arid through loss of soil and vegetative cover. The process is often accelerated by excessive continuous overstocking and drought.

Design Capacity - The maximum theoretical amount of use a developed recreational site was built to accommodate. Usually expressed in Persons At One Time (PAOTs).

Design Standard (Recreation) - Approved design and construction specifications for recreational facilities, which includes specified materials, colors, and dimensions.

Designated Travelway - A road or trail that has been identified by a Forest Service decision as open to all forms of travel.

Designated Wilderness Areas - See Wilderness.

Desired Future Condition - A portrayal of the land or resource conditions that are expected to result if goals and objectives are fully achieved.

Desired Plant Community - A plant community that produces the kind, proportion, and amount of vegetation necessary for meeting or exceeding the land use plan/activity plan objectives established for an ecological site. The desired plant community must be consistent with the site's capability to produce the desired vegetation through management, land treatment, or a combination of the two.

Desired Plant Species - Species that contribute positively to the management objectives.

Deteriorated Range - Range where vegetation and soils have significantly departed from the natural potential. Corrective management measures, such as seeding, would change the designation from deteriorated range to some other term.

Detrimentally Impacted Soils - An increase in bulk density from the average undisturbed bulk density values and the removal of soil from a continuous area of 100 square feet or more.

Detritus - Fragmented, particulate organic matter derived from the decomposition of debris.

Developed Recreation - This type of recreation is dependent on facilities provided to enhance recreational opportunities in concentrated use areas. Examples include campgrounds and picnic areas. Facilities in these areas might include roads, parking lots, picnic tables, toilets, drinking water and buildings.

Developed Recreation Sites - Relatively small, distinctly defined areas where facilities are provided for concentrated public use, such as campgrounds, picnic areas, and swimming beaches.

Development and Full Field Development (Oil and Gas) - 1) Development Well: A well drilled in proven territory in a field to complete a pattern of production. 2) Full Field Development: The drilling of the necessary development wells and associated field facilities, including roads, production facilities, pipelines, injection wells and power lines.

Development Roads - See Forest Development Roads.

Diameter at Breast Height - The diameter of a standing tree at a point four feet, six inches from ground level.

Direct Effects - Environmental effects caused by an action and that occur at the same time and place.

Directional Drilling (Oil and Gas) - Drilling boreholes with the directional course of the hole planned before drilling. Such holes are usually drilled with rotary equipment at an angle to the vertical and are useful in avoiding obstacles or in reaching side areas or the mineral estate beneath a restricted surface.

Discovery Well (Oil and Gas) - An exploratory well that encounters a new and previously untapped mineral deposit. A discovery well may open up a new field, or it may locate a new and previously unknown producing horizon in an old field.

Dispersal - Leaving an area of birth, origin, or activity for another area.

Dispersed Recreation - This type of recreational use requires few, if any, improvements and may occur over a wide area. This type of recreation involves activities related to roads, trails and undeveloped waterways, and beaches. The activities do not necessarily take place on or adjacent to a road, trail, or waterway, only in conjunction with them. Activities are often day-use oriented and include hunting, fishing, boating, off-road vehicle use, hiking, and others.

Distance Zones - Distance zones are mapped for travel ways and use areas.

Immediate foreground: 0 to 300 feet. At an immediate foreground distance, people can distinguish individual leaves, flowers, twigs, and small animals (chipmunks and songbirds) and can notice movement of leaves and grasses in light winds.

Foreground: 0 to 1/2 mile. At a foreground distance, people can distinguish small boughs of leaf clusters, individual shrubs, clumps of wildflowers, medium-sized animals (squirrels and rabbits), and medium-to-large birds (hawks, geese, and ducks).

Middle ground: 1/2 to 4 miles. Middle ground is usually the predominant distance zone at which national grassland and forest landscapes are seen. At this distance, people can distinguish individual tree forms, large boulders, flower fields, small openings in the forest, and small rock outcrops. Form, texture, and color remain dominant, and pattern is important.

Background: 4 miles to horizon. At a background distance, people can distinguish groves or stands of trees, large openings in the forest, and large rock outcrops. Texture has disappeared and color has flattened, but large patterns of vegetation or rock are still distinguishable and landform ridgelines and horizon lines are the dominant visual characteristic.

District Ranger - The official responsible for administering the National Forest System lands, including national grasslands, on a ranger district.

Disturbance - A discrete event, either natural or human induced, that causes a change in the existing condition of an ecological system.

Diverse Landscape - Refers to the relative abundance and distribution of plant and animal communities and species within an area.

Diversity - Diversity refers to the distribution and abundance of different plant and animal communities and species within the area covered by land and resource management plans. This term is derived from the National Forest Management Act (NFMA). This term is not synonymous with biological diversity.

Domestic - Refers to those animals and plants that are under the control of humans throughout their life cycle. Animals whose breeding is controlled by humans.

Down and Dead Woody Material - Woody material, from any source, that is dead and lying atop the ground.

Draft Environmental Impact Statement (DEIS) - The statement of environmental effects required for major federal actions under Section 102 of the National Environmental Policy Act and released to the public and other agencies for comment and review.

Drainage (Oil and Gas) – 1) Drainage occurs when oil and gas migrates in the subsurface from areas of high pressure to areas of lower pressure, such as is found near a producing well. 2) Production of migrated oil and gas without compensation to the owner and/or lessee from whose estate the hydrocarbons moved is called drainage.

Drift Fence - An open-ended fence used to retard or alter the natural movement of livestock. Generally used in connection with natural barriers.

Drought – Any year or sequence of years when annual precipitation amounts are less than 75% below average.

Dry Meadow - A meadow dominated by grasses and characterized by soils that become moderately dry by mid-summer.

Easement - A right held by one person to make use of another's land for a limited purpose, such as a special-use authorization for a right-of-way that conveys a limited interest in National Forest System land and is compensable according to its terms.

Ecological Diversity - The variety of ecosystems occurring within a given landscape.

Ecology - The study of the interrelationships of organisms with their environment.

Economic Efficiency - The usefulness of inputs (costs) to produce outputs (benefits) and effects when all costs and benefits that can be identified and valued are included in the computations. Economic efficiency is usually measured using present net value, though use of benefit-cost ratios and rates-of-return may sometimes be appropriate.

Ecoregion - A continuous geographic area over which the macroclimate is sufficiently uniform to permit development of similar ecosystems on sites with similar properties. Ecoregions contain multiple landscapes with different spatial patterns of ecosystems.

Ecosystem – 1) A community of living plants and animals interacting with each other and with their physical environment. A geographic area where it is meaningful to address the interrelationships with human social systems, sources of energy, and the ecological processes that shape change over time. 2) A community of organisms and its environment functioning as an ecological unit in nature.

Ecosystem Health - A condition where the parts and functions of an ecosystem are sustained over time and where the system's capacity for self-repair is maintained, such that goals for uses, values, and services of the ecosystem are met.

Ecosystem Management - Scientifically based land and resource management that integrates ecological capabilities with social values and economic relationships to produce, restore, or sustain ecosystem integrity and desired conditions, uses, products, values, and services over the long term.

Ecotone - A transition or junction zone between two or more diverse communities.

Ecotype - A locally adapted population of a species that has a distinctive limit of tolerance to environmental factors. A genetically uniform population of a species resulting from natural selection by the special conditions of a particular habitat.

Edaphic - The influence of soils on living organisms, particularly plants, including people's use of the land for plant growth.

Edge Effect - Either suppression of growth or excessive growth at the edges of a plot where the plants come in contact with plants of a different variety and different competitive ability. With respect to edges as boundaries of ecosystems, it refers to the greater diversity of animals found, those from each of the adjoining ecosystems as well as those that specialize on the edge itself.

Effects - Physical, biological, social, and economic results (expected or experienced) resulting from achievement of outputs. Effects can be direct, indirect, and cumulative.

Effects (Heritage Resources) - Impacts to the characteristics that qualify a heritage resource for the National Register of Historic Places. These can include alterations in location, setting, use design, materials, feeling, and association. Adverse effects include:

- Physical destruction or damage.
- Isolation from or alteration of setting.
- Introduction of visual, audible, or atmospheric elements.
- Physical deterioration from neglect or from any action.
- Transfer, lease, or sale.

Eligible (Heritage Resources) - Indicates that a specific heritage resource qualifies for or is already listed in the National Register of Historic Places.

Emergency repairs - One or more of a variety of operations on a producing well designed to re-establish or maintain production or to prohibit or mitigate environmental risks and risks to human health, such as those that might be caused by leaking equipment. Emergency repairs are those immediately necessary to ensure that producing operations are in continuous compliance with laws, regulations, policies, management plan direction, and permit requirements. Examples of emergency repairs related to maintaining production and conservation of the mineral resource include, but are not limited to, pump engine repairs and adjustments; heater treater and dehydration unit repairs and adjustments; fracturing, acidizing, and hot oil treatments; squeezing cement; replacing or repairing a bottom hole assembly, tubing, or rods; and repairing leaks, such as from a stuffing box, casing head, flowline, pipeline, heater treater, dehydration unit, or collection tanks or pits. Emergency repairs related to environmental and/or human health and safety risks include, but are not limited to, pump engine repairs and adjustments, squeezing cement; and repairing leaks, such as from a stuffing box, casing head, flowline, pipeline, heater treater, dehydration unit, or collection tanks or pits. Emergency repairs may or may not require the use of a workover rig and may be completed in a few hours or several days, depending on the nature of the emergency.

Emergent Vegetation - A plant rooted in water with much of its vegetative growth extending above the water surface.

Encroachments - Improvements occupied or used on National Forest System lands, including national grasslands, without authorization.

Endangered Species - Any species of animal or plant in danger of extinction throughout all or a significant portion of its range and so designated by the Secretary of Interior in accordance with the 1973 Endangered Species Act.

Endangered Species Act of 1973 - An act to conserve ecosystems for endangered species and threatened species, to conserve the endangered species and threatened species themselves, and to take appropriate steps to achieve the purposes of the (relevant) treaties and conventions.

Endemic – Plants or animals that occur naturally in an area and whose distribution is relatively limited to a particular locality.

Environment - All the conditions, circumstances, and influences surrounding and affecting the development of an organism or group of organisms.

Environmental Analysis - An analysis of alternative actions and their predictable short- and long-term environmental effects, which include physical, biological, economic, social, and environmental design factors and their interactions.

Environmental Assessment - A concise public document, for which a federal agency is responsible, that serves to:

- Briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact.
- Aid an agency's compliance with the National Environmental Policy Act when no environmental impact statement is necessary.
- Facilitate the preparation of an environmental impact statement when one is necessary.

Environmental Impact Statement (EIS) - A document prepared by a federal agency in which anticipated environmental effects of a planned course of action or development are evaluated. A federal statute (Section 102 of the National Environmental Policy Act of 1969) requires that such statements be prepared. An EIS is prepared first in draft or review form and then in a final form and includes the following points:

- The environmental impact of the proposed action.
- Any adverse impacts that cannot be avoided by the action.
- The alternative courses of action.
- The relationship between local short-term use of the human environment and the maintenance and enhancement of long-term productivity.
- A description of the irreversible and irretrievable commitment of resources which would occur if the action was accomplished.

Ephemeral Streams - Streams that flow only as a direct response to rainfall or snowmelt events. They have no base flow.

Equilibrium Theory - In island biogeography, greater numbers of species are expected to be found on larger islands because the populations on smaller islands are more vulnerable to extinction. Often applied to terrestrial analogs, such as forest or grassland patches in agricultural or suburban areas or nature reserves.

Eradication (Plant) - Complete killing or removal of a noxious plant from an area, including all plant structures capable of sexual or vegetative reproduction.

Erosion - The wearing away of the land surface by running water, wind, ice, gravity, or other geological activities.

Essential Experimental Population – Population of a federally listed species released under Section 10(j) of the Endangered Species Act and shoes loss would be likely to appreciably reduce the likelihood of the survival of the species in the wild. Section 10(j) of ESA authorizes listed species to be released as experimental populations outside their currently occupied range, but within probable historic habitat, to further species conservation.

Essential Habitat - Those areas designated by Regional Foresters as possessing the same characteristics as critical habitat without having been declared as critical habitat by the Secretary of Interior. The term includes habitats necessary to meet recovery objectives for endangered, threatened, and proposed species and those habitats necessary to maintain viable populations of sensitive species.

Executive Order - An order or regulation issued by the President or some administrative authority under presidential direction.

Exempt Stock - Livestock permitted to graze on federal land free of charge. Usually confined to animals actually used for domestic purposes, like saddle horses and milk cows.

Exemption (oil & gas leasing) - Case-by-case exemption from a lease stipulation. The stipulation continues to apply to all other sites within the leasehold to which the restrictive criteria applies.

Existing Road System - All existing roads, owned or administered by various agencies, that are wholly or partly within or adjacent to and serving national forests and national grasslands or intermingled private lands (ref: FSM 7705.21). These roads may or may not be included on the current Forest Transportation Inventory but are evident on the ground as meeting the definition of a road.

Exotic - Not native to the place where it is found. Often in reference to a specific race or variety of an organism that has been transplanted to a new region.

Exotic Species - An organism that exists in a free state in an area in which it is not native. Also refers to animals from outside the country in which they are held captive or in free-ranging populations.

Experimental Population Area – Area designated through the federal rule-making process for release of a federally listed species under the provisions of Section 10(j) of the Endangered Species Act.

Exploration and Wildcat Wells (Oil and Gas) - Wells drilled to test for the presence of oil or gas in a previously undeveloped area.

Extensive Grazing Management – Grazing management that utilizes relatively large land areas per animal and a relatively low level of labor, resources or capital.

Extinction - Disappearance of a taxon of organisms from existence in all regions.

Extirpated - The elimination of a species from a particular area.

Extractive Use - Use of natural resources that removes them from their natural setting.

Facility - Structures needed to support the management, protection, and utilization of the national forests and national grasslands, including buildings, utility systems, and other construction features. There are three categories of facilities: recreation, administrative, and permitted.

Fair Market Value - The amount or value for which, in all probability, a property would be sold by a knowledgeable owner willing but not obligated to sell to a knowledgeable purchaser who desires but is not obligated to buy.

Fauna – All vertebrate and invertebrate animal species.

Fee Sites (Recreation) - A Forest Service recreational area where users must pay a fee. Fee sites must meet certain standards and provide certain facilities.

Fee Title (Landownership) - The full and complete possessory ownership of a parcel of land. An inheritable estate.

Feed Lot - A commercial facility for high-intensity feeding of livestock under a controlled environment.

Feral - Plants or animals that are no longer under human cultivation or domestication and have reverted to a wild state.

Fertilizer - Mineral nutrients added to the substrate of plants to enhance growth and vitality.

Fire Incidence - The average number of fires in a specified area during a specified time.

Fire Occurrence - Number of fires per unit time in a specified area. Synonymous with fire frequency.

Fire Risk - The chance of a fire starting, as affected by nature and incidence of causative agents, including lightning, people, and industry. Three risk scales are used:

- **High**: includes locations where lightning, people, or industry have commonly caused fires in the past.
- **Moderate**: includes locations where lightning, people, or industry have periodically caused fires in the past.
- **Low**: includes locations where lightning, people, or industry have infrequently caused fires in the past.

Fire Suppression - All the work and activities connected with fire-extinguishing operations beginning with discovery and continuing until the fire is completely extinguished.

Fire Suppression Objective - To suppress wildfires at minimum costs consistent with land and resource management objectives and fire management direction as determined by the National Fire Management Analysis System (NFMAS). This includes all work and activities associated with fire-extinguishing operations, beginning with discovery and continuing until the fire is completely extinguished. An example might be a fire suppression objective of five acres, based on a cost-effectiveness analysis.

Fire-dependent Systems - Forests, grasslands, and other ecosystems historically composed of species of plants that evolved with and are maintained by fire regimes.

Fireline Intensity - The rate of heat energy released per unit time per unit length of a fire front. Numerically, it is the product of the heat combustion, quality of fuel consumed per unit area in the fire front, and the rate of spread of a fire (as measured in BTUs per second foot of the fire front).

Firewood - See Fuel Wood.

Fiscal Year - Within the Forest Service, the fiscal year includes October 1 to September 30, the following year. For example, October 1, 1996 to September 30, 1997 is referred to as a Fiscal Year 1997.

Floodplain - The area adjacent to a stream/river channel effective in carrying flow, within which carrying capacity must be preserved and where the flood hazard is generally highest; that is, where flood depths and velocities are the greatest (FSH 2520).

Flora – All plant species.

Forage - Vegetation used for food by wildlife and livestock, particularly ungulate wildlife and domestic livestock.

Forage Production - The weight of forage that is produced within a designated period of time on a given area. The weight may be expressed as green, air dry, or oven dry. The term may also be modified as to time of production such as annual, current year, or seasonal forage production.

Forbs - Any herbaceous plant other than those in the grass, sedge, and rush families. For example, any non grass-like plant that has little or no woody material.

Foreground - See Distance Zones.

Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA) - An act of Congress requiring the preparation of a program for the management of the National Forest's renewable resources, and of land and resource management plans for units of the National Forest System, including national grasslands. It also requires a continuing inventory of all National Forest System lands and renewable resources.

Forest Development Roads - A Forest road under the jurisdiction of the Forest Service. Forest Development Roads are not intended to meet the transportation needs of the public at large. Generally, these are roads constructed to a standard to serve expected traffic generated by resource management. Although generally open and available for public use, the Forest Service may restrict or control use to meet specific management direction.

Forest Development Trails - As defined in 36 CFR 212.1 and 261.2, those trails wholly or partly within or adjacent to and serving national forests and national grasslands that have been included in the Forest Development Transportation Plan. A trail is a pathway for purposes of travel by foot, stock, or trail vehicle.

Forest Development Transportation Facility - An access road, trail, waterway, or airfield wholly or partly within, or adjacent to, and serving national forests and national grasslands, which has been included in the Forest Development Transportation System.

Forest Development Transportation Plan - The plan for the system of access roads, trails, and airfields needed for the protection, administration, and utilization of the national forests and national grasslands or the development and use of resources upon which communities within or adjacent to National Forest System lands are dependent.

Forest Development Transportation System - Those facilities, Forest Development Roads, trails, and airfields in the transportation network and under Forest Service jurisdiction.

Forest Facility Master Plan - The plan that depicts the development and management of each national forest's facilities. This includes the current volume of business and projections for the future, locations of needed skills to perform program work, existing administrative sites and proposed locations of new sites, and management strategies concerning consolidation or sharing between units.

Forest Plan (Forest Land and Resource Management Plan) - A document that guides natural resource management and establishes standards and guidelines for a national forest or national grassland. Required by the National Forest Management Act.

Forest Supervisor - Official responsible for administering any particular national forest. Forest supervisors report to regional foresters.

Forest System Roads - Roads that are part of the Forest Development Transportation System, which includes all existing and planned roads, as well as other special and terminal facilities designated as part of the Forest Development Transportation System.

Forest Visitor Map - Maps depicting detailed information concerning national forests, national grasslands, national recreation areas, and special interest areas. The format is an entire national forest, national grassland, or subdivision thereof. Forest Visitor Maps are available to the public at a price that reimburses the cost of printing and distribution.

Forested Range - Forestland that produces, at least periodically, sufficient under story vegetation suitable for forage and that can be grazed without significantly impairing wood production and other forest values.

Fossil - The remains or traces of an organism or assemblage of organisms that have been preserved by natural processes in the Earth's crust. Minerals, such as oil and gas, coal, oil shale, bitumen, lignite, asphaltum and tar sands, phosphate, limestone, diatomaceous earth, uranium, and vanadium, while they may be of biologic origin, are not here considered fossils. Fossils of scientific value may occur within or in association with such minerals.

Fragmentation - The breakup of a large land area (such as a grassland) into smaller patches isolated by areas converted to a different land type. The opposite of connectivity.

Free-flowing - Existing or flowing in natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway.

FSH - Forest Service Handbook

FSM - Forest Service Manual

Fuel Break - A zone in which fuel quantity has been reduced or altered to provide a position for wildfire suppression. Fuel breaks are designated or constructed before the outbreak of a fire. Fuel breaks may consist of one or a combination of the following: natural barriers, constructed fuel breaks, and human-made barriers.

Fuel Loading - The volume of available or burnable fuels in a specified area, usually expressed in tons per acre.

Fuel Treatment - Any manipulation or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control, including lopping, chipping, crushing, piling, and burning. Synonymous with fuel modification.

Fuels - The organic materials that will support the start and spread of a fire: duff, litter, grass, weeds, forbs, brush, trees, and dead woody materials.

Fuels Management - Manipulation or reduction of fuels to meet protection and management objectives while preserving and enhancing environmental quality.

Fuelwood - Round, split, or sawed wood cut into short lengths for burning as fuel.

FY - Fiscal Year

Gap Analysis - A process to determine distribution and status of biological diversity and assess adequacy of existing management areas to protect biological diversity.

Gene Flow - The movement of genes from one part of a population to another or from one population to another, through the transfer of gametes.

Gene Pool - The sum total of all the genes of all the individuals in a population at a given time.

Genetic Diversity - The genetic variation present in individuals, populations or species.

Geographic Area - A piece of land where management is directed toward achieving a specified desired condition.

Geographic Information System (GIS) - A spatial type of information management system that provides for the entry, storage, manipulation, retrieval, and display of spatially oriented data.

Geological Area - A unit of land that has been designated by the Forest Service as containing outstanding formations or unique geological features of the earth's development, including caves and fossils.

Geophysical Operation - Prospecting for minerals or mineral fuels by measuring the various physical properties of the rocks and interpreting the results in terms of geologic features or the economic deposits sought. Physical measurements are taken at the surface, concerning the differences in the density, electrical resistance, or magnetic properties of the rocks. There are four main methods employed in geophysical prospecting: gravitational, magnetic, electrical, and seismic, with several modifications of each.

Geothermal Resources - Of or relating to the heat of the Earth's interior.

Goal - A concise statement that describes a desired condition to be achieved sometime in the future. A goal is normally expressed in broad, general terms that are timeless in that there is no specific date by which the goal is to be achieved (36 CFR 219.3). The Region 2 Desk Guide has this to say about goals: "Desired conditions and processes are measurable, have a timeless nature, and describe a resource condition or ecological process. In the first round of (land and resource management) planning, these statements were often termed 'goals.' They describe the conditions or processes we expect to achieve through resource management. Complete accomplishment of desired conditions is not mandatory during the current planning phase, but it is our ultimate intent."

Goods and Services - The various outputs, including on-site uses, produced by forest and rangeland renewable resources.

Graminoid - Grass or grass-like plant, such as *Poa*, *Carex*, and *Juncus* species

Grant - A grant passes some estate or interest, corporeal or incorporeal, in the lands that it embraces. To give or permit as a right or privilege, such as a grant of route authority.

Grass - A member of the grass family, Poaceae.

Grassland - Any land on which the dominant plants are grasses or on which grasses originally dominated.

Grassland Agriculture - The management and utilization of the land within areas of native and introduced grasses and the land's associated resources and values in harmony with nature's requirements and behavior so as to foster the long-term stability and productivity of the ecosystem and the rural land base of the area, the quality of life and economic stability of people living on the land, and the local communities associated with the land.

Grazing - The act of animals consuming plants on range or pasture.

Grazing Association - A group of individuals permitted to graze the National Grassland under a grazing agreement. This group is governed by its established constitution, by-laws, and rules of management.

Grazing Capacity - The maximum number of livestock under management that a given range area is capable of supporting within guidelines found in the allotment management plan.

Grazing Distribution - Dispersion of livestock or wild herbivores grazing within a given area.

Grazing District – 1) An administrative unit of federal range established by the Secretary of the Interior under the provisions of the Taylor Grazing Act of 1934, as amended. 2) An administrative unit of state, private, or other rangelands, established under certain state laws.

Grazing Fee - A charge, usually on a monthly basis, for grazing use by a given kind of animal.

Grazing Land - An area of rangeland, public or private, that is used by animals for grazing.

Grazing Permit - Official, written permission to graze a specified number, kind, and class of livestock for a specific period on a defined range allotment.

Grazing Season – 1) A period of grazing to obtain optimum use of the forage resource. 2) On public lands, an established period for which grazing permits are issued.

Grazing System - A specialization of grazing management that defines systematically recurring periods of grazing and deferment for two or more pastures or management units. Some examples are: deferred grazing, rotation grazing, deferred-rotation grazing, and short-duration grazing.

Grazing Trespass - The grazing of livestock on a range area without proper authority and resulting from a willful or negligent act.

Grazing Unit - An area of rangeland, public or private, that is grazed as an allotment or pasture.

Grazing, Short-duration - A grazing system in which animals are concentrated on less than one-half of the total land area and the lengths of deferment exceed the lengths of grazing.

Ground Cover - The percentage of material, other than bare ground, covering the land surface. It may include live and standing dead vegetation, litter, cobble, gravel, stones, and bedrock. Ground cover plus bare ground would total 100 percent.

Groundwater - Water within the Earth that supplies wells and springs. Specifically, water in the zone of saturation where all openings in soils and rocks are filled. The upper surface level forms the water table.

Growing Season - In temperate climates, that portion of the year when temperature and moisture permit plant growth.

Guideline - Advisable actions that should be followed to achieve grassland or forest goals and objectives. Deviations from guidelines must be analyzed during project-level analysis and be documented in a project decision document but do not require management plan amendments.

Guilds - A group of organisms that share a common food source.

Habitat – The sum total of environmental conditions of a specific place occupied by a wildlife species or a population of such species.

Habitat Capability – The capacity of a vegetative community to support selected wildlife and fish species for all or a part of its life cycle. Habitat capacity is normally expressed as projected populations or densities of animals.

Habitat Effectiveness - As used in this document, habitat effectiveness refers to the capability of an area to support big game based on forage, cover, open roads, and the spatial distribution of the three factors, regardless of the time of year.

Habitat Suitability – A measure of current habitat quality relative to the local biological potential of an area to provide habitat for a species. Habitat suitability is usually expressed as low, moderate or high or is quantitatively presented as an index value scaled from 0 (unsuitable) to 1.0 (optimum habitat).

Half Lives - The time required for half of a chemical agent to undergo decay to a neutral chemical compound.

Hard Snags - A dead or partially dead tree composed primarily of sound wood, particularly sound sapwood.

Hardened Sites (Recreation) - Developed recreation sites where techniques have been used to protect natural resources (soil, water, vegetation, etc.) from overuse. For example, vehicles may be confined to roads by barriers or gravel, pavement, or soil additives may be placed on roads, walkways, and under picnic tables.

Hardwood - Pertains to broadleaf trees or shrubs.

Hardwood Draws - Upland drainages containing deciduous trees and shrubs.

Hay - Herbage, especially grass and legumes, mowed, cured, and stored for fodder.

Haying - The mowing, baling, and storage of hay to be used as a product.

Herb - A plant with one or more stems that dies back to the ground each year.

Herbaceous Crop - A crop of plants with herb characteristics.

Herbicide - A chemical substance used for killing plants.

Herbivore - An animal that subsists principally or entirely on plants or plant material.

Herd - An assemblage of animals usually of the same species.

Heritage Resources - The physical remains and conceptual content or context of an area. Physical remains may include artifacts, structures, landscape modifications, rock art, trails, or roads. Conceptual content/context includes the setting for legendary, historic, or prehistoric events, such as a sacred area for American Indians.

High Edge Contrast - Found at the junction of two communities or stands that are structurally very different: for example, a mature forest and grass/forb community.

Historic Property - Any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the National Register. This term includes artifacts, records, and remains related to and located within such properties.

Historical Range of Variability - The natural fluctuation of components of healthy ecosystems over time. Refers to the range of conditions and processes that are likely to have occurred prior to settlement of the project area by people of European descent (approximately the mid-1800s), which would have varied within certain limits over time. Historical conditions and processes portrayed include such variables as forest or grassland vegetation types, compositions, and structure; fish and wildlife habitats and populations; and drought, grazing, and fire regimes.

Holistic Resource Management - Holistic Resource Management (HRM) is a practical, goal-oriented approach to the management of the ecosystem including the human, financial, and biological resources on farms, ranches, public, and tribal lands, as well as national parks, vital water catchments, and other areas. HRM entails the use of a management model that incorporates a holistic view of land, people, and dollars.

Home Range - The geographic area within which an animal restricts its activities.

Human Environment - Includes the natural and physical environment and the relationship of people within that environment.

Hydrologic Cycle - The ecological cycle that moves water from the air, by precipitation, to the earth and back to the atmosphere. A variety of processes are involved, including evaporation, runoff, infiltration, percolation, storage, and transpiration.

IDT - Interdisciplinary Team

Ignition - The initiation of combustion.

Implementation - Those activities necessary to initiate the actions in the approved land and resource management plan.

Inaccessible Range – Rangeland that is not grazed by livestock because of barriers, distance to water or steep slopes.

Inactive Prairie Dog Colony - A prairie dog colony that no longer supports a prairie dog population due to poisoning or plague; however, the colony area still retains its intact burrow system.

Increaser (Plant) - Plant species of the original vegetation that increase in relative amount, at least for a time, under continued disturbance (heavy defoliation, fire, drought) to the norm.

Indigenous Species - Animals or plants that originated in the area in which they are found; for example, animals or plants that were not introduced after frontier settlement of the Northern Great Plains and that naturally occur on the Northern Great Plains.

Indirect Effects - Environmental effects caused by an action but resulting later in time or farther away in place, yet which are still reasonably foreseeable.

Infrastructure - The facilities, utilities, and transportation systems needed to meet public and administrative needs.

Ingress - The act or right to enter; access; entrance.

In-holdings - Lands within the proclaimed boundaries of a national forest or national grassland that are owned by some other agency, organization, or individual.

Insecticide - A chemical or biological agent formulated to kill insects.

Instream Flows - The minimum water volume (cubic feet per second) in each stream necessary to meet seasonal stream flow requirements for maintaining aquatic ecosystems, visual quality, recreational opportunities, and other uses.

Integrated Pest Management (IPM) - A process for evaluating and selecting a program from available techniques to reduce pest populations in an ecologically, economically, and socially acceptable manner. Programs may include one or a combination of available techniques: for example, the use of pesticides, cultural or silvicultural treatments, biological control agents, host resistance, genetic control, mechanical destruction or trapping, and behavioral chemicals, including attractants and repellants.

Intensity (Fire Management) - A measure (in BTUs per foot per second) of the energy released per unit of time in an area of actively burning fire; the amount of heat released per foot of fire front per second.

Intensive Grazing Management – Grazing management that attempts to increase production or utilization per unit area or production per animal through a relative increase in stocking rates, forage utilization, labor, resources, or capital. Intensive grazing management is not synonymous with rotation grazing. Grazing management can be intensified by using any one or more of a number of grazing methods that use relatively more labor or capital resources.

Interdisciplinary Team (ID Team) - A group of people with different specialized training assembled to solve a problem or perform a task. The team is assembled out of recognition that no one discipline is sufficiently broad to adequately solve the problem. Through interaction, participants bring different points of view and a broader range of expertise to bear on the problem.

Intermittent Service (Roads) - A facility developed and operated for periodic service and restricted to nonmotorized use for more than one year between periods of use.

Intermittent Stream – 1) A stream that flows only 50 to 90 percent of the year when it receives water from some surface source, such as melting snow. 2) A stream that does not flow continuously, as when water losses from evaporation or seepage exceed the available stream flow.

Interpretive Services - Visitor information services designed to inform and educate national forest and national grassland visitors in order to improve their understanding, appreciation, and enjoyment of national forest and national grassland resources.

Introduced Species - A species not a part of the original fauna or flora of the area in question.

Invader (Plant) - Plant species that were absent in undisturbed portions of the original vegetation of a specific range site and will invade or increase following disturbance or continued heavy grazing.

Invasive Plant - A species that displays rapid growth and spread, free from natural controls and enhanced by abundant seed production and germination.

Invertebrate Fossils - The fossilized remains of animals that do not have a bony skeleton or backbone. Examples of invertebrate fossils include: shellfish, snails, and bugs.

Irretrievable Commitments - Applies to losses of production or use of renewable natural resources for a period of time. For example, road construction leads to an irretrievable loss of the productivity of the land under which the road is located. If the road is later obliterated, the land may eventually become productive again. The production lost is irretrievable, but the action is not irreversible.

Irreversible Commitments - Decisions causing changes that cannot be reversed. For example, if an area is mined, that area cannot, at a later date, be allocated to some other resource activities, such as Wilderness. Once mined, the ability of that area to meet Wilderness criteria, for instance, has been irreversibly lost. Irreversible commitments often apply to some non-renewable resource, such as minerals and heritage resources.

Jurisdiction - The right, power, or authority to administer or control. As an example, a county has jurisdiction over county roads and may manage them as desired.

Key Area - 1) An area selected to monitor the effects of management activities on ecosystem health. Examples may include but are not limited to, woody draws, uplands, riparian areas, and valley bottoms. 2) That portion of a pasture or grazing unit which is selected as a monitoring point because of its location, use, or grazing value.

Keystone Species - Species that play roles affecting many other organisms in an ecosystem. Often they are grouped according to their perceived importance to humans, such as upland birds or waterfowl.

Known Geologic Structures (KGS) - A trap in which an accumulation of oil and gas has been discovered by drilling and which is determined to be productive. Its limits include all acreage that is presumptively productive.

Lacustrine Systems - A wetland / aquatic habitat with water in a depression, generally greater than 20 acres (lakes).

Land Exchange - The conveyance of nonfederal land or interests to the United States in exchange for National Forest System land, including national grasslands, or interests in such land.

Land Unit - A mapped land type polygon or a mapped soil unit.

Landline Location - The legal identification, accurate location, and description of property boundaries.

Landowner - Person who has title to land recognized by the prevailing legal system.

Landscape - The landforms of a region in aggregate.

Landscape Connectivity - The spatial contiguity within the landscape. A measure of how easy or difficult it is for organisms to move through the landscape without crossing habitat barriers.

Landscape Diversity - Variability of the components of a landscape.

Landtype - An inventory map unit, with relatively uniform potential, for a defined set of land uses. Properties of soils, landform, natural vegetation, and bedrock are common components of land type delineation used to evaluate potentials and limitations for land use.

Landtype Group - A logical grouping of land types that facilitate resource planning.

Late Succession Forests - Ecosystems distinguished by old trees and related structural features. The term encompasses the later stages of stand development that typically differ from earlier stages in structure, composition, function, and other attributes. There are two types of late succession ponderosa pine defined for the Northern Great Plains:

- Open-canopy, late succession ponderosa pine occurs where periodic, low-intensity fires have been part of the ecosystem. These late successional stands consist of clumps or groups of trees with grasses in the openings between the clumps. The clumps or groups of trees contain little down dead material and few small trees.
- Closed-canopy, late succession ponderosa pine occurs where periodic, low-intensity, high-frequency fires have not been a significant part of the ecosystem. These stands contain large old trees with open branches and irregular crowns. The stands have multiple canopy layers made up of various-aged trees. They are well-stocked with trees and contain standing dead and down trees.

Lead Agency - The agency or agencies preparing or having taken the primary responsibility for preparing an environmental impact statement.

Leasable Minerals - Those minerals or materials designated as leasable under the Mineral Leasing Act of 1920. They include coal, phosphate, asphalt, sulphur, potassium, sodium minerals, and oil and gas. Geothermal resources are also leasable under the Geothermal Stream Act of 1970.

Lease (Oil and Gas) - A legal contract granting the right to explore for, develop, and produce oil and gas resources for a specific period of time under certain agreed-upon terms and conditions.

Lease Modification (Oil and Gas) - Fundamental change to the provisions of a lease stipulation either temporarily or for the term of the lease. A modification may include an exemption from or alternation to a stipulated requirement. Depending on the specific modification, the stipulation may or may not apply to all other sites within the leasehold to which the restrictive criteria applied.

Lease Stipulations (Oil and Gas) - Additional specific terms and conditions that modify the lease rights or change the manner in which an operation may be conducted.

Leasehold (Oil and Gas) - The area described in a federal oil and gas lease.

Lessee (Oil and Gas) - A person or entity holding record title in an oil and gas lease issued by the United States.

Listed Species - Any species of fish, wildlife, or plant officially designated as endangered or threatened by the Secretary of the Interior or Commerce.

Litter - A surface layer of loose organic debris consisting of freshly fallen or slightly decomposed organic materials.

Livestock - Domestic animals.

Livestock Use Permit - Used to document specific animal numbers, class, and seasons of use under a specified management plan for a given period (10 years).

Local Roads - Roads that connect terminal facilities with collector roads, arterial roads, or public highways. May be developed for either short-term or long-term service.

Locatable Minerals - Minerals or mineral materials subject to claim and development under the Mining Law of 1872, as amended. Generally, locatable minerals include metallic minerals, such as gold and silver, and other materials not subject to lease or sale, like some bentonites, limestone, talc, zeolites, etc.

Loess - A uniform and unstratified fine sand or silt transported by wind.

Logging - Harvest of trees of given size from a forest.

Maintenance (Transportation Management) - The upkeep of the entire Forest Development Transportation Facility, including surfaces and shoulders, parking and side areas, structures, and such traffic control devices as are necessary for its safe and efficient utilization.

Maintenance Levels - See Road Maintenance Levels.

Major Federal Action - Includes actions with effects that may be major and which are potentially subject to federal control and responsibility.

Managed Season (Recreation) - That period of time during which developed recreational sites are open for public use, with routine maintenance, cleanup, and operation on a scheduled basis.

Management - The organization of actions designed to reach a given set of objectives.

Management Area – Area of the grassland that are managed for a particular emphasis. These areas have common management direction and may be non contiguous on the national forest or national grassland.

Management Indicator Species – A plant or animal species selected because their status is believed to (1) be indicative of the status of a larger functional group of species, (2) be reflective of the status of a key habitat type, or (3) act as an early warning of an anticipated stressor to ecological integrity. The key characteristic of a MIS species is that its status and trend provide insights to the integrity of the larger ecological system to which it belongs.

Management Indicators (Fish and Wildlife) - Plant or animal species or habitat components selected in a planning process used to monitor the effects of planned management activities on populations of wildlife and fish, including those that are socially or economically important.

Marginal Land - Land of questionable physical or economic capabilities for sustaining a specific use.

Market Value - The unit price of an output normally exchanged in a market after at least one stage of production, expressed in terms of what people are willing to pay as evidenced by market transactions.

MBF - Thousand Board Feet

MCF - Thousand Cubic Feet

Meadow – 1) An area of perennial herbaceous vegetation, usually grass or glasslike, used primarily for hay production. 2) Openings in forests and grasslands of exceptional productivity in arid regions, usually resulting from high water content of the soil (streamside situations, areas having a perched water table).

Memorandum of Understanding (MOU) - A legal agreement between the Forest Service, other agencies, private parties, or individuals resulting from consultation between them that states specific measures they will follow to accomplish a project. A memorandum of understanding is not a fund-obligating document.

Mesa - A flat-topped mountain or other elevation bounded on at least one side by a steep cliff.

Microsite - A rock outcrop, snag, seep, stream pool, and other environmental features small in scale but unique in character.

Middleground - See Distance Zones.

Midgrass - Grasses which normally grow 18 - 36 inches tall, as in western wheatgrass.

Migration - The movement of genotypes (as individuals) into or out of a population.

Mineral Development - The activities and facilities associated with extracting a proven mineral deposit.

Mineral Entry - Claiming public lands administered by the Forest Service, including national grasslands, under the Mining Law of 1872 for the purpose of exploiting minerals. This can also refer to a mineral exploration and development under the mineral leasing laws and the Material Sale Act of 1947.

Mineral Estate - The ownership of minerals, including rights necessary for access, exploration, development, and transportation operations.

Mineral Material - Common varieties of sand, building stone, gravel, clay, etc., obtainable under the Minerals Act of 1947, as amended.

Mineral Material Permit - A document used for sale transactions of common variety, salable minerals.

Mineral Potential - The classification of lands according to the probability of undiscovered mineral resources, delineated as to the type of mineral, the extent of the expected deposit, and the likelihood of its occurrence. The likelihood of occurrence for oil and gas is classified as follows:

- **High Potential:** Describes a geologic environment that is highly favorable for discovering oil and gas resources. The area is on or near a producing field, and evidence exists that the geologic conditions of the reservoir, source, and trap necessary for the accumulation of oil and gas are present.
- **Moderate Potential:** Refers to an environment that is favorable for the occurrence of undiscovered oil and gas resources; however, one of the geologic conditions necessary for the accumulation of oil or gas may be absent.
- **Low Potential:** Refers to an environment that is not favorable for the accumulation of oil and gas as indicated by geologic, geochemical, and geophysical characteristics. Evidence exists that one of the geologic conditions necessary for the accumulation of oil or gas is absent.
- **Unknown Potential:** Refers to the region for which geologic information is insufficient to otherwise categorize potential. This category should be limited to specific areas for which there is a true lack of data and should not be used as a substitute for performing the interpretation.

Mineral Production - The extraction of mineral deposits.

Mineral Rights - 1) **Mineral rights outstanding** are third-party rights, an interest in minerals not owned by the person or party conveying the land to the United States. It is an exception in the deed that is the result of a prior conveyance separating title of certain minerals from the surface estate. 2) **Reserved mineral rights** are the retention of ownership of all or part of the mineral rights by a person or party conveying land to the United States. Conditions for the exercising of these rights have been defined in the Secretary's *Rules and Regulations to Govern Exercising of Mineral Rights Reserved in Conveyances to the United States* attached to and made a part of deeds reserving mineral rights.

Mineral Withdrawal - The exclusion of locatable mineral deposits from mineral entry on areas required for administrative sites by the Forest Service and other areas highly valued by the public. Public lands withdrawn from entry under the General Mining Laws and/or the Mineral Leasing Laws.

Minimum Management Requirements - Standards for resource protection, vegetative manipulation, silviculturist practices, even-age management, riparian areas, soil and water, and diversity to be met in accomplishing National Forest System goals and objectives.

Mining Claims - That portion of the public estate held for mining purposes in which the right of exclusive possession of locatable mineral deposits is vested in the locator of a deposit.

Mining Law of 1872 - Provides for claiming and gaining title to locatable minerals on public lands. Also referred to as the General Mining Law or Mining Law.

Mitigate - To lessen the severity.

Mitigation - Includes avoiding an impact by not taking certain actions; minimizing impacts by limiting the degree or magnitude of the action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and compensating for the impact by replacing or providing substitute resources or environments.

Mitigation (Heritage Resources) - Actions taken to reduce or eliminate adverse effects caused to heritage resources. Avoidance is not considered a mitigation measure.

Mixed grass prairie - Grassland type west of the tallgrass prairie in North America, consisting of a mixture of tall-, short-, and midgrasses and other herbaceous plants, also called mixed prairie.

MMBF - Million Board Feet

MMCF - Million Cubic Feet

Modeling - The use of mathematical and computer-based simulations as a tool to enhance understanding of complex systems and as planning techniques for such purposes as developing species recovery plans and understanding population structure, extinction vulnerabilities, or deforestation rates.

Modification (Oil and Gas Leasing) - Modifications are similar to exceptions, but broader in scope, and involve a fundamental change to the provisions of the stipulation. They can be granted either temporarily or for the duration of the lease. A modification may, therefore, include an exemption from or alteration to a stipulated requirement. Depending on the specific modification, the stipulation may or may not apply to all other sites within the leasehold to which the restrictive criteria applied.

Monitoring and Evaluation - The sample collection and analysis of information regarding Forest Plan management practices to determine how well objectives have been met, as well as the effects of those management practices on the land and environment.

Monoculture - The cultivation of a single crop to the exclusion of other land uses.

Motorized Equipment - Machines that use a motor, engine, or other nonliving power source. This includes, but is not limited to, such machines as chain saws, aircraft, snowmobiles, generators, motor boats, and motor vehicles. It does not include small battery or gas-powered hand-carried devices, such as shavers, wristwatches, flashlights, cameras, stoves, or other similar small equipment.

Motorized Recreation - A recreational opportunity provided through the use of a motorized vehicle. This includes travel on and off highways, Forest roads, and four-wheel-drive primitive roads and trails. Travel regulations may be established to protect forest and grassland resources, to minimize use conflicts, and to promote user safety.

MOU - See Memorandum of Understanding.

Mowing - The cutting of hay to be left on the ground.

Multiple Use - According to the Multiple Use Sustained Yield Act of 1960, multiple use is the management of all the various renewable surface resources of the National Forest System, including national grasslands, so that they are utilized in the combination that will best meet the needs of the American people. Such management makes the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions. Some lands will be used for less than all of the resources. Harmonious and coordinated management of the various resources is employed, each with the other, without impairment of the productivity of the land. Consideration is given to the relative values of the various resources and not necessarily the combination of uses that gives the greatest dollar return or the greatest unit output.

National Environmental Policy Act of 1969 (NEPA) - An act declaring a national policy to encourage productive harmony between people and their environment, to promote efforts that will prevent or eliminate damage to the environment and the biosphere and stimulate the health and welfare of people and to enrich the understanding of the ecological systems and natural resources important to the nation and to establish a Council on Environmental Quality.

National Fire Management Analysis System (NFMAS) - A broad umbrella process to help fire managers identify the most efficient fire program meeting the direction in the Forest Plan. This includes information for the planning record on program composition, annual programmed costs, emergency firefighting costs, expected resource impacts, and net value change.

National Forest Management Act (NFMA) - A 1976 law that amended the Forest and Rangeland Renewable Resources Planning Act and requires the preparation of Regional and Forest Plans and regulations to guide forest plan development.

National Forest System (NFS) Lands - Federal lands designated by Executive Order or statute as national forests, national grasslands, or purchase units, or other lands under the administration of the U.S. Forest Service.

National Grasslands - Lands designated national grasslands by the Secretary of Agriculture and permanently held by the Department of Agriculture under Title III of the Bankhead-Jones Farm Tenant Act.

National Natural Landmark - An area possessing such exceptional value or qualities for illustrating or interpreting the natural heritage of our nation that they are considered to be of national significance. To possess national significance, such an area must be a true, accurate, essentially unspoiled example of nature.

National Recreation Trails - Trails designated by the Secretary of Interior or the Secretary of Agriculture as part of the national system of trails authorized by the National Trails System Act. National recreation trails provide a variety of outdoor recreation uses.

National Register of Historic Places (NRHP) - A list of heritage resources that have local, state, or national significance maintained by the Secretary of the Interior.

National Wild and Scenic River System - Rivers with outstanding scenic, recreational, geological, fish and wildlife, historic, cultural, or other similar values designated by Congress under the Wild and Scenic Rivers Act for preservation of their free-flowing condition.

National Wilderness Preservation System - All lands covered by the Wilderness Act and subsequent wilderness designations, irrespective of the department or agency having jurisdiction.

Native - A plant or animal indigenous to a particular locality.

Native Seed - Seeds of plants considered indigenous to the Northern Great Plains.

Natural - Occurring in conformity with the ordinary course of nature. An area having undergone no, or at least minimal, disturbance by anthropogenic forces.

Natural Area - An area of land in which organisms and geological processes are undisturbed by humans, with as few controls as possible.

Natural Barrier - A natural feature that will restrict livestock movements, such as a dense stand of trees or downfall, or a feature that will stop the spread of fire, such as a talus slope, water course, or areas otherwise devoid of fuel.

Natural Community - A community uninfluenced by external factors.

Natural Fuels - Fuels resulting from natural processes and not directly generated or altered by land management practices.

NCSS (National Cooperative Soil Survey) - A nationwide partnership of federal, regional, state, and local agencies and Institutions. This partnership works to cooperatively investigate, inventory, document, classify, and interpret soils and disseminate, publish, and promote the use of information about soils of the United States.

NEPA Process - Means all measures necessary for compliance with the requirements of Section 2 and Title I of NEPA.

Net Public Benefits - An expression used to signify the overall long-term value to the nation of all outputs and positive effects (benefits) less all associated inputs and negative effects (costs) whether they can be quantitatively valued or not. Net public benefits are measured by both quantitative and qualitative criteria rather than a single measure or index. The maximization of net public benefits to be derived from management of units of the National Forest System, including national grasslands, is consistent with the principles of multiple use and sustained yield.

Niche - The ecological role of a species in a community.

No Adverse Effect (Heritage Resources) - Any effect on a heritage resource that would not be considered harmful to those characteristics that qualify the property for inclusion in the National Register of Historic Places.

No Effect (Heritage Resources) - No effect to those characteristics that qualify the property for inclusion in the National Register of Historic Places.

No Lease (Oil and Gas) - A decision not to lease until some future analysis determines the lands are available for leasing.

No Surface Occupancy (NSO) (Oil and Gas) - A fluid mineral leasing stipulation that prohibits occupancy or disturbance on all or part of the land's surface to protect special values or uses. The NSO stipulation includes the following terminology: no surface use/occupancy, no surface disturbance, conditional NSO, and surface disturbance or surface occupancy restriction by location. The lessee may exploit the oil and gas or geothermal resources under leases restricted by this stipulation through use of directional drilling from sites outside NSO areas.

No Action Alternative - An alternative that maintains established trends or management direction.

Non-consumptive Use - Those resources that do not reduce the supply. No consumptive uses of water include hydroelectric power generation, boating, swimming, etc.

Non-essential Experimental Population – Population of a federally listed species released under Section 10(j) of the Endangered Species Act and whose loss would not be likely to appreciably reduce the likelihood of the survival of the species in the wild. Section 10(j) of ESA authorizes listed species to be released as experimental populations outside their currently occupied range, but within probable historic habitat, to further species conservation.

Non-extractive Use - Use that does not remove a resource from its natural setting.

Nonmotorized Activities - Activities that do not incorporate the use of a motor, engine, or other nonliving power source. This includes such machines as aircraft, hovercraft, motorboats, automobiles, motor bikes, snowmobiles, bulldozers, chainsaws, rock drills, and generators.

Non-point Source Pollution - Pollution whose source is not specific in location. The sources of the pollutant discharge are dispersed, not well-defined or constant. Examples include sediments from logging activities and runoff from agricultural chemicals.

Non-vertebrate Fossils - The fossilized remains of anything that does not have a bony skeleton or backbone. Examples of non-vertebrate fossils include: plants, pollen, petrified wood, shellfish, snails, and bugs.

Northern Region - The Forest Service organizational unit consisting of Montana, northern Idaho, North Dakota, and northwestern South Dakota. Also known as Region 1.

Not Administratively Available (Oil and Gas) - Decision that lands are not available for leasing. They are no longer considered for any type of leasing and no further decision is required concerning those lands.

Notice of Intent - Notice that an environmental impact statement will be prepared and considered. The notice briefly describes the proposed action and possible alternatives, the agency's scoping process, and the address and name of the agency to contact regarding questions about the proposed action and the environmental impact statement.

Noxious Weeds - Those plant species designated as weeds by federal or state laws. Noxious weeds generally possess one or more of the following characteristics: aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host for serious insects or diseases, and generally non-native.

Objective - A concise, time-specific statement of measurable, planned results that respond to pre-established goals. An objective forms the basis for further planning to define the precise steps to be taken and resources to be used in achieving identified goals.

Occupied Nest – Nest that is repaired or tended in the current year; also includes nests within a nesting territory while raptors are demonstrating pair bonding activities and developing an affinity to the area.

Off-Highway Vehicle (OHV) or Off-Road Vehicle (ORV) - Any motorized vehicle designed for or capable of cross-country travel on or immediately over land, water, snow, ice, marsh, swampland, or other natural terrain.

Offset Drilling - To drill a well adjacent to a previously drilled well, usually in the adjacent spacing unit.

Oil and Gas Lease - A legal contract granting the right to explore for, develop and produce oil and gas resources for a specific period of time under certain agreed-upon terms and conditions.

On-Top-the-Surface (Fossils) - Fossil resting on surface, collection requires no digging or prying to remove.

Open Range – 1) Range that has not been fenced into management units. 2) All suitable rangeland of an area upon which grazing is permitted. 3) Untimbered rangeland. 4) Range on which the livestock owner has unlimited access without benefit of land ownership or leasing.

Operating Plan - A written plan, approved by a forest officer and prepared by those engaged in mining activity on the national forest or national grassland. It covers prospecting, exploration, or extraction activities that will take place on National Forest System lands, including national grasslands.

Operating Right (Oil and Gas) - The interest created out of a lease that authorizes the holder of that interest to enter upon the leased lands to conduct drilling and related operations, including production of oil and gas from such lands in accordance.

Opportunity Cost - A foregone value. In this analysis, it is a cost calculated as the difference between present net value of the alternative and the present net value (PNV) of the maximum PNV increment.

Organism - An individual or living thing.

Outpost Well - A well drilled a farther distance from a production well than a step-out well, but still on the same structural trend. The distance could be a couple of miles.

Outputs - The goods, end products, or services purchased, consumed, or utilized directly by people. Outputs are goods, services, products, and concerns produced by activities that are measurable and capable of being used to determine the effectiveness of programs and activities in meeting objectives. A broad term used to describe any result, product, or service that a process or activity actually produces.

Overgrazing - Continued heavy grazing that exceeds the recovery capacity of the community and creates a deteriorated range.

Overstocking - Placing a number of animals on a given area that will result in overuse if continued to the end of the planned grazing period.

Overstory - The portion of vegetation in a forest that forms the uppermost foliage layer.

Paleontological Areas - A unit of land that contains fossils of plants and animals, shellfish, early vertebrates, coal swamp forests, early reptiles, dinosaurs, and other prehistoric plants and animals.

Paleontological Resources - Fossil resources, including both body and trace fossils, of all groups of organisms (vertebrates, invertebrates, plants, pollen, and spores, etc.)

Paleontology - The study of life in past geologic times.

Palustrine Systems - A wetland habitat generally less than 20 acres and less than 6.5 feet (2 meters) deep (marshes).

Particulates - Small particles suspended in the air and generally considered pollutants.

Parturition Habitat - Habitat used by big game species during the birthing season.

Pasture - A land area consisting of grass or other growing plants used as food by grazing animals. Also an area used for grazing, often enclosed and separated from other areas by fences, hedges, ditches, or walls.

Patent - The instrument with which the federal government grants public lands to an individual. A land patent is monument of title issued by the federal government for the conveyance of some portion of the public domain under the 1872 Mining Law.

Patented Mining Claim - A claim for which title has passed from the federal government to the mining claimant under the Mining Law of 1872.

Payment in Lieu of Taxes (PILT) - Payments to local or state governments based on ownership of federal land and not directly dependent upon production of outputs or receipt sharing. Specifically, they include payments made under the Payments in Lieu of Taxes Act of 1976.

Perch-inhibitors – Devices placed on power poles to discourage raptor perching and mortality from electrocution.

Perennial Plant - A plant that lives for two or more years.

Perennial Streams - Streams that flow continuously throughout most years.

Perimeter Control - A strategy that seeks to confine the active zone that is responsible for fire spread. Actual fire line location (I.e., direct vs. indirect) will be selected to minimize the combined cost of suppression and the values that could be lost in a fire. The benefits of fire's effects may also be used to determine location.

Permitted Grazing - Use of a National Forest System range allotment under the terms of a grazing permit.

Permittee (Grazing) - One who holds a permit to graze livestock on state, federal, or certain privately owned lands.

Persons at One Time (PAOT) - A recreational capacity measurement indicating the number of people who can use a facility or area at one time.

Person-Year - The amount of work done by one person working all year or several people working a portion of a year. Approximately 2,000 working hours.

Pesticide - A chemical agent formulated to kill or suppress insects, plants, or animals.

pH - The degree of acidity or alkalinity.

Pioneer Species - The first species or community to colonize or recolonize a barren or disturbed area in primary or secondary succession.

Pitting - Making shallow pits or basins of suitable capacity and distribution on range to reduce overland flow from rainfall and snowmelt.

Plain - A broad stretch of relatively level, treeless land.

Plan of Operations - A written plan describing mining and mineral processing activities that will likely cause a significant surface disturbance. The plan is prepared by those engaged in activities, such as prospecting, exploration, or mining, in the national forest or national grassland. This plan must be approved by a Forest Officer.

Planned Ignitions - A fire started by a deliberate management action under an approved plan to meet specific resource objectives.

Planning Area - The area of the National Forest System, including national grasslands, covered by a Regional or Forest Plan.

Planning Criteria - Standards, tests, rules, and guidelines by which the planning process is conducted and upon which judgments and decisions are based.

Planning Horizon - The overall time period considered in the planning process that spans all activities covered in the analysis or plan and all future conditions and effects of proposed actions that would influence the planning decisions. In the National Forest System planning process, this is 150 years.

Planning Period - A time interval for which inputs and outputs are identified in a planning process. Current RPA and National Forest Plan intervals are five and ten years, respectively.

Planning Questions - A major policy question of long-range significance, derived from the public issues and management concerns, to be addressed when selecting among alternative Forest plans.

Planning Records - Documents and files that contain detailed information and decisions made in developing the Forest Plan. Available at the Forest Supervisor's Office.

Planning Unit – Each individual national grassland and forest in the planning area.

Plant Associations - A grouping of plants that have reached dynamic equilibrium with the local environmental conditions; equivalent to climax. On site, there is no evidence of replacement by other dominant plant species, and there is no evidence of serious disturbances.

Plant Communities - Assemblages of plant species living in an area. A plant community is an organized unit to the extent that it has characteristics in addition to the individuals and populations and functions as a unit.

Potential Natural Community (PNC) - A taxonomic unit of vegetation classification. The biotic community that would be established under present environmental conditions if all successional sequences were completed without additional human-caused disturbances. Natural disturbances, such as drought, flood, wildfire, grazing by native fauna, and insect and disease infestations, are inherent in the development of potential natural communities, which may include naturalized, non-native species.

Prairie - A tract of level to hilly land that has a dominance of grasses and forbs, has a scarcity of shrubs, and is treeless. The natural plant community consists of various mixtures of tall grass, mid-grass, and short-grass plant species.

Prairie Dog Colony Complex – A group of at least 10 prairie dog colonies with nearest-neighbor intercolony distances not exceeding 6 miles and with a total colony complex acreage of at least 1,000 acres.

Prairie Grouse – A name used in this document to refer collectively to sharp-tailed grouse, prairie chicken, and sage grouse.

Precambrian - All geologic time and its corresponding rocks before the beginning of the Paleozoic; it is equivalent to about 90 percent of geologic time.

Preferred Alternative - The alternative recommended for implementation in the Forest Plan based on the evaluation completed in the planning process.

Prehistoric Site - Archeology sites associated with American Indians and usually occurring before contact with Europeans.

Prescribed Burning - Controlled application of fire to wild land fuels in either their natural or modified state, under specified environmental conditions, that allows the fire to be confined to a predetermined area and, at the same time, to produce the fire line intensity and rate of spread required to attain planned resource management objectives.

Prescribed Fire - A fire burning with prescription, resulting from planned or unplanned ignition.

Prescription (Fire Management) - A written statement defining objectives to be attained as well as temperature, humidity, wind direction and speed, fuel-moisture content, and soil moisture under which the fire will be allowed to burn. Generally expressed as acceptable ranges of the various indices and the limit of the geographic area to be covered.

Present Net Value (PNV) - The difference between the discounted value (benefits) of all outputs to which monetary values or established market prices are assigned and the total discounted costs of managing the planning area.

Present Net Worth - The discounted value of price times the quantity less the cost.

Prevention of Significant Deterioration of Air Quality (PSD) - A classification established to preserve, protect, and enhance the air quality in National Wilderness Preservation System areas in existence prior to August 1977 and other areas of national significance, while ensuring economic growth in a manner consistent with the preservation of existing clean air resources. Specific emission limitations and other measures, by class, are detailed in the Clean Air Act.

Primary Range - Areas that animals prefer to use and over which they will graze when management is limited. The area on which overuse will occur before secondary range is used when animals are allowed to shift for themselves.

Primitive Area - All areas so designated by the Secretary of Agriculture on the effective date of the Wilderness Act and that have not yet been permanently designated as Wilderness or to other use by act of Congress.

Production Pit – 1) A pit on an oil and/or gas well location after well completion. 2) A pit associated with the production of oil or gas.

Productivity - The total quantity of organic material produced within a given period by organisms or the energy that this represents, such as gram-calories per square centimeter per year. The innate capacity of an environment to produce plant and animal life. The capacity of a soil to produce a certain kind of crop under a defined set of management conditions.

Products Other than Logs (POL) - Products such as posts, poles, and fiber from trees or parts of trees that are less than saw log size. POL usually include trees greater than five inches diameter at breast height and less than 7.9 inches diameter at breast height, with the tops of the trees greater than four inches to less than six inches.

Program Development and Budgeting - The process by which activities for the national forest or national grassland are proposed and funded.

Programmatic EIS - An area-wide EIS that provides an overview when a large-scale plan is being prepared for the management of federally administered lands on a regional or multi-regional basis. A programmatic EIS is a necessary analysis of the affected environment and the potential cumulative effects of the reasonably foreseeable actions under that program or within that geographical area. Analyses of lesser scope or more site-specificity may be tiered to the analysis in a programmatic EIS.

Proper Functioning Condition (PFC) - Riparian/wetland areas achieve proper functioning condition when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high water flows. This reduces erosion; improves water quality; filters sediment; captures bed load; aids floodplain development; improves floodwater retention and groundwater recharge; develops root masses that stabilize stream banks against cutting action; develops diverse ponding and channel characteristics to provide habitat and water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and supports greater biodiversity. The functioning condition of riparian/wetland areas is a result of the interaction among geology, soil, water, and vegetation.

Proposed Action - In terms of the National Environmental Policy Act, the project, activity, or action that a federal agency intends to implement or undertake and which is the subject of an environmental analysis.

Proposed Critical Habitat - Habitat proposed for designation to benefit any listed or proposed species. Notice of proposed critical habitat appears in the Federal Register.

Proposed Species - Any species of fish, wildlife, or plant that is proposed by the Fish and Wildlife Service or the National Marine Fisheries Service for listing as threatened or endangered.

Province - A continuous geographic area wherein species composition, both plant and animal, is more homogenous than between adjacent areas.

Public - The people of an area, state, or nation that can be grouped together by a commonality of interests, values, beliefs, or life-style.

Public Access - Usually refers to a road or trail route over which a public agency has secured a right-of-way for public use.

Public Involvement - A Forest Service process designed to broaden the information base upon which agency decisions are made. It includes the following steps:

- Informing the public of Forest Service activities, plans, and decisions.
- Encouraging public understanding about the participation in the planning processes that lead to final decision-making.

Public Issue - A subject or question of widespread public interest identified through public participation relating to management of National Forest System lands, including national grasslands.

Quality Habitat – Habitat that is highly suitable for a plant or animal species or community based on the local biological site potential.

Range - Any land supporting vegetation suitable for grazing including rangeland, grazeable woodland, and shrubland.

Range Allotment - A designated area of land available for livestock grazing upon which a specified number and kind of livestock may be grazed under a range allotment management plan. It is the basic land unit used to facilitate management of the range resource on National Forest System lands, including national grasslands, and other associated lands administered by the Forest Service.

Range Analysis - Systematic acquisition and evaluation of rangeland resources data needed for allotment management planning and overall land management.

Range Betterment Funds - Funds established by Title IV, section 401 (b)(1), of the Federal Land Policy and Management Act of 1976 to be used for range improvement. This consists of 50 percent of all money received by the United States as fees for grazing livestock on the national forest and national grasslands in the 16 contiguous western states.

Range Condition – 1) A rangeland is considered to be in satisfactory condition when the desired condition is being met or short-term vegetative objectives are being achieved to move the rangeland toward the desired condition or trend. Unsatisfactory condition is when the desired condition is not being met and short-term vegetative objectives are not being achieved to move the rangeland toward the desired condition or trend. 2) Historically, range condition usually has been defined in one of two ways: (a) a generic term relating to present status of a unit of range in terms of specific values or potentials. Specific values or potentials must be stated or (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 plant for the site.

Range Development, Nonstructural - Any practice designed to improve range condition or facilitate more efficient utilization of the range.

Range Development, Structural - Any structure or excavation to facilitate management of range or livestock.

Range Management - 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 associated uses. Two kinds of range management can be described:

- **Extensive** range management carries the goal to control livestock numbers within the present capacity of the range, but little or no attempt is made to achieve uniform distribution of livestock. Range management investments are minimal and only to the extent needed to maintain stewardship of the range in the presence of grazing. Past resource damage is corrected and resources are protected from natural catastrophes.
- **Intensive** range management carries the goal to maintain full plant vigor and to achieve full livestock utilization of available forage. This goal is achieved through implementation of improved grazing systems and construction and installation of range improvements. Cultural practices, such as seeding and fertilizing, to improve forage quality and quantity may be used.

Rangeland - Lands on which the native vegetation is predominately grasses, grass-like plants, forbs, or shrubs suitable for grazing or browsing usage. Includes lands revegetated naturally or artificially to provide a forage cover that is managed like native vegetation.

Rangeland Health - The degree to which the integrity of the soil, the vegetation, the water, and air as well as the ecological processes of the rangeland ecosystem is balanced and sustained. Integrity is defined as: Maintenance of the structure and functional attributes characteristic of a particular locale, including normal variability.

Ranger District - Administrative subdivision of the national forest or national grassland supervised by a district ranger who reports to a forest supervisor.

Rare Communities - A ranking system used by The Nature Conservancy to assess relative endangerment. Community types are ranked on a global, national, and state scale of 1 to 5. A rank of G1 (Global 1) indicates that a community type is critically imperiled globally to rarity, endemism, and/or threats. A rank of G5 indicates little to no risk of global elimination. Similar definitions apply to national and state rankings.

RARE II - See Roadless Area Review and Evaluation II.

Rate of Spread (Fire Management) - Relative activity of a fire in extending its horizontal dimensions for a specified period in the fire's history. Expressed as rate of increase of the perimeter, rate of increase in area, or rate of advance of its head, depending on the intended use of the information. Generally units are in chains or acres per hour.

Reasonably Foreseeable Development (RFD) (Oil and Gas) - A projection of likely exploration, development, and production of oil and gas within a study area based on existing and credible geologic data, technology, economics, and activity trends.

Receipts - Money collected from timber stumpage, livestock grazing, campground fees, special-use permits, and oil and gas lease rentals and royalties and returned to the federal treasury.

Reclamation - Returning disturbed lands to a form and productivity that will be ecologically balanced, often in conformity with a predetermined reclamation plan.

Reconstruction - Construction activities performed on an existing facility. Reconstruction includes those activities that alter the facility from its originally constructed or subsequently reconstructed condition.

Record of Decision - A document separate from, but associated with, an environmental impact statement that publicly and officially discloses the responsible official's decision on the proposed action.

Recovery Plan - Identifies, justifies, and schedules the research and management action necessary to reverse the decline of a species and ensure its long-term survival.

Recreation Capacity - The number of people who can take advantage of the supply of recreational opportunities at one time without substantially diminishing the quality of the recreational experience or the area's resources.

Recreation Development Scale - Classification of the development level in camp and picnic sites that describes the types of recreational opportunities and modifications to the environment that can be expected. The levels, from 1 to 5, are listed below:

1. **Minimum Site Modification:** Rustic or rudimentary improvements are designed for protection of the site rather than the comfort of users. Use of synthetic materials are excluded. Minimum controls are subtle. Spacing is informal and extended to minimize contacts between users. Motorized access is not provided or permitted.
2. **Little Site Modification:** Rustic or rudimentary improvements are designed primarily for protection of the site rather than the comfort of users. Use of synthetic materials is avoided. Minimum controls are subtle. Little obvious regimentation is visible. Spacing is provided or permitted. The primary access is over primitive roads. Interpretive services are informal, almost subliminal.
3. **Site Modification Moderate:** Facilities provide approximately equal protection for the site and comfort for users. Contemporary or rustic design of improvements is usually based on the use of native materials. Inconspicuous vehicular controls are usually provided. Roads may be hard-surfaced and trails formalized. Development density is about three family units per acre. The primary access may be over high-standard roads. Interpretive services are informal, but generally direct.

4. **Site Heavily Modified:** Some facilities are designed strictly for comfort and convenience of users. Luxury facilities are not provided. Facility design may incorporate synthetic materials. Artificial surfacing of roads and trails is used extensively. Vehicle traffic controls are usually obvious. The primary access is usually over paved roads. Development density is about three to five family units per acre. Plant materials are usually native. Interpretive services are often formal or structured.
5. **High Degree of Site Modification:** Facilities are mostly designed for comfort and convenience of users and usually include flush toilets. Showers, bathhouses, laundry facilities, and electrical hook-ups may also be included. Synthetic materials are commonly used. Formal walkways or surfaced trails are evident. The regimentation of users is obvious. Access is usually by high-speed highways. Development density is five or more family units per acre. Plant materials may be foreign to the environment. Formal interpretive services are usually available. Designs are formalized and architecture may be contemporary. Mowed lawns and clipped shrubs are not unusual.

Recreation Information Management (RIM) - The Forest Service system for recording recreation facility condition and use.

Recreation Opportunity - Availability of a real choice for a user to participate in a preferred activity within a preferred setting in order to realize desired experiences.

Recreation Opportunity Spectrum (ROS) - A system for planning and managing recreational resources that categorizes recreational opportunities into eight classes (listed below). Each class is defined in terms of the degree to which it satisfies certain recreational experience needs based on the extent to which the natural environment has been modified, the type of facilities provided, the degree of outdoor skills needed to enjoy the area, and the relative density of recreation use.

- **Primitive:** The area is characterized by an essentially unmodified natural environment of fairly large size. Interaction between users is very low and evidence of other users is minimal. The area is managed to be essentially free from evidence of human-induced restrictions and controls. Motorized use within the area is not permitted.
- **Semi-primitive Nonmotorized:** The area is characterized by a predominately natural or natural-appearing environment of moderate to large size. Interaction between users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but would be subtle. Motorized recreation is not permitted,
- but local roads used for other resource management activities may be present on a limited basis. Use of such roads is restricted to minimize impact on recreational opportunities.
- **Semi-primitive Motorized:** The area is characterized by a predominately natural or natural appearing environment of moderate to large size. The concentration of users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but would be subtle. Motorized use of local primitive or collector roads with predominately natural surfaces and trails suitable for motor bikes is permitted.

Recreation Opportunity Spectrum, cont.

- **Roaded Natural:** The area is characterized by predominately natural-appearing environments with moderate evidence of the sights and sounds of people. Such evidence is usually harmonious with the natural environment. Interaction between users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident but compatible with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities.
- **Roaded Natural Nonmotorized (Dakota Prairie only):** The area is closed to motorized use, yet has been heavily modified or is not large enough to be set aside as semi-primitive nonmotorized.
- **Roaded Modified:** An area characterized by a natural environment that has been substantially modified by structure and vegetative manipulation. No on-site facilities are present except signing at major road junctions. Moderate evidence of other users on roads is present. Minimal site controls of users are present, except for gated roads.
- **Rural:** The area is characterized by a natural environment that has been substantially modified by development of structures, vegetative manipulation, or pastoral agricultural development. Resource modification and utilization practices may be used to enhance specific recreational activities and to maintain vegetative cover and soil. Sights and sounds of humans are readily evident, and the interaction between users is often moderate to high. A considerable number of facilities are designed for use by a large number of people. Facilities are often provided for special activities. Moderate user densities are present away from developed sites. Facilities for intensified motorized use and parking are available.
- **Urban:** The area is characterized by a substantially urbanized environment, although the background may have natural-appearing elements. Renewable resource modification and utilization practices are often used to enhance specific recreational activities. Vegetative cover is often exotic and manicured. Sights and sounds of humans are predominant on the site. Large numbers of users can be expected both on the site and in nearby areas. Facilities for highly intensified motor use and parking are available, with forms of mass transit often available to carry people throughout the site.

Recreation Visitor Day (RVD) - A unit for measuring recreational activities, which aggregates 12 visitor hours. This may consist of one person for 12 hours, 12 persons for one hour, or any equivalent combination of continuous or intermittent recreation use by individuals or groups. RVDs are used to measure recreational production or output capacity.

Recreational Livestock Use - The use of an area with animals, such as horses and mules, in conjunction with recreation, like horseback riding.

Recreational Residence - A house or cabin on National Forest System lands, including national grasslands, used seasonally for recreation, but not the primary residence of the owner.

Reference Areas – Land areas selected, managed and monitored to help determine the local biological site potential to provide quality habitat for a plant or animal species or community.

Reforestation - The renewal of forest cover by seeding, planting, and natural means.

Refugia - Areas that have not been exposed to great environmental changes and disturbances undergone by the region as a whole. Refugia provide conditions suitable for survival of species that may be declining elsewhere.

Regeneration - The renewal of a tree crop, whether by natural or artificial means. This term may also refer to the crop itself.

Region - An administrative unit within the National Forest System lands, which includes national grasslands. The United States is divided into nine geographic regions. Each region has a headquarter office and is supervised by a regional forester. Each region contains national forests and sometimes national grasslands or other lands administered by the Forest Service.

Regional Forester - The official responsible for administering a single region.

Regional Guide - A document developed to meet the requirements of the Forest and Rangeland Renewable Resources Act of 1974, as amended, that guides all natural resource management activities and established management standards and guidelines for National Forest System lands, including national grasslands in a given Region. This management direction is applied to the national forests and national grasslands within that Region.

Rehabilitation - Actions taken to restore or reclaim site productivity, water quality, or other values.

Relict - A remnant or fragment of the climax plant community that remains from a former period when it was more widely distributed.

Renewable Resources - Resources that can be used indefinitely when the use rate does not exceed the ability to renew the supply. However, in the RPA program, the term is used to describe those matters within the scope of the responsibilities and authorities of the Forest Service as required by the Forest And Rangeland Renewable Resources Planning Act of 1974. Consequently, the renewable resources include: timber, range, minerals, wildlife and fish, water, recreation, and Wilderness.

Research Natural Area (RNA) - A physical or biological unit in which current natural conditions are maintained insofar as possible. These conditions are ordinarily achieved by allowing natural, physical, and biological processes to prevail without human intervention. However, under unusual circumstances, deliberate manipulation may be utilized to maintain the unique feature that the RNA was established to protect.

Residual Cover – Standing or lodged herbaceous vegetation left after livestock grazing and killing frost.

Resource Road - A road that access an oil and gas facility and terminates at that facility

Resource Values - The tangible and intangible worth of forest and grassland resources.

Response Guild – A group of plant or animal species that respond in a similar way to changes in habitat conditions resulting from land uses or management activities.

Responsible Official - The Forest Service employee who has the delegated authority to make a specific decision.

Rest - To leave an area of rangeland ungrazed by livestock or unharvested by mechanical methods for at least one year (12 consecutive months).

Rest Rotation (Livestock Grazing) - An intensive system of management where grazing is deferred on various parts of the range during succeeding years, allowing the deferred part complete rest for one year. At least two, but usually three or more, separate grazing units are required.

Restoration - Holistic actions taken to modify an ecosystem to achieve desired, healthy, and functioning conditions and processes. Generally refers to the process of enabling the system to resume its resiliency to disturbances.

Revegetation - The reestablishment and development of plant cover. This may take place naturally through the reproductive processes of the existing flora or artificially through reforestation or reseeding.

Revision Topics - Major focus areas for land and resource management plan revisions identified through the public involvement and the need for change.

Rhizome - A horizontal underground stem, usually sending out roots and above-ground shoots from the nodes.

Rights-of-Way - 1) Land authorized to be used or occupied for the construction, operation, maintenance, and termination of a project or facility passing over, upon, under, or through such land (36 CFR 251.51). 2) The privilege that one person or persons particularly described may have of passing over the land of another in some particular line.

Riparian - The bands and adjacent areas of water bodies, water courses, seeps, and springs whose waters provide soil moisture in excess of what is locally available. This results in a more moist habitat than that found on the contiguous flood plains and uplands. Refers to land bordering a stream, lake, or tidewater, and generally implies a particular type of habitat physiognomy often characterized by an over story of trees or other large woody plants with a complex under story of other woody and/or herbaceous species.

Riparian Area - Areas of the aquatic and riparian ecosystems with distinctive resource values and characteristics that are geographically delineated (FSM 2526). Ecological units with distinctive vegetation, landform, soil, and water regimes consisting of the aquatic ecosystem and wet-to-moist areas located between aquatic ecosystems and adjacent terrestrial ecosystems. Includes floodplains and wetlands. Riparian ecosystems are distinguished by soil characteristics and distinctive existing or potential vegetation communities that are adapted to soils with consistently high levels of moisture.

Riparian Communities - Repeating, classified, defined and recognizable assemblages of plant or animal communities associated with riparian areas.

Riparian Ecosystem - A transition between the aquatic ecosystem and the adjacent upland terrestrial ecosystem. It is identified by soil characteristics and by distinctive vegetative communities that require free or unbounded water.

Ripping - The mechanical penetration and shearing of range soils to depths of 8 to 18 inches for the purpose of breaking hardpan layers to facilitate penetration of plant roots, water, organic matter, and nutrients. A range improvement practice used where native grasses of a rhizomatous nature can be spread into the ripped soil.

Risk Assessment - Process of gathering data and making assumptions to estimate short- and long-term effects on human health or the environment from particular products or activities.

Risk Index (Fire Management) - A number related to the probability of an ignition.

Road - A general term denoting a way with at least two-wheel tracks for purposes of travel by vehicles greater than 50 inches in width.

Road Credits - Credits earned by timber purchasers and which are applied toward the sale price of timber in exchange for building the roads needed for access.

Road Density - Road density refers to the miles of road per square mile. There are different road densities depending on what road types are being considered.

- **Forest Development Road Density:** The miles of Forest Development Roads per square mile. This is the road density of the road system managed by the Forest Service for resource management.
- **Open Road Density:** The miles of Forest Development Roads and other private and public roads and highways open for public travel.
- **Wheel-track Density:** The miles of established wheel tracks per square mile. Wheel tracks are not managed as part of the Forest Development Road System and are formed by repeated travel off system roads by users.

Road Functional Classification - The way in which a road services land and resource management needs and the character of services it provides. Functional classification for roads include the following:

- **Forest Arterial Road:** Provides service to large land areas and usually connects with public highways or other Forest Service arterial roads to form an integrated network of primary travel routes. The location and standard are often determined by a demand for maximum mobility and travel efficiency rather than specific resource management service. It is usually developed and operated for long-term land and resource management purposes and constant service.
- **Forest Collector Road:** Serves smaller land areas than a Forest Arterial Road and is usually connected to a Forest Arterial Road or public highway. Collects traffic from Forest Local Roads and/or terminal facilities. The location and standard are influenced by both long-term multi-resource service needs, as well as travel efficiency. May be operated for either constant or intermittent service, depending on land use and resource management objectives for the area served.
- **Forest Local Road:** Connects terminal facilities with Forest Collector or Forest Arterial Roads or public highways. The location and standard are usually controlled by a specific resource activity rather than travel efficiency. Forest Local Roads may be developed and operated for either long- or short-term service.

Road Maintenance Level - Defines the level of service provided by, and maintenance required for, a specific road, consistent with road management objectives and maintenance criteria. There are five maintenance levels:

- **Maintenance Level 1:** Assigned to intermittent service roads during the time they are closed to vehicular traffic. The closure period is one year or longer. Basic custodial maintenance is performed.
- **Maintenance Level 2:** Assigned to roads open for use by high-clearance vehicles. Passenger car traffic is not a consideration.

Road Maintenance Level, cont.

- **Maintenance Level 3:** Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities.
- **Maintenance Level 4:** Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds.
- **Maintenance Level 5:** Assigned to roads that provide a high degree of user comfort and convenience. Normally, roads are double-laned and paved or aggregate-surfaced with dust abatement.

Road Prism - Equivalent to the term roadway. The portion of the road within the limits of excavation and embankment, including slope rounding. A similar term is road template, the shape and cross-sectional dimensions of the roadway to be constructed as defined by the construction staking notes and the characteristics of the typical sections.

Roadless Analysis - A scientifically-based procedure to assess environmental and social issues and concerns associated with maintaining, constructing, reconstructing, and decommissioning National Forest System roads such as that found in the report, Roads Analysis: Informing Decisions About Managing the National Forest Transportation System, (USDA Forest Service, 1999, Misc. Rep. FS-643).

Roadless Area - Areas within the National Forest System, which are evaluated and considered as potential wilderness areas. They are areas which remain essentially roadless and undeveloped, and which have not yet been designated as wilderness or for other uses by law. Direction for evaluating potential wilderness and recommending areas to the congress for wilderness designation is found in 36 CFR 219.17 and FSM 1923. The procedures for identifying and evaluating potential wilderness in the National Forest System are found in FSH 1909.12.

Roadless Area Review and Evaluation II (RARE II) - A comprehensive process, instituted in June 1977, to identify roadless and undeveloped land areas in the National Forest System, including national grasslands, and to develop alternatives for both Wilderness and other resource management.

Roadless Inventory - Roadless areas identified by following the inventory criteria listed in FSH 1909.12 Chapter 7.

Roadside Corridor - A passageway that frames a road or travel way. The corridor includes the viewing area and facilities, which may be within the immediate roadside area or part of a sweeping distance panorama.

Rocky Mountain Region - The Forest Service organizational units consisting of Colorado, Wyoming, part of South Dakota, Nebraska, and Kansas. Also known as Region 2.

Rodenticide - A chemical agent formulated to kill rodents.

Rotation - The planned number of years between the formation or regeneration of a crop or stand and its final cutting at a specified stage of maturity.

Rotation Grazing - A grazing scheme where animals are moved from one grazing unit (paddock) in the same group of grazing units to another without regard to specific graze/rest periods or levels or plant defoliation.

RPA Assessment and Program - The RPA Assessment is prepared every 10 years and describes the potential of the nation's forests and rangelands to provide a sustained flow of goods and services. The RPA Program is prepared every five years to chart the long-term course of Forest Service management of the national forests and national grasslands, assistance to state and private landowners, and research. An RPA Assessment and Program are prepared in response to Sections 3 and 4 of the Forest and Rangeland Renewable Resources Planning Act of 1974.

Runoff - The total stream discharge of water, including both surface and subsurface flow, usually expressed in acre-feet of water yield.

Rural Development - A partnership or program designed to enrich the cultural life, enhance the environment, provide employment, and improve living conditions in rural America.

Savanna - A grassland with scattered trees, either as individuals or clumps. Often a transitional type between true grassland and forest.

Scenery - General appearance of a place, a landscape, or features of a landscape.

Scenery Management - The art and science of arranging, planning, and designing landscape attributes relative to the appearance of place and expanses in outdoor settings.

Scenic Area - A unit of land with outstanding natural beauty that requires special management to preserve this beauty.

Scenic Attractiveness - The scenic importance of a landscape based on human perceptions of the intrinsic beauty of landform, rock form, water form, and vegetation pattern. Reflects varying visual perception attributes of variety, unity, vividness, intactness, coherence, mystery, uniqueness, harmony, balance, and pattern.

- **Distinctive:** Areas where landform, vegetation patterns, water characteristics, and cultural features combine to provide unusual, unique, or outstanding scenic quality. These landscapes have strong positive attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern, and balance.
- **Typical:** Areas where landform, vegetation patterns, water characteristics, and cultural features combine to provide ordinary or common scenic quality. These landscapes have generally positive, yet common attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern, and balance. Normally they would form the basic matrix within the ecological unit.
- **Indistinctive:** Areas where landform, vegetation patterns, water characteristics, and cultural land uses have low scenic quality. Often water and rock form of any consequence are missing in class C landscapes. These landscapes have weak or missing attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern, and balance.

Scenic Class - A system of classification describing the importance or value of a particular landscape or portions of that landscape.

Scenic Easement - An interest in the land that allows the easement holder specified uses or rights without actual ownership of the land; in this case, control of the use of land adjacent to public highways, parks, and rivers. It may provide something attractive to look at within the easement area, an open area to view something attractive beyond the easement itself, or a screen to block out an unsightly view beyond the easement area.

Scenic Integrity (Existing or Objective) - State of naturalness or, conversely, the state of disturbance created by human activities or alteration. Integrity is stated in degrees of deviation from the existing landscape character in a national grassland or forest. The scenic integrity levels are:

- **Very High (Unaltered): Preservation.** This level refers to landscapes where the valued landscape character is intact with only minute, if any, deviations. The existing landscape character and sense of place is expressed at the highest possible level.
- **High (Appears Unaltered): Retention.** This level refers to landscapes where the valued landscape character appears intact. Deviations may be present but must repeat the form, line, color, texture and pattern common to the landscape character so completely and at such scale that they are not evident.
- **Moderate (Slightly Altered): Partial retention.** This level refers to landscapes where the valued landscape character appears slightly altered. Noticeable deviations must remain visually subordinate to the landscape character being viewed.
- **Low (Moderately Altered): Modification.** This level refers to landscapes where the valued landscape character appears moderately altered. Deviations begin to dominate the valued landscape character being viewed, but they borrow valued attributes such as size, shape, vegetative type changes or architectural styles outside the landscape being viewed. They should not only appear as valued character outside the landscape being viewed but compatible or complimentary to the character within.
- **Very Low (Heavily Altered): Maximum Modification.** This level refers to landscapes where the valued landscape character appears heavily altered. Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, vegetative type changes or architectural styles within or outside of the landscape being viewed. However, deviations must be shaped and blended with the natural terrain (landforms) so that elements such as roads, and structures do not dominate the composition.
- **Unacceptably Low:** This level refers to landscapes where the valued landscape character being viewed appears extremely altered. Deviations are extremely dominant and borrow little if any form, line, color, texture, pattern, or scale from the landscape character. Landscapes at this level of integrity need rehabilitation.

Scenic Resource - Attributes, characteristics, and features of landscapes that provide varying responses from, and varying degrees of benefits to, humans.

Scoping Process - An early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to the proposed action. Identifying the significant environmental issues deserving of study and de-emphasizing insignificant issues, narrows the scope of the environmental impact statement accordingly.

Scoria - Porcellanite, one of the saleable minerals. Used widely for surfacing roads. A natural by-product of prehistoric burning of coal and shale beds.

Season-long Grazing (Livestock Grazing) - Allowing livestock to graze a single pasture throughout one growing season.

Secondary Range - Range that is lightly used or unused by livestock under minimal management and will ordinarily not be fully used until the primary range has been overused.

Sediment - Material suspended in water or deposited in streams and lakes.

Sediment Load - The solid material transported by a stream and expressed as the dry weight of all sediment that passes a given point in a given period of time.

Sediment Yield - Amount of sediment leaving an analysis area and entering a channel.

Seeps - A spot where water or petroleum flows from the earth, often forming the source of a small stream.

Self-sustaining Fish Population - A reproducing fish population that does not require supplemental hatchery stocking.

Sensitive Species - Those plant and animal species identified by Regional Foresters for which population viability is a concern, as evidenced by the following:

- Significant current or predicted downward trends in population numbers or density.
- Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

Sensitivity Levels (Visuals) - A measure of people's concern for the scenic quality of the national forests and national grasslands. Three sensitivity levels are employed, each identifying a different level of user concern for the visual environment: Level 1 (highest sensitivity), Level 2 (average sensitivity), and Level 3 (lowest sensitivity).

Seral (Ecology) - A biotic community that is in a developmental, transitory stage in an ecological succession.

Seral Stages (Ecology) - The sequence of a plant community's successional stages to potential natural vegetation.

Sere - The series of stages that follow one another in an ecologic succession. A series of biotic communities that follow one another in time on any given area of the earth's surface.

Severely Burned Soil - A condition in which most woody debris and the entire forest or grassland floor is consumed down to bare mineral soil. Soil may have turned red due to extreme heat. Also, fine roots and organic matter are charred in the upper one-half inch of mineral soil.

Shortgrass - Grasses which normally are only a few inches tall, including blue and hairy grama and buffalograss

Shortgrass prairie - Native grasslands which are dominated by shortgrasses.

Short-term Transportation Facility - A facility developed and operated for a limited period of time that will cease to exist as a transportation facility after the purpose for which it was constructed is completed and the occupied land is reclaimed and managed for natural resource purposes.

Significant Archeological Sites - Sites eligible for inclusion in the National Register of Historic Places as determined by the Forest Service in consultation with the State Historic Preservation Officer.

Silviculture - Generally, the science and art of tree management, based on the study of the life history and general characteristics of forest trees and stands, with particular reference to local factors. More particularly, the theory and practice of controlling the establishment, composition, constitution, and growth of forests for desired conditions.

Site Productivity - Production capability of specific areas of land.

Snag - A standing dead tree or standing portion from which at least the leaves and smaller branches have fallen. Often called a stub if it is less than 20 feet tall.

Social Analysis - An analysis of the social (as distinct from the economic and environmental) effects of a given plan or proposal for action. Social analysis includes identification and evaluation of all pertinent desirable and undesirable consequences to all segments of society.

Soft Snag – A snag composed primarily of wood in advanced stages of decay and deterioration, particularly in the sapwood portions; generally not merchantable.

Soil Compaction - A physical change in soil properties that results in a decrease in porosity and an increase in soil bulk density and strength.

Soil Erosion - The detachment and movement of soil from the land surface by water or wind. Soil erosion and sediment are not the same.

Soil Productivity - The inherent capacity of a soil to support the growth of specified plants, plant communities, or a sequence of plant communities. Soil productivity may be expressed in terms of volume or weight/unit area/year, percent plant cover, or other measures of biomass accumulation.

Soil Profile - A vertical section of the soil from the surface down through all of its layers into the parent material.

Soil Survey - A general term for the systematic examination of soils in the field and in laboratories; their description and classification; the mapping of soil types; the interpretation of soils according to their adaptability for various crops, grasses, and trees; their response to treatment for plant production or for other purposes; and their productivity under different management systems.

Soil Surveys - The systematic examination, description, classification, and mapping of soils in an area.

Special Interest Area - Place with unusual scenic, historic, prehistoric, scientific, natural, or other special attributes which merit special attention and management.

Special Stipulations - Terms and conditions of use attached to leases, where needed, to protect specific resources or uses on National Forest System lands, including national grasslands (36 CRF 261.2).

Special Uses - Improvements or activities owned or carried out by private individuals, corporations, or other business entities on National Forest System lands, including national grasslands, under the authorization of a permit.

Special-use Application - A written request for use of National Forest System lands, including national grasslands.

Special-use Permits - A permit, term permit, lease, or easement that allows occupancy, use, rights, or privileges on National Forest System lands, including national grasslands (36 CFR 261.2).

Species - A group of potentially interbreeding populations that are reproductively isolated from other such groups.

Species at Risk – Federally listed endangered, threatened, candidate, and proposed species and other species for which loss of viability, including reduction in distribution or abundance, is a concern within the planning area. Other species at risk include sensitive species and state listed species.

Species Composition – The proportions of various plant species in relation to the total on a given area. It may be expressed in terms of cover, density, weight, etc.

Species Diversity - A measurement that relates the density of individuals of a species in a habitat to the number of different species present in the habitat. The number of different species in a given habitat.

Species Viability - A species consisting of self-sustaining and interacting populations that are well distributed through the species' range. Self-sustaining populations are those that are sufficiently abundant and have sufficient diversity to display the array of life history strategies and forms to provide for their long-term persistence and adaptability over time.

Split-estate (Minerals) - Lands where the surface estate is owned by one entity and the mineral estate is owned by another.

Stabilization (Heritage Resources) - Arresting the deterioration of a damaged heritage resource in order to prevent further damage from occurring. Stabilization may include reconstructing portions of the heritage resource.

Stand - A community of trees or other vegetative growth occupying a specific area and sufficiently uniform in species composition, age, spatial arrangement, and conditions as to be distinguishable from the other growth on adjoining lands, so forming a silvicultural or management entity.

Standard - Actions that must be followed or are required limits to activities in order to achieve grassland or forest goals and objectives. Site-specific deviations from standards must be analyzed and documented in management plan amendments.

Standard Lease Terms (SLT) – The terms incorporated into every oil and gas lease. Standard lease terms require compliance with all laws and regulations to ensure protection of other energy, mineral, and surface resources, such as soil, water, vegetation, cultural, and threatened and endangered species. It is important to recognize that the authorized officer has the authority to modify the siting and design of facilities, control the rate of development and timing of activities as well as require other mitigation under Sections 2 and 6 of the standard lease terms (BLM Form 3100-11 and 43 CFR 3101.1-23).

State Historic Preservation Officer (SHPO) - A person appointed by a state's governor to administer the State Historic Preservation Program.

Step-out Well - A well drilled adjacent to or near a proven well to ascertain the limits of the oil or gas reservoir. An outpost is a well drilled a farther distance (a couple of miles) from a step-out well, but still on the same structural trend.

Stewardship - Caring for land and associated resources and passing healthy ecosystems to future generations.

Stipulation (Oil and Gas) - A provision that modifies standard lease rights attached to and made a part of the lease.

Stocking Rate (Livestock Management) - The actual number of animals, expressed in either animal units or animal unit months, on a specific area for a specific time.

Stream Health - The condition of a stream, relative to robust health, for that stream type and landscape, considering indicators such as channel pattern, slope, particle size, pool frequency and depth, bank vegetation, and woody debris, which reflect the stability and habitat quality of the stream.

Stream Order - A classification of the relative position of streams in a channel network. Each nonbranching channel segment is designated as a first-order stream. The channel segment below the confluence of the two first-order tributaries. The channel segment below the confluence of two second-order streams is designated a third-order stream, etc.

Stream Type - A class of stream reach having a discrete combination of valley geomorphology and climate, flow regime, stream size, and channel morphology, which differs from other stream types in its ability to support biota and respond to management.

Structural Stages (Silviculture) - Any of several developmental stages of tree stands described in terms of tree age and the extent of canopy closure they create.

Structural Stage 1 (Grass/Forb): Forest openings created by disturbances, such as fire or wind throw. Meadows and prairies are also modeled as grass/forb, although succession will not move beyond this stage.

Structural Stage 2 (Shrubs/Seedlings): Developmental stage dominated by tree seedlings (less than one-inch diameter breast height) and shrub species.

Structural Stage 3 (Sapling/Pole): Developmental stage dominated by young trees up to seven inches diameter breast height, 10 to 50 feet tall, and usually less than 50 years old. This stage is subdivided into three canopy closure classes: 1) less than 40 percent, b) 40 to 70 percent, and c) greater than 70 percent.

Structural Stage 4 (Mature): Consists of trees larger and older than Structural Stage 3. Also classified by the same canopy closure categories as Structural Stage 3.

Structural Stage 5 (Old Growth): This structural stage is characterized by trees 160 years of age and older.

Structure - See Vegetation Structure.

Submarginal Land - Land that is either physically or economically incapable of indefinitely sustaining a certain use.

Subsection (Ecological) - An ecological unit which is characterized by a combination of climate, geomorphic process, topography, and stratigraphy.

Subspecies - A genetically distinct subunit of a species.

Succession - The progress of vegetational development where different plant communities successively occupy an area.

Successional Stages (Seral Stages) - The relatively transitory communities that replace one another during development toward a potential natural community.

Suitable Lands - Lands that are appropriate for the application of certain resource management practices as determined by an analysis of the economic and environmental consequences and the alternative uses foregone.

Suitable Rangeland - 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 uses forgone. A unit of land may be suitable for a variety of individual or combined management practices.

Sundry Notice (Oil and Gas) - Standard form to notify and/or approve well operations subsequent to an Application to Permit to Drill in accordance with Forest Service regulations.

Suppress a Fire - To extinguish a fire or contain it within specified boundaries.

Surface Occupancy (Minerals) - The occupancy of the surface with mining activities. When approved, occupancy will be identified in the operation plan.

Suspended Sediment - The very fine soil particles that remain suspended in water for a considerable period of time without contact with the bottom of the channel.

Sustainability - Continuation of a desired level of productivity, quality, or variability, generally of organisms.

Sustained Yield - The achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources on National Forest System lands, including national grasslands, without impairment of the productivity of the land.

Swale - An area of low, sometimes wet, land.

Swing Pasture - A pasture that is not used by livestock unless climatic conditions, such as drought, fire, or hail affect other pastures and warrant the use of the pasture

Tailings (Minerals) - The parts or a part of any incoherent or fluid material separated as refuse or separately treated as inferior in quality or value, also leavings; remainders; dregs. The sand, gravel and cobbles that pass through the sluices in hydraulic mining were formerly designated as tailings; more recently, they have been called mining debris or simply debris in states and U.S. legislative documents.

Tailings Disposal - The act of disposing or placing of ore materials after completion of processing.

Tallgrass - Grasses that normally grow over 36 inches tall, as in big bluestem.

Tallgrass prairie - Native prairie grassland characterized by tall and midgrasses, located primarily in the eastern Great Plains; synonymous with true prairie.

Talus Slopes - The accumulation of broken rocks that occurs at the base of cliffs or other steep slopes.

Target Surveys – Surveys that are strategically designed to determine the presence or absence or to monitor selected plant or animal species.

Targets - Objectives assigned to the Forest by the Regional Plan.

Temporary Facility - Any structure or other human-made improvement that can be readily and completely dismantled and removed from the site when the authorized use terminates.

Terrestrial - A land-based ecosystem. (See ecosystem). An interacting system of soil, geology, and topography with plant and animal communities.

Thermal Cover (Wildlife) - Cover used by animals to ameliorate the effects of weather. Optimally, thermal cover is provided by a stand of coniferous trees, 30 to 60 acres in size, at least 40 feet tall, with a canopy cover of at least 70 percent.

Thinning - The practice of removing some of the trees in a stand to meet desired conditions. Two types of thinning may be done:

> **Pre-commercial/Non-commercial:** Removing trees that are too small to make a merchantable product
>
> **Commercial:** Removing trees that have reached sufficient size to be manufactured into a product and to improve tree spacing and promote more rapid growth.

Threatened Species - Any species likely to become endangered within the foreseeable future throughout all or a significant portion of its range and that has been designated in the Federal Register by the Secretary of Interior as such.

Tiering - Refers to the elimination of repetitive discussions of the same issue by referencing the general discussion in an environmental impact statement of broader scope. For example, a project environmental assessment could be tiered to the Forest Plan EIS.

Timber - A general term applied to tree stands that provide a wood-fiber product.

Timber Base - The lands within a national forest or national grassland suitable for timber production.

Timber Production - The purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use, except fuel wood.

Timing Limitation (Seasonal Restriction) - Prohibits surface use during specified time periods to protect identified resource values. The stipulation does not apply to the operation or maintenance of production facilities unless the finding analysis demonstrates the continued need for such mitigation and the insufficiency of less stringent, project-specific mitigation measures.

Title Claim - A claim of land as a person's own, based on any reasonable evidence that establishes the person's actual use of the land as though the person had obtained ownership in fee (FSH 5509.1105). A claim of land as a person's own, based on any reasonable evidence that establishes the person's actual use of the land as though the person had full title from the time the person obtained ownership of the abutting land.

Topography - The configuration of a land surface including its relief, elevation, and the position of its natural and human-made features.

Toxic Waste - Poisonous residues that may be harmful to plants, animals, and humans.

Trace Fossils - A sedimentary structure consisting of a fossilized track, trail, burrow, or tube resulting from the life activities of an animal, such as a mark made by an invertebrate or vertebrate creeping, feeding, hiding, or resting on or in soft sediment.

Traditional Practitioners - American Indians who practice traditional cultural life ways and belief systems.

Traditional Use Areas - An area that is significant to a living community because of its association with cultural practices or beliefs that are rooted in the community's history and are important in maintaining the continuing cultural identity of the community.

Trail - The general term denoting a way for purposes of travel by foot, stock, or trail vehicle.

Trailhead - The parking, signing, and other facilities available at the terminus of a trail.

Trampling - Treading underfoot. The damage to plants or soil brought about by movements or congestion of animals.

Transitory Range - Land that is suitable for grazing use for a period of time. For example, on particular disturbed lands, grass may cover the area for a period of time before being replaced by trees or shrubs not suitable for forage.

Transportation Corridor - A strip of land that includes up to a maximum of 1,000 feet for major roads (500 feet either side of the road's centerline) or 500 feet for major trails (250 feet either side of the trail's centerline). Transportation corridors form a passageway that allows travelers to experience and interact with the quality and character of the landscape. Also called travel corridor.

Transportation Facility - Any developed facility to enhance or allow travel between two points. Transportation facilities include airports, highways, trails, railroads, and other facilities.

Transportation System - All roads needed to manage and administer Forest resources. A road network.

Transportation/Utility Corridor - A linear strip of land identified for the present location of transportation or utility rights-of-way within its boundaries.

Travel Corridor - A strip of land that includes up to a maximum of 1,000 feet for major roads (500 feet either side of the road's centerline) or 500 feet for major trails (25 feet either side of the trail's centerline). Travel corridors form a passageway that allows travelers to experience and interact with the quality and character of the landscape.

Travel Management - Travel management is the movement of people and products to and through national forests and national grasslands. It connects many different varieties of user and multiple uses on National Forest System lands.

Travel Order - A travel management decision issued by the responsible official to restrict, prohibit, or allow the use of a described area or facility to entry or mode of travel.

Travelways - A way of passage of vehicles, conveyances, persons, or domestic livestock (stock driveways), developed by construction or use; may be referred to as a road or trail.

Treated Area - An area on which management, like timber harvesting or prescribed burning, occurs.

Trespass - The act of going on another's land or property unlawfully.

Unclassified Road - A road that is not constructed, maintained, or intended for long-term highway use, such as roads constructed for temporary access and other remnants of short-term use roads, associated with fire suppression, timber harvest, and oil, gas, or mineral activities, as well as travel ways resulting from off-road vehicle use.

Understory (Vegetation) - The lowest layer of vegetation in a forest or shrub community composed of grass, forbs, shrubs and trees less than 10 feet tall. Vegetation growing under the tree canopy.

Undesirable Species - 1) Species that conflict with or do not contribute to the management objectives. 2) Species that are not readily eaten by animals.

Ungulate - A hoofed animal, including ruminants (cattle, but also horses, tapirs, elephants, rhinoceroses, and swine).

Universal Soil Loss Equation (USLE) - The USLE is an erosion model designed to predict average soil losses from sheet and rill erosion. The USLE does not predict deposition nor compute sediment yields from gully, stream-bank, and stream-bed erosion. USLE was developed by the Agricultural Research Service in cooperation with the Natural Resources Conservation Service (formerly the Soil Conservation Service) and state experiment stations.

Unpalatable Species (Range Management) - Plant species that are not readily eaten by an ungulate animal.

Unplanned Ignition - A fire started at random by either natural or human causes or a deliberate incendiary fire. Acceptance of unplanned ignitions as a prescribed fire must be within an approved plan.

Utility Corridors - Utility rights-of-way designated as corridors are normally based on the following specifications, except for areas of heavy concentration of smaller utilities on the Little Missouri National Grassland.

- Electrical Transmissions - 45 kilovolts or larger
- Pipelines - 8 inches or larger for crude oil; 12 inches or larger for all others
- Telecommunications - All fixed communication sites
- Telephone Lines - Main trunk lines and fiber optic

Utilization Levels (Livestock Grazing) - The portion of the current year's forage production by weight consumed or trampled by livestock. Utilization levels are usually expressed as a percentage.

Valid Existing Rights (Minerals) - Legal interest that attaches to a land or mineral estate and that cannot be divested from the estate until that interest expires or is relinquished.

Values at Risk (Fire Management) - Any or all natural resources, improvements, or other values that may be jeopardized if a fire occurs.

Vegetation Structure – The vertical characteristics of vegetation.

Vegetation Treatment - Any activities undertaken to modify the existing condition of the vegetation.

Vegetative Buffer Zones - Strips of grass or other erosion-resisting vegetation between areas of ground disturbance and areas needing protection from sedimentation.

Vegetative Management - Any activities undertaken to modify the existing condition of the vegetation.

Vertebrate Fossils - The fossilized remains of animals that had a bony skeleton or backbone.

Viable Population - A group of individuals of a particular species that produces enough offspring for long-term persistence and adaptation of the species or population in a given place. For planning purposes, 36 CFR 219.19 defines a viable population as one that has the estimated numbers and distribution of reproductive individuals to ensure that a continued viable population is well-distributed in the planning area. A planning area is further defined by 36 CFR 219.3 as the "area of the National Forest System covered by a regional guide or forest plan." Direction estimated numbers and distribution of reproductive individuals to ensure the continued existence of the species throughout its existing range (or range required to meet recovery for listed species) within the planning area.

Viewshed - Total visible area from a single observer's position or the total visible area from multiple observer positions. View sheds are accumulated seen areas from highways, trails, campgrounds, towns, cities, or other view locations. Examples are corridors, feature, or basin view-sheds.

Visitor Information Service (VIS) Site - A site that provides interpretive information (directional, historical, statistical) located at national forest or national grassland historical sites, over-look sites, or special interest areas.

Visual Absorption Capability (VAC) - The inherent capability of the landscape to support management activities without significantly affecting its visual character. Rated as high, moderate and low:

- **High:** High visual capability to absorb change.
- **Moderate:** Moderate visual capability to absorb change.
- **Low:** Low visual capability to absorb change.

Visual Obstruction Reading – A measurement of the height that herbaceous vegetation obscures 100% a round pole placed vertically in grassland vegetation.

Waiver (Oil and Gas) - Permanent exemption from a lease stipulation. The stipulation no longer applies anywhere within the leasehold.

Walk-in Fishery - Areas managed for semi-primitive, no motorized access to fishing in order to protect riparian ecosystems. Areas managed in such manner will be designated on the recreation map and at the specific sites.

Wallow - A depression, pool of water, or wet area produced or utilized by elk, moose, or bison during the breeding season.

Warm-Season Plant - A plant that makes most or all its growth during the spring, summer, or fall and is usually dormant in winter. A plant that usually exhibits the C4 photosynthetic pathway.

Warm-water Fishery - Stream and lake waters that support fishes with a maximum summer-temperature tolerance of about 80 degrees Fahrenheit. Bluegills, perch, and largemouth bass are examples of warm-water fish.

Waste Dumps (Minerals) - The area where the overburden or non-ore material is place. This material is derived from materials removed in gaining access to the targeted ore. Any dirt or rock that has been removed from its original location by mining operations.

Water Development - A facility constructed or placed to hold water for livestock use.

Water Influence Zone - The water influence zone (WIZ) includes the geomorphic floodplain, riparian ecosystem, and inner gorge. Its minimum horizontal width (from top of each bank) is the greater of 100 feet or the mean height of mature dominant late-seral vegetation. It includes adjacent unstable and highly-erodible soils. The WIZ protects interacting aquatic, riparian, and upland functions by maintaining natural processes and resilience of soil, water, and vegetation systems (Reid and Ziemer, 1994).

Water Rights - Rights given by state and federal governments for the diversion and use of water.

Water Table - The upper surface of the ground water or that level below which the soil is saturated with water.

Water Yield - 1) The measured output of surface water, usually measured in acre-feet. 2) The runoff from a watershed, including groundwater outflow.

Water Yield Treatments - Land management methods that affect the amount and/or timing of water yield. For example, certain harvest methods increase the likelihood that there will be increased water yield. Other management approaches, such as protecting and enhancing riparian areas, increase the likelihood that water flow will be sustained for a longer period of time.

Waters of the United States - Waters used for navigation and all other waters such as lakes, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, and their tributaries.

Watershed - The area of land, bounded by a divide, that drains water, sediment, and dissolved materials to a common outlet at some point along a stream channel (Dunne and Leopold, 1978), or to a lake, reservoir, or other body of water. Also called drainage basin or catchment.

Watershed Class - defined as follows:

- **Class I:** The watershed has high soil and water integrity relative to its natural potential condition. Disturbance does not compromise soil-hydrologic function of soil/stream resilience. No stream segment is damaged by physical, chemical, or biological impacts such that any designated beneficial use is not fully supported or any resource value is seriously degraded.
- **Class II:** The watershed has moderate soil and water integrity relative to its natural potential condition. Disturbance partly compromises soil-hydrologic function or soil/stream resilience. Recovery can occur naturally or through revised management with minimal capital investment. A minor part (less than 20%) of the stream segment miles are damaged by physical, chemical, or biological impacts such that any designated beneficial use is not fully supported or any resource value is seriously degraded.
- **Class III:** The watershed has low soil and water integrity relative to its natural potential condition. Disturbance widely compromises soil-hydrologic function or soil/stream resilience. Recovery requires capital investments and revised management. Land-disturbing actions are precluded, but must complement recovery. A major part (more than 20%) of the stream segment miles are damaged by physical, chemical, or biological impacts such that any designated beneficial use is not fully supported or any resource value is seriously degraded.

Watershed Order - The number assigned to an entire drainage basin contributing to the stream segment of a given order and bearing an identical designation; for example, a first-order watershed contains all of the drainage area of a first-order stream. Also called basin order.

Water-Use Facilities - These are facilities and structures which include diversion and discharge structures, ditches, and pipes.

Weed - Any plant growing where unwanted and having a negative value.

Weeding (Silviculture) - A silvicultural operation eliminating or suppressing undesirable vegetation, mainly herbaceous, during the seeding state of a forest crop so as to reduce competition with the seedling stand.

Wet Meadow - A meadow where the surface remains wet or moist throughout the growing season, usually characterized by sedges and rushes.

Wetland Communities - Plant communities that occur on sites with soils typically saturated with or covered with water most of the growing season.

Wetlands - Those areas that are inundated by surface water or groundwater with a frequency sufficient to support, and under normal circumstances do or would support, a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mudflats, and natural ponds.

Wild and Scenic Rivers - Rivers or sections of rivers designated by Congressional actions under the 1968 Wild and Scenic Rivers Act, as wild, scenic, or recreational by an act of the legislature of the state or states through which they flow. Wild and Scenic Rivers may be classified and administered under one or more of the following categories:

- **Wild River areas:** Rivers or sections of rivers that are free of impoundments with watersheds still largely primitive and shorelines largely undeveloped but accessible in places by roads.
- **Scenic River areas:** Rivers or sections of rivers that are free of impoundments, with watersheds still largely undeveloped but accessible in places by roads.
- **Recreational River areas:** Rivers or sections of rivers that are readily accessible by road or railroad that may have some development along their shorelines and that may have undergone some impoundment or diversion in the past.

Wildcat Well (Oil and Gas) - A well drilled in an area where oil and gas have not been previously discovered.

Wilderness - Areas designated by Congressional action under the 1964 Wilderness Act or subsequent acts. Wilderness is defined as undeveloped federal land retaining its primeval character and influence without permanent improvements or human habitation. Wilderness areas are protected and managed to preserve their natural conditions, which generally appear to be affected primarily by the forces of nature, with the imprint of human activity substantially unnoticeable. Wilderness areas have outstanding opportunities for solitude or for a primitive and confined type of recreation. They include at least 5,000 acres or are of sufficient size to make practical their preservation, enjoyment, and use in an unimpaired condition; they may contain features of scientific, educational, scenic, or historic value, as well as ecologic and geologic interest.

Wildfire - Any wild land fire not designated and managed as a prescribed fire within an approved prescription. An appropriate suppression action will be applied to all wildfires.

Wildland/Urban Interface - This references those lands that are intermingled private and National Forest System lands where one encounters residential developments.

Wildlife - Collectively the no domesticated vertebrate animals, except fishes. The natural community of animals.

Windthrow - The act of trees being uprooted by the wind.

Winter Feeding - Providing supplemental feed for livestock on National Forest System lands during the winter.

Winter Range - Rangeland that is grazed during the winter months.

Withdrawal (Minerals) - An action that restricts the use of public land and segregates the land from the operation of some or all of the public land and mineral laws.

Wooded Draws - A classification of areas, particularly in grassland settings, where an over story of woody vegetation in small drainages creates habitat for many animal species and shade, wind protection, and forage for livestock and wildlife. The vegetation is a result of higher moisture conditions than in the surrounding area, but surface water, if any, running through the area is generally short term.

Woodlot - A small area of land occupied by trees.

Workover - One or more of a variety of remedial operations on a producing well to try to increase production. Examples of workover operations are deepening, plugging back, pulling and resetting liner, squeeze cement, and so on. *(University of Texas at Austin, Petroleum Extension Service, 1979, Dictionary of Petroleum Terms)*

Workover rig - A portable servicing unit consisting of a hoist and engine mounted on a wheeled chassis with a self-erecting mast and substructure, with rotary, pump, pits, and other auxiliaries that permit handling and working a drill string or production string. *(Modified from definition of "production rig" in Dictionary of Petroleum Terms)*

Xeric - Having very little moisture. Tolerating or adapted to dry conditions.

Zone of Influence - A delineated geographic area within which the present and proposed actions exert an important influence on residents and visitors.

Zoological Area – Part of a national grassland or forest of high value for a native animal species or community.

APPENDIX H HABITAT DESCRIPTIONS

HIGH STRUCTURE GRASSLANDS

Management Indicator Species: Plains Sharp-tailed Grouse (*Tympanuchus phasianellus jamesi*)

The plains sharp-tailed grouse is selected as a management indicator species for the biological community most often found in grasslands with a diversity of structural stages, including an abundance of high structure grasslands. Interspersed shrubs and shrub communities also contribute to habitat suitability for this species and many other wildlife species. Habitats that are grazed lightly by livestock and/or periodically rested from annual livestock grazing generally benefit sharp-tailed grouse and many sensitive species including but not limited to short-eared owl, upland sandpiper, and long-billed curlew. Several species of upland nesting waterfowl also respond favorably to high structure levels resulting from lighter grazing intensities and periodic rest from annual grazing. A more complete list of other wildlife species that typically benefit from management for high vegetation structure, structurally diverse grasslands, and maintenance and enhancement of shrubs on grasslands is provided in the supporting FEIS.

Northern Mixed Grass Prairie

Hens on northern mixed grass prairie tend to select areas with the tallest and densest cover available for their nests in the spring. Most nest-site selection and initiation occurs in April and early May before or just as spring green-up is beginning. At this time most of the available cover is residual from previous growing seasons. In addition to being the primary cover available at the onset of nesting, residual cover also helps to offset the negative effects of a lack of current-year nesting cover during drought years when new vegetative cover is reduced or unavailable.

Cover height and density at nest sites in the spring frequently exceed average visual obstruction readings (Robel et al. 1970) of 6 inches. Average visual obstruction readings (VORs) of 11 inches have been reported at nest sites in some study areas. Hens frequently select clumps of herbaceous cover taller than the surrounding vegetation for their nest sites. Although it's dependent on the uniformity of livestock grazing within an area, average VORs of 4 inches or more across pastures or range sites in the spring typically provide patches of suitable cover for nest sites. Average VORs of 3 inches or more in the spring will provide suitable cover for a few nest sites but only if forage utilization by livestock has been patchy rather than uniform. If cover levels are being monitored in the fall or early winter after livestock grazing, loss of cover over the winter to wind, snowpack and other natural factors has to be considered to reasonably predict nesting cover conditions the following spring. Long-term monitoring of over-winter loss of cover will help better determine the relationships between fall and spring cover levels.

Another important consideration in the management of nesting cover for this species is the size of the grassland patches providing quality cover for nest sites. If quality nesting habitat occurs as small islands in a sea of moderately to heavily grazed habitat with relatively low and uniform cover levels, predation may reduce nesting success in the quality habitat. Under these conditions, nest densities may also be substantially lower than what could be expected where quality habitat is provided across a higher percentage of the landscape. Within sharp-tailed grouse habitat, at least 20%of the area around display grounds or across potential habitat should be managed as quality nesting cover to establish or maintain populations. To maximize sharp-tailed grouse populations, approximately 80% or more of an area should be managed as quality nesting habitat. Most nests are located within 1 mile of display grounds. Individual patch sizes of quality nesting cover across pastures or range sites should be at least 160 acres in size.

Quality nesting cover on mixed grasslands occurs where mid and/or tall grass species are dominant, and ungrazed or lightly grazed cover has accumulated over a few years. On more productive grasslands (17 or more inches of average annual precipitation) where mid and/or tall grass species are dominant, hens commonly find quality cover on upland sites. On less productive mixed-grass prairies that receive an average of 14 to 16 inches of precipitation, less quality nesting cover is typically found on upland sites and the taller and denser cover patches in run-in sites and along drainages become more important for nesting. Where long-term grazing has reduced the composition of mid and/or tall grass species, quality nesting cover is sometimes unavailable regardless of the grazing intensity.

Although residual cover is an important factor influencing sharp-tailed grouse productivity, maintaining adequate levels of current-year vegetation as nesting and brood cover is also critical. Also, a diversity of plant species composition and cover levels across the landscape helps provides quality brooding habitat. This diversity should include conditions that favor forb production and a full range of cover levels within pastures or grazing allotments, including substantial areas with relatively high vertical grassland structure remaining through August as escape cover from predators, especially raptors.

To provide quality nesting and brooding habitats, herbaceous vegetation and litter should be allowed to accumulate over a period of years. However, to maintain optimum breeding and foraging habitats over time requires periodic burning or intensive grazing once every 3 to 5 years to maintain vigor of native grasses and forbs. This interval should be extended when drought conditions occur.

Preferred winter habitats include structurally diverse grasslands with interspersed shrubs. Tree buds and fruits of buffaloberry, rose, snowberry, and juniper are common winter foods in many areas. Small grains and croplands on intermingled private croplands are also heavily utilized when available.

Sandhills Prairie

Much of the information presented above can be used to describe quality sharp-tailed grouse habitat in the Nebraska Sand Hills. However, some adjustments are needed in the recommended VORs for quality nesting cover. Because sandhill prairies are more characteristic of a bunchgrass community with patchy vegetation and frequent bare ground in the hills, VORs are typically less than those from sod-forming grasslands with more continuous vegetative cover.

The average VOR of residual cover in the general vicinity of nest sites in the sandhills most often exceeds 3 inches. Nests are frequently positioned against or within clumps of little bluestem or sand lovegrass. Suitable patches of residual cover for nest sites in the spring are usually provided by maintaining average VORs of 2 inches or more across the steeper hills (sands and choppy sands range sites). If cover levels are being monitored in the fall or early winter after livestock grazing, loss of cover over the winter to wind, snowpack and other natural factors has to be considered to reasonably predict nesting cover conditions the following spring. Long-term monitoring of over-winter loss of cover will help better determine the relationships between fall and spring cover levels. Quality nesting habitat conditions across 25%or more of an area is generally needed to maintain grouse populations over time. Resting approximately 15% of an area from annual livestock grazing is also recommended for enhancing sharp-tailed grouse habitat and populations in the sandhills.

Maintaining cover through July as shade for broods is also critical since surface temperatures on the sandy soils during the brooding season can be extreme.

Preferred winter habitats include grasslands with moderate and heavy amounts of herbaceous cover interspersed with shrub and forb patches for foraging. Fruits of snowberry, rose, juniper, and poison ivy are common winter foods. Insects including beetles and grasshoppers are also common food items throughout much of the year.

HIGH STRUCTURE GRASSLANDS

Management Indicator Species: Greater Prairie Chicken (*Tympanuchus cupido pinnatus*)

The greater prairie chicken is selected as a management indicator species for the biological community most often found in grasslands with a diversity of structural stages, including an abundance of high structure grasslands. A list of other wildlife species that typically benefit from management that emphasizes high grassland structure and structurally diverse grasslands is provided in the supporting FEIS. Some of these species include sharp-tailed grouse, short-eared owl, upland sandpiper, and long-billed curlew and Dakota skipper. Several species of upland nesting waterfowl also respond favorably to higher grassland structure levels resulting from lighter livestock grazing intensities and periodic rest from annual grazing.

Northern Mixed Grass Prairie

Hens on mixed-grass prairie tend to select undisturbed (no livestock present) areas with the tallest and densest cover available for their nests. Most nest-site selection and initiation occurs in April and early May, and the availability of sufficient quality and quantity of residual cover at that time is critical. Residual cover also helps to offset the negative effects of a lack of current year nesting cover during drought years when new growth to serve as cover is reduced or unavailable.

Like sharp-tailed grouse, prairie chicken hens frequently select clumps of herbaceous cover taller than the surrounding vegetation for their nest sites. Average VORs at prairie chicken nests on the Fort Pierre National Grassland generally exceed 6 inches and may exceed 10 inches at some nests. Average VORs of 4 inches or more across the more productive range sites in the spring typically provide suitable cover for nest sites. If cover levels are being monitored in the fall or early winter after livestock grazing, loss of cover over the winter to wind, snowpack and other natural factors has to be considered to reasonably predict nesting cover conditions the following spring. Long-term monitoring of over-winter loss of cover will help better determine the relationships between fall and spring cover levels.

Another important consideration in the management of nesting cover for this species is the size of area providing quality nesting cover. If quality nesting habitat occurs as small islands in a sea of moderately to heavily grazed habitat with relatively low and uniform cover levels, predation may reduce nesting success in the quality habitat. Under these conditions, nest densities may also be substantially lower than what could be expected where quality habitat is provided across a higher percentage of the landscape. A range of 30 to 50%of the habitat around display grounds or across potential prairie chicken habitat should be managed as quality nesting cover to establish or maintain populations. Most nests are located within 1 mile of display grounds. Individual patch sizes of quality nesting cover across pastures or range sites should be a minimum of 160 acres.

Minimum grassland areas for prairie chicken populations is considered several thousand acres, but this figure shouldn't be assumed to support viable prairie chicken populations. In the northern part of the chickens range, over 13,000 to 26,000 acres of quality nesting, brooding, wintering and roosting habitat are likely needed to support a viable prairie chicken population.

Nesting cover for early nests is initially provided by residual herbaceous cover but quality nesting cover, both residual and current year, is important throughout the nesting and brooding season. A diversity of plant species composition and cover levels across the landscape helps provide quality brooding habitat. This diversity should include conditions that favor forb production and a full range of cover levels within pastures or grazing allotments, including substantial areas with relatively high, vertical grassland structure remaining through August as escape cover from predators, especially raptors.

To provide quality nesting and brooding habitats, herbaceous vegetation and litter should be allowed to accumulate over a period of years. However, to maintain optimum breeding and foraging habitats over time requires disturbances including burning or intensive grazing once every 3 to 5 years to maintain vigor of native grasses and forbs. This interval should be extended when drought conditions occur.

Preferred winter habitats include grasslands with heavy cover for roosting and interspersed shrub patches for winter foraging. Fruits of buffaloberry, rose, snowberry, and juniper are common winter food items. Small grains on intermingled private croplands are also heavily utilized and are especially important.

Sandhills Prairie

Quantitative information on the height and density of residual cover at prairie chicken nests in the sandhills is limited. However, it seems reasonable to assume that quality nesting habitat descriptions described above for prairie chicken in mixed grass prairie are similar for nesting habitat in the more rhizomatous vegetation in sandhill valleys. It's also assumed that average VORs for quality nesting cover for this species in the hills is similar to or greater than that described for sharp-tailed grouse in sandhills.

Greater prairie chicken nests occur in the hills, valleys and meadows. Prairie chicken nests on the Valentine National Wildlife Refuge in the Nebraska Sand Hills are commonly found in tall and dense subirrigated meadow vegetation. Because more cover can be produced in the valleys than in the hills, higher nest densities are more likely in the valleys, but the hills still should not be discounted as nesting habitat.

The nesting seasons for greater prairie chicken in the sandhills coincides with that of the sharp-tailed grouse with most nest-site initiation beginning in mid April. Residual cover provides most of the nest concealment for the first part of the nesting season. The importance of residual cover is further emphasized during drought years when current year cover is reduced or unavailable.

A diversity of plant species composition and cover levels across the landscape provides quality brooding habitat. This diversity should include conditions that favor forb production and a full range of cover levels within pastures or grazing allotments, including substantial areas with relatively high vertical grassland structure remaining through August as escape cover from predators, especially raptors. The heavier cover is especially critical in the sandhills where soil surface temperatures on the sand can be extreme during the brooding season. The heavier cover provides critical shade for broods.

Preferred winter habitats include grasslands with moderate and heavy amounts of cover interspersed with shrub and forb patches for foraging. The forb patches occur primarily where livestock congregate. Fruits of snowberry, rose, juniper, and poison ivy are common winter foods. Insects including beetles and grasshoppers are also common food items throughout much of the year.

SAGEBRUSH HABITATS WITH TALL, DENSE AND DIVERSE UNDERSTORIES

Management Indicator Species: Greater Sage Grouse (*Centrocercus urophasianus*)

The sage-grouse is selected as a management indicator species for sagebrush habitats that have tall, dense and diverse herbaceous understories. These areas typically have a history of lighter livestock grazing intensities. A list of other wildlife species that typically favor these habitat conditions is provided in the supporting FEIS. Some of these species include sage thrasher, Brewer's sparrow, pronghorn and sage vole. Several species of upland nesting waterfowl also respond favorably to these habitat conditions that result from lighter grazing intensities and periodic rest from annual grazing.

Sagebrush stands with relatively tall and dense sagebrush and an abundance of residual herbaceous cover are preferred by sage-grouse for nesting. Nest success and sage-grouse productivity have been reported to increase with increased sagebrush height and residual cover levels in the herbaceous understory. Once again, the importance of residual cover is noted, and its importance undoubtedly increases during drought years when current year herbaceous cover is reduced or unavailable.

Most nesting in Wyoming occurred in sagebrush cover of 20 to 40 percent, which is comparable to what is reported in other states. Other investigators suggested that sage cover over 30 percent may be too thick, and nesting suitability for sage-grouse may begin declining beyond that level. Quality habitat is described as a sagebrush stand with 15 to 25% canopy cover of sagebrush and a tall and dense understory of native grasses and forbs. The tallest sagebrush available on Wyoming sites is reported as being preferred for nesting and is also valuable as winter habitat. Tall (>7 inch height) and dense residual herbaceous cover of native grasses and forbs from the previous growing season provides the cover available at the onset of the nesting season when most nest sites are selected and egg-laying and incubation begins. Most nests are within 2 to 3 miles of display grounds.

Brooding habitat is found in sagebrush communities of 10 to 30 percent sagebrush cover with small grassland openings or intermingled meadows that support an abundance of bugs and forbs like dandelions and yarrow for foraging by young grouse. Like other prairie grouse species, grasshoppers and other insects are also important diet items, especially for broods.

PRAIRIE DOG COLONIES AND LOW STRUCTURE GRASSLANDS

Management Indicator Species: Black-tailed Prairie Dog (*Cynomys ludovicianus*)

The black-tailed prairie dog is selected as a management indicator species for low structure grasslands and the biological community associated with prairie dog colonies. A list of other wildlife species that typically benefit from management for low structure grasslands and maintenance or expansion of prairie dog colonies is provided in the supporting FEIS. Some of these species include burrowing owl, ferruginous hawk, and mountain plover. Average VORs across prairie dog colonies are typically less than 1 or 2 inches.

Black-tailed prairie dogs occupy prairies (shortgrass and mixed grass) and shrublands dominated by sagebrush on the northern plains. Most soils on the NFS lands in the planning area are suitable for prairie dog burrowing. Some of the sandy soils in the valleys of the Nebraska sandhills can support burrowing activities. Even soils with shallow bedrock are known to support prairie dog colonies. Some soils may be preferred by prairie dogs but few soils in the planning area preclude prairie dog burrowing.

Forested and wetlands vegetation types are considered unsuitable for prairie dogs. Grassland vegetation types including those with minor shrub components are considered preferred habitat. Since black-tailed prairie dogs also occur in shrublands and modify shrublands by removing shrubs in and around their colonies, shrublands are considered secondary but, none-the-less, potential habitat.

Slopes with suitable soils and vegetation that are less than 10 percent slope are considered preferred habitat. Slopes ranging from 10 to 30 percent are classified as secondary or suitable habitat. Areas with average slopes exceeding 30 percent are identified as unsuitable.

All water and wetlands are classified as unsuitable for prairie dog colonization. Areas with shallow water tables are also classified as unsuitable.

On mixed grass prairie and to a lesser extent on shortgrass prairie, colonies frequently originate on sites that have been disturbed from previous farming or other soil disturbances and on areas grazed by livestock. Heavily grazed sites where livestock concentrate are more likely to be colonized by prairie dogs. 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 and potential sites likely to be colonized by prairie dogs.

OPEN MATURE AND LATE SUCCESSIONAL PONDEROSA PINE FORESTS

Management Indicator Species: Pygmy Nuthatch (*Sitta pygmaea*)

The pygmy nuthatch is selected as a management indicator species for open mature and late successional ponderosa pine forests that have a relative abundance of snags and large tall trees. A list of other wildlife species that typically benefit from management for these forest conditions is provided in the supporting FEIS. Some of the species on this list include Lewis woodpecker and merlin.

Quality habitat for this yearlong resident is simply described as open mature and late successional (structural stages 4a, 4b and 5) ponderosa pine forests with snags and relatively large and tall trees. Ideal habitat includes tall pines with broken-off branches or tops (towering stubs). Pygmy nuthatches generally use stands with less than 70% canopy cover. This species is a primary cavity nester preferring soft snags, but they occasionally use deserted woodpecker cavities.

This species is primarily insectivorous with bark and leaf beetles being some of the important diet items.

References Consulted

Plains Sharp-tailed Grouse

Connellly, J.W., M.W. Gratson, and K.P. Reese. 1998. Sharp-tailed Grouse. *In* The Birds of North America, No. 354 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

Fitzgerald, J.A., D.N. Pashley, and B. Pardo. 1999. Partners in Flight Bird Conservation Plan for the Northern Mixed-grass Prairie, Version 1.0. Missouri Department of Conservation, Jefferson City. 65 pp (plus attachments).

Grosz, K.L. 1988. Sharp-tailed Grouse Nesting and Brood Rearing Habitat in Grazed and Ungrazed Treatments in Southcentral North Dakota. M.S. Thesis, North Dakota State Univ., Fargo. 72pp.

Prose, B.L. 1987. Habitat Suitability Index Models: Plains Sharp-tailed Grouse. USDI Fish and Wildlife Service, Bio. Rep. 82 (10.142). 31pp.

Prose, B.L. 1992. Heterogeneity and Spatial Scale in Nesting Habitat Selection by Sharp-tailed Grouse in Nebraska. M.S. Thesis. Colorado State University, Ft. Collins. 71pp.

Sedivec, K.K., W.T. Barker, T.A. Messmer, D.R. Hertel and K.F. Higgins. 1995. "Effects of Grazing Management on Sharp-tailed Grouse in North Dakota." pp. 20-22. In Proceedings of the Prairie Grouse Technical Council. August 28-31, 1995. Medora, North Dakota.

Sisson, L. 1976. The Sharp-tailed Grouse in Nebraska. Nebraska Game and Parks Commission. 88pp.

The Nature Conservancy. 2000. Sharp-tailed Grouse. Wings of the Americas (www.tnc.org/wings/wingresource/stgr2.htm).

Traylor, S.S. 1994. The Effects of Vegetative Structure on Prairie Grouse Nest Site Selection and Success: Characterization of Initial Nest Sites of Sharp-tailed Grouse in the Nebraska Sandhills. Nebraska Game and Parks Commission PR Report W-41-T-19. 48pp.

Vodehnal, W.L. and G.L. Schenbeck. 1997. Characteristics of Sharp-tailed Grouse Nests in the Nebraska Sand Hills. Unpublished Forest Service File Rep. 22pp.

Greater Prairie Chicken

Fitzgerald, J.A., D.N. Pashley, and B. Pardo. 1999. Partners in Flight Bird Conservation Plan for the Northern Mixed-grass Prairie, Version 1.0. Missouri Department of Conservation, Jefferson City. 65 pp (plus attachments).

Kirsch, L.M. 1974. Habitat Management Considerations for Prairie Chickens. Wildlife Society Bulletin, 2(3):124-129.

Kobriger, G.D. 1999. Status and Management of the Greater Prairie Chicken in North Dakota. pp 63-74. In: The Greater Prairie Chicken: A National Look. Minnesota Agricultural Experiment Station, Misc. Publ. 99-1999.

Manske, L.L. and W.T. Barker. 1988. "Habitat Usage by Prairie Grouse on the Sheyenne National Grassland." In symposium proceedings: Prairie Chickens on the Sheyenne National Grassland. pp 8-20. A.J. Bjugstad, Tech. Coord. USDA Forest Service, Gen. Tech. Rep. RM-159. 73pp.

Newell, J.A., J.E. Toepfer and M.A. Rumble. 1988. "Summer Brood-Rearing Ecology of the Greater Prairie chicken on the Sheyenne National Grassland." In symposium proceedings: Prairie Chickens on the Sheyenne National Grassland. A.J. Bjugstad, Tech. Coord. USDA Forest Service, Gen. Tech. Rep. RM-159. 73pp.

Prose, B.L. 1985. Habitat Suitability Index Models: Greater Prairie Chicken. USDI Fish and Wildlife Service. Bio. Rep. 82 (10.102). 33pp.

Rumble, M.A., J.A. Newell, and J.E. Toepfer. 1987. "Diets of Greater Prairie Chickens on the Sheyenne National Grasslands." In symposium proceedings: Prairie Chickens on the Sheyenne National Grassland. pp. 49-54. A.J. Bjugstad, Tech. Coord. USDA Forest Service, Gen. Tech. Rep. RM-159. 73pp.

Schroeder, M.A., and L.A. Robb. 1993. Greater Prairie Chicken. *In* The Birds of North America, No. 36 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

Svedarsky, W.D., R.H. Hier, and N.J. Silvy, (eds). 1999. "The Greater Prairie Chicken: A National Look." Minnesota Agricultural Experiment Station, Misc. Publ. 99-1999. 187pp.

Svedarsky, D., and G. Van Amburg. 1996. Integrated Management of the Greater Prairie Chicken and Livestock on the Sheyenne National Grassland. North Dakota Game and Fish Department and U.S. Forest Service.

Toepfer, J.E. and R.L. Eng. 1987. "Winter Ecology of the Greater Prairie Chicken on the Sheyenne National Grasslands, North Dakota." In symposium proceedings: Prairie Chickens on the Sheyenne National Grassland. pp. 32-48. A.J. Bjugstad, Tech. Coord. USDA Forest Service, Gen. Tech. Rep. RM-159. 73pp.

Vodehnal, W.L. 1999. Status and Management of the Greater Prairie Chicken in Nebraska. pp 81-98. In: The Greater Prairie Chicken: A National Look. Minnesota Agricultural Experiment Station, Misc. Publ. 99-1999.

Westemeier, R.L., and S. Gough. 1999. "National Outlook and Conservation Needs for Greater Prairie Chickens." pp 169 –187. In: The Greater Prairie Chicken: A National Look. Minnesota Agricultural Experiment Station, Misc. Publ. 99-1999.

Greater Sage Grouse

Colin, M.S., W.D. Edge and J.A. Crawford. 1998. "Nesting Habitat Selection by Sage Grouse in South-central Washington." J. Range Manage. 51(3):265-269.

Connolly, J.W., M.A. Schroeder, A.R. Sands, and C.E. Braun. 2001. Guidelines for Management of Sage Grouse Populations and Habitats. *in press* Wildl. Soc. Bull.

Heath, B.J., R. Straw, S.H. Anderson and J. Lawson. 1997. Sage Grouse Productivity, Survival, and Seasonal Habitat use Near Farson, Wyoming. Wyoming Game and Fish Department.

Maj, M. and J. Mariani. 1995. Sage Grouse and Range Permit Reissuance. Unpublished FS Region 1 File Rep. 6 pp.

Paige, C. and S.A. Ritter. 1999. Birds in a Sagebrush Sea: Managing Sagebrush Habitats for Bird Communities. Partners in Flight Western Working Group, Boise, ID. 47 pp.

Patterson, R.L. 1952. The Sage Grouse in Wyoming. Sage Books, Inc., Denver. 341 pp.

Peterson, J.G. 1995. Ecological Implications of Sagebrush Manipulation: a Literature Review. Montana Fish, Wildlife and Parks, PR Project (W-101-R-2) Report. 49 pp.

Schroeder, M.A., J.R. Young, and C.E. Braun. 1999. Sage Grouse. *In* The Birds of North America, No. 425 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

Stroud, D. and K. Spence. 1991. "Sage for Wildlife." Wyoming Wildlife 8:18-25.

Wallestad, R.O. 1975. Life History and Habitat Requirements of Sage Grouse in central Montana. Mont. Fish and Game Dept., Tech. Bull. 66pp.

Black-tailed Prairie Dog

Campbell, T. M., III, and T. W. Clark. 1981. "Colony Characteristics and Vertebrate Associates of White-tailed and Black-tailed Prairie Dogs in Wyoming." Am. Midl. Nat. 105:269-276.

Carlson, D. C. and E. M. White. 1987. "Effects of Prairie Dogs on Mound Soils." Soil Sci. Soc. Am. J. 51:389-393.

Cincotta, R. P., D. W. Uresk, and R. M. Hansen. 1987. "Demography of Black-tailed Prairie Dog Populations Reoccupying Sites Treated with Rodenticide." Great Basin Nat. 49:339-343.

Clippinger, N. W. 1989. Habitat Suitability Index Model: Black-tailed Prairie Dog. USDI Fish and Wildlife Service, Biol. Rep. 82(10). 21pp.

Dahlsted, K. J., S. Sather-Blair, B. K. Worcester, and R. Klukas. 1981. "Application of Remote Sensing to Prairie Dog Management." J. Range Manage. 34:218-223.

Jones, J.K. Jr., D.M. Armstrong, R.S. Hoffman and C. Jones. 1983. Mammals of the Northern Great Plains. University of Nebraska Press, Lincoln. 379 pp.

Knowles, C. J. 1982. Habitat Affinity, Populations, and Control of Black-tailed Prairie Dogs on the Charles M. Russell National Wildlife Refuge. Ph.D. Dissertation. Univ. of Montana, Missoula. 171pp.

Knowles, C. J. 1986. "Some Relationships of Black-tailed Prairie Dogs to Livestock Grazing." Great Basin Nat. 46:198-203.

Knowles, C. J. 1994. A Review of Black-tailed Prairie Dog Literature in Relation to Rangelands Administered by the Custer National Forest. Rep. to USDA Forest Service. 61pp.

Knowles, C. J. 2000. Black-tailed Prairie Dog Population Viability Assessment for North Dakota. Final Report to North Dakota Department of Game and Fish, Bismarck. 57pp.

Koford, C. B. 1958. "Prairie Dogs, White faces, and Blue grama." Wildl. Monogr. No. 3. 78pp.

Munn, L. C. 1993. "Effects of Prairie Dogs on Physical and Chemical Properties of Soils." pp. 11-17. In proceedings: Management of Prairie Dog Complexes for the Reintroduction of the Black-footed Ferret. Oldemeyer, J. L., D. E. Biggins, and B. J. Miller, eds. USDI Fish and Wildlife Service, Biol. Rep. 13. 96pp.

Powell, K. L. 1992. Prairie Dog Distribution, Habitat Characteristics, and Population Monitoring in Kansas: Implications for Black-footed Ferret Recovery. M.S. Thesis, Kansas State Univ., Manhattan. 131pp.

Reading, R. P. and R. Matchett. 1997. "Attributes of Black-tailed Prairie Dog Colonies in North-central Montana." J. Wildl. Manage. 61(3):664-673.

Reid, N. J. 1954. The Distribution of the Black-tailed Prairie Dog in the Badlands of Southwestern North Dakota. M.S. Thesis. State Univ. Iowa, Iowa City. 30pp.

Snell, G. P., and B. D. Hlavachick. 1980. "Control Prairie Dogs - the Easy Way." Rangelands 2:239-240.

Stromberg, M. R. 1975. Habitat Relationships of the Black-tailed Prairie Dog: Vegetation, Soils, Comparative Burrow Structure and Spatial Patterns. M.S. Thesis, Univ. of Wisc., Madison. 175pp.

Uresk, D. W., J. G. McCracken, and A. J. Bjugstad. 1981. "Prairie Dog Density and Cattle Grazing Relationships." In proceedings: 5th Great Plains Wildlife Damage Control Workshop. pp. 199-201. R. M. Timm and R. J. Johnson, eds. Univ. of Nebraska, Lincoln.

Uresk, D. W. 1987. "Relation of Black-tailed Prairie Dogs and Control Programs to Vegetation, Livestock, and Wildlife." pp. 312-323. In: Integrated Pest Management on Rangelands: A Short-grass Prairie Perspective. J. L. Capinera, editor. Westview Press, Boulder, Colo.

Pygmy Nuthatch

Anderson, S.H. 1976. "Comparative Food Habits of Oregon Nuthatches." Northwest Science 50:213-221.

Bent, A.C. 1948. "Life Histories of North American Nuthatches, Wrens, Thrashers, and Their Allies." U.S. National Museum, Bull. 195. Washington, D.C.

Jones. S.L. 1998. "Pygmy Nuthatch." pp 360-361 In: Colorado Breeding Bird Atlas. H.E. Kingery (ed.). Colorado Bird Atlas Partnership and Colorado Division of Wildlife. 636pp.

APPENDIX I SUGGESTED STOCKING RATES

Monitoring information and suggested stocking rates (AUMs/Acre) are used to help design livestock grazing strategies for meeting plant species composition and vegetation structure objectives presented in Chapter 2. Livestock grazing intensity[1] is a primary factor influencing both plant species composition and vegetation structure on rangelands. For the purposes of this Land and Resource Management Plan, the suggested stocking rates presented below define light, moderate and heavy grazing intensities that, in turn, are expected to help provide the desired mosaic of seral stages and vegetation structure on rangelands. A diverse mosaic of vegetation conditions will help ensure quality habitats for management indicator species and a wide variety of native plant and animal species.

The suggested stocking rates are as follows:

Light Grazing Intensity: A level of herbage utilization that allows palatable plant species (decreasers) preferred by livestock to maximize their herbage producing ability. The dominance of these plant species and the lower forage utilization levels help provide quality habitat for management indicator species (Appendix H) and other plant and animal species that benefit from diverse and high vegetation structure on rangelands. It also helps reduce the impacts of drought on these species. This grazing intensity reduces habitat suitability for wildlife species requiring low structure grasslands. The suggested stocking rate for this grazing intensity is 30 to 40% lighter than the suggested stocking rates used by the Natural Resources Conservation Service in the local area.

Moderate Grazing Intensity: A level of herbage utilization that allows the preferred plant species to maintain themselves but usually does not permit them to improve in herbage producing ability. When growing conditions are normal or better, this grazing intensity typically results in a limited amount of quality habitat, usually restricted to run-in sites and other favorable micro-sites, for the management indicator species and other plant and animal species that benefit from high structure grasslands or sagebrush understories. The suggested stocking rate for this grazing intensity is the Natural Resource Conservation Service (NRCS) stocking rate for the local area.

Heavy Grazing Intensity: A level of herbage utilization that does not permit the preferred plant species to maintain themselves. This grazing intensity encourages early successional stages and does not permit movement toward late successional stages. This grazing intensity typically provides no quality habitat for the plant and animal species requiring diverse and high structure rangeland vegetation, but provides quality habitat for those species that use low structure (average visual obstruction readings or stubble heights < 2 inches) grasslands. The suggested stocking rates for this grazing intensity is 10 to 20% heavier than the NRCS stocking rate for the local area.

The suggested stocking rates and local NRCS stocking rates apply only to those portions of a pasture or allotment that are considered suitable for livestock grazing.

---

[1] Hanson et al. 1970, Hanson et al. 1978, Hart and Ashby 1998, Holechek et al. 1999, Jasmer and Holechek 1984, Lewis et al. 1956, Olson et al. 1985

Monitoring will be conducted to validate that the suggested stocking rates are meeting or making measurable progress in meeting the desired vegetation objectives (Chapter 2) and providing quality habitat for the management indicator species identified for the local area. If they are not, adjustments in the suggested stocking rates will be made. Suggested stocking rates may be also be adjusted for individual allotments or pastures where monitoring information on vegetation and habitat conditions support an adjustment. The monitoring information must have been collected using standard methods of determining composition, structure (height and density), production or utilization. Photographs and videography are also useful in supplementing monitoring information.

References Consulted

Guthery, F.S. 1996. Upland gamebirds. Pages 59-82 in P.R. Krausman, ed. Rangeland wildlife. The Society for Range Management, Denver, Colorado. 440pp.

Hanson, C.L., A.R. Kuhlman, C.J. Erickson, and J.K. Lewis. 1970. Grazing effects on runoff and vegetation on western South Dakota rangeland. J. Range Manage. 23(6):418-420.

Hanson, C.L., A.R. Kuhlman, and J.K. Lewis. 1978. Effect of grazing intensity and range condition on hydrology of western South Dakota ranges. South Dakota State University, Agricultural Experiment Station Bull. 647. 25pp.

Hart, R.H., and M.M. Ashby. 1998. Grazing intensities, vegetation, and heifer gains: 55 years on shortgrass. J. Range Manage. 51:392-398.

Holechek, J.L., H. Gomez, F. Molinar, and D. Galt. 1999. Grazing studies: what we've learned. Rangelands 21(2):12-16.

Holechek, J.L., R.D. Pieper, and C.H. Herbel. 2001. Range management: principles and practices. 4th Edition. Prentice Hall, Inc.

Jasmer, G.E, and J.L. Holechek. 1984. Determining grazing intensity on rangeland. J. Soil and Water Conserv. 39(1):32-35.

Lewis, J.K., G.M. Van Dyne, L.R. Albee, and F.W. Whetzal. 1956. Intensity of grazing: its effect on livestock and forage production. South Dakota State College, Agricultural Experiment Station Bulletin 459. 44pp.

Natural Resource Conservation Service. 1997. National range and pasture handbook. Grazing Lands Technology Institute.

Olson, K.C., R.S. White, and B.W. Sindelar. 1985. Response of vegetation on the northern Great Plains to precipitation amount and grazing intensity. J. Range Manage. 38(4):357-361.

APPENDIX J PALEONTOLOGY

Probable Fossil Yield Classification - (PFYC)

Developed by the Paleontology Center of Excellence and the R-2 Paleo Initiative, 1996.

Introduction

This is a planning tool wherein geological units, usually at the formation or member level, are classified according to the probability of yielding paleontological resources that are of concern to land managers. Existing statutes and policies regulate the collection and disposition of vertebrate fossils, but not nonvertebrate fossils except in special circumstances. Therefore, this classification is based largely on how likely a geologic unit is to produce vertebrate fossils. The classes are described below, with some examples of corresponding management considerations or actions. Useful references are the Paleoresources Use and Management Action Spectrum (PUMA), Criteria for Scientific Significance--Specimen, Criteria for Sensitivity Ranking--Locality.

NOTE: This system is based on **probabilities**, not certainties or special circumstances. There will be exceptions to each criterion used as the basis for classification. These are expected and should be handled as unique cases.

Paleo Classes

Class 1

Description: Igneous and metamorphic (volcanic ashes are excluded from this category) geologic units that are not likely to contain recognizable fossil remains.

Basis:

- Fossils of any kind known *not* to occur except in rare circumstances.
- Igneous or metamorphic origin.

Example: Vishnu Schist

Management examples:

- Paleo acres not weighted the Geology Resource Base Acres budget allocation criterion.
- No Class 1 paleo acres included in Geology Management Acres budget allocation criterion.
- Acres with this classification not included in paleontological reconnaissance work plans.

The land manager's concern for paleoresources on Class 1 acres is negligible. Ground-disturbing activities will not require mitigation except in rare circumstances. Budgets do not need to allocate dollars for paleo-weighted geology acres. Much of the acreage of high altitude, mountainous districts will be determined Class 1.

Class 2

Description: Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils.

Basis:

- Vertebrate fossils known to occur *very rarely or not at all*.
- Age greater than Devonian.
- Age younger than 10,000 years before present.
- Deep marine origin.
- Aeolian origin.
- Diagenetic alteration.

Example: Mancos Shale

Management examples:

- Paleo acres not weighted in the Geology Resource Base Acres budget allocation criterion.
- Paleo acres *generally not* included in Geology Management Acres, but rare exceptions are likely to be scientifically significant and require some management prescription.
- Class 2 Paleo *generally not* included in paleontological reconnaissance work plans. There may be rare exceptions.

The land manager's concern for paleoresources on Class 2 acres is low. Ground-disturbing activities are not likely to require mitigation. Management alternatives should tend toward the middle of the PUMA [high access--low management], in all but exceptional cases. Recreational fee-based or user-based opportunities unlikely.

Class 3

Description: Fossiliferous sedimentary geologic units whose fossil content varies in significance, abundance, and predictable occurrence. Also sedimentary units of unknown fossil potential.

Basis:

- Primarily marine origin with sporadic known occurrences of vertebrate fossils (other than fish scales and shark teeth).
- Vertebrate fossils and significant nonvertebrate fossils known to occur inconsistently--predictability known to be low.
- Poorly studied and/or poorly documented. Potential yield cannot be assigned without ground reconnaissance.

Example: Chinle Formation

Management examples:

1. Some Class 3 paleo acres *may be* weighted in the Geology Resource Base Acres budget allocation criterion.
2. Some Class 3 paleo acres *may be* included in Geology Management Acres budget allocation criterion and reported in MAR:
   - Opportunity Areas--see below
     Highly sensitive areas needing special protection (see Criteria for Sensitivity Ranking--Locality).
     Areas actively being researched
3. Acres with this classification *may be* included in paleontological reconnaissance work plans, if this designation is made on the basis of criterion 3 above.
4. Fee-based and/or user based recreational opportunities possible.

The land manager's concern for paleoresources on Class 3 acres may extend across the entire PUMAS, with some areas requiring very little budget and management and providing high levels of unregulated access, while other areas may require annual budget allocations for intense management. Ground-disturbing activities will require sufficient mitigation to determine whether significant paleoresources occur in the area of a proposed action. Mitigation beyond initial findings will range from no further mitigation necessary to full and continuous monitoring of significant localities during the action. Recreational opportunities should be identified where appropriate and utilized under recreation fee authorities to produce revenues that can be applied to paleoresource management.

Class 4

Description: Class 4 geologic units are Class 5 units (see below) that have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation.

Basis:

- Significant vegetative cover; outcrop is not exposed.
- Areas of exposed outcrop are smaller than 2 contiguous acres
- Outcrop forms cliffs of sufficient height that most is out of reach by normal means.
- Other characteristics that lower the sensitivity of both known and unidentified fossil sites (see Criteria for Sensitivity Ranking--Locality).

Example: Covered acres of Morrison Formation.

Management examples:

1. Class 4 paleo acres *are* weighted in the Geology Resource Base Acres budget allocation criterion.
2. Some Class 4 paleo acres *may be* included in Geology Management Acres budget allocation criterion and reported in MAR:
   - Opportunity Areas

     Highly sensitive areas needing special protection (see Criteria for Sensitivity Ranking--Locality)

     Areas actively being researched

     Paleo reports likely to be counted in Geology Reports MAR (permits, agreements, contracts, etc.)

     Acres with this classification *should be* included in paleontological reconnaissance work.

     Scientific and educational use likely. Paleo special use permits and Challenge Cost Share agreements likely.

     Ongoing curation agreements with regional accredited museums recommended.
3. Fee-based and/or user based recreational opportunities most likely.

The land manager's concern for paleoresources on Class 4 acres is toward management and away from unregulated access. Ground-disturbing activities will require mitigation to determine whether significant paleoresources occur in the area of a proposed action. Mitigation beyond initial findings will range from no further mitigation necessary to full and continuous monitoring of significant localities during the action. Class 4 paleo acres are the *most likely* to yield appropriate recreational opportunities. These should be identified and optimized under recreation fee authorities. Class 4 paleo acres are the most likely to generate revenues that can be applied to managing highly sensitive Class 5 paleoresources.

Class 5

Description: Highly fossiliferous geologic units that regularly and predictably produce vertebrate fossils and/or scientifically significant nonvertebrate (plant and invertebrate) fossils, and that are at risk of natural degradation and/or human-caused adverse impacts.

Basis:

- Vertebrate fossils and/or scientifically significant nonvertebrate fossils are *known and documented* to occur consistently, predictably, and/or abundantly.
- Outcrop is exposed: little or no vegetative cover.
- Extensive exposed outcrop; discontinuous areas are larger than 2 contiguous acres.
- Outcrop erodes easily, may form badlands.
- Easy access to extensive outcrop in remote areas (increased potential for illegal collection; damage by vandals).
- Other characteristics that increase the sensitivity of both known and unidentified fossil sites (see Criteria for Sensitivity Ranking - Locality).

Example: White River Formation/Group

Management examples:

1. Class 5 paleo acres *are* weighted in the Geology Resource Base Acres budget allocation criterion.
2. Some Class 5 paleo acres *may be* included in Geology Management Acres budget allocation criterion and reported in MAR:
   - Opportunity areas

     Highly sensitive areas needing special protection (see Criteria for Sensitivity Ranking--Locality)

     Areas actively being researched

     Paleo reports likely to be counted in Geology Reports MAR (permits, agreements, contracts, etc.)

     Paleontological reconnaissance work should focus only on poorly known areas of Class 5 acres because they are already considered a management priority.

     Scientific and education use highly likely. Highest number of paleo special use permits expected for Class 5 acres. Challenge Cost Share agreements with a broad spectrum of professional and avocational paleontologists expected.
3. Fee-based and/or user based recreational opportunities possible.
   - Ongoing curation agreements with regional accredited museums recommended.

The land manager's highest concern for paleoresources should focus on Class 5 acres. These areas are likely to be poached. Mitigation of ground disturbing activities is required and may be intense. Frequent use by the full range of interested publics is to be expected. Areas of special interest and concern should be designated and intensely managed. Field-based, technical training in paleoresource management should be provided to Forest and District staff and to Law Enforcement Officers. Memoranda of Understanding, Challenge Cost Share, and/or Participating agreements with professional academic paleontologists should be sought and maintained in order to provide a consistent source of outside expertise. Curation Agreements should be maintained with area museums so that there is always a repository for fossils collected and turned over to the Forest. Class 5 paleo acres are likely to yield appropriate recreational opportunities, though it is more difficult to isolate opportunity acres from surrounding critical acres and therefore access must be more intensely regulated. These should be identified and utilized under recreation fee authorities, but the delicate balance between opportunity and potential degradation of critical Class 5 paleoresources must be recognized and addressed in planning for such use.

Predictive Modeling and the Designation of Paleo Classes

The Rocky Mountain Region of the Forest Service is currently experimenting with the PFYC in partnership with the University of Wyoming and Bureau of Land Management. The model that develops out of this experiment will predict where paleoresource management and dollars should be concentrated in the Northern Great Plains. Paleo classes are assigned to geologic units in the Northern Great Plains Planning area on the basis of empirical data gathered through on-line searches of the GeoRef Geological Database. Classes are recommended by the investigator based on the number of “hits” produced by search strings optimized to capture most references to

vertebrate fossils in the key unit being investigated. Calibration of the parameters employed will be preliminary and probably subject to continuous refinement as designated classes are validated through actual paleoresource management. This method does not allow designation of Class 4 Paleo acres, because in most cases the physical characteristics of the surficial outcrop will not be known from the literature alone. Therefore, these units will by default be designated as Class 5, until other methods allow separation of Class 4 units or areas on units. Other methods would include aeraial reconnaissance, interpretation of remote-sensed data, and on-the-ground field reconnaissance.

The Fossil Yield Potential Classification is a tool developed for the Forest Service by the Paleontology Center of Excellence and funded by the Paleo Initiative, as is paleontological assessment of the Northern Great Plains Planning area which will be the first test of the FYPC.

The management examples and narrative recommendations are not to be considered directives, or standards and guidelines for planning purposes. They are informal guidelines to supplement policies, regulations, and directions in draft for the national paleontology program. These guidelines are not exhaustive; many other factors are considered in management decisions.

The criteria given as the basis for classification are not exhaustive either. They are designed to guide the outside expert who may be recommending classification as part of a partnership, contract, or permit. Final designations will be made by the reviewing Forest Service paleontolgist or one of our qualified colleagues from another Federal agency. Designations are not final and are expected to change as we gain understanding about the paleoresources of National Forests and Grasslands.

Locality/Site Sensitivity Rankings For Fossil Resources

Paleontological sensitivity rankings are composite evaluations derived from individual consideration of the following factors. Sensitivity rankings apply to paleontological sites and localities, not to individual specimens.

1. **Scientific significance** of specimens associated with the site.
2. **Probability of yield** based on likelihood that geologic strata at the site are fossiliferous. This factor may be evaluated by direct reconnaissance or by consulting the pertinent literature; preferably both methods will be employed.
3. **Values** of an educational, interpretive, or recreational nature.

   Public education, interpretive, and recreational values are those that utilize the power of fossil resources to provoke insight into ancient lifeways and ancient ecology, and to reveal their connections to the present and future. Educational values also enhance a stewardship ethic towards legacy resources, and stress the importance of environmental and scientific literacy.
4. **Risk** of resource degradation at the site.

   Risk factors include:

   Biotic agents: vandalism, theft, destruction; grazing impact; trail-use impact.

   Abiotic agents: chemical and mechanical destruction of fossils exposed by erosion; landslides; inundation; fluvial transport; etc.

Each factor above should be ranked individually on a scale of 1 to 5, where **1** is the **lowest** sensitivity ranking and **5** the **highest**. The composite ranking of sensitivity for a locality or site is the arithmetic mean of the individual rankings.

Example 1. A *category: vertebrate site* is identified in rocks of the Orellan Land Mammal Age on the Pawnee National Grassland.

1. Scientific Significance ranking = **5**.

   See Scientific Significance Criteria below. Specimen-based criterion 3 is met. Criteria 1, 2, and 3 are likely to be met by many specimens in this geologic formation. Context-based criterion 2 is met--the mammalian fauna of the Pawnee NG is critically important for constraining age correlations in the Orellan.

2. Probability of Yield ranking = **4**.

   The formation is known to be fossiliferous. Mammal fossils are likely to be found following erosional events.

3. Values ranking = **4**.

   The mammalian fauna of the Orellan in the Western Interior is informative to questions of paleoecology and biogeography. Interpretive materials that utilize this paleontological resource would be good examples of the way scientists interpret ancient ecosystems, and how that information can be applied to modern-day problems of global change.

   Risk factor ranking = **5**.

   Biotic agents: Significant and sensitive sites are located near or on trails. These trails are advertised in area guides as "good places to pick up fossils."

   Abiotic agents: Sites are located in geologic strata that erode very easily and rapidly, especially during the spring and early summer. Fossils may be easily washed out of their informative context, or removed altogether and re-buried downstream by ephemeral flows.

4. Composite ranking: 5 + 4 + 4 + 5 = 18; divide by 4 = **4.5 sensitivity ranking for this site.**

   Appropriate management strategies for this site would include: designation as a Research Natural Area. Allowable activities on an Opportunity Spectrum would include: research by qualified investigators, technical educational field work by non-specialists overseen by qualified technicians, guided interpretive tours for the public.

Example 2: A *category: vertebrate site* is identified in Cretaceous marine rocks on the Buffalo Gap NG.

1. Scientific Significance ranking = **1**.

   The only identified fossils at and near the site are shark teeth and an occasional fish vertebra.

2. Probability of Yield ranking = **5**.

   Shark teeth are exceedingly abundant, and in places form a deflation surface.

3. Values ranking = **2**.

The recreational public is likely to enjoy picking up shark teeth in this area, and to consider the past environment in which they were deposited --without interpretive aids. The area does not lend itself to formal interpretive displays or activities.

4. Risk factor ranking = **2**.

   Biotic agents: The likelihood that sufficient collecting by the general public will deplete the supply of shark teeth is low for the foreseeable future; however, the possibility that other, more significant fossils will be found and carried away exists and cannot be easily monitored. The area is heavily grazed, but the fossils are fairly evenly distributed on the landscape, so areas where cattle do not congregate are fairly free of impact.

   Abiotic agents: The outcrop area is low, flat-lying, and heavily vegetated, so the chances that erosion, landslides, floods, or flash floods will threaten the fossil resource is low.

5. Composite ranking: 1 + 5 + 3 + 2 = 10; divide by 4 = **2.5 sensitivity ranking for this site.**

   Appropriate management strategies for this site would be: no permit required for picking up shark teeth; mention in a Forest/District brochure on paleontological resources as an educational and interpretive tool to promote understanding of represented ancient environment; request that the public report any unusual fossil finds; occasional reconnaissance to determine if collecting of shark teeth is threatening other resources in the area or affecting the scenic and aesthetic values of the site.

Significance Criteria for Paleontological Resources -- Vertebrate, Invertebrate, and Plant Fossils, including Ichnofossils

Scientific significance may be attributed to a fossil specimen or trace and/or to its context (e.g., location in time and space; association with other relevant evidence; or association with cultural resources).

The scientific significance of a paleontological specimen or trace and/or its context is determined by meeting any one of the following criteria:

Specimen-based criteria:

- Represents an unknown or undescribed/ unnamed taxon.
- Represents a rare taxon, or rare morphological/ anatomical element or feature. The "rareness" criterion comprises either absolute rareness in the fossil record, or relative or contextual rareness as described below.
- Represents a vertebrate taxon.
- Exhibits an exceptional type and/or quality of preservation.
- Exhibits remarkable or anomalous morphological/anatomical character(s) or taphonomic alteration.
- Represents "soft tissue" preservation or presence.
- Exhibits cultural affiliation; e.g., alteration or use by ancient man.

Context-based criteria:

- Is associated in a relevant way with other evidence of scientific interest, providing taphonomic, ecologic, environmental, behavioral, cultural, or evolutionary information.

- Is evidence that extends and/or constrains the stratigraphic, chronologic and/or geographic range of a taxon or functional paraphyletic group.

Paleontological Survey Process

Once a ground-disturbing project is identified to take place and during the NEPA process, a series of steps are taken to determine if paleontological resources will be impacted and what process will be needed for mitigation:

Step 1. Determine if the area to be disturbed will impact paleontological resources:

- Each unit will determine if the project area contains fossils by consulting the maps delineating the geologic formation classifications.
- If the formation is Class 1, fossils are not likely to be discovered; document in NEPA project file.
- If the formation is Class 2, significant fossils are not likely to be discovered; notify the Forest Service Paleontologist and proceed with Step 2.
- If the formation is Class 3-5, significant fossils will likely be discovered; notify the Forest Service Paleontologist and proceed with Steps 2-5.

Step 2. The Forest Service Paleontologist will conduct a literature search of paleontological information for the project area that may be contained in permitting documents, scientific literature, geological maps, libraries, and museums. This information will become of the NEPA project file. Surveying will not be required when no scientifically important specimens or sites are discovered in the literature. Go to Step 3 if the literature review indicates scientifically important fossils may be impacted.

Step 3. Forest Service Paleontologist, and/or qualified consultant will conduct a pedestrian survey of proposed project area and document findings. If paleontological sites are discovered then go to Step 4. If survey reveals no surface indication of fossils, then document in the NEPA project file.

Step 4. The Forest Service Paleontologist or qualified consultant will determine the sensitivity ranking for the sites to be impacted. (A Class 5 geologic formation may contain sites of low sensitivity.) The paleontologist on site will have to make this determination based on professional judgment and according to the process outlined in the Sensitivity Ranking.

Step 5. In sites with Class 3, 4, or 5 and a high sensitivity ranking, a Forest Service Paleontologist shall develop a protection and mitigation plan prior to project initiation and periodically monitor for compliance with the mitigation plan throughout the project.

Note: Units with formations ranked as Classes 3-5 should have repository agreements in place with agencies or institutions collecting fossils as part of mitigation in order for the fossils to be cared for in perpetuity.

APPENDIX K NATIONAL GOALS

National goals relevant to land and resource management (based on Forest Service manual objective statements)

American Indians - 1563

1. Maintain a governmental relationship with federally recognized tribal governments.
2. Implement programs and activities honoring treaty rights and fulfill legally mandated trust responsibilities to the extent that 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.
4. Provide research, transfer of technology and technical assistance to American Indian governments.

Noxious Weed Management - 2080.2

To use an integrated weed management approach to control and contain the spread of noxious weeds on National Forest System lands to adjacent lands. Specific objectives to be achieved through noxious weed management include:

1. Prevention of the introduction and establishment of noxious weed infestations.
2. Containment and suppression of existing noxious weed infestation.
3. Formal and informal cooperation with State agencies, local landowners, weed control districts and boards, and other Federal agencies in the management and control of noxious weeds.
4. Education and awareness of employees, users of National Forest System lands, adjacent landowners, and State agencies about noxious weed threats to native plant communities and ecosystems.

Solid Waste Management - 2130.2

1. Program objectives are to design, operate, and maintain all solid waste systems under Forest Service jurisdiction in such a manner so as to meet all federal, state, and local requirements; promote public health and safety; protect Forest resource and environmental qualities; and complement and support the total land-use management process.

Pesticide Management - 2150.2

1. To ensure the proper use of pesticides.

Energy Management - 2170.2

1. Conserve energy in the conduct of Forest Service programs and in the operation of Forest Service programs and facilities, and to improve efficiency in the production and use of wood products.
2. Minimize undesirable consequences associated with development of renewable and non-renewable energy source extracted from Forest System lands.
3. Facilitate recovery of fuels from Forest System lands and implement programs to support production and use of alternative fuels.
4. Provide leadership and support for environmentally acceptable and scientifically sound development, production, and use of all energy resources from lands.

Range Management - 2202.1

1. To manage range vegetation to protect basic soil and water resources, provide for ecological diversity, improve or maintain environmental quality, and meet public needs for interrelated resource uses.
2. To integrate management of range vegetation with other resource programs to achieve multiple-use objectives contained in Forest System land and resource management plans.
3. To provide for livestock forage, wildlife food and habitat, outdoor recreation, and other resource values dependent on range vegetation.
4. To contribute to the economic and social well-being of people by providing opportunities for economic diversity and by promoting stability for communities that depend on range resources for their livelihood.

Grazing and Livestock Use Permit System - 2230.2

1. To administer the grazing permit system consistent with range resource management objectives found in Forest land management plans, and to best serve the public's long-term economic and social needs.

Range Improvements - 2240.2

1. Without impairing land productivity or water quality, implement and maintain range improvements to the extent benefits are commensurate with cost and demand for livestock forage.
2. Provide information and advice through the Range Technical Information System and the Rangeland Technology Equipment Council to enhance restoration, improvement, and quality of rangeland.

Structural Range Improvement - 2242.02

1. Install structural range improvements to obtain proper livestock management and to meet objectives contained in Forest land and resource management plans and allotment management plans.

Maintenance of Improvement - 2244.02

1. To maintain in operable condition all range improvements on the National Forest System and other lands controlled by the Forest Service.

Range Improvement Investment - 2246.02

1. Invest in cost-effective range improvements to achieve objectives established in Forest land and resource management plans and allotment management plans.

Recreation - 2302

1. To provide non-urbanized outdoor recreation opportunities in natural-appearing forest and rangeland settings.
2. To protect the long-term public interest by maintaining and enhancing open-space options, public accessibility, and cultural, visual, and natural resource values.
3. To promote public transportation and/or access to National Forest recreation opportunities.
4. To shift landownership patterns as necessary to place urbanized recreation setting into other ownerships to create more public open space and/or natural resource recreation values.

National Wilderness Preservation System - 2320.2

1. Maintain and perpetuate the enduring resource of Wilderness as one of the multiple uses of National Forest System land.
2. Maintain Wilderness in such a manner that ecosystems are unaffected by human manipulation and influences so that plants and animals develop and respond to natural forces.
3. Minimize the impact of those kinds of uses and activities generally prohibited by the Wilderness Act, but specifically exempted by the Act or subsequent legislation.
4. Protect and perpetuate Wilderness character and public values including, but not limited to, opportunities for scientific study, education, solitude, physical and mental challenge and stimulation, inspiration, and primitive recreation experiences.

Recreation in Wilderness - 2323.11

1. Provide, consistent with management of the area as Wilderness, opportunities for public use, enjoyment, and understanding of the Wilderness, through experiences that depend on a Wilderness setting.
2. Provide outstanding opportunities for solitude or a primitive and unconfined type of recreation.

Range in Wilderness - 2323.21

1. Manage Wilderness range in manner that utilizes the forage resource in accordance with established Wilderness objectives.

Wildlife and Fish Management in Wilderness - 2323.31

1. Provide an environment where the forces of natural selection and survival rather than human actions determine which and what numbers of wildlife species will exist.
2. Consistent with objective #1, protect wildlife and fish indigenous to the area from human-caused conditions that could lead to federal listing as threatened or endangered.
3. Provide protection for known populations and aid recovery in areas of previous habitation, of federally listed threatened or endangered species and their habitats.

Soil and Water in Wilderness - 2323.41

1. Maintain satisfactory natural watershed condition within Wilderness.

Forest Cover in Wilderness - 2323.51

1. Manage forest cover to retain the primeval character of the environment and to allow natural ecological processes to operate freely.

Air Resource in Wilderness - 2323.61

1. Protect air quality and related values, including visibility, on Wilderness land designated Class 1 by the Clean Air Act as amended in 1977.
2. Protect air quality in Wilderness areas not qualifying as Class 1 under the same objectives as those for other national Forest System lands.

Minerals in Wilderness - 2323.72

1. To preserve the Wilderness environment while allowing activities for the purpose of gathering information about mineral resources.
2. To ensure that mineral exploration and development operations conducted in accordance with valid existing rights for federally owned, locatable, and leasable minerals (FSM 2810 and FSM 2820) and for non-federally owned minerals (FSM 2830) preserving the Wilderness resource to the extent possible.
3. To ensure the restoration of lands disturbed during exploration and development activities as nearly as practicable promptly upon abandonment of operations.

Insects and Disease in Wilderness - 2324.11

1. To allow indigenous insect and plant diseases to play, as nearly as possible, their natural ecological role within Wilderness.
2. To protect the scientific value of observing the effect of insects and diseases on ecosystems and identifying genetically resistant plant species.
3. To control insect and plant disease epidemics that threaten adjacent lands or resources.

Fire Management in Wilderness - 2324.21

1. Permit lightning-caused fires to play, as nearly as possible, their natural ecological role within Wilderness.
2. Reduce, to an acceptable level, the risks and consequences of wildfire within Wilderness or escaping from Wilderness.

Structures and Improvements in Wilderness - 2324.31

1. To limit structures and improvements for administrative purposes or under special-use permit to those actually needed for management, protection, and use of the Wilderness for the purpose for which the Wilderness was established.

Research in Wilderness - 2324.41

1. To provide appropriate opportunity for scientific studies that are dependent on a Wilderness environment.

Motorized Equipment in Wilderness - 2326.02

1. To accomplish management activities with non-motorized equipment and non-mechanical transport of supplies and personnel.
2. Exclude the sight, sound, and other tangible evidence of motorized equipment or mechanical transport within Wilderness except where they are needed and justified.

Public Managed Recreation Opportunities - 2330.2

1. To maximize opportunities for visitors to know and experience nature while engaging in outdoor recreation.
2. To develop and manage sites consistent with the available natural resources to provide a safe, healthful, aesthetic, non-urban atmosphere.
3. To provide a maximum contrast with urbanization at National Forest sites.

Privately Provided Recreation Opportunities - 2340.2

1. To provide, under special-use authorization, sufficient, suitable facilities and services that supplement or complement those provided by the private sector, state, and local government on private land and the Forest Service on National Forest System land to meet public needs, as determined through land and resource management planning.
2. To facilitate the use, enjoyment, understanding, and appreciation of the National Forest, natural resource setting.

Concession Uses Involving Privately Developed Facilities - 2343.02

1. To provide a diversity of recreation activities that emphasize the Forest setting and rustic, natural-resource-based recreation opportunities.

Group Use By Institutions or other Entities - 2345.02

1. To allow group recreation opportunities, facilities, and service at camps on National Forest System land when suitable private lands are not available.

Trail, River, and Similar Recreation Opportunities - 2350.2

1. Provide recreation opportunities for users of the general forest, water, and cave resources.
2. Provide opportunities for a variety of recreation pursuits with emphasis on activities that are in harmony with the natural environment and consistent with the recreation role of the National Forest.
3. Mitigate adverse impacts of users on the natural resources, cultural and historical resources, and on other users.

Forest Development Trails - 2353.02

1. Provide trail-related recreation opportunities that serve public needs and meet land management and recreation policy objectives.
2. Provide trail recreation opportunities that emphasize the natural setting of the National Forest and are consistent with land capability.
3. Provide trail access for National Forest management and protection.

Scenic and Historic Trails - 2353.41

1. To develop and administer National Scenic or National Historic Trails to ensure retention of the outdoor recreation experience for which the trail was established and continued production of maximum benefits from the land.

National Wild and Scenic Rivers System - 2354.02

1. Provide river and similar water-recreation opportunities to meet the public needs in ways that are appropriate to the National Forest recreation role and are within the capabilities of the resource base. Protect the free-flowing conditions of designated Wild and Scenic Rivers and preserve and enhance the values for which they were established.

Off-Road Vehicle Management - 2355.02

1. Provide off-road vehicle recreation opportunities that are in concert with the environmental setting, minimize off-road vehicle effects on the land and resources, promote public safety, and control conflicts with other uses of National Forest System lands.

Cave Management - 2356.02

1. Provide cave-related recreational, cultural, educational, and scientific study opportunities that serve public need. Balance surface resource management and cave use with the protection of cave values.

Special Interest Areas - 2360.2

1. To protect and, where appropriate, foster public use and enjoyment of areas with scenic, historical, geological, botanical, zoological, paleontological, or other special characteristics. To classify areas that possess unusual recreation and scientific values so that these special values are available for public study, use, or enjoyment.

Cultural Resources - 2361.02

1. Complete an inventory of cultural resources on all National Forest System land by 1985 sufficient to provide a database for land management planning.
2. Complete an inventory of all cultural resources on National Forest System land by 1990.
3. Until these inventories are complete, exercise caution to ensure cultural resources are not damaged, destroyed or transferred by meeting the coordination requirements outlined in FSM 2361.3.
4. As part of the decision-making process, document inventory and evaluation procedures to ensure adequate participation by cultural resource professionals.
5. Perform inventories at appropriate levels prior to initiating project actions.

National Registry of National Landmarks - 2373.02

To cooperate with the U.S. Department of Interior National Park Service:

1. Encourage the preservation of sites illustrating the geological and ecological character of the United States.
2. Enhance the scientific and educational value of sites thus preserved.
3. Foster a greater concern in the conservation of the Nation's natural heritage.

Visual Quality - 2380.2

1. To manage all National Forest System lands to attain the highest possible visual quality commensurate with other appropriated public uses, costs, and benefits.

Interpretive Services/Visitor Information - 2390.2

1. To assist those visitors in the National Forest, research projects, and state and private forestry locations in gaining a greater appreciation of the role of conservation in the development of the nation's heritage and culture.
2. To promote visitor understanding of the Forest Service, the National Forest System, forestry research, and state and private forestry programs.
3. To inform visitors of recreation opportunities and facilities on the National Forests.
4. To help visitors know and experience the natural environment.
5. To implement an interpretive program that helps solve management problems and aids in the development of public understanding of Forest Service management.
6. To expand the number of interpretive associations that contribute to public understanding of Forest Service practices, support interpretive services objectives, increase public awareness, and aid in management of National Forest resources.
7. To increase visitor understanding of natural and cultural history principles and their relation to land management techniques.

Timber Management - 2402

1. Provide a continuous supply of National Forest timber for the use and necessities of the citizens of the United States.
2. To provide, as far as feasible, an even flow of National Forest timber in order to facilitate the stabilization of communities and opportunities for employment.
3. Manage and provide for regeneration of tree stands.
4. Maintain a diversity of forest vegetation types and resources consistent with the Forest Plan.
5. Plan and conduct cost-effective timber sales and other timber management activities.

Personal Use Firewood - 2431.6

1. Make existing firewood available to all potential users consistent with protection of other resources values and budget and personnel constraints.

Commercial Timber Sales - 2430.2

1. To provide an orderly program of timber sales from each National Forest in accordance with the Forest Plan or approved interim plans.
2. To offer for sale the ASQ and other sales specified in Forest Plans, subject to financing levels or other modification during their implementation.
3. To coordinate the timber sales program with planning, management, and use of other Forest resources.
4. To provide a continuous flow of raw material to local forest industries.
5. To ensure the Government only conducts business with responsible persons and in a manner which protects the interest of the Government and public.

Salvage Sales - 2435.02

1. Provide for the removal of damaged or dead timber as soon as practically possible to avoid unnecessary loss of value and volume and to respond to potentially serious catastrophes such as wildfire, windthrow or hurricane.
2. Manage timber stands at high risk of spreading disease or insect epidemics to prevent volume loss.
3. Manage the use of the salvage sale fund to provide for the rapid, optimum practical use of wood material damaged through natural events such as insects, windstorms, wildfires, hurricanes and tornados.

Silvicultural Practices - 2470.2

1. To prescribe, implement, and monitor silvicultural practices that develop forest stand conditions, which meet land management objectives designated in Regional Guides and Forest Plans.

Harvest Cutting - 2471.02

1. Manage timber and other forest resources for protection, enhancement, and sustained yield of those resources through the sale or permitted use of forest products with the long-term intent to regenerate the stand.

Reforestation - 2472.02

1. Maintain all forest lands within the National Forest System in appropriate forest cover.
2. Improve the quality and yield of new timber stands.
3. Achieve desired time and stocking level goals in a cost-efficient manner.
4. Develop and demonstrate successful reforestation methods and techniques and encourage their use by private landowners.

Timber Stand Improvement - 2476.02

1. Maintain or increase the growth rate, health, species composition, and/or improve the quality of stands for timber or other resource uses according to direction in the Forest Plan.
2. Develop and demonstrate the benefit of improved methods and techniques of timber stand improvement for all resource uses as an encouragement for private landowners to apply timber stand improvement practices on their own land.

Watershed Management - 2502

1. To protect and, where appropriate, enhance soil productivity, water quality and quantity, and timing of waterflows.
2. To maintain favorable conditions of streamflow and continuous production of resources from National Forest System watersheds.

Watershed Planning – 2510.2

1. To identify and evaluate watershed condition or damage producing events that cause threat to live or property, site deterioration, water pollution, or unstatifactory water yield, and plan appropriate corrective action on the contributing watershed.
2. To ensure appropriate liaison in connection with our-Service water resource development projects.

3. To identify and evaluate the potential use and enhancement opportunities of the soil and water resource by:
    - Ensuring the timely availablity of soil and water resource information needed for the Forest and Rangeland Renewable Resources Planning Act (RPA) assessment and program in land resource management planning.
    - Devloping and fully integrating watershed management goals and objectives into RPA and into land and resource management planning.

Watershed Data Management – 2513.02

1. To program complex analyses efficiently and accurately
2. To facilitate the storage and retrieval of technical soil and water data.

***Refer to FSM 6602 for overall objective in management of Forest Service Systems

Watershed Protection and Management - 2520.2

1. To protect National Forest watersheds by implementing practices designed to retain soil stability, improve or maintain site productivity, secure favorable conditions of water flow, and preserve or enhance aquatic values.

Watershed Improvement - 2522.02

1. Restore hydrologic balance of degraded watershed areas by stabilizing soil, controlling surface runoff and erosion, reducing flood potential, and improving long-term soil productivity.
2. Improve soil and water quality.

Burned Area Emergency Rehabilitation - 2523.02

1. To determine if emergency watershed conditions exist.
2. To alleviate emergency watershed conditions following wildfire to help stabilize soil, control water, sediment, and debris movement, and to prevent threats to life, property, and other downstream values, both on-site and off-site.

Riparian Areas - 2526.02

1. To protect, manage, and improve riparian areas while implementing land and resource management activities.
2. To manage riparian areas in the context of the environment in which they are located, recognizing their values.

Floodplain Management Wetland Protection - 2527.02

1. To reduce risk of flood loss.
2. To minimize impacts of floods on human safety, health, and welfare.
3. To minimize destruction, loss, and degradation of wetlands.
4. To preserve and restore the natural and beneficial values of floodplains and wetlands.

Water Quality Management - 2532.02

1. To protect and, where needed, improve the physical, chemical, biological, and aesthetic quality of the water resource consistent with the purposes of the National Forests and national water-quality goals.

2. To provide water of a quality suitable for the beneficial uses identified in the land and resource management planning process. (FSM 1920)
3. To ensure safe drinking water subject to public use on National Forests, whether the source is a natural or developed water supply. (FSM 7420. Where state standards do not exist, observe EPA water-quality criteria.)
4. To ensure safe water quality for designated primary contact recreation areas. (Where State standards do not exist, observe EPA water quality criteria)

Municipal Supply Watersheds - 2542.02

1. To manage National Forest System lands for multiple uses by balancing present and future resource use with domestic water-supply needs.

Soil Resource Improvement - 2553.02

1. To improve soil quality to selected levels for specific purposes by mechanical treatment, chemical, or other soil additives, irrigation, or vegetative manipulation.
2. To rehabilitate soils that are in unsatisfactory condition.

Soil Quality Monitoring – 2554.02

1. To meet direction in the National Forest Management Act of 1976 and other legal mandates. To manage National Forest System lands under ecosystem management principles without permanent impairment of land productivity and to maintain or improve soil quality.

Air Quality - 2580.2

1. Protect air-quality-related values within Class 1 areas, as described in 42 U.S.C.7475 (d)(2)(b) and (c) and section 2580.5.
2. Control and minimize air-pollutant impact from land management activities.
3. Cooperate with air regulatory authorities to prevent significant adverse effects of air pollutants and atmospheric deposition on forest and rangeland resources.

Fish and Wildlife - 2602

1. Maintain ecosystem diversity and productivity by:
    a. Recovering threatened or endangered species.
    b. Maintaining at least viable populations of all native and desired non-native wildlife, fish, and plants in habitats distributed throughout their geographic range on National Forest System lands.
    c. Producing habitat capability levels to meet sustained yield objectives relative to demand for featured management indicator species identified in RPA and Forest Plans.
2. Provide diverse opportunities for aesthetic, consumption, and scientific uses of wildlife, fish, and sensitive plant resources in accordance with national, regional, state and local demands.

Animal Damage Management - 2650.2

1. The objective of animal damage management activities is to protect National Forest System resources, to protect activities taking place on National Forest System lands, and to reduce threats to human health and safety.

Threatened and Endangered Species - 2670.21

1. Manage National Forest System habitats and activities for threatened and endangered?species to achieve recovery objectives so that special protection measures provided under the Endangered Species Act are no longer necessary. Promote recovery efforts through Research and State and Private Forestry programs.

Sensitive Species - 2670.22

1. Develop and implement management practices to ensure that species? do not become threatened or endangered because of Forest Service? actions.
2. Maintain viable populations of all native and desired non-native ?wildlife, fish, and plant species in habitats distributed ?throughout their geographic range on National Forest System lands.
3. Develop and implement management objectives for populations and/or habitat of sensitive species.

Special Uses - 2702

1. To manage special uses of National Forest System lands in a manner which protects natural resource values and public health and safety, consistent with the Forest land and resource management plans;
2. To administer special uses based on resource management objectives and sound business management principles; and
3. To develop and maintain a well-trained workforce to properly manage and administer special uses.

Special Use Administration - 2721.02

1. To issue and to administer special-use permits for recreation uses that serve the public, promote public health and safety, and protect the environment.

Special Uses Management - 2730.2

1. Provide rights-of-way for the public road system, including the federal-aid system, when such roads cross National Forest System lands or interest in lands.
2. Accommodate the access needs for the protection, development, and utilization of lands and resources owned by private interests or administered by public agencies when the planned Forest Development Road System and public road system do not meet those needs adequately.
3. Protect and enhance the quality of air, water, soil, and natural beauty of Forest Service administered lands in the granting of any right-of-way.
4. Cooperate with intermingled and adjacent landowners in developing roads that serve the needs of both parties through the exchange of rights-of-way.
5. Provide access across National Forest System land to private land that is adequate to secure the owners thereof reasonable use and enjoyment of their land without unnecessarily reducing the management options of the Forest Service or damaging National Forest lands or resources.

Withdrawals - 2761.02

1. Protect the United States' improvements and other unique values that are subject to disposition or destruction under the public land laws.

2. Provide a consistent and efficient withdrawal program that meets land and resource management objectives.
3. Ensure cooperation and coordination with the Secretary of the Interior and the Bureau of Land Management.
4. Encourage mineral activity where mineral extraction is the best use of the site.

Federal Power Act Projects - 2770.2

1. To ensure hydroelectric production where it is compatible with National Forest purposes.?To ensure that planning, construction, and operation of hydroelectric projects are performed in such a manner to protect or effectively utilize National Forest System land and resources.

Minerals and Geology - 2802

1. Encourage and facilitate the orderly exploration, development, and production of mineral and energy resources within the National Forest System in order to maintain a viable, healthy minerals industry and to promote self-sufficiency in those mineral and energy resources necessary for economic growth and the national defense.
2. Ensure that exploration, development, and ?production of mineral and energy resources are conducted in an environmentally sound manner and that these activities are integrated with the planning and management of other National Forest resources.
3. Ensure that lands disturbed by mineral and energy activities are reclaimed for other productive uses.

Minerals Reservations Outstanding Mineral Rights - 2830.2

1. To administer mineral reservations and outstanding mineral rights consistent with the rights reserved or outstanding and the acquired rights of the United States in a manner that minimizes damage to National Forest System resources.

Reclamation - 2840.2

1. Minimize the environmental impacts resulting from such activities.
2. Ensure that disturbed lands are returned to a use that is consistent with long-term Forest land and resource management plans.

Mineral Materials - 2850.2

1. To meet the demand for mineral materials consistent with the management of other surface resources.

Rural Development - 3602

1. To utilize Forest Service programs and authorities to provide more jobs and income opportunities, to improve rural living conditions, to enrich the cultural life of rural America, and to maintain and protect the environment and natural resources of rural areas.
2. Participation in the Rural Conservation and Development Program (RC&D) is to improve the ability of state and local units of government and local sponsors to accelerate the conservation, development, and use of forest resources with the aim of improving the social, economic, and environmental conditions in an authorized RC&D area.

Rural Development - 3610.2

1. To protect and manage the natural resources including scenic, Wilderness, and other

special values of forest and range environments in rural areas.

2. To promote research to expand the technological base for forestry and the use of forest products and to lend support for rural housing goals.
3. To encourage the development and transfer of technological improvements to protect and improve the quality of the rural environment, and to extend the supplies of natural resources.
4. To maintain or increase the forest land base, improve its productivity, and improve forest landownership patterns.
5. To promote orderly development and wise use of forest resources consistent with sound stewardship to develop and increase rural employment and income with the aim of improving or stabilizing rural social and economic conditions.
6. To expand public understanding of environmental conservation and natural resource planning, protection, and management and how stewardship is related to these activities.
7. To provide information and analysis for determining forest resource potentials and opportunities to enhance rural development.

Resource Conservation and Development Program - 3620.2

1. To help provide the people of the area with employment and other economic opportunities through the orderly development, improvement, conservation, and utilization of forest land and related resources in the RC&D areas.
2. To provide state and local leadership with the opportunity to coordinate and use the facilities and techniques available under current agricultural programs and any applicable new programs as may be instituted to aid in planning and carrying out a balanced program?of development, conservation, and protection of natural resources to meet local, state, and national needs.
3. To develop a level of state and local leadership that can assume independent programs in forest and related resource management and achieve state and local forestry and related resource goals and objectives.

Research Natural Areas - 4063.02

1. Preserve a wide spectrum of representative areas that typify important forest, shrubland, grassland, alpine, aquatic, geological, and similar natural situations that have special or unique characteristics of scientific interest and importance that in combination form a national network of ecological areas for research, education, and maintenance of biological diversity.
2. Preserve and maintain genetic diversity.
3. Protect against serious environmental disruptions.
4. Serve as reference areas for the study of succession.
5. Provide on-site and extension educational activities.
6. Serve as baseline areas for measuring long-term ecological changes.
7. Serve as control areas for comparing results from manipulative research.
8. Monitor effects of resource management techniques and practices.

Fire Management - 5102

1. To integrate consideration of fire protection and use into the formulation and evaluation of land and resource management objectives, prescriptions, and practices.
2. To provide a cost efficient level of wildfire protection on National Forest System lands commensurate with the threat of life and property and commensurate with the potential for resource and environmental damage based on hazard, risk, values, and management objectives.
3. Consistent with land and resource management objectives, to minimize the sum of (a) the fire program cost, plus (b) the net change in value of planned resource outputs due to fire.
4. To protect, maintain, and enhance the production and quality of National Forest and Grassland resources through fire protection and use of prescribed fire.

Fire Suppression - 5130.2

1. To safely suppress wildfires at minimum cost consistent with land and resource management objectives and fire management direction as stated in fire management action plans.

Prescribed Fire - 5140.2

1. To use prescribed fires, from either management ignitions or natural ignitions, in a safe, carefully controlled, cost-effective manner as a means of achieving management objectives defined in the Forest and Grassland Plan.

Fuel Management - 5150.2

1. To identify, develop, and maintain fuel profiles that contribute to the most cost-efficient fire protection and use program in support of land and resource management direction in the Forest and Grassland Plan.

Landownership Adjustment - 5402

1. Achieve the optimum landownership pattern to provide for resource uses to meet the needs of the people now and in the future.
2. Settle land title claims equitably and promptly.
3. Provide resource administrators readily accessible and understandable title information affecting the status and use of lands and resources they administer.

Land Purchases and Donations - 5420.2

1. Enhance the multiple use and sustained yield of the goods and services from the National Forest System.
2. Protect and improve the quality of renewable resources.
3. Protect and preserve important historic, cultural, and natural aspects of the national heritage.
4. Provide for access, use, and enjoyment of the forest resources by the public.
5. Improve administrative efficiency and effectiveness of the National Forest System.

Land Exchange - 5430.2

1. To implement land management and resource planning directions to attain an optimum National Forest System landownership pattern that provides for resource uses that best meet the present and future needs of the people.

Partial Interest Acquisition - 5440.2

1. Provide for acquisition of only those interests in land necessary to meet planned program objectives.
2. Provide for continuance of private land uses which are consistent with planned program objectives.

National Forest System Modification - 5450.2

1. The objectives of National Forest System modifications are to:
    a. Obtain National Forest status for all appropriate lands within the National Forest System.
    b. Modify existing National Forest System unit boundaries as needed to provide logical exterior boundaries.
    c. Establish purchase units as needed to meet program objectives.
    d. Establish National Forest or other boundaries as needed to facilitate management and administration.
2. The objectives of land transfers are to:
    a. Improve management efficiency of federal lands.
    b. Improve service to the public.
    c. Result in net benefits to the government, to the public, or both.

Right-of-Way Acquisition - 5460.2

Rights-of-way acquisition objectives are to acquire:

1. Road and trail rights-of-way that are adequate for the protection, administration, and utilization of the National Forests System;
2. Rights-of-way in time to meet road and trail construction and resource development program schedules;
3. All interests needed for use of roads and trails to meet the long-term management and multiple use objectives of National Forest System lands as set out in Forest land and resource management plans; and
4. When compatible with National Forest System needs, the utilization and development of resources in other ownerships on which communities within or adjacent to the National Forests depend.

Reservations and Outstanding Rights - 5470.2

1. To accomplish real property adjustments free of encumbrances that would detract from present or future uses of National Forest System land or that would needlessly restrict private land use and impose an unwarranted management obligation on the Forest Service.

Condemnation - 5480.2

1. To acquire real property or interests in property by condemnation when all other methods of acquisition fail and the property or interest is required for the protection, administration, or utilization of National Forest System lands.

Land Surveying - 7151.02

1. Provide legal land surveys and related services to locate, mark, post, and maintain land corners, property corners, and property lines between National Forest System land and other ownerships for the protection and management of National Forest System lands and resources.

Landline Location Program - 7152.02

1. Provide the land manager and public with visible and legally defendable administrative and property boundary lines on the ground, and to accurately depict the location of landownership lines on administrative maps produced by the Forest Service.

Sign and Poster Program - 7160.2

1. Support accomplishment of management area direction contained in the Forest Plan for the administration, protection, management, and use of National Forest System lands.
2. Provide information for the safety, enjoyment and convenience of National Forest and National Grassland visitors, users, cooperators, and employees.
3. Provide information about geographic and historical features, and the use, management, and research activities on the National Forest and National Grasslands.
4. Identify National Forest and National Grassland facilities and lands.

Potable Water Supply - 7420.2

1. Protect the health of the public and Forest Service personnel by ensuring that water provided by the Forest Service for human consumption at any administrative site or public use area is both safe and protected.

Wastewater Collection Systems and Treatment Works - 7430.2

1. Avoid creating health hazards or nuisance conditions.
2. Restore and maintain the chemical, physical, and biological quality of water resources.
3. Prevent future pollution or degradation of surface or groundwater.

Effluents - 7440.2

1. The objective of this program is to plan, design, construct, operate, and maintain wastewater disposal facilities and other related effluent-disposal activities to ensure that discharge and/or infiltration of pollutants do not create health hazards or nuisance conditions, nor alter the quality or characteristics of either groundwater or surface water beyond applicable federal and/or state water-quality and effluent-discharge standards. Where no standards exist, the quality of characteristics of surface and groundwater shall:
    a. Be maintained as near to their existing conditions as measurable.
    b. Not be degraded to adversely affect either present or projected beneficial uses (FSH 7409.11 Ch. 20).

c. Not be allowed to degrade the quality of subsequent ground- or surface-receiving waters beyond the standards when such have been established.

Transportation System - 7702

1. To plan, develop, and operate a network of transportation facilities and transportation modes that provide user safety, convenience, and efficiency of operations.
2. To provide access to National Forest System lands in order to accomplish management direction and protection objectives.
3. To coordinate access to National Forest System lands with national and statewide transportation needs.
4. To minimize the total transportation present-worth costs including user, maintenance, construction, reconstruction, rehabilitation, restoration, realignment, and betterment costs.

Transportation Planning - 7710.2

1. To efficiently provide facilities that will achieve Forest management direction and that are appropriate for their intended purpose.
2. To direct the orderly development and management of the transportation system and to ensure the documentation of decisions affecting the system.

Development - 7720.2

1. To locate, survey, design, and construct transportation facilities in accordance with FSM 7702.

Operation and Maintenance - 7730.2

1. Operate and maintain the Forest Development Transportation System in a manner to provide cost effective support of resource management direction and safe travel for users of the system while protecting the environment, adjacent resources and the public investment.

Highway Safety Program - 7733.02

1. To reduce traffic accidents, deaths, injuries and any resulting property damage.

Federal Lands Highway Program - 7740.2

1. To assist the Federal Highway Administration with the administration of the Forest highway program to plan and develop access roads to:
    a. Enhance the value of National Forest System resources.
    b. Protect, develop, and use the National Forest System and its renewable resources.
    c. Enhance economic development at the local, regional, and national levels.
    d. Serve local needs and communities dependent on the National Forest System activities.
    e. Provide for economy of operation and maintenance and the safety of the users.
    f. Provide safe and adequate rural highways connecting the National Forest System with major highway systems.

APPENDIX L NATIONAL AND REGIONAL POLICIES

Following is a partial listing of national and regional Forest Service policy relevant to this Land and Resource Management Plan. A complete listing can be found in the Forest Service Manual and the Forest Service Handbook. The Forest Service Manual and the Forest Service Handbook are both quite lengthy—each comprising nearly 100 three-ring binders. They are both indexed by subject matter. The national direction is printed on white pages, and can be supplemented by Regional direction printed on blue pages, and Forest direction printed on green pages.

AMERICAN INDIANS (FSM 1563)

On October 22, 1992, the United States Department of Agriculture issued a policy statement on Indian tribes. The outlined policies include:

a. Supporting the principles of self-government delineated in the Indian Self-determination Act and Education Assistance Act.

b. Consulting with tribal governments regarding the influence of USDA activities on water, land, forest, air and other natural resources of tribal governments.

c. Seeking input from tribes on USDA policies and issues affecting tribes and reconciling Indian needs with the principles of good resources management.

d. Observing the American Indian Religious Freedom Act.

e. Working with tribal governments, high schools and universities to encourage the development of agribusiness skills and sharing of information through exchange of technical staff and skills.

f. Encouraging early communication and cooperation between agencies with responsibilities to tribal governments.

g. Consistent with applicable law or regulation, facilitating tribal participation in program planning and activities.

BIOLOGICAL DIVERSITY (FSM 2670)

Sensitive Species

Manage sensitive species habitat as directed in interim directive 2600-95-7.

CAVES (FSM 2356)

1. Caves will be protected and evaluated under provisions of the Federal Cave Resources Protection Act of 1988. Caves determined to be significant under the Act or being evaluated are exempt from locational disclosure under the Freedom of Information Act. The location of caves will be kept confidential when needed to protect important archeological resources, habitat for endangered wildlife, sensitive cave biota, and unique geological features.

2. Management plans will be prepared for caves determined to be significant.

3. Coordinate the management of cave and surface resources.
    a. Manage the cave resource in partnership with caving organizations, other governmental agencies, scientists, researchers, and outdoor recreationists.
    b. Interpret cave resources and provide public evaluation for increased public understanding and awareness of the need to protect and preserve these unique ecosystems.
    c. Provide for public health and safety while recognizing that no cave is completely safe and that risk-taking is part of the caving experience.
4. Adjust silvicultural prescriptions to protect caves.
    a. Retain a vegetative buffer area around cave entrances.
    b. Do not alter cave entrances with timber harvest activities.
    c. Do not dispose of slash, refuse, or burn slash at cave entrances.
5. Road or trail signs should not direct public attention to wild caves.
6. Access for exploration and development of locatable mineral resources will be analyzed in response to a proposed operating plan.
7. Potential impacts to cave resources will be considered in reviewing any project.?
8. The water, sediment, nutrient and temperature regimes of caves and karst features will be protected so these environments can function naturally.

DAMS (FSM 7500)

1. For administrative Class A, B, C and high hazard Class D dams located on National Forest System lands, annually update the National Inventory of Dams (PL99-662) in accordance with data elements required by the Federal Emergency Management Agency (FSM 7514).
2. Maintain a record for all dams on National Forest System lands over six feet high (vertical difference between the lowest point on the crest of the dam and the lowest point in the original stream bed). As a minimum, the record should include the dam identification, location, purpose, owner, administrative classification, hazard-potential classification, height, and maximum storage (FSM 7514).

FIRE AND FUELS (FSM 5100)

Fire Suppression

1. Structural firefighting is the responsibility of local fire service agencies. Structural fire protection from advancing wildfire within the National Forest and Grassland Protection Boundary is the responsibility of local fire service agencies and the Forest Service (FSM 5138.1).

Fuel Treatment

2. Cooperate with state and local governments and fire protection districts in the development of fire hazard reduction plans and ordinances by providing technical assistance (FSM 3172, 3173, 3174).

3. Provide a level of protection from wildfire outside of incorporated towns that minimizes the risk of building damage or firefighter exposure. A fire management plan will be written for all facilities on National Forest and Grassland lands and will be maintained in the Forest's and Grassland Fire Management Action Plan. National Fire Protection Association (NFPA) standards will be used as guidelines for the development of individual plans. Each plan will provide guidance for structural, vegetative, and infrastructure management of the facilities on the Forest and Grassland. Planning standards will be used to provide guidance for private landowners requesting direction for wildland fire-protection improvements.

Prescribed Fire

4. Use prescribed fire to accomplish resource management objectives, such as reducing fuel load buildup, wildlife habitat improvement, etc. Identify objectives in conjunction with a burning plan approved by a line officer. Prescribed burns adjoining private or other federal or state lands will be coordinated with the adjoining landowner?(FSM 5140).

5. Use prescribed fire where it will meet management objectives in the most economically and ecologically acceptable way (FSM 5140).

GEOLOGY (FSM 2800)

1. Permit appropriate prospecting and collecting proposals for fossils and minerals by non-commercial, scientific, and/or educational institutions, and provide appropriate opportunities for recreational collection of mineral and fossil materials, where consistent with Forest Plan goals and objectives (FSM 2860.3).

2. Prevent unauthorized removal of fossil and mineral resources (FSM 5302).

3. Propose significant paleontologic sites for designation as special interest areas or geologic areas?(FSM 2360, 2372, 4063).

4. Identify special geologic hazards and problems that affect land and resource management and encourage research in those areas (FSM 2880, 2883, 2884).

HERITAGE RESOURCES (FSM 2360)

Locate, evaluate, protect and foster public use and enjoyment of heritage resources.

a. Protect all heritage resources listed on or eligible for the National Register of Historic Places (NRHP).

b. Nominate all eligible heritage resources to the NRHP.

c. All projects will be reviewed by a Forest Service professional heritage resources specialist for complete heritage resource inventories, evaluations and mitigation measures for a project's area of potential effect prior to issuing environmental decision notices (FSM 2361).

d. Avoid effects to heritage resources until evaluated and determined ineligible for the NRHP.

e. Implement appropriate mitigative measures in consultation with the State Historic Preservation Officer (SHPO) and/or the President's Advisory Council on Historic Preservation (ACHP) when eligible heritage resources will be affected.

f. Maintain, stabilize, or enhance all eligible heritage resources.

INTEGRATED PEST MANAGEMENT (FSM 4500)

Use only chemicals registered with the Environmental Protection Agency and follow label instructions.

LANDS (FSM 5400)

Landownership Adjustments

1. Work with other federal agencies to consolidate ownership and propose jurisdictional transfers that achieve the following objectives:
    a. Develop more effective and efficient work units.
    b. Reduce administrative costs.
    c. Improve, maintain and simplify user access to public lands.
2. Adjust National Forest System and private lands to create a landownership pattern that meets objectives of the Forest Service and other landowners.
3. Manage National Forest System lands identified for exchange or sale consistent with surrounding management area goals and in accordance with the following:
    a. Terminate special-use permits on an opportunity basis and in compliance with applicable regulations and Forest Service policy.
    b. Renew or extend special-use permits on an annual basis only with specific notice of the potential sale or exchange included in the authorization.
    c. Do not authorize construction of additional permanent facilities.
    d. Do not adversely affect land values by management activities.
    e. Do not adversely affect land values through issuance of special-use permits.
    f. Acquire unrestricted rights-of-way whenever possible to maintain the value of the public land.
    g. Ensure needed public rights-of-way are retained across all lands conveyed out of public ownership (FSM 5403.1).
4. Convey lands only if:
    a. Flood hazards on and downstream from conveyed lands are not increased.
    b. Natural and beneficial values of acquired wetlands equal or exceed those of conveyed wetlands.
    c. Natural water regimes in wetlands downstream from conveyed lands are not disrupted.
    d. Lands have been evaluated for the presence of hazardous materials and known hazardous materials have been removed.
    e. Lands do not contain habitat identified by the U.S. Fish and Wildlife Service as necessary for recovery of federally listed threatened and endangered species.
    f. Lands do not contain unique resource characteristics (FSH 5409.13, Chapter 30).

5. Effect jurisdictional transfers that achieve the following objectives:
    a. Reduce duplication of efforts by users and agencies in terms of time, cost and coordination.
    b. Improve or maintain user access to the administrating agency.
    c. Decrease travel and enhance management.
    d. Improve public understanding of applicable laws, regulations, policies and procedures.
    e. Develop more effective and efficient work units.

Property Boundary Administration (FSM 7150)

6. Locate, mark and post landlines according to the following priorities:
    a. Lines needed to meet planned activities;
    b. Lines needed to protect NFS lands from encroachment, and
    c. All other lines (FSM 7152).

MINERALS (FSM 2800)

General

1. Require an operating plan for each significant proposed mineral action that may disturb surface resources (FSM 2817, 2818, 2820).
2. In areas of active, producing sites or areas containing known reserves, consider only surface resource programs compatible with mineral activities.
3. Provide reasonable access to outstanding and reserved mineral rights (FSM 2830.5).
4. In designated Wilderness areas, provide for reasonable access to proposed operations and for restoration of disturbed lands as near as practical to their natural condition when they are no longer needed for operation.
5. Consider significant cave discoveries for mineral withdrawal and other protection measures (FSM 2761, 5302).
6. Deny drilling, mining or production on withdrawn lands, with the exception of valid existing rights at the time of withdrawal (FSM 2811, 2818).
7. Resolve suspected abuse of the mining laws such as occupancy of the land for purposes other than prospecting, mining and related operations.
8. Avoid placing or proposing capital investments or other surface resource activities in areas where they would interfere with operating sites or known mineral resources (FSM 2761).
9. Request mineral leasing withdrawals in situations, such as for classified lands.
10. Cover mining activity by an operating plan and performance bond of the appropriate amount.
11. Reclamation will return disturbed lands to the planned uses.

Leasable Minerals

12. Approve Surface Use Plan of Operation (36 CFR 228.107) in conformance with all stipulations included in the lease and necessary conditions of approval determined during review of the applications (FSM 2800).

Geophysical Operations

13. Permit geophysical operations on withdrawn, classified lands where the operations do not interfere with purposes for which the lands are withdrawn. Do not permit such operations if significant adverse effects cannot be prevented (FSM 2860).

Coal, Uranium and Non-Energy Common Materials

14. In designated Wilderness, Congressionally designated Wilderness study areas, and areas recommended for Wilderness in RARE II upon which Congress has not taken final action:
    a. Prospecting for and disposals of common varieties of mineral materials will not be authorized.
    b. Coal mining in the National Wilderness Preservation System is prohibited by the Coal Leasing Amendments Act of 1975.
    c. Unless there is statutory language to the contrary, in which case the statutory provisions control, recommend, or consent to BLM for issuance of leases or permits where operations, including surface-based access, product transportation and other necessary ancillary facilities, will not cause irreversible and irretrievable damage to surface resources and where the lands disturbed can be restored as near as practical to natural conditions.
15. In classified lands other than Wilderness (Wild and Scenic River Systems, RARE II Further Planning areas, National Recreation Areas, National Historic Sites, Natural Areas, Special Areas: such as geological, scenic and zoological, and some other specific classifications):
    a. Authorize common variety exploration and disposals under terms and conditions to protect the purposes for which the lands were classified. The objective of reclamation requirements will be to return lands to a condition suitable for the purposes for which they were classified.

    For special areas classified under 36 CFR 294 and 251.23 for specific management purposes, the regulatory provisions permit no use or occupancy inconsistent with the classification.

    b. Coal mining is prohibited by the Coal Leasing Amendment Act of 1975, within the National System of Trails and the Wild and Scenic Rivers System, including study rivers designated by that Act.
    c. Recommend or consent to BLM for issuance of leases, permits or licenses only when terms and conditions can be applied that will protect the purposes for which the lands were classified.

RANGE (FSM 2200)

1. Allotment management plans (AMPs) need to provide for threatened, endangered and sensitive species?(FSM 2203, 2211, 2212).
2. When updating AMPs, display forage utilization factors by type of management, the season of use, and the ecological type by condition and seral stage within the AMP?(FSM 2210, 2211).
3. Construct structural improvements to maintain or improve rangeland conditions within classified Wilderness, consistent with Wilderness values?(FSM 2323.26).
4. Riparian utilization or stubble-remaining standards are to be developed and included in AMPs. Consider season of use to minimize impacts on riparian zones?(FSM 2211, 2212, 2526).
5. Give emphasis to developing livestock management strategies that are economically efficient, environmentally sound and compatible with other resources?(FSM 2212.03 - 2212.8).
6. Structural and non-structural improvements to maintain or improve rangeland conditions will be designed to benefit livestock and wildlife and minimize impacts on wildlife and recreation users (FSM 2240).

RECREATION (FSM 2300)

Developed

1. Where terrain allows and demand exists, facilities will be considered for development to accommodate people with disabilities. Different challenge levels will be planned, depending upon the nature of the improvement and the principal form of recreation being provided.
2. The customer will be recognized as a spectrum of our society interested in a wide array of dispersed, sedentary, adventure, developed, guided, self- determined, motorized and non-motorized activities in controlled and uncontrolled environments. Potential customers will be recognized as those who might use National Forest resources if appropriate services and resources were available (FSM 2330)
3. Sites will be managed and maintained according to the needs of our customers using the site. Safety and cleanliness are of utmost importance. Remove hazardous and/or dead trees in developed sites (FSM 2331 R-2 Supplement 2300-93-6, FSM 2332).
4. The type and level of development sophistication in developed sites may vary, depending upon the situation and need. They are developed by the Forest Service, concessionaires or cooperators and may be managed by any or a mix of these (FSM 2303).

Recreation Opportunity Spectrum

5. A recreation opportunity spectrum (ROS) table is included in Chapter 1 of this Forest Plan. A decision to change an ROS class will be documented in a NEPA decision document (FSM 1922.15, 2310.3).

RESEARCH NATURAL AREAS (FSM 4060)

1. Discourage or prohibit any public use that contributes to impairment of research or natural values (FSM 4063.02,4063.3).

2. Use special-use permits or cooperative agreements to authorize and document scientific activity (FSM 4063.3).

RIGHTS-OF-WAY (FSM 5460)

Acquisition

1. Acquire rights-of-way on existing and proposed Forest System roads and trails that cross other than National Forest System lands.

2. Acquire rights-of-way using the following criteria:

    a. Legal access for existing roads and trails that provide general access to the National Forest.

    b. Legal access to support planned projects and high priority activities at least two years prior to project implementation (FSM 5461.2).

SOILS (FSM 2550)

1. Soil should not be displaced more than a continuous area of 100 square feet or more (FSH 2509.18 R-2 Supplement).

2. Soils should not be compacted more than (FSH 2509.18 R-2 Supplement):

    a. A 15 percent increase in bulk density from the average undisturbed density, or

    b. Bulk density values that exceed the following threshold values:

        1.25g/cc - silt and clay
        1.30 g/cc - silty clay, silty clay loam and silt loam
        1.40 g/cc - loam and clay loam
        1.50 g/cc - sandy loam, sandy clay loam and sandy clay
        1.60 g/cc - sand and loamy sand

3. Maintain adequate plant cover to protect the watershed and maintain plant health consistent with the soil type.

4. Management practices will be designed and implemented to maintain or improve the long-term soil productivity potential of the National Forest (FSH 2509.18 R-2 Supplement).

5. Soil quality monitoring will be conducted to determine if soil management goals, objectives and standards are being achieved (FSH 2509.18 R-2 Supplement).

6. Monitoring results will be used to adjust management activities and mitigating measures where necessary to prevent significant impairment of the long-term soil productivity (FSH 2509.18 R-2 Supplement).

SPECIAL LAND USES (FSM 2700)

1. Act on special-use applications according to the following priorities:
    a. Those required by law or regulation, or national in scope.
    b. Those in the public interest, mainly local or regional in nature.
    c. All others.
2. Do not approve any special-use applications that can be reasonably met on non-federal ?or other federal lands unless it is clearly in the public interest (FSM 2703.2).
3. Do not approve special-use applications for areas adjacent to developed sites unless the proposed use is compatible with the purpose and use of the developed site.
4. Utilize approved electronic sites where feasible.
5. Do not approve applications for use of federal land that involve any hazardous materials as defined in U.S.C. 9601 et seq., 40 CFR 261.30 and 40 CFR 302.4. The hazardous materials listed are individual chemicals. These references do not relate to hazardous waste dumps (FSM 2703).

TIMBER (FSM 2400)

General

1. Forests are to be managed to provide net public benefits. Many different philosophies and strategies are used that provide benefits desired in the areas of urban interface, those areas used for recreation and viewing, for wildlife habitat, watershed protection, water-yield enhancement, and others, as well as for wood and fiber products. In most cases, these must be integrated. Managers are to develop and use a wide variety of prescriptions to meet these public priorities and to accept that traditional economic considerations must be supplemented with both the empirical and subjective ones?(FSM 2470.3).
2. Plan areas for timber harvest only if assured, based on existing technology and knowledge, that long-term soil productivity will not be degraded (FSH 2409.26 Chapter 10).
3. Provide for wildlife habitat improvement and enhancement of other renewable resources in sale area improvement plans.

Tree Stand Improvement (Precommercial Thinning)

4. Provide for accelerated growth, create specific stocking, and improve quality and vigor of timber stands.

Silvicultural Prescriptions

5. Silvicultural prescriptions for tree-stand improvement, including thinning, should evaluate the tradeoffs associated with alternative treatments in terms of increased timber yields, economic efficiency, enhanced wildlife habitat, increased wood-products yield and quality, improved long-term forest health, increased species and structural diversity and the desired future condition for the stand (FSH 2409.17 Chapter 6).

6. Silvicultural prescriptions will be prepared for all vegetation management activities proposing the management of forested vegetation to work toward achieving the desired future condition (FSH 2409.26).
7. Apply a variety of silvicultural systems and harvest methods that best meet resource management objectives.
8. Prepare individual silvicultural prescriptions for areas or site-specific practices.?
9. Use thinning practices that consider genetic diversity, competition among the trees for water, nutrients and light. The frequency of thinning should depend upon the tree species, financial efficiency, and the site's growing conditions (as commonly measured by site index) (FSH 2409.17 Chapter 6).
10. Where appropriate, reduce competition between desired trees and other vegetation (FSH 2409.17 Chapter 6).
11. If the silvicultural system being applied to a particular area of the landscape is uneven-aged, harvest trees designated for commercial timber production based on the desired density as determined by age class or size, and the objective for the area (FSH 2409.26).
12. In most circumstances, rely on or make primary use of those silvicultural systems that ensure regeneration of forest stands through natural seeding and suckering (FSH 2409.26b Chapter 70).
13. Use artificial regeneration methods when we cannot rely on the natural sequence of events and/or environmental conditions to regenerate the forests within five years or earlier (FSH 2409.26b Chapter 70).
14. Inventory improvement needs in sale areas during sale reconnaissance. Use KV funds as applicable after sale closure to accomplish needed improvements including education and interpretation (FSH 2409.19).

TRANSPORTATION AND TRAVEL

Transportation System Management (FSM 7700)

1. Unless a proposed road is determined necessary as a permanent addition to the National Forest Transportation System, close it and revegetate it. Revegetation will be achieved within six months. Close or obliterate temporary roads immediately when use ends (FSM 7703).
2. Retain access rights (FSM 7712.31).
3. Establish the specific purpose and intended use for each existing and proposed road, based on management direction. Document this purpose by writing specific road management objectives, which include appropriate design, operation, and maintenance criteria. Employ traffic (travel) management strategies of encourage, accept, discourage, eliminate, unrestricted, or prohibit on all roads (FSM 7712.31).
4. Develop road management programs to require commercial users to pay their share of road maintenance.

5. Propose state and county roads as Forest Highways where the use and development of National Forest System lands affect the public road system, thus necessitating federal investments to ensure that these roads are safe and adequate. Such designation identifies state and local government roads that qualify for construction and reconstruction funding under the Forest Highway program. Designate and develop Forest Development Roads as Forest Highways when use of the road meets requirements for Forest Highway designation (FSM 7740.3).
6. Coordinate Forest information and directional signs with appropriate transportation agencies (FSM 7103).

Trails (FSM 2300)

7. Provide for a wide range of recreational opportunities, both motorized and non-motorized. The trail system on each National Forest will:
    a. Consider barrier-free opportunities for all new construction or rehabilitation proposals.
    b. Not be dedicated to single use unless clearly necessary to resolve conflicts or create unique opportunities.
    c. Have documentation on the purpose and use of each trail (FSH 2309.23).
8. Trail systems will be integrated across administrative boundaries, including adjacent Forest Service units, other federal agencies, state, and municipal trails (FSM 2353).
9. Maintain each trail to the standard required for the intended user types.
10. The permanent Forest trail system will be determined and identified in the Forest Trail Development Plan. This plan will include the existing and future trail system, trail use type, trail management objectives, and ROS and visual quality constraints as they apply to trail experiences (FSM 2353).
11. National Historic, Scenic, or Recreation Trails will receive higher priority than other trails for reconstruction, operation and maintenance?(FSM 2353).
12. Maintain all trails to established Forest standards.
    a. Maintain trails in accordance with standards in the Trail Handbook.
    b. Schedule trail maintenance in accordance with Regional acceptable work standards.
13. Construct or reconstruct trails when needed as part of the transportation system.

VISUAL QUALITY (FSM 2380)

1. Management activities must be consistent with the visual quality objectives (VQO) in this Forest Plan unless a decision is made to change the VQO. A decision to change the VQO will be documented in project NEPA decision documents (FSM 2382.21).
2. At the project implementation stage, the VQO should be refined to the project scale.
3. As new viewer platforms (such as roads, trails, recreation areas or major housing developments outside National Forests) are developed, the VQOs should be reassessed (FSM 2382.32).

4. For areas which do not currently meet the VQO, use landscape rehabilitation as a short-term alternative to restore landscapes containing undesirable visual impacts to a desired visual quality (FSM 2383).

   Since the previous Management Plan was published, the Forest Service has updated the old visual management system into the new Scenery Management System. The Chief of the Forest Service has directed all field units to implement the new system.

WATER (FSM 2520)

Water Quality

1. Develop integrated soil/water/fishery improvement schedules for watersheds, coordinated with other resources. Coordinate with state wildlife agencies. Apply treatment and land-use controls as needed to restore soil productivity, water quality, channel stability and aquatic habitat. (FSM 2522.03, 2522.2)

WILDLIFE AND FISH (FSM 2600)

1. Manage animal damage in cooperation with the state wildlife agencies and the Animal and Plant Health Inspection Service to prevent or reduce damage to other resources and direct control toward preventing damage or removing only the offending animal.

2. Provide forage for big game. Allocate forage to big game based on direction in management area prescriptions and FSM 2210, range analysis and allotment management planning.

Endangered or Threatened Species

3. Provide habitat for federally listed or proposed endangered or threatened species on National Forest System lands (FSM 2672.24, 2676).

4. Complete biological evaluations on actions authorized through NEPA decision documents, funded or carried out by the Forest Service to determine the effects on federally listed or proposed endangered or threatened species (FSM 2672.4).

5 . Carry out consultation, "informal" or "formal" as appropriate, with the U.S. Fish and Wildlife Service when biological assessments determine that Forest Service actions may affect federally listed or proposed endangered or threatened species (FSM 2671.45).

APPENDIX M ACCIDENTAL DISTURBANCE OF HUMAN REMAINS

Human remains will be treated with dignity and respect for the wishes of the deceased individuals they represent. For all activities undertaken on National Forest System lands covered by this Management Plan, the general policy shall be strict avoidance of all human burials, whether marked or unmarked, whenever possible.

Reinterment in-place and avoidance of further disturbance through project redesign will be conducted where feasible. Programmatic Agreements with the appropriate tribal entities will be fashioned detailing the proper procedure, contacts and respectful treatment of Native American human remains as per the Native American Graves Protection and Repatriation Act (NAGPRA) Sec 10.5 (f).

In the case of accidental disturbance of historic graves or interment sites and in the absence of a Programmatic Agreement, the following steps will be taken:

1. All activities that may further disturb the remains will cease immediately in the area of the discovery and the appropriate line officer and Forest Service archaeologist notified. The remains are to be secured and protected until the discovery has been evaluated.
2. Non-destructive, in situ evaluation by Forest Service archaeologist will be made immediately to determine if the skeletal remains are human. Local law enforcement will then be contacted to determine if burial contains a victim of a recent prosecutable crime or accidental death.
3. Within 24 hours, the line officer will notify the appropriate Historic Preservation Office of the discovery of human remains and then consult with this office regarding proper treatment.
4. Should the remains be of Native American ancestry, the appropriate tribal entity will be notified within 24 hours of the discovery as specified in NAGPRA Subpart 10.4 and 10.51a.
5. Should the remains be of Native American ancestry, the Forest Service archaeologist and line officer, in consultation with the appropriate tribal entity, shall make a determination as to whether the burial can be adequately and safely restored in situ or whether the burial should be disinterred completely and reinterred in another location.
    - In cases where reinterment in place is possible, the Line Officer, in consultation with the appropriate tribal entity, shall cause the burial to be backfilled, stabilized and protected from further disturbance by human activities or natural processes which caused the disturbance in the first instance.
    - In cases where reinterment in place is not prudent or feasible, the appropriate tribal entity will be consulted regarding proper reinterment as per NAGPRA Subpart 10.4.