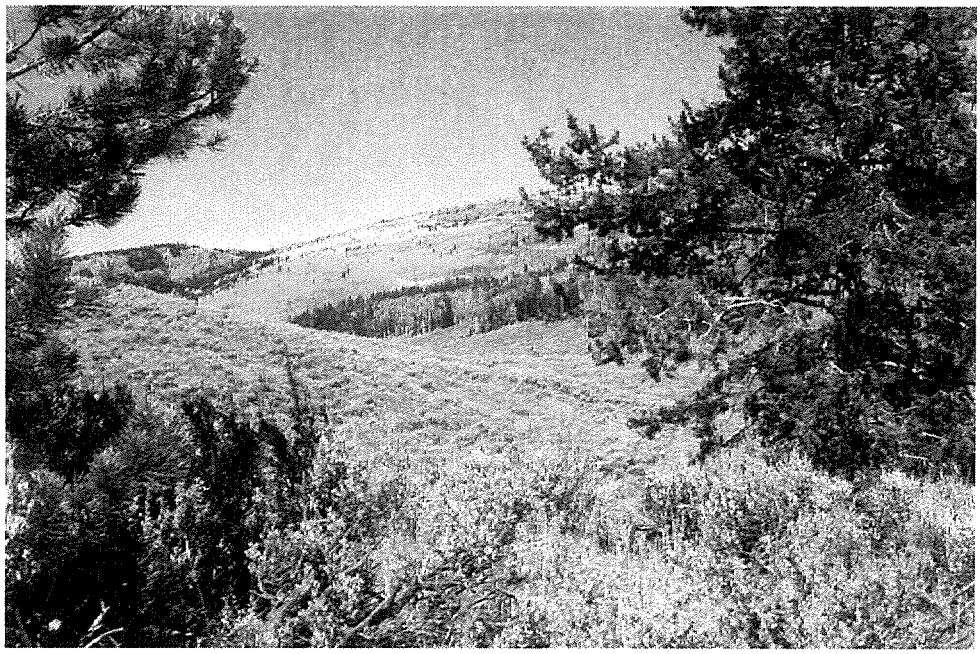
United States
Department of
Agriculture

Forest Service

Intermountain Region

Commissary Ridge/Tunp Range Landscape Scale Assessment



Bridger-Teton National Forest
June, 2001

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List of Acronyms

Acronym	Definition
AMP	Allotment Management Plan
AQRV	Air Quality Related Value
ATV	All Terrain Vehicle
BTNF	Bridger Teton National Forest
BLM	Bureau of Land Management
BMP	Best Management Practice
CCC	Civilian Conservation Corps
CDNST	Continental Divide National Scenic Trail
CFR	Code of Federal Regulations
CRC	Colorado River Cutthroat Trout
DBH	Diameter Breast Height
DC	Desired Condition
DEQ	Department of Environmental Quality
DFC	Desired Future Condition
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FR	Forest Road
HUC	Hydrologic Unit
IWWI	Inland West Watershed Initiative
LSA	Landscape Scale Assessment
LTA	Landtype Association
MA	Management Area
NADP	National Atmospheric Deposition Program
NEPA	National Environmental Policy Act
NF	National Forest
NP	National Park
OHV	Off Highway Vehicle
OSV	Over Snow Vehicle
PFC	Properly Functioning Condition
PNF	Prescribed Natural Fire
PNV	Potential Natural Vegetation
RD	Ranger District
ROS	Recreation Opportunity Spectrum
SNOTEL	Snow Telemetry
SST	Sweet Smelling Toilet
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WGFD	Wyoming Game and Fish Department

EXECUTIVE SUMMARY

The Commissary Ridge/Tunp Range Landscape Scale Assessment (LSA) area is located in the southwestern portion of the Bridger-Teton National Forest, within Lincoln and Sublette Counties, Wyoming. It makes up the entire Kemmerer Ranger District and consists of two major watersheds, the Green River and Bear River, and four subwatersheds, the LaBarge, Fontenelle Creek, Hams Fork, and Smiths Fork Watersheds. The area lies within two major geologic regions of western and southwestern Wyoming, the Green River Basin and the Overthrust Belt.

The diversity of habitats within the area makes it important to wildlife. Forest-wide resource management goals within the LSA area provide habitat adequate to meet the needs of resident wildlife populations, including those of Federally listed Threatened, Endangered, and Sensitive Species. Current trends, management strategies, and public issues evaluated during the assessment reveal that the two most crucial resources to conducting ecosystem management within the LSA are vegetation and recreation.

The forested vegetation communities within the area consist of a diverse mix of species and age classes. Forest types include, lodgepole pine, Douglas-fir, limber/whitebark pine, Engelmann spruce/subalpine fir and aspen. The non-forested vegetation consists of a wide variety of grasses, shrubs, and forbs. Relevant vegetation issues concern decreased aspen, increased age of standing trees and sagebrush, an increase in noxious weeds, a decrease in wood products, and fire frequency.

Subbasins in the area contain populations of Bonneville cutthroat trout (*Onchororhynchus clarki utah)* and Colorado cutthroat trout (*Onchorhynchus clarki pleuriticus)*. Problems with current conditions of fish and fish habitat are related to past land management practices including, road construction, timber harvest, livestock management, fish stocking, and fish management. Desired conditions for fish and fish habitat include removal of non-native fishes, presence of metapopulations, and no damaged stream segments, including bank damage and sediment loading.

Relevant recreation issues concerning forest users include resource damage from road management and access, the illegal use of off highway vehicles (OHVs), an increasing occurrence of illegal roads, and increasing dispersed camping.

Different ecosystem management opportunities have been explored and the appropriate Desired Conditions are listed. The Desired Conditions of the LSA area principally consist of restoring degraded ecosystems, sustaining desired plant communities, and providing system roads and campgrounds at national and Forest Service standards.

Chapter 1 - Introduction

This document provides a Landscape Scale Assessment (LSA) of the Commissary Ridge and Tunp Range subsections that lie within the Green River and Bear River watershed basins, respectively. Descriptions of existing and reference conditions, desired conditions (DCs), and recommended management opportunities are included. **This is not a decision document.** It is an ecosystem assessment at the watershed, or landscape, scale. This assessment recognizes that ecosystems transcend administrative boundaries and, therefore, overlap private lands and lands administered by other agencies. However, results from this assessment will establish a context for future decision-making processes on Forest System lands. Future processes include project planning and development, and regulatory compliance.

Assessment Goal

The goal of this document is to provide a Landscape Scale Assessment (LSA) of the Commissary Ridge and Tunp Range subsections. This landscape makes up the Kemmerer Ranger District and consists of two major watersheds, the Green River and the Bear River. Included in this assessment is a description of existing conditions, desired conditions, and recommended management opportunities. This assessment considered the physical and biological needs and limitations of the ecosystem, as well as the social and economic needs of user groups.

Assessment Outcomes

The four primary outcomes of the analysis include:

- Identifying Forest Plan Amendments
- Data Collection
- Monitoring Needs
- Project Identification that address resource condition gaps between the described future conditions and existing conditions.

Secondary outcomes from the analysis include:

- Building relationships, both internal and external
- Documenting how and why a specific outcome came to be
- Incorporating the Natural Resource Agenda into the Forest Plan
- Developing common interest where public involvement is more integrated into our decision-making process.

Assessment Process

The process of this assessment was adapted from the *Federal Guide for Watershed Analysis, Version 2.2*, and includes the following steps:

- Identify the land area to be assessed

- Define existing conditions
- Describe reference (historic) conditions
- Identify key issues/concerns/conflicts/opportunities
- Analyze differences between existing and reference conditions
- List key elements for developing DCs
- Formulate DCs and specific recommendations for their achievement

Desired Conditions (DCs) are the synthesis of information collected for the biological, physical, and human dimensions that exist, interact with, and define the landscape. DCs were derived from comparing existing conditions with reference conditions, by resource. Resource conditions and associated concerns were used to guide the DC process. In addition, direction from the Bridger-Teton National Forest Land Management Plan (Forest Plan) was also used as a basis for DC and project development.

Overview of the Landscape Scale Assessment Area

The assessment area is located in the southwestern portion of the Bridger-Teton National Forest, within Lincoln and Sublette Counties, Wyoming (**Map 1-1**). It makes up the entire Kemmerer Ranger District, which encompasses approximately 280,500 acres. The LSA is made up of four subwatersheds: LaBarge Watershed, Fontenelle Creek Watershed, Hams Fork Watershed, and Smiths Fork Watershed. Throughout this document, land within the Commissary Ridge/Tunp Range Landscape Scale Assessment will be referred to as the *assessment area.*

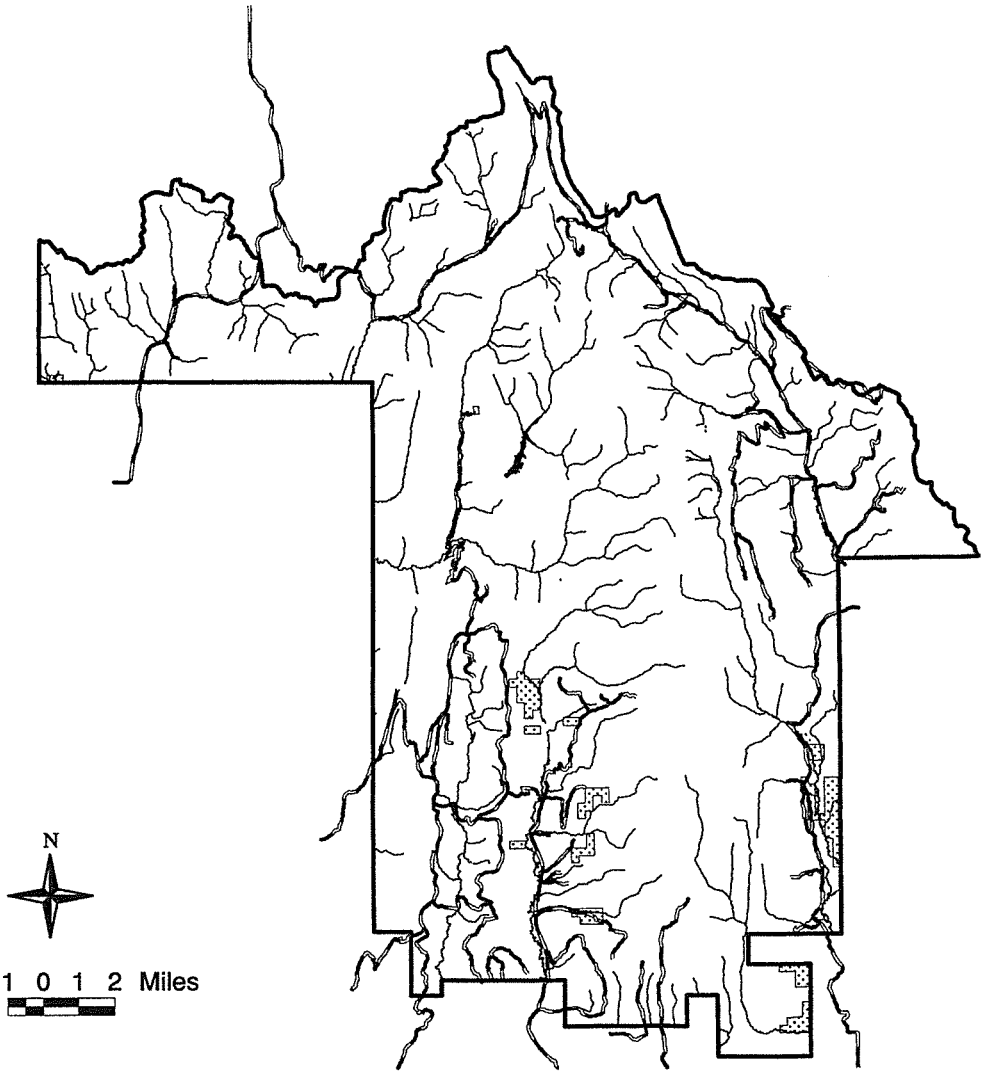
LaBarge Watershed lies east of Hams Fork, on the east face of Commissary Ridge and is drained by LaBarge Creek, a tributary of the Green River. Elevations range from 7,500 feet, where LaBarge Creek exits the Forest boundary, to 10,330 feet on Graham Peak.

Fontenelle Creek Watershed is located south of LaBarge Creek, whose headwaters originate from the Fontenelle Lakes area, and is a tributary of the Green River. Elevations ranges from 9,800 feet along the crest of Commissary Ridge, to 7,400 feet where Fontenelle Creek leaves the Bridger-Teton National Forest.

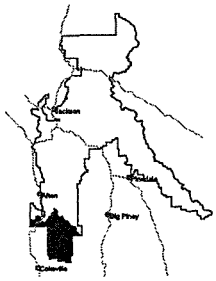
Hams Fork Watershed is located north of Kemmerer, Wyoming. It is drained by the Hams Fork River, West Branch of the Hams Fork River, and all three branches of Beaver Creek, all of which are tributaries of the Green River. Elevations range from 7,500 feet on the Hams Fork River, to 10,000 feet along the crest of Commissary Ridge.

Smiths Fork Watershed is located northeast of Cokeville, Wyoming, west of the Hams Fork watershed. It makes up the western edge of the assessment area and is drained by Smiths Fork, Hobble Creek, and Coantag Creek, all of which are tributaries of the Bear River. Elevations range from 7,000 feet at Hobble Creek, to 10,000 feet along the crest of Commissary Ridge.

Map 1-1. Commissary Ridge/Tunp Range Landscape Scale Assessment



Vicinity Map



LEGEND

Streams
Roads
Private Lands

BRIDGER-TETON
National Forest

Intended Use: Report
Plot Date: March 27, 2001
By: T. Bills

Current Forest Plan Direction

Based on the provisions of the National Forest Management Act (NFMA) of 1976, the 1990 Land and Resource Management Plan (Forest Plan) establishes which National Forest Lands are suitable for certain purposes, describes the land and resource management goals and objectives, and prescribes land and resource management policies. The plan provides resource management prescriptions, standards, and guidelines for land use. Desired future conditions (DFCs) describe the land management direction intended to accomplish the goals and objectives of the Forest Plan **(Table 1-1)**.

Table1-1. LSA 1990 Forest Plan Desired Future Condition Summary

DFC	Acreage	General Forest Plan DFC Attributes
1B	7900	Substantial commodity resource development with moderate accommodation of other resources
2A	21,400	Non-motorized recreation areas
9A	1500	Developed and administrative sites
10	167,600	Simultaneous development of resources, opportunities for human experiences, and support for big-game and a wide variety of wildlife species
12	82,100	Backcountry big-game hunting, dispersed recreation, and wildlife security areas

Note: This table refers to DFCs contained with in the Bridger-Teton National Forest 1990 Land and Resource Management Plan

Historic Overview

The assessment area has a rich history of human use and occupation. In order to fully understand the human connection with this landscape, it is necessary to consider events and environments from a regional or even national perspective.

Native American Presence. People have explored and exploited these mountains and river valleys for thousands of years, starting with aboriginal Native American tribes. Archeological evidence recovered from this area, as well as from the Green River Basin as a whole, indicates that aboriginal peoples have inhabited this area for much of the last 10,000 years. These hunters and gatherers probably ranged throughout the area from the valley bottoms and foothills to the high mountain meadows and peaks on a seasonal round, following migrating herds of big game species and availability of plant foods. There is no evidence of year-round occupation, but the abundance of plant and animal resources would have made this an attractive area from late spring through the summer months and into the fall. It is likely that these groups wintered on the margins of the Green River Basin in close proximity to wintering big game herds. Obsidian artifacts recovered from the area indicate that these groups also had contact with the Yellowstone country to the north, the Jackson Hole area, and the Snake River Plain in present-day southeast Idaho. When early Euro-American explorers and trappers arrived in present-day western Wyoming, this area was the homeland of the Shoshone Indian Tribe.

The Shoshone were one of the first tribes in the Rocky Mountain area to acquire horses, and they used this innovation to range widely on both sides of the Wind River Mountains in pursuit of bison herds and to travel throughout much of present-day western Wyoming, eastern Idaho, and southern Montana. The Sheepeater Indians, a sub-tribe of the Shoshone, may also have lived in the study area. Unlike the main Shoshone Tribe, the Sheepeaters did not incorporate the horse into their culture, opting instead to remain on foot in the high mountain meadows and valleys. They subsisted primarily by hunting mountain sheep and gathering roots and other abundant plants in the high elevation environments. Although the Shoshone and Sheepeaters were the primary tribes to use this area, the Blackfeet and Crow from the north and the Bannock tribe from the west were also known to have crossed through the region.

Trapping. By the beginning of the 19th century, Euro-American explorers and trappers were beginning to make their way into the Green River country. Although these explorers and trappers visited the Upper Green as early as 1811, it wasn't until 1823 that documented exploration near the study area began in earnest. In that year, William Ashley led an expedition through the area in search of the mystical river Buena Ventura, which was thought to drain into the Columbia River. Ashley's men explored the Green River drainage and crossed to the Bear River Valley, possibly by ascending the Hams Fork River. Ashley also instituted the rendezvous system of trade, a departure from the old system that required defended fixed fur posts in Indian country. Instead, an informal rendezvous site was chosen each year in the middle of the best trapping grounds, and the trappers brought the season's catch to this central location to facilitate trading and shipping. Although many of the annual rendezvous were held in the northern part of the Green River Basin, the rendezvous of 1834 was held on the Hams Fork somewhere east of present-day Kemmerer. The mountains and streams of the assessment area were the site of much of the fur trapping activity. Famous trappers such as Jim Bridger, Lucien Fontenelle, Joseph LaBarge, and Zacharias Hams worked these streams and rivers. The fur trapping era boomed from the 1820s to 1840s. By 1840, the demand for beaver pelts declined, and coupled with the decimation of the beaver population, the colorful fur trapping industry came to an abrupt end in the Green River country.

Settlement. Many of the earlier fur trappers stayed in the Green River country and served as guides for future exploration expeditions and the growing number of emigrants who were starting to make their way west to the Pacific northwest and the Salt Lake country. Throughout the 1840s the swelling tide of emigration to the west resulted in a number of wagon trails and cut-offs across the Green River basin and the southern end of the Wyoming Range. In 1857, Fredrick Lander constructed the first federally funded road west of the Mississippi, which became known as the Lander Cut-off of the Oregon Trail. This cut-off enters the study area at Thompson Pass, drops into the LaBarge Creek drainage and proceeds up this creek to the present day LaBarge Guard Station. From there, the trail heads west to the Smiths Fork, then north into the Salt River drainage at the southern end of Star Valley. During the first year of its use, some 13,000 emigrants passed over the Lander Cut-off accompanied by large herds of cattle. One of Lander's papers indicated that there was an average of 2.9 people and 12.2 head of stock per wagon. Although the trail provided a short cut for those heading west, it was a dangerous and difficult trail through the mountainous country. Many emigrants lost their lives during their travels west. Some of these graves, along with names carved into trees along the trail, can still be seen today. The final sighting of a westward bound emigrant wagon on the trail was in 1912.

Grazing. Starting around 1875 a major reversal flow began on the Lander Cut-off as herds of cattle were brought eastward. Most of these cattle were used to establish range herds in the Green River Basin and on ranches in eastern Wyoming and western Nebraska, but other herds were brought to the Union Pacific railroad in southern Wyoming for transportation to eastern markets. By 1877, approximately 50,000 head were being driven eastward into Wyoming and by 1879 that number had increased to an estimated 100,000 head. The late 1800s also saw the establishment of the sheep industry in the mountains of western Wyoming. Large herds of sheep were being trailed from the Salt Lake Valley along stock driveways. One such driveway enters the study area along the Dry Fork of Smiths Fork, over Sheep Pass on the Commissary Ridge, and north to the head of Corral Creek. Over 40,000 head of sheep were herded over this stockway in the spring, then returned the same way in the fall. The Forest Reserves had not been established at this time and there was no real control over grazing on public lands. Livestock numbers were high and lack of range management created serious range problems. Sheepmen and cattlemen felt the range belonged to whoever got there first. Sheep and cattle from Utah and Idaho were being brought into the area and the local livestock interests had to compete with them. Gunfights and range wars were not uncommon on the open ranges. Around 1890 a deadline was established by the cattlemen to divide the sheep and cattle range. On the west side of the Green River Basin, this deadline extended up Fontenelle Creek to Miller Mountain and Deadline Ridge. In essence, the mountainous country became sheep country while the lower valleys and basins became cattle country.

With the creation of the Yellowstone Forest Reserve in 1904, and later the Wyoming National Forest in 1908, a system of grazing allotments was established in order to gain some control of the grazing on public lands. The sheep driveways were creating big problems for the Forest. The responsibility of administering use of the driveways, gaining cooperation of the users, and keeping the herds on the driveways and properly spaced sometimes led to problems. One of these was the condition of the range. Because the conditions of the driveways had deteriorated so badly, the Forest Service eliminated the practice of trailing sheep in the 1960s and required that the sheep be trucked onto and off the Forest each year.

Past Management

Fire Management

Active fire suppression in this area began during the early 1900s. By the 1920s, several guard stations had been constructed and connected to phone lines, providing the ability to staff many of the detected fires within the first burn period. The construction of Wyoming Peak Lookout, located north of the Kemmerer District, provided improved detection from much of this area.

Since 1920, the majority of fires have been controlled at less than one acre. There have been less than a half dozen fires exceeding 100 acres. Compared to the rest of the Forest, the assessment area has had a very low occurrence of large fires since the turn of the century. During the early 1930s, there were numerous large fires on the rest of the Forest, with only two fires in the 100 to 300 acres size class in this area. Fire records from 1950 to 1998 (48 years) indicate 638 acres burned for an average of 13 acres burned per year.

While settlers were successful in suppressing naturally ignited wildfires, they were also responsible for numerous human-caused ignitions. Little is known how this compares with the pre-settlement

aboriginal use and cause of wildland fire, but current information indicates the influence was minimal.

There were 270 wildfires detected from 1960 through 1998, at an average of seven fires per year. Human-caused fires accounted for 37 percent of the fires while 63 percent were lightning caused. Human-caused fires are most often associated with recreation use, especially during the fall hunting season. During the late 1970s there were numerous human fire starts caused by seismograph exploration. Except for that period, the majority of the human fire starts are often along developed roads, trails, and back-country campsites. There has been a noticeable trend towards fewer human-caused fires during the past seven years. Since 1992, 29 of the 39 fires (74 percent) were determined to be lightning-caused. There could be several reasons for this, including significant lightning activity during the 1994 season, accounting for 17 lightning fires. The district also adopted a formal fire organization during the early 1990s with a more concentrated effort on prevention.

The entire Kemmerer District is currently classified as a suppression zone. An appropriate suppression response is taken for each wildfire. Responses can range from aggressive and expensive suppression in areas of high value to a less aggressive response in lower value areas, especially during low fire danger periods. The concept of appropriate suppression response has evolved since abandonment in the 1970s of the "10 a.m. policy." The 10 a.m. policy required that all fires be controlled by the following day at 10 a.m.

At this time, initial attack suppression is accomplished using a mix of engines with ground forces for the lower-elevation, accessible areas, and aerial delivery of smoke jumpers and helitack firefighters for the remote, higher-elevation areas. Improved road access that coincided with expansion of timber harvest during the 1960s has allowed for much greater ground access with engines and crews.

Detection of fires is primarily from Forest Service, county, and private aircraft along with ground reports from visitors and Forest Service employees. Numerous small fires (less than 1/4 acre), especially at the higher and more remote elevations, are never detected and burn out naturally.

An ambitious prescribed burning was initiated between 1978 and 1984, with burning in LaBarge, Little Fall Creek, Bluejay, Fontenelle, and Little Hornet drainages. Prescribed burning picked up again in the early 1990s. Since 1990, approximately 4,600 acres were burned primarily in the Fontenelle, Hams Fork, and Turkey Creek areas. Most of the burning was in sagebrush/grass and aspen types, with some small areas of conifer. Most often prescribed burning was undertaken with the range and wildlife objectives of increasing herbaceous growth, removing older sagebrush, and stimulating aspen growth.

Table 1-2. Prescribed Burning Kemmerer Ranger District 1978-1998

Name	Location	Date	Acres	Fuel Type
LaBarge	T28N R116W Sec 24,25	5/26/79	885	Sage/grass
Turkey Creek		5/78		Sage/grass
Blue Jay	26N 116W Secs, se34, sw 35	8/20/81	400	Sage/aspen/conifer
Little Fall Crk.		9/30/81		
Fontenelle	26N 116W Sec 1,2,11,13,14,24,25,26 27N 116W Sec 1,2,12,13,23,24,25,26,35	9/29/81	2000	Sage/grass
Hams Fork		1987	200	Sage/grass
Little Hornet	T28N 116W Sec35 T27N 116W Sec 2	10/7/84		Sage/aspen
Fontenelle Willow	T27N R116W Sec 1,2,12,35 T26N R116W Sec 13,24,25	5/89	200	Willow/grass
Mooneys Burn				Sage/aspen/grass
Turkey Creek	T28N R116W S24,25	10/95	1960	Sage/grass/aspen
Fontenelle	T26N R117W Sec 11	10/96	360	Sage/aspen
Elk Creek		9/ 96	30	
Steppe Creek	T27N R116W Sec 12,13,24,25	10/96	700	Sage/aspen
Shafer Creek	T33N R116W Sec 11,14	10/21/97	350	Sage/grass
East Fork Hams	T26N R117W Sec 33	10/96	300	Sage/grass
West Hams		10/96	700	Sage/grass/aspen

Range Management

Prior to the mid 1800s, wildlife grazing occurred across the lower end of the Wyoming Range. With settlement of western lands, the introduction of domestic stock and development of lands forced big game species off the prairies and into higher-elevation timbered areas. Combined with use and the high numbers of livestock brought into the west, available forage dwindled. Consequently, ranchers were forced to compete for available forage in higher elevations. This led to extreme overgrazing across the west. In 1904, with designation as a Forest Reserve, control of domestic livestock grazing began.

At the turn of the century, the early cattle boom had ended, but as cattle numbers began adjusting to range capacity, sheep numbers increased dramatically. By 1909, Wyoming had 6 million sheep. Ideal summer range attracted a large percentage of these animals at least part of the year. Because there were no grazing allotments, various sheep herds competed for the forage by racing to summer ranges, using as much forage as possible, and leaving the site unfit for other herds. Consequently, range depletion by sheep occurred from lower elevations to ridges and mountain meadows at upper elevations.

Unregulated cattle grazing and later sheep grazing have substantially affected portions of the study area. Cattle originally depleted much of the available forage near lower elevations of forested areas. Vegetation conditions were depleted up to an estimated 75 percent of native/natural conditions. Other areas heavily impacted by livestock include stock driveways, meadows, and sage/grass communities, which were more vulnerable to livestock damage. The animals used much of the forest that borders rangeland for bedding and shelter and severely trampled forest undergrowth. Consequently, old-growth stands in these areas rarely have undergrowth development indicative of stand age.

Timber Management
The end of the 19th century also saw the birth of the timber industry on National Forest System Lands. With the arrival of the Oregon Short Line into Kemmerer in 1881, railroad ties were needed and the Upper Hams Fork was an ideal location to harvest these ties. In addition, mine props were needed for the numerous coal mines being dug in the Kemmerer area. Small tie hack camps and isolated cabins sprang up in the Upper Hams Fork country. Cut ties and mine props were dumped into the river and floated down stream to Kemmerer.

The Union Pacific Railroad, crossing southern Wyoming, was also in need of huge numbers of railroad ties. Tie hack operations were established in the Upper Green as early as 1868. However, it wasn't until the 1920s that large-scale tie hack operations moved west to the foothills of the Wyoming Mountain Range. In the Hams Fork, 1,528 acres were cut by 1929 and an additional 470 acres were cut in the West Branch of the Hams Fork. In 1937, the Standard Timber Company moved its operations to the LaBarge Creek area and built a major tie hack village on the banks of South LaBarge Creek. Approximately 3,000 acres were partially cut in the next 15 years. At this time, the old Lander Trail was the only access into the drainage and improvements were made to the road to allow entry. In addition to the South LaBarge tie hack village, a number of isolated cabins were built throughout the area, most of which have been removed or destroyed. Other evidence of tie hack activity is the numerous sawdust piles and slash piles left throughout the drainage. These piles mark the locations of portable saw mills that were used to square off logs prior to floating them down stream to the rail head. Portable saw mills were first used in the 1920s and replaced the old system of squaring ties by hand. The tie hack activities in the LaBarge Creek drainage came to a close in 1952.

Wildlife Management
Prior to the arrival of Euro-Americans, wildlife existed in a dynamic equilibrium with its habitat. Fire was the primary modifying force. Osbourne Russell (1955) reported the mountainous country adjacent to the Hams Fork to "abound with buffaloe, antelope, elk and bear; and some few deer along the rivers." Grizzly bears (*Ursus arctos horriblus*) and gray wolves (*Canis lupus*) were also common (Gowans 1992). The area's richness in beaver and other fur-bearing animals led to the Hams Fork being selected for the trappers' 1834 rendezvous. Approximately 600 trappers gathered on the Hams Fork for the rendezvous (Russell 1955). The Lander Trail route, which crosses the assessment area, was selected for its abundance of grass, timber, pure water, fish, and game (USFS 1987).

The fur trade took a heavy toll on the area's wildlife populations; wildlife was also exploited for subsistence in these early days. Many species were extirpated, including bighorn sheep, bison, gray wolves, and grizzly bear. Other populations such as beaver, elk, mule deer, and pronghorn antelope were severely reduced.

Attitudes towards wildlife began changing in the late 1860s. The first territorial legislature, in October 1869, passed a rudimentary "Act for the Protection of Game and Fish in the Territory of Wyoming" (Blair 1987). Although this act was ineffective, it illustrated the changing attitudes toward wildlife. The first law establishing hunting seasons was established in 1875.

A large area of western Wyoming including the assessment area was set aside as the Yellowstone Forest Reserve in 1904. One result of the Forest Reserve was protection of wildlife habitat. The Forest Reserve evolved into the present day Bridger-Teton National Forest. In 1921, the Wyoming Legislature created a Game and Fish Commission to manage the State's wildlife.

With the necessary components in place, positive public attitude, secure habitat, and a wildlife management agency, many wildlife populations began to recover. By the 1926 game census, all major game species showed population increases (Blair 1987).

Public opinion towards non-game species evolved through the late 1960s and early 1970s, culminating in the Endangered Species Act of 1973. The Endangered Species Act and the National Forest Management Act both recognized National Forests as critical to the survival of plants and animals and the conservation of biotic diversity.

Chapter 2 - Physical Environment

Climate

Existing Conditions
Climatic factors within the region follow a gradient from the dry, cool areas south and east to moist, cold areas to the north and west. Temperature and precipitation levels generally correspond to differences in elevation. Zones of temperature, precipitation, and growing season change significantly over short distances westward from LaBarge, Wyoming to the Salt River Range.

Table 2-1. Meteorological Conditions of the Assessment Area

Station/ Elevation	Mean Annual Temperature	Mean Annual Precipitation	Average Total Snowfall
Border/6,120'	38.1 F	13.54"	66.5"
Kemmerer/6,936'	38.8F	10.28"	51.1"
LaBarge/6,830'	38.4 F	8.28"	31.5"

None of these stations are located on the Forest. In general, mean annual temperatures drop from those values presented in **Table 2-1** and the growing season is less than 60 days. Extrapolated data indicates that annual precipitation increases to 60 inches, mostly in the form of snow, on the higher elevations within the analysis area. Most of the assessment area has precipitation that ranges from 40 - 60 inches.

Geology

Existing Conditions
The analysis area lies within two major geologic regions of western and southwestern Wyoming: the Green River Basin and the Overthrust Belt.

The Overthrust Belt is characterized by massive folding and thrust faulting, which has generated several major north-south trending mountain ranges in the region, i.e., the Salt River Range, the Wyoming Range, Tunp Range, Commissary Ridge, and Mahogany Ridge. These mountain ranges are comprised primarily of up-thrust limestones, dolomites, and quartzites of Paleozoic age.

The Green River Basin formed after the Overthrust Belt was in place. The basin is comprised generally of fluviatile and lacustrine sediments of primarily Eocene age. The most widely distributed formations are the Wasatch, Green River, and Bridger Formations. The Hams Fork and Fontenelle drainages within the upper Green River Basin are formations generally comprised of shales, mudstones, sandstones, and marlstones, with occasional tuffs and limestones.

Landslides are primarily associated with the Overthrust Belt, especially with Tertiary and Cretaceous sediments, i.e., Wasatch Formation, Ephraim Conglomerate, Aspen Shale, Bear River Formation, and Hilliard Shale. Landslides also occur in the Green River Basin where slopes are oversteepened.

Soils

Characterizaton

Interpretation and Rating Categories.

Erosion Hazard, Compaction Hazard, and Revegetation Limitations are the categories for soil interpretations and ratings. The Bridger-West Soil Survey rating criteria were adopted from the *Bridger-Teton National Forest, Soil Interpretive Guide*, 1985. All ratings as listed are based on "Representative Value" (the midpoint of the range in the database) or criteria used for that interpretation. **Table 2-2** displays a summary of soil management interpretations within the assessment area. **Map 2-1** shows the location of Sensitive Ground within the assessment area.

Limitation Ratings.

Limitation ratings identify the degree of limitation that restricts the application of a soil for a specific use. In order to properly evaluate a specific soil mapping unit for the purposes of this document, the most limiting criteria was used to establish the overall rating. These limitation ratings are defined as:

- High/Severe: This rating is given to soils that have one or more properties unfavorable for the rated use. This degree of limitation generally requires major soil reclamation, special design, or intensive maintenance. Some soils can be improved by reducing or removing soil features that limit use, but it is difficult and costly in most situations to alter the soil or to design a structure so as to compensate for a high/severe degree of limitation.

Erosion Hazard Ratings. Erosion hazard is the probability that damage will occur as a result of disturbance activities that expose the soil surface. Disturbance activities may include, site preparation, cutting timber, skid trails, log landings, and fire lanes, as well as off-road and off-trail travel. Erosion hazard ratings are based on slope, k-factor, and rock fragments on the surface layer. "**Slight**" refers to soils where erosion is unlikely under ordinary climatic conditions. "**Moderate**" refers to soils where some erosion is likely and control measures may be needed. "**Severe**" refers to soils where erosion is very likely and control measures for vegetation re-establishment on bare areas and structural measures are advised.

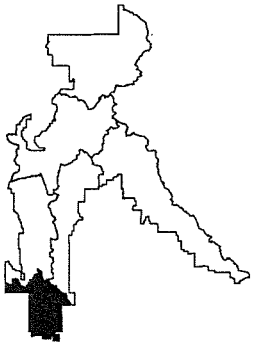
Ratings assess sheet and rill erosion from exposed soil surfaces caused by various silvicultural practices: grazing, mining, fire, firebreaks, etc… These are activities that disturb the site, resulting in 50 to 75 percent bare ground in the effected area, including the use of any equipment type or size and uncontrolled livestock grazing. Ratings assume a 50 to 75 percent exposed, roughened mineral surface layer. Ratings do not assume clean tillage and other similar activities that disturb up to nearly 100 percent of the area and change the character of the soil.

Soil Compaction Ratings. Soils are rated for compaction according to limitations that affect their suitability for off-road vehicles, camp areas, picnic areas, playgrounds, paths, and trails. Off-road vehicles would be the most limiting criteria to establish an overall rating for a map unit. Snowmobiles are not considered in this category, but it does include four-wheel-drive vehicles, dune buggies, and other all-terrain vehicles. It is based on undisturbed surfaces when soils are not saturated. This rating only considers the potential for compaction by vehicles crossing terrain in a

Map 2-1 Sensitive Ground

N

Vicinity Map



LEGEND

Sensitive Ground

BRIDGER-TETON
National Forest

Intended Use: Report
Plot Date: June 11, 2001
By: Randy Frazier

random fashion. Repetitive, intensive use invariably results in irreparable reduction in soil productivity.

The soil strength or bearing capacity rating is based on unified engineering soil classification groups of the surface horizon. As a result of intensive use by wheeled off-road vehicles, soils with a **slight** limitation rating will generally not suffer an irreparable reduction in their long-term natural productivity level. Soils with a **moderate** limitation rating will suffer a significant reduction in their long-term natural productivity level as a result of intensive use by wheeled off-road vehicles. However, soils with a moderate rating can be managed for sustained natural productivity by controlling the timing and intensity of use, and their natural productivity can be restored through the application of relatively simple soil compaction amelioration treatments. Soils with a **severe** limitation rating generally will suffer irreparable reduction in their long-term natural productivity level, even with limited use of off-road vehicles.

Revegetation Limitation Ratings. Soils are rated on their limitations for revegetation on cut and fill slopes. Ratings are based on uniform slopes with a one-to-one grade that had completed seeding during the first growing season following construction. Revegetation failure is caused mainly by either too much water (wetness), or too little water (droughty). Soil droughtiness is caused by several factors: lack of rainfall at the right time, low available water capacity, rooting depth less than 40 inches, and high evaporation.

The amount of water held in the soil for plant use is determined by available water capacity and the depth to bedrock or a cemented pan. Seedlings can survive on soils with low available water capacity if rains come at the right time, frequency, and duration. Soil texture must be course enough so that water enters readily, but not so course as to have low available water capacity. Revegetation may be affected by higher temperatures and evaporation associated with steep, south and west facing slopes.

Unstable Ground: Areas where landslides are present and mass movement is evident are unstable ground.

Sensitive Ground: Soils with high erosion and compaction hazard with severe revegetation limitations are classified as sensitive ground. Soils within this classification are potentially slow to recover from ground-disturbing activities and may require special measures to revegetate and stabilize.

Table 2-2. Summary of Soil Management Interpretations

Soil Management Interpretations	Percent of Area
High Erosion Hazard	95%
High Compaction Hazard	36%
Severe Revegetation Limitations	96%
Unstable Ground	8%
Sensitive Ground	27%

Reference Condition
Though **Table 2-2** shows that 95 percent of the soils in the assessment area have a high erosion hazard and 96 percent of the soils have severe revegetation limitations, the sensitive ground rating of 27 percent is where management should pay special attention. In most cases, erosion and revegetation are mitigated through best management practices (BMPs), but sensitive ground areas may not respond as well to routine BMPs due to sensitive site conditions. Reference condition implies that the soil resource is adequately managed to protect soil productivity and hydrologic function. Most soils within the assessment area appear to be fully functional except where accelerated erosion has removed too much of the A and B horizons (topsoil). Examples of these areas include historic sheep driveways, sheep bedding grounds, and/or road cuts.

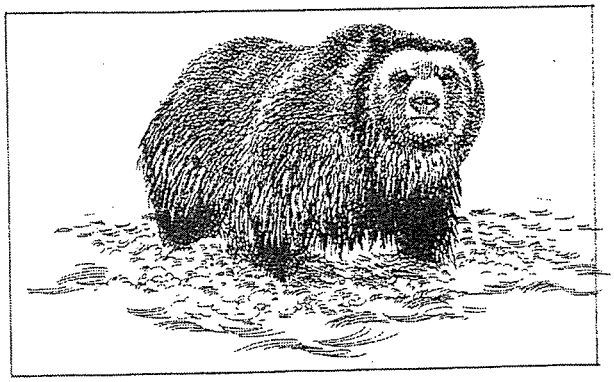
Existing Conditions
Soils within the assessment area are generally high in clay content, especially on slopes less than 40 percent gradient. The Hams Fork and Fontenelle Creek drainages have soils that are high in clay and are subject to compaction and to accelerated soil erosion when disturbed. Due to steep slopes and the predominance of Tertiary-aged sedimentary bedrock, most of the assessment is prone to erosion and once disturbed very slow to revegetate. The reestablishment of vegetation is also hampered due to the short growing seasons associated with the higher elevations within the assessment area.

Past management practices have had a significant effect on soil productivity, especially where Cretaceous and/or Tertiary-aged parent materials are common. Sheep grazing and in some cases cattle grazing during the early-to-mid 1900s resulted in huge losses of top soil, which has decreased soil productivity on high elevation sites. Lowering of domestic livestock numbers has expedited the recovery of damaged sites. However, some sites have not rehabilitated. These sites will take many more years to recover due to the short growing season, loss of both A and B soil horizons (surface soil and subsoil), and, in some cases, a lack of seed sources. Examples of damaged sites include: Red Park, Big Park, LaBarge Meadows, West Fork of the Smiths Fork, and Commissary Ridge.

Desired Conditions
♦ Soil is productive enough in the long term to support healthy, diverse, and resilient terrestrial and aquatic ecosystems.

♦ Degraded ecosystems are restored and sustain desired plant communities.

♦ Roads and trails are maintained, rehabilitated and/or decommissioned, and reclaimed to protect watershed function.



Watershed Condition

Characterization
The three subbasins within the assessment area are the Central Bear River, Blacks Fork, and Upper Green River **(Map 2-2)**. The assessment area contains an estimated 962 stream miles, of which 436 miles (or 45 percent) are perennial (**Table 2-3**).

Table 2-3. Subbasin Total and Perennial Stream Miles

		Total	Perennial
Hydrologic Unit	**4th Code**	**Stream Miles**	**Stream Miles**
Upper Green River	14040101	306	161
Blacks Fork	14040107	251	102
Central Bear River	16010102	406	173
	Totals:	962	436

Each of these three subbasins is further divided into smaller hydrologic units[1], watersheds, and subwatersheds. There are six watersheds partially or wholly within the LSA area (**Table 2-4**).

Table 2-4. Six Watersheds Partially or Wholly Within the Assessment Area

		Total	Perennial
Hydrologic Unit	**5th Code**	**Stream Miles**	**Stream Miles**
Fontenelle Creek	1404010103	144	72
LaBarge Creek	1404010106	161	89
Hams Fork	1404010716	251	102
Lower Smiths Fork	1601010203	27	4
Salt Creek	1601010206	93	44
Upper Smiths Fork	1601010207	286	125

The **Central Bear River subbasin** contains Bonneville cutthroat trout (*Onchorhynchus clarki utah*), a regionally sensitive species and one that was petitioned for federal listing in November 1998. There are three watersheds within the Central Bear River subbasin that are on the Forest: the Upper Thomas Fork, Upper Smiths Fork, and Lower Smiths Fork watersheds (118,400 acres) **(Map 2-3).** The Upper Smiths Fork drainages coincide with Forest Plan DFC 12 and the other two watersheds are within DFC 10 **(Map 2-4).** Because of the special status afforded this cutthroat subspecies, the Forest Service and its partners have paid particular attention to activities that have potential to impact its habitats.

The **Blacks Fork subbasin** contains Colorado River cutthroat trout (*Onchorhynchus clarki pleuriticus*), a regionally sensitive species. As with the Bonneville cutthroat trout, the Forest Service and its partners pay particular attention to the activities of this subbasin, which have the potential to impact this sub-species habitat. This subbasin has only one watershed on the Forest, the Hams Fork watershed (74,400 acres) **(Map 2-5)**. Much of this watershed has been designated DFC 10 and 1B **(Map 2-4),** which allows for substantial commodity development.

[1]It is important to define the scale of broad-scale interpretation and analysis. Most of the analysis that follows is derived from the Inland West Watershed Reconnaissance (1998) data and aggregated upwards from the subwatershed (6th code) to the watershed level (5th code).

The **Upper Green River subbasin** also contains Colorado River cutthroat trout (CRC). This subbasin has two watersheds partially on the Forest, the Fontenelle and LaBarge watersheds (91,000 acres) **(Map 2-6).** These watersheds have been designated DFC 10, 2A, and 12 **(Map 2-4),** which allows for some commodity development while having no adverse resource impacts.

A forest-wide watershed assessment was completed in 1998, the Inland West Watershed Initiative (IWWI). This assessment provided a "coarse filter" of **1)** the relative disturbance within a watershed and **2)** crucial stream segments and damaged stream segments. The assessment provides an overview of resource concerns within a particular watershed that could affect future land management decisions. It also serves as a basis for identifying additional data needs and potential watershed rehabilitation sites. **Map 2-7?** displays the results of the ratings.

Reference Condition
Sixth code hydrological units (HUCs) were grouped into three categories based on watershed geomorphic integrity (natural geologic/landform characteristics), including the degree of ground disturbance from roads, timber management, range management, recreation use, and mining activities. Additionally, watersheds were rated for water quality integrity and watershed vulnerability. A description of those ratings follows, along with a summary of the ratings. Appendix **A-3** displays the detailed HUC ratings for subwatersheds within the analysis area.

The IWWI indicates that all HUCs within the assessment area were in properly functional condition (reference condition). Reference condition is considered to be fully functional, including such attributes as high soil and water integrity relative to its natural potential condition. Natural and/or human-caused disturbance does not compromise soil-hydrologic function or soil-stream resilience.

Watershed Vulnerability ratings are as follows:

Low: A minor part (less than 20 percent) of the watershed is in sensitive lands.

Moderate: A moderate part (20 - 50 percent) of the watershed is in sensitive lands.

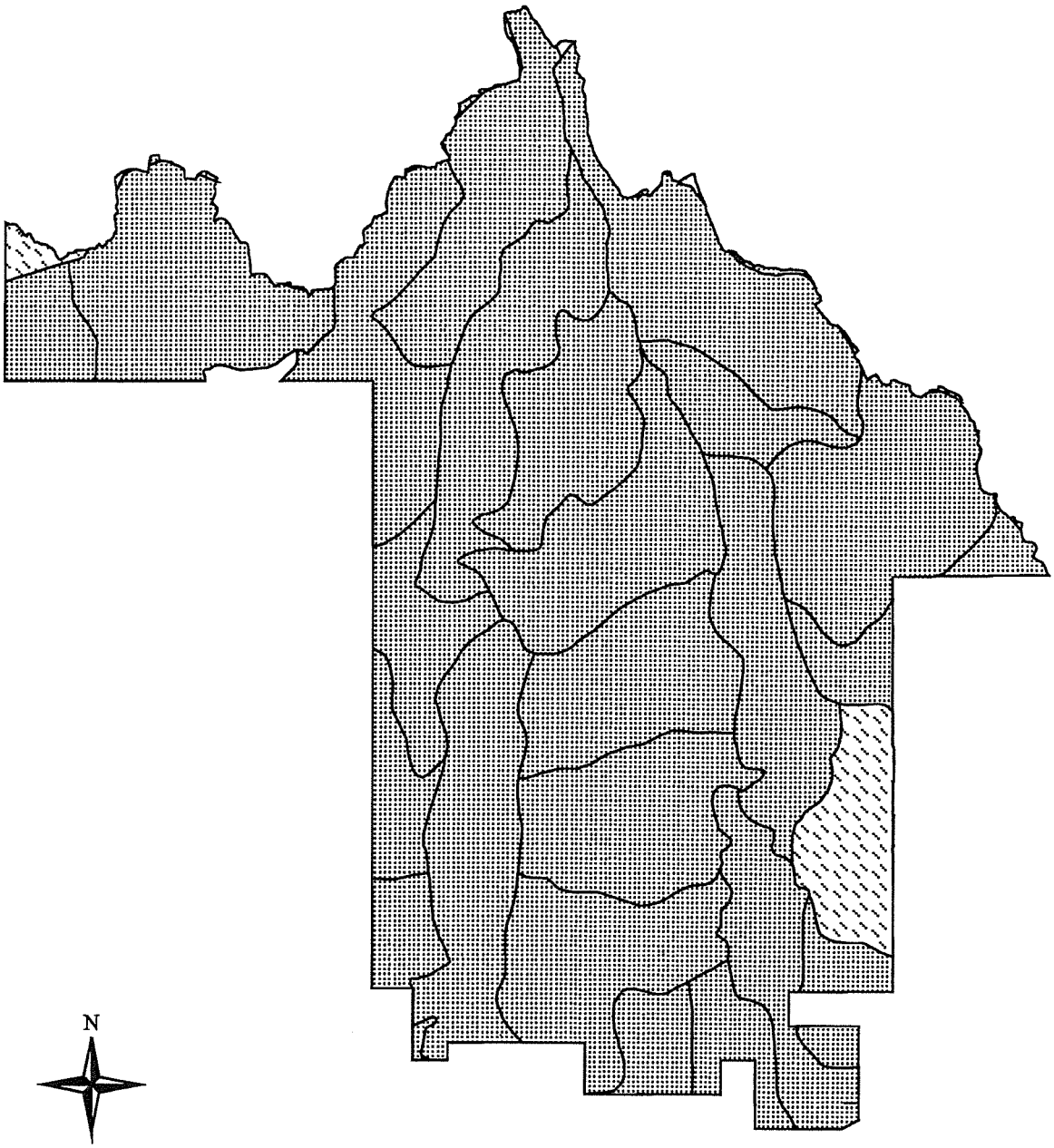
High: A major part (greater than 50 percent) of the watershed is in sensitive lands.

Sensitive Lands are areas where disturbances pose a high probability of degrading watershed soil-hydrologic functions or stream segments. Sensitive lands include:

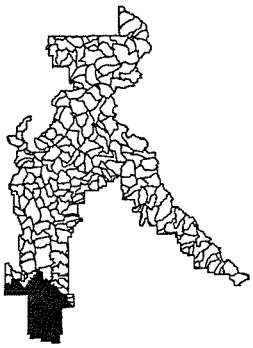
1. Areas with highly-dissected slopes
2. Highly erodible soils
3. Landslide deposits and potential landslide areas (unstable soils).

Existing Conditions
Table 2-5 displays the results of the IWWI Watershed Vulnerability analysis.

Map 2-7 Watershed Vulnerability



Vicinity Map



LEGEND

Vulnerability Rating

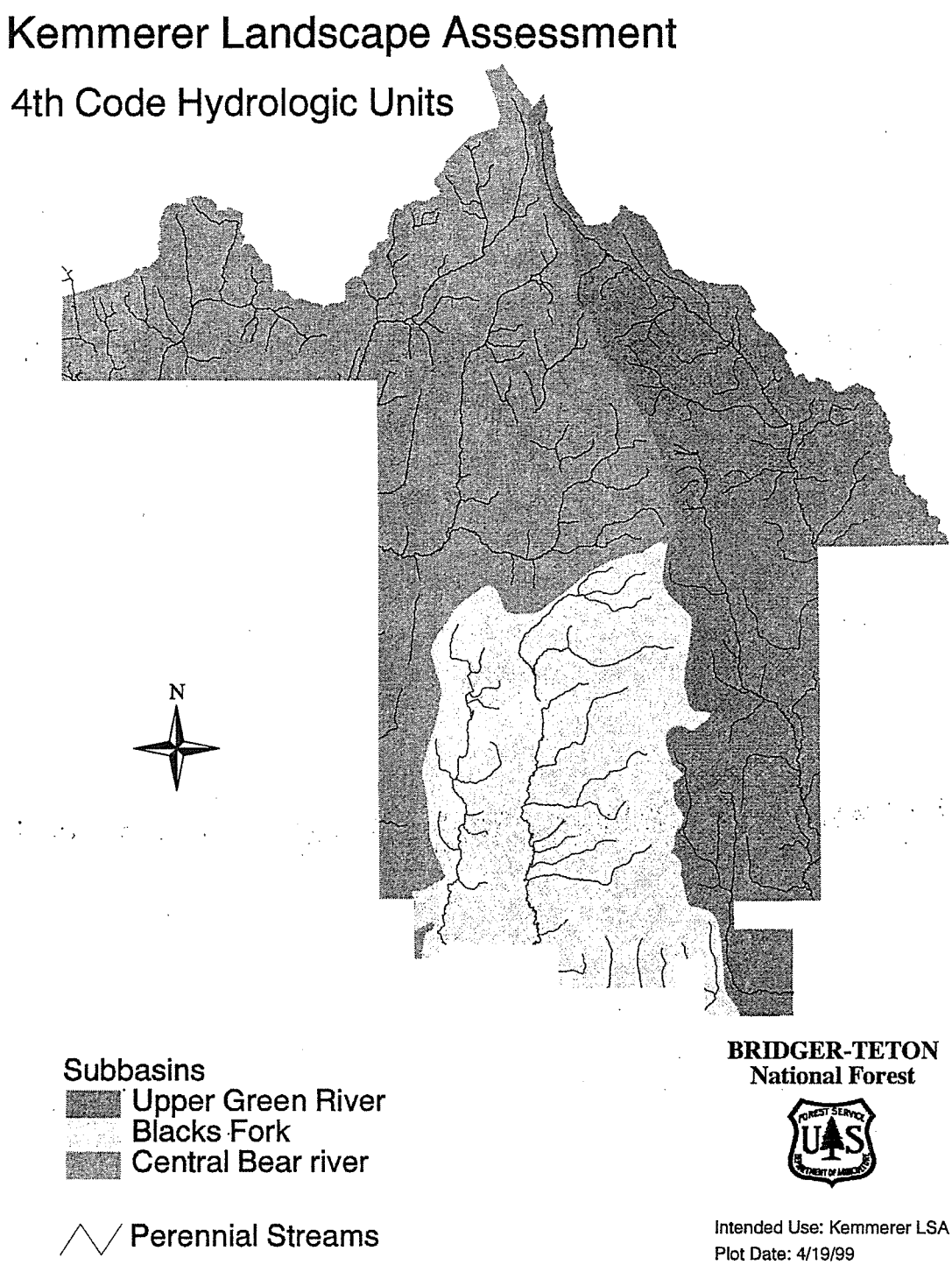
- Moderate
- High

BRIDGER-TETON
National Forest

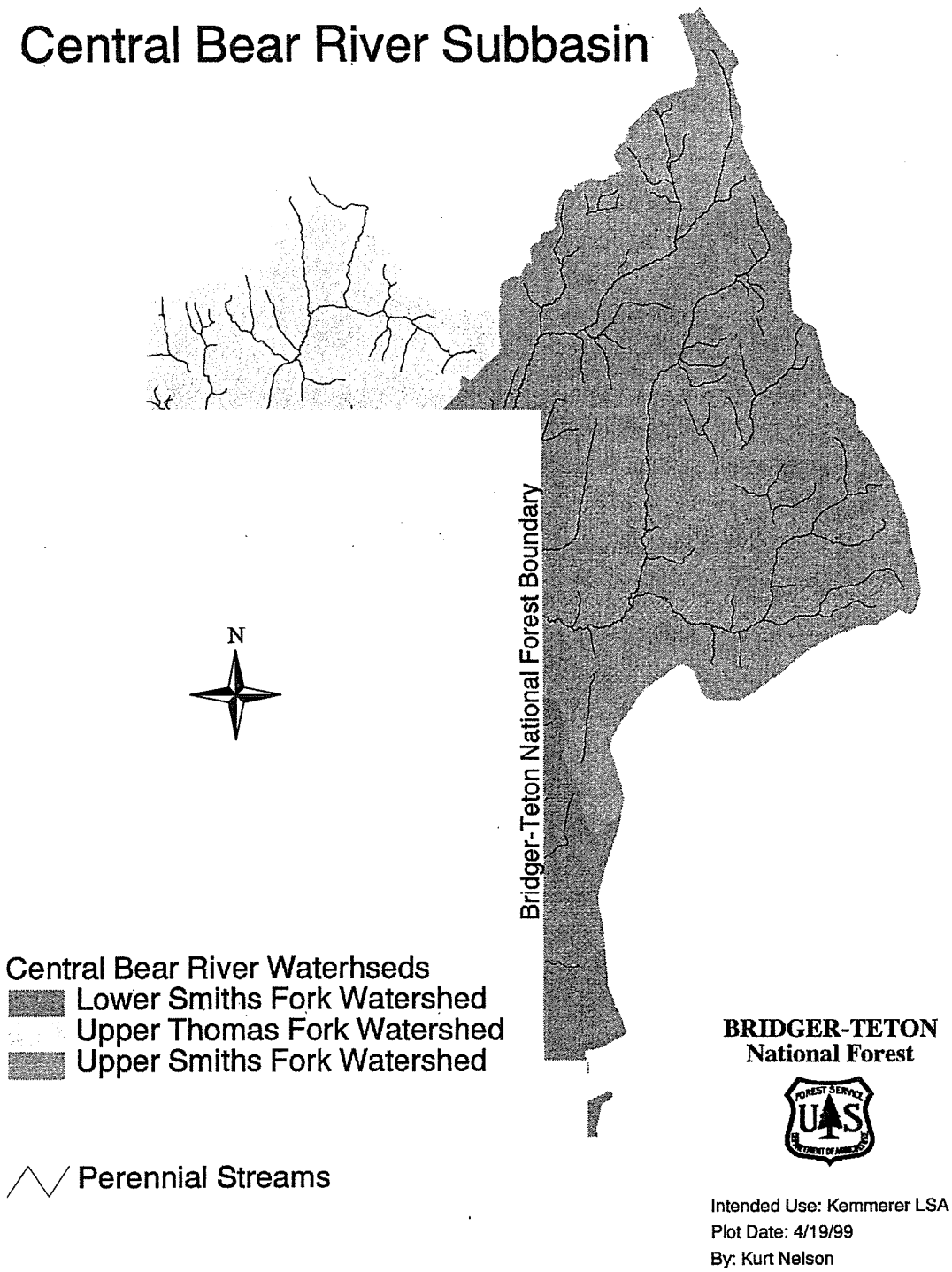
Intended Use: Report

Plot Date: 6/11/2001

By: Randy Frazier



Map 2-2. There are portions of three subbasins within the Commissary Ridge/Tunp Range assessment area.



Map 2-3. There are three watersheds within the Central Bear River subbasin, the Upper Thomas Fork, Upper Smiths Fork and Lower Smiths Fork. The Upper Smiths Fork watershed is almost entirely on Forest.

Forest Plan
Current Desired Future Conditions

Forest Plan DFC
- 10 - Simultaneous development, no adverse effects
- 12 - Managed for big game habitat and recreation
- 1B - Substantial resource commodity development
- 2A - Non-motorized recreation areas
- 9A - Developed and administrative sites

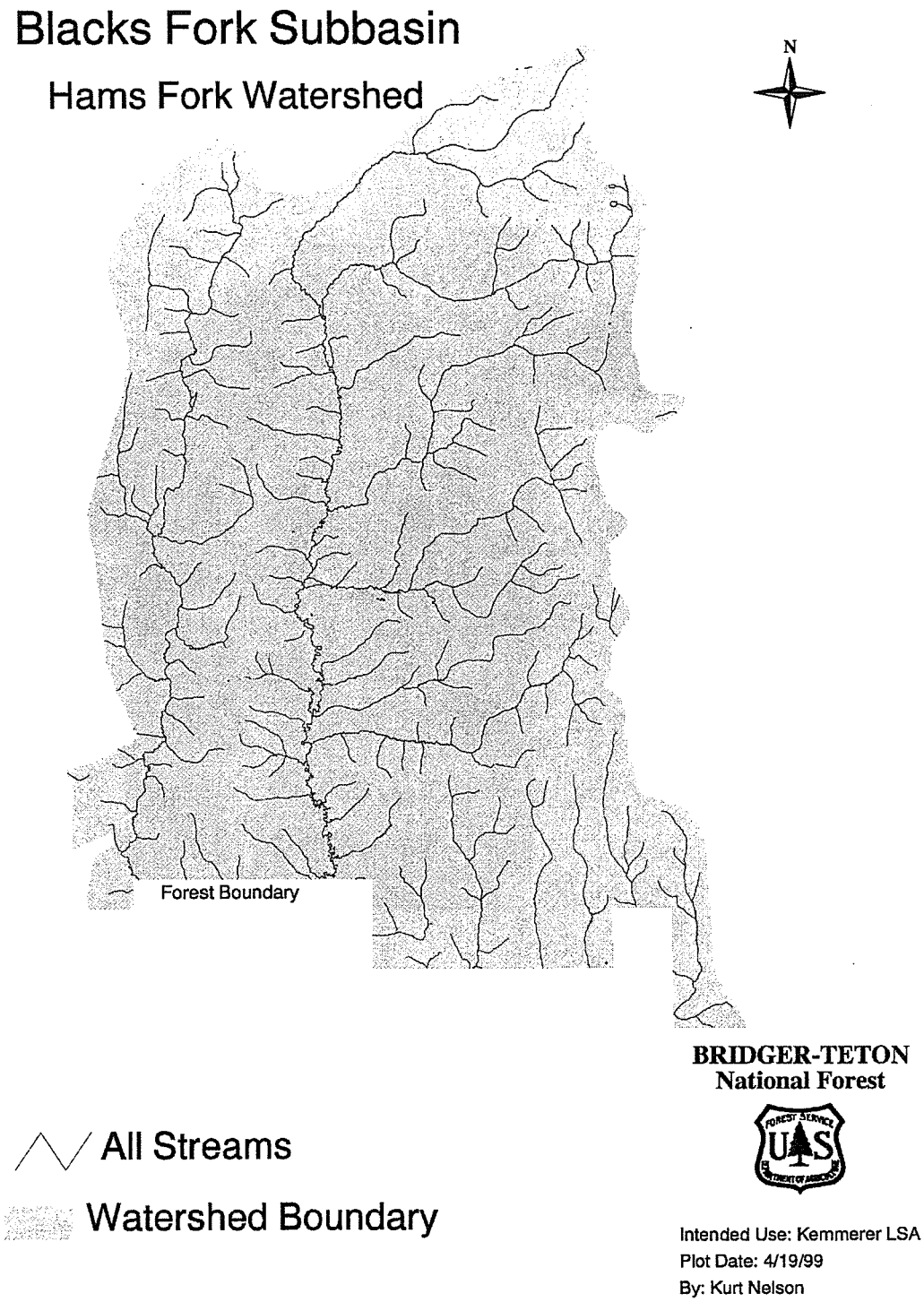
Perennial Streams

9 0 9 18 Kilometers

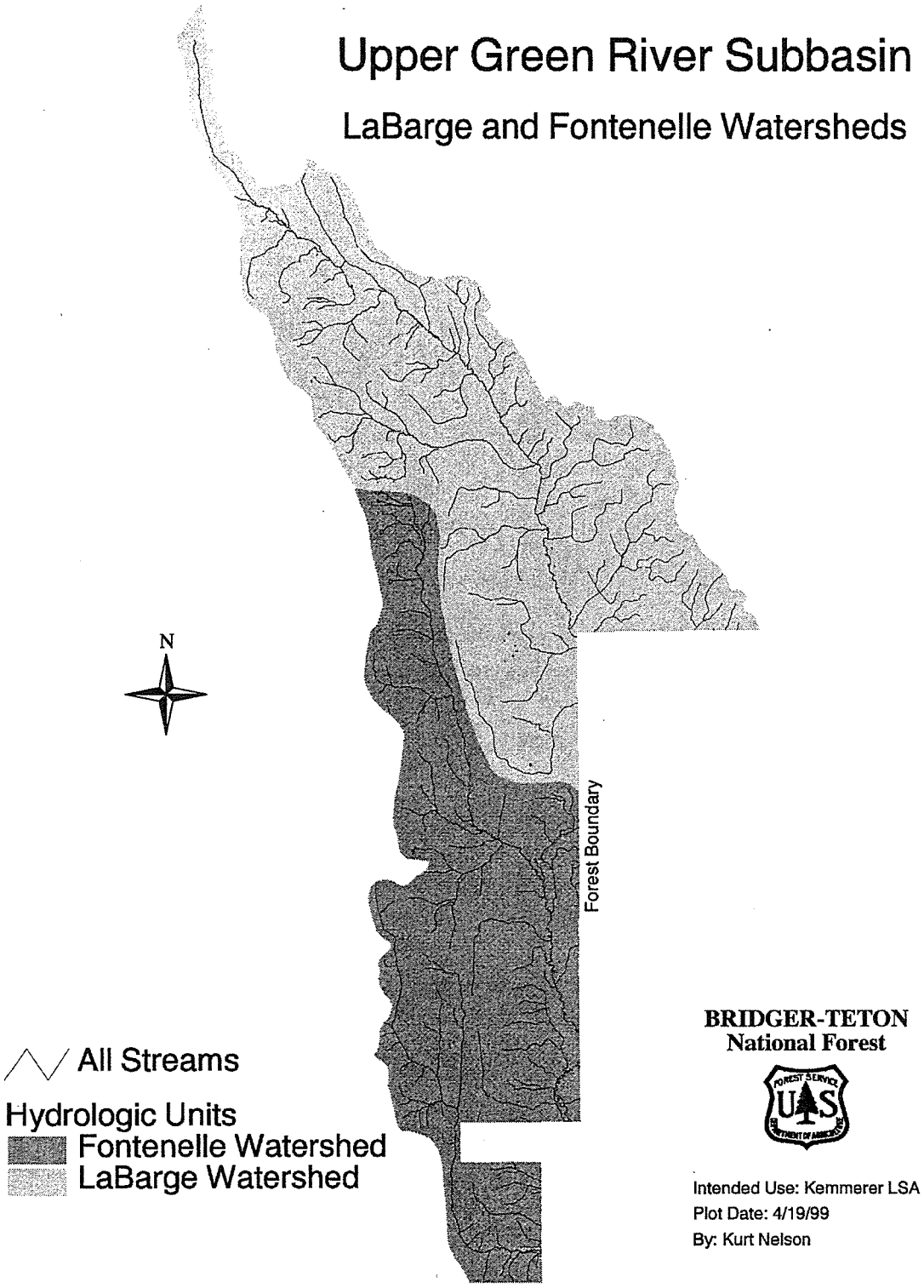
BRIDGER-TETON
National Forest

Intended Use: Kemmerer LSA
Plot Date: 4/19/99
By: Kurt Nelson

Map 2-4. Forest Plan desired future conditions within the Commissary Ridge/Tunp Range LSA area.



Map 2-5. Blacks Fork subbasin contains only the Hams Fork watershed on the Forest.



Map 2-6. The Upper Green River subbasin has two watersheds partially on the Forest; the Fontenelle and LaBarge watersheds.

Table 2-5. IWWI Watershed Vulnerability Ratings Summary

Watershed Name	Hydrologic Unit Code	Low Risk Acreage	Moderate Risk Acreage	High Risk Acreage
Green River Watershed				
Fontenelle Creek	1404010103	0	39,211	0
LaBarge Creek	1404010106	0	26,927	24,837
Hams Fork	1404010716	0	34.090	40.327
Bridger-Teton NF Watershed Total		**0**	**155,384 (61%)**	**10,008 (39%)**
Bear River Watershed				
Lower Smiths Fork	1604010203	0	8,046	0
Salt Creek	1604010206	0	0	24,700
Upper Smiths Fork	1604010207	0	55,200	29,602
Bridger-Teton NF Watershed Total		**0**	**64,136 (54%)**	**54,302 (46%)**

IWWI Geomorphic Integrity ratings are as follows:

- *Fully Functional:* The watershed has high soil and water integrity relative to its natural potential condition. Disturbance does not compromise soil-hydrologic function or soil-stream resilience.

- *Functioning at risk:* 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. Less than 20 percent of the soil-hydrologic function, stream miles, or riparian areas are functioning at risk or non-functioning.

- *Non-Functional:* 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 investment and revised management. More than 20 percent of the soil-hydrologic function, stream miles, or riparian areas are functioning at risk or non-functioning.

Existing Conditions

Table 2-6 displays the management areas and their respective IWWI Watershed Geomorphic Integrity Ratings. As the table shows, the Fontenelle Creek watershed is rated as non-functioning. The other hydrologic units are rated as functioning at risk primarily due to roads and range management.

Table 2-6. IWWI Geomorphic Integrity Ratings Summary

Watershed Name	Hydrologic Unit Code	Fully Functional Acreage	Functioning at Risk Acreage	Non-Functional Acreage
Green River Watershed				
Fontenelle Creek	1404010103	0	29,203	10,008
LaBarge Creek	1404010106	0	51,764	0
Hams Fork	1404010716	0	74,417	0
Bridger-Teton NF Watershed Total		**0**	**155,384 (94%)**	**10,008 (6%)**
Bear River Watershed				
Lower Smiths Fork	1604010203	0	8,046	0
Salt Creek	1604010206	0	23,982	718
Upper Smiths Fork	1604010207	0	84,802	0
Bridger-Teton NF Watershed Total		**0**	**117,720 (99%)**	**718 (1%)**

IWWI Water Quality Integrity ratings are as follows:

- *Fully Functional:* No stream segment is damaged by physical, chemical, or biological impacts such that any resource value appears to be seriously degraded.

- *Functioning at Risk:* A minor part (less than 20 percent) of stream segment miles is damaged by physical, chemical, or biological impacts such that any resource value appears to be seriously degraded.

- *Non-Functional:* A major part (greater than 20 percent) of stream segment miles is damaged by physical, chemical, or biological impacts such that any resource value appears to be seriously degraded.

Existing Condition

Table 2-7 displays the management areas and their respective IWWI Water Quality Integrity Ratings. As the table shows, the Fontenelle Creek watershed is rated as non-functioning. The other hydrologic units are rated as functioning at risk primarily due to roads and range management.

Table 2-7. IWWI Water Quality Integrity Ratings Summary

Watershed Name	Hydrologic Unit Code	Fully Functional Acreage	Functioning at Risk Acreage	Non-Functional Acreage
Green River Watershed				
Fontenelle Creek	1404010103	0	29,203	10,008
LaBarge Creek	1404010106	0	51,764	0
Hams Fork	1404010716	0	74,417	0
Bridger-Teton NF Watershed Total		**0**	**55,384 (94%)**	**10,008 (6%)**
Bear River Watershed				
Lower Smiths Fork	1604010203	0	8,046	0
Salt Creek	1604010206	0	4,870	19,830
Upper Smiths Fork	1604010207	0	84,802	0
Bridger-Teton NF Watershed Total		**0**	**98,608 (83%)**	**19,830 (17%)**

Desired Conditions for Watershed

♦ Promote healthy watersheds that provide a steady flow of water that sustains all of its water-related or water-dependent species without degrading the quality of its soil, despite disturbances such as fires and floods. Watershed health thus has three requirements:

1) Maintaining the integrity of water systems and soil quality.
2) Meeting needs of thriving terrestrial and aquatic ecosystems.
3) Supplying values for people, such as drinking water, recreation, and commodity uses that do not compromise watershed health.

♦ Watersheds provide the timing, quality, and quantity of water needed for beneficial uses and to sustain desired conditions.

♦Riparian areas and wetlands are fully functional with healthy aquatic habitats.

♦All watersheds are fully functional.

Transportation System/Infrastructure/Lands

Existing Conditions

There are 287 miles of road within the assessment area: 97 miles of arterials and collectors and 190 miles of local roads. Many roads have been closed during the last 25 years. Prior to those closures there were 40 miles of high clearance vehicle and 4 X 4 trails that were user-developed into the following destinations: Devils Hole Lakes, Red Park and Lake Alice. See **Map 1-1**.

Road condition surveys have been completed for a number of roads in the assessment area. **Table 2-8** displays a summary of those efforts. A more detailed account of those conditions surveyed follows.

Table 2-8 Summary of Transportation System

Road Name	Road Number	Class of Road	Road Surface Type	Miles	Road Condition	TSL**	Mnt Level
Fontenelle Crk	10103	Arterial	Native	13.6	Rutted	C	3
Hams Fork	10062	Arterial	Native with some gravel	19.6	Variable	C	3
LaBarge Crk	10138	Arterial	Native with some gravel	14.6	Variable	B	3
Smiths Fork	10072	Arterial	Native with some gravel	24.4	Variable	B	3
Big Park*	10066	Collector	Native	13.0	Rutted		
Hobble Crk	10193	Collector	Native a little gravel	14.6	Rutted	D	2
Dry Fork	10071	Collector	Native	3.0	Rutted	D	2
Nugent Park	10069	Collector	Native	7.3	Rutted	D	2

**Big Park Road was renamed Hobble Creek Road in 1998. See Big Park Road narrative.*
***Traffic Service Level*

Fontenelle Creek Road (10103)
A road hazard survey was conducted on this road in 1996 by landscape architect interns. A narrative and photo log was prepared in conjunction with the landscape inventory and conceptual plan: Fontenelle Drainage Study. A summary of their findings include:

- Deep ruts are common with some road widening where vehicles had been stuck in the road.
- Water ponding on the road either from blocked culverts or from rain events.
- Geotextile fabric exposed where pit run road surfacing was improperly installed.
- Riparian areas being encroached by vehicles leaving roadway for better road passage.

Road reconstruction occurred on the Pomeroy Basin to LaBarge Creek section of the road in 1992. The road was shifted out of the riparian area associated with Little Fall Creek, many culverts were replaced, and some road surfacing was installed. Some landslides were reactivated by some of the roadcuts that were excavated.

Hams Fork (10062)
A road condition survey was completed in 1992. The Hams Fork has two sections; the first section runs from the forest boundary to the intersection of Road #10063. This section has some aggregate surfacing but is worn out with little aggregate remaining. Some rutting is present and there is minimal cross drainage. This road was widened in the mid 1980s to accommodate oil well drilling equipment. Many of the new road cuts failed and most have since stabilized.

The second section runs from Hams Fork Campground to Kelly Guard Station and Big Springs. This section was relocated in 1997. The new alignment avoided an unsafe set of switch-backs and included a new bridge across the Hams Fork, which should lessen the impact on the riparian area. Pit-run road surfacing was added to the new roadway in 1997.

P and M Coal Company reconstructed several access routes to their private in-holdings off the main Hams Fork Road in 1997.

LaBarge Creek Road and Smiths Fork Road (10072 & 10138)
This road connects Salt Pass (WY 89 FH7) on the west with WY 189 on the east about one mile south of the town of LaBarge. This is a single lane road with turnouts. There is about five miles of gravel surfacing from the Forest boundary on the LaBarge side to the Scaler Cabin junction. The rest of the road is native surface. There is some sluffing on both the cut and fill slopes on a section near the Dry Fork Junction. There are ruts in places, blind curves, and it is rough and narrow in some sections. The portion from the Forest boundary on the LaBarge side to the paved portion is extremely rough with one or more washouts.

Hobble Creek Road (Big Park Road) (10193)
A road condition survey was completed in 1992. The Big Park-Red Park Road has been eliminated and is now a trail. The Big Park Road #10066 originally was a loop road that began and ended on the Hams Fork Road #10062. In 1989, a new road was completed from the Big Park Road into Hobble Creek Campground. Major reconstruction of the first five miles was accomplished by a timber sale contractor and was completed in 1996. In 1998, the section from the Hams Fork Road to Hobble Creek was designated as a collector and became the Hobble Creek Road #10193. This included about six miles of the old Big Park Road.

In February 1998, the transportation management system was updated, but as of this writing the changes are not in the Forest transportation system database. This is a single lane road with turnouts, some blind curves, rough bedrock spots, and sections where rocks roll off the cut slopes onto the road.

P and M Coal Company reconstructed several access routes to their private in-holdings in the Green Knoll area off the main Big Park Road in 1997.

Dry Fork Road (10071)
There are mudholes, ruts, and it is extremely slippery when wet. It connects the BLM road with the Smiths Fork Road.

Nugent Park Road (10069)
This is a single lane road with turnouts. There are some blind curves and mudholes when wet. It connects with the BLM road on the south, which divides one road going down Pine Creek and the other going down Dempsy Ridge. It is a sedan road when dry and four wheel drive when wet. A road condition survey was completed in 1992. The road had major reconstruction in 1989, including road drainage and some surfacing.

In 1998 the Transportation Inventory was reviewed and updated. All roads are now depicted fairly accurately in this Inventory.

Desired Condition
Table 2-9 displays the desired transportation system for the assessment area.

Table 2-9. Desired Condition Transportation System for the Assessment Area

NAME	No.	MI	CLASS	SURFACE	TSL	MTC
Fontenelle Crk	10103	13.6	artery	gravel, single lane , ITO	B	4
Hams Fork	10062	19.6	artery	gravel, single lane , ITO	B	4
LaBarge Crk	10138	14.6	artery	gravel, double lane	B	4
Smiths Fk	10072	24.4	artery	gravel, double lane	B	4
Dry Fork	10071	3	collector	gravel, single lane, TO	C	3
Nugent Park	10069	7.3	collector	gravel, single lane, ITO	C	3
Hobble Crk	10193	14.6	collector	mp 0-8 gravel, remainder spot gravel, single lane, TO	C	3
TOTALS		**72.2** **24.9**	**artery** **collector**		**B=4** **C=3**	**4=4** **3=3**

No. - Road number
MI - Miles
CLASS - Classification of the road
ITO - intervisible turnouts
TO - turnouts
TSL - Traffic Service Level
MTC - Maintenance level
mp - milepost

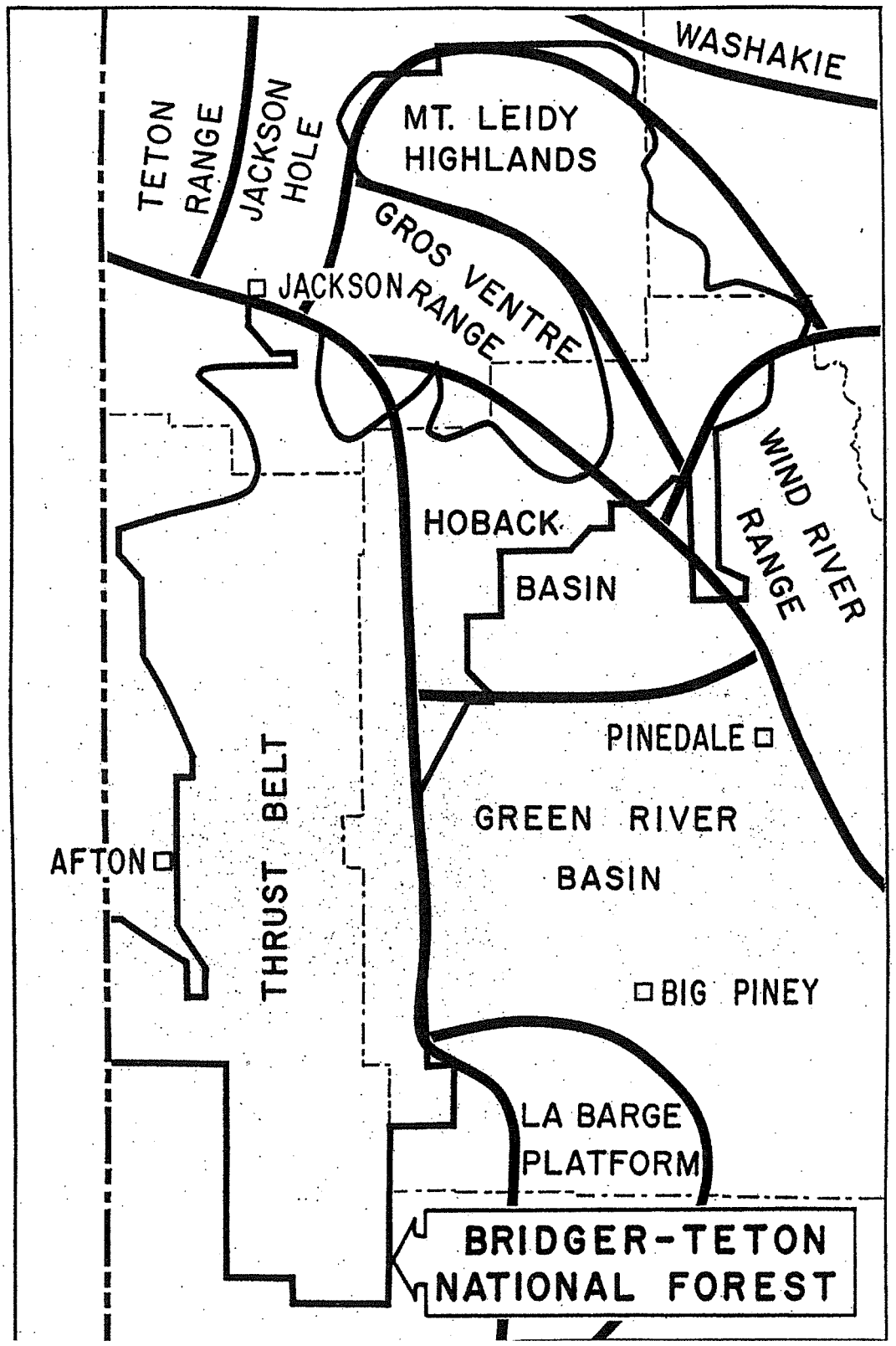
♦ Local roads vary from a double lane surfaced road that accesses Allred Campground to a two-track jeep trail that accesses a dead end.

♦ The transportation system is at and maintained to the standards in the Road Maintenance Objectives.

Minerals and Energy Development

The lands administered by the Bridger-Teton National Forest outside of the established Wildernesses and Wilderness Study Areas have been divided into five areas based on geology and the potential for the discovery of economic oil and gas resources within the next 10-15 years. The areas within which future exploration and development will most likely occur are the leading edge and eastern two-thirds of the northern Wyoming Thrust-Belt, which includes the assessment area. See **Map 2-8.**

The thrust belt geology of the assessment area contains complex anticlinal features capable of trapping commercial quantities of oil and gas (Holm 1987). Holm reported that natural gas would be the most likely hydrocarbon found within the assessment area, with some oil, CO_2 and H_2S possible. According to Holm, due to the complex geology of the area and the high costs and risk of drilling operations in the area, exploration and development activity in the next 10 to 15 years will likely proceed at a slow and methodical pace.



Map 2-8. Oil and Gas Potential in the Assessment Area. The eastern two thirds of the Wyoming Thrust Belt contain the best chance for economically viable hydrocarbon reserves.

Chapter 3 - Biological Environment

Forested Vegetation

Overview

The Forests on the Kemmerer District are a diverse mix of species and age classes in a mosaic across a complex landscape. Forest types present are: lodgepole pine; Douglas-fir; limber/whitebark pine; Engelmann spruce/subalpine fir; and aspen. The Forests are not static; they have been changing throughout their existence because of successional growth patterns, forest fires, insect and disease outbreaks, climate changes, and even many localized events such as avalanches, large soil movements, and landslides. In the last 100 years there have been changes brought on by settlers looking for house logs, firewood, railroad ties, lumber, and mine props. In order to meet the needs of the National Forest Resource agenda and provide future generations with vital resources from their Forest lands, we must recognize the changing conditions and capabilities of the forest types found on the Kemmerer District. These tree species provide essential wildlife habitat, recreational opportunities, watershed protection, and renewable wood resources.

Existing Vegetation - Mapping and Acre Calculation: Existing vegetation for the Commissary Ridge-Tunp Range LSA was determined using a combination of two sources. Timber stand data from the Bridger-Teton Forest Plan, which was interpreted from 1:15,480 scale aerial photography during the 1970s and later digitized into a GIS, was compared to figures obtained from a classified Landsat-TM image from 1994 (Homer 1998). Both sources of information are useful for the purpose of determining the extent and acreage of existing vegetation. However, biases and differences exist between the two methods and should be recognized. The timber inventory focused on timber species only. Groups classified as lodgepole, for instance, may have subalpine fir or other species present in the canopy that were ignored and, therefore, not mapped accurately or figured into acreage calculations. Any non-forested vegetation was classed as non-forested and left at that. Likewise, the satellite classification can misrepresent acreage and extent in similar ways. For instance, a typical class description taken directly from the landcover classification report (Homer, 1998) for the "Alpine Fir/Spruce" type reads:

> "Conifer forest principally co-dominated by subalpine fir *Abies lasiocarpa* and Engelmann spruce *Picea engelmannii* at canopies > 59%. Primary associated tree species include *Pinus contorta*, *Pinus albicaulis*, *Populus tremuloides*, and *Pseudotsuga menziesii*. Primary associated shrub species include *Amelanchier alnifolia*, *Lonicera utahensis*, *Ribes spp.*, *Symphoricarpos oreophilus*, and *Vaccinium spp.*"

Non-forested vegetation types were classified by the dominant species. However, many of these types occur in complexes difficult to map accurately.

It is likely that the timber survey data was biased towards lodgepole pine. The satellite imagery, on the other hand, is most likely biased towards subalpine fir. The satellite image also underestimates the amount of Douglas-fir, whereas the timber survey underestimates whitebark and limber pine. Aspen differs between the two sources and the reason for this is difficult to determine. Some aspen

has probably been encroached by conifer species since the timber survey was conducted. This could account for some but not all of the difference between the two figures.

For the final determination of existing vegetation acreage, professional judgment was used to manipulate and regroup the satellite image to more closely fit the assumptions of the land managers. The forest plan vegetation information was also used to moderate and adjust the acreage figures for final calculations.
Table 3-1 shows the different classes and acreages obtained by each source and the difference between the two for the forested vegetation types.

Table 3-1. Assessment Area Forest Types by Class and Associated Acreages

Forest Type	Satellite Image	Forest Plan (Stand Strata)	Difference	Professional Judgment
Subalpine fir Spruce (<20%)		10,437		
Subalpine fir Spruce (>20%)		16,392		
Subalpine fir/ Spruce (Total)	80,196	26,829	-53,880	50,000 to 70,000
Lodgepole pine (<20%)		32,800		
Lodgepole pine (>20%)		71,526		
Lodgepole pine (Total)	54,828	104,326	+49,498	70,000 to 80,000
*Limber/white-bark/	3,248		-3,248	2,000 to 4,000
Douglas-fir (<20%)		1,847		
Douglas-fir (>20%)		3,127		
Douglas-fir (Total)	150	4,974	+4,824	3,000 to 5,000
**Clear cut areas seedling/sapling/	3,0002	3,822		4,400
Total Conifer	141,422	139,411		
Aspen	23,729	40,728	+16,999	30,000 to 45,000
Total Forest	165,151	180,139		
Total Forest >20%		91,045		

*Limber whitebark included with lodgepole
**Most clearcut classed as brush

Fire: Wildland fire has played a major historic role in the formation of the assessment area's vegetation. Fires often burned unchecked throughout the Wyoming and Salt River Mountain Ranges prior to European settlement. Numerous accounts attesting to fire constantly burning in the mountains are found first in the journals and diaries of trappers/hunters of the beaver trade era (1820 - 1840), and continuing throughout the great immigration period (1840 - 1860).

> "Nearby is an immense conflagration among the pines, column after column of red flames, darting with roaring noise into the sky. All through these mountains the immense forests are on fire. The ground is piled with dead, dry pine, which furnishes food for the furious element, and causes it even to consume the green branches of the tallest pines" (Katherine Dunlap, Lander Trail Emmigrant, near LaBarge Creek, 1864).

The periodic presence of fire has prepared seedbeds, cycled nutrients, maintained various stages of vegetation, provided favorable habitats for various wildlife species, maintained a diversity of age

classes and vegetative types, reduced susceptibility of vegetation to some types of insects and diseases, modified fuel loadings, and has been instrumental in the development of vegetation communities. Intense fires during periods of drought assured grasslands and aspen stand maintenance while impeding conifer and sagebrush encroachment within these stands. Fires also provided conditions for lodgepole pine stand regeneration.

Fire suppression and other factors such as grazing and climate changes have impacted the ecological role of fire in forested environments. Because of fire suppression in the conifer types, a higher percentage is in older age classes and these are more receptive to insects, disease, and wildfire. Some of the larger fires were taken out of the picture, along with smaller stand-replacing fires and lower-intensity surface fires that would have broken up the homogeneous stands. The lodgepole, Engelmann spruce/subalpine stands that are greater than 150 years old are likely to burn in large stand-replacing fires given favorable burn conditions. Subsequently, many of the young pole and post stands identified in early surveys (1914) are now mature/over mature forested stands. Aspen stands identified in the past are now over-mature, heavily encroached by conifers, or have been replaced by conifers.

The more dramatic effects of fire are at the lower elevation, with shorter fire interval types. Much of this area bounds large, low-lying elevation areas where large range fires likely burned frequently in the past, often times running into the low-to-mid elevation forested areas. Successful fire suppression in these areas (much of it BLM and private adjacent to the Forest) has reduced the occurrence of these fires.

Many of the even-aged conifer stands in the assessment area likely date from large fire years. These fire years were characterized by long-term drought along with widespread lightning and wind events. Although most of the stands are not homogeneous, they include many smaller areas of different age classes initiated by either smaller fires or other disturbances, such as insects or diseases. These smaller fires that may have burned up to 500 or 1,000 acres during average burning seasons are now often contained at less than five acres by aggressive initial attack. There is no doubt that active fire suppression has prevented a certain number of potentially large fires that were ignited early in the season and suppressed at a small size. If allowed to burn, some of these fires would slowly grow through the summer, until a favorable combination of weather produced active burning conditions and large fire growth.

A complete description of the fire regimes in this area is included in the appendix.

Other Disturbances: Insect and disease agents have also affected and shaped the forests of the assessment area. The primary agents have been mountain pine beetle, lodgepole dwarf mistletoe, spruce beetle, spruce budworm, bark beetles that affect subalpine fir, Douglas-fir beetle, commandra rust, and a number of agents that affect aspen. These agents have played a natural role in the landscape, along with fire to change the composition of species, create snags and structure, and create fuels that sustain forest fires. As forest age increases and tree growth becomes denser, individual trees are stressed. These conditions promote larger outbreaks and buildups of many forest insects and disease.

Other disturbances such as landslides and avalanches have locally affected vegetation. An example can be found in many aspen stands off Absaroka Ridge in the Little Hornet area. The unstable and

wet soils there, from massive land movement, support aspen stands with some young conifer also coming in. Avalanches and snow slides affect high elevation subalpine fir/spruce stands and limber/whitebark pine forests on steeper slopes, such as in the upper LaBarge drainage.

The desired condition (DC) of these Forests must recognize changes due to successional growth patterns, forest fires, insect and disease outbreaks, climate changes, and large soil movements, while also adapting to changing and increasing public demands. Management will strive to manage vegetation within the historic range of variability as identified in the Forest Properly Functioning Condition (PFC) process while meeting social needs. The DC will include disturbance through fire or other means such as the harvesting of trees and site preparation.

Harvesting operations will be primarily limited to readily accessible areas and sites where operations can be accomplished in appropriate Forest Plan management areas without impairing other important resource values. Management will include thinning and density control of forests to reduce susceptibility to insects and Integrated Pest Management control measures for pest control in high value trees such as around campgrounds. Prescribed fires and wildland fires would be used as appropriate to enhance timber and range values.

In backcountry and roadless areas where timber harvest or mechanical treatment is not appropriate, wildland fire use and prescribed fire will be preferred. Fires will be managed to protect investments in packbridges, recreation sites, and cultural sites. These sites will be identified and it will be determined if mechanical treatments may be required to protect these investments.

In order to maintain forests that can meet increasing public demands, forest health conditions will be monitored and appropriate actions taken to reduce or prevent damage to important resources.

Lodgepole pine

Characterization/Reference Condition

Historically, lodgepole pine-dominated stands likely occupied a slightly larger area than they do now. Some of the areas now dominated by subalpine fir were, in the presence of more frequent fires, maintained in an early seral lodgepole state. However, some areas where lodgepole has encroached into aspen stands would have been maintained in more seral aspen with frequent fires. Other than these differences, distribution of lodgepole across the landscape was similar to existing distribution. Large open "parks" and aspen stands were maintained by frequent fires, preventing encroachment of lodgepole and maintaining a vegetative mosaic while reducing connectivity of lodgepole patches.

Fire occurred more frequently as subalpine fir seedlings appeared and grew in the shade of established lodgepole pine, rather than after subalpine fir became the dominant species. Some fires flared up to stand replacing intensity for short periods but most covered less than 1,000 acres in size. These fires left relatively even-aged stands of lodgepole pine, from 10 to 1,000 (and occasionally more) acres in size. Lodgepole pine seeded in fire-created snags and clumps of old live trees. Low intensity ground fires were more frequent, creeping around in lodgepole stands, for longer time periods, before significant precipitation put them out. This caused variable levels of mortality in lodgepole and other trees on the site, created small openings, and cleared fuel accumulations from

the forest floor. Following these fires, many live trees remained to re-seed new stands. Results of these were multistory or two-storied stands with a higher diversity of species present.

Across the landscape, there was greater age class diversity, with more even distribution of seedling/sapling stands, pole-size stands, and older lodgepole stands with alpine fir becoming established. Many of the older stands had a less dense overstory due to low-intensity fire and greater amounts of lodgepole regeneration in openings and in the opened understory. There were greater numbers of snags in the seedling/sapling stands and greater fuel accumulations in the pole-size stands as
snags began to rot and blow down. These snags and fuels created conditions that allowed some areas to re-burn before the trees became mature or over-mature. Insects and diseases that affect lodgepole were present throughout the landscape, with rare epidemic outbreaks. Fewer older trees, more younger trees, and greater fire frequencies would have affected insect and disease distribution levels. Bark beetles and dwarf mistletoe had less desirable conditions to reach epidemic levels.

Existing Conditions
Lodgepole pine is the predominant tree species in the assessment area. In the LaBarge drainage, for example, lodgepole-dominated forests comprise 42 percent of the total area and 63 percent of the forested area. For the entire analysis area there are approximately 75,000 acres of lodgepole forests. Significant numbers of lodgepole pine also occur in areas mapped as subalpine fir, aspen, limber/whitebark pine, and Douglas-fir. Lodgepole pine occurs in all drainages of the analysis area and at elevations from 6,800 feet to just over 9,000 feet. In this area, lodgepole averages 8-10 inches in diameter (DBH) and 60-70 feet in height and is seldom larger than 24 inches (DBH) and 90 feet in height. It tends to occur on drier sites as elevation increases in its range. At lower elevations it is found on cooler, wetter north-facing slopes, while sagebrush/grass occupies the drier and warmer slopes. At higher elevations it is replaced by limber and whitebark pine and Engelmann spruce on the cooler and wetter slopes. Lodgepole pine is a seral species, occupying sites after fire and other disturbances and gradually being replaced by subalpine fir or, less frequently, by Engelmann spruce as stands get beyond 100 years old. Due to the broken topography and diverse soils throughout the analysis area, patch sizes are limited. Patches as small as a few acres up to several thousand acres occur, but patches are more typically several hundred acres in size. They are broken up across the landscape by wide riparian areas dominated by willow; large open sagebrush/grass areas and "parks," wide, bare ridgelines; aspen patches and stringers; and spruce-fir forested areas. These landscape features also influence patch shape, which tends to be irregular with many naturally occurring edges.

Lodgepole pine forests occur most frequently and prolifically on flatter, bench areas and mild slopes. Lodgepole is found most commonly in almost pure stands, from 80 to 100 years old, with little understory trees or with a young understory of subalpine fir less than five feet tall. Throughout the Nugent Park and Big Park area, lower Hams Fork drainage, and lower LaBarge Creek there are extensive areas where these stands predominate. They originated from fires and tie hacking operations in the last part of the 19th century and early 20th century. By 1929, almost 3,000 acres had been tie hacked in the Hams Fork and West Branch Hams Fork. Many of these acres also burned following harvest. Most of the lodgepole in these areas are relatively healthy but many areas are heavily stocked, with up to 700 trees-per-acre evenly distributed on the site. The tree canopy is mostly closed with some scattered, small openings occurring throughout. Diameters of these trees

average seven to nine inches. These stands will be at increasing risk to mountain pine beetle damage.

There are also many acres of older lodgepole stands, greater than 150 years old, where the lodgepole is dying out and being replaced by subalpine fir and spruce, which make up 20 to 50 percent of the overstory. There is also a significant understory of fir in these stands, ranging from one to 30 feet tall. These stands are located throughout the analysis area wherever intense fires haven't burned in the last 150 years. Large areas of these forests occur on Deadline Ridge, Packsaddle Ridge, Middle Ridge, major tributaries of the Hams Fork, Ferney Gulch, and the south facing slopes of Smiths Fork. These areas have 10 to 20 percent, and occasionally higher, mortality in the lodgepole pine. Susceptibility to insect and disease damage is also high. In most of these areas, lodgepole dwarf mistletoe is a major disease factor, limiting growth of the lodgepole and increasing susceptibility to other insect and disease agents. Some of these stands would have likely burned by now if fire suppression practices had not prevented these areas from burning.

> "Some stands are made up of entirely old-growth timber, wheras others are made up of old-growth with two to three acre clumps of lodgepole pine poles interspersed within the stands...the understory of all units consists of seedling/sapling size subalpine fir...large quantities of down woody fuel are present...." Silvicultural Prescription, Absaroka Timber Sale, 1982.

In these older lodgepole stands, there is now an increased potential for larger and more widespread fires. The increased dead-and-down fuel loading and understory of subalpine fir and Engelmann spruce both contribute to higher fire intensity. The understory also provides greater vertical fuel continuity, providing favorable conditions for fires to work from ground fuels into the canopy. These 150-year-old-plus stands will burn in stand-replacing fires given favorable burning conditions. Because the stands are more homogenous, the fires are likely to burn more completely and grow to a larger size.

In the bigger picture, fire exclusion has affected this overall vegetation type by preventing some of the larger fires, along with smaller stand-replacing fires and lower-intensity surface fires that would have broken up these homogenous stands.

Another recent example of this was the extensive damage to the subalpine fir in these older stands from bark beetles and drought stress due in part to overstocked conditions.

These areas also provide important big game cover and old-growth habitat attributes such as numerous snags and down logs on the forest floor.

Approximately 4,400 acres of seedling/sapling stands are present in areas accessible to roads, originating from clearcut harvesting over the past 35 years. Most of these areas have been regenerated with lodgepole pine through tree planting efforts. A few areas were successfully seeded in the early 1970s and some areas were left for natural regeneration. Subalpine fir and Engelmann spruce have also seeded naturally in these areas. Pocket gophers have been a problem with regeneration in many areas, particularly in large clearings adjacent to natural openings that were left to natural regeneration. However, almost all areas do meet Forest Plan standards for tree stocking. Due to tree growth on these sites, an estimated 40 to 50 percent of these areas are no longer considered openings. Approximately 1,729 acres have been thinned to achieve more desirable tree

densities. Hardly any other areas of seedlings/saplings are present due to the absence of wildfires in the past 50 years.

Tie hacking activities are discussed in the Timber Management section of the Past Management overview.

Desired Condition

The lodgepole pine forests occupy essentially the same current and historical sites they always have. Overall, areas of lodgepole have increased slightly to bring occurrence of lodgepole closer to historic levels. There are fewer lodgepole growing in areas occupied by aspen. Areas that have been disturbed remain predominantly lodgepole but other species such as Engelmann spruce and subalpine fir are seeding in and add diversity to those sites. When created openings are thinned or re-planted, a diversity of species is encouraged to reflect naturally occurring diversity in the specific area. Some areas where lodgepole has pioneered into openings revert back to openings when disturbed. Some areas, especially in the inaccessible backcountry, continue to advance toward dominance by subalpine fir, until a fire or other natural disturbance provides conditions for a return to seral lodgepole pine. There are greater areas occupied by seedling/ sapling forests (10 to 20 percent) and fewer areas occupied by over-mature lodgepole. Overall, a variety of age classes exist throughout the area. Large areas of over-mature forest still exist and provide old-growth habitat attributes for those species dependent on this habitat.

Areas of suitable timber identified in the Forest Plan are considered for management activities that meet diverse demands for resources and promote healthy forest conditions. The lodgepole stands under 120 years of age are evaluated for density management activities. Thinning 50 to 100 acres of these stands each year will reduce susceptibility to bark beetle, reduce fuel loadings, provide fuel breaks, and provide wood products to meet demands. A few small, scattered openings in these stands will mimic historic occurrence of small fires and provide age class diversity. The lodgepole stands greater than 120 years old are evaluated for salvage harvesting or regeneration harvests. Regeneration of these stands by harvesting trees, in areas accessible to roads, will provide the disturbance necessary to recycle some of these areas to younger-aged lodgepole. Snags and some woody are maintained to provide habitat and protect soil productivity. Within areas suitable to timber harvest, 50 to 100 acres of these stands are harvested each year. Harvested areas are either planted, where necessary, or left to natural regeneration.

In the 4,400 acres of seedling saplings resulting from timber harvest disturbance in the last 35 years, monitoring and density management occurs. Thinning of 50 to 100 acres each year ensures that optimal tree density is maintained to provide wildlife habitat and improve tree growth. In some areas where tree density is low, planting or site preparation activities improve stocking. These areas are also evaluated for protection needs from the spread of dwarf mistletoe and treatments occur where feasible.

In areas inaccessible to roads and not in the timber base, fire is allowed to play its natural role in regenerating lodgepole pine. Mixed-severity burns (small patch fires) occur every 70 to 120 years, with stand replacing fires every 120 to 250 years. They will prepare a seedbed for lodgepole pine regeneration, liberate nutrients by speeding decomposition rates, and provide a means of converting older stands to young stands contributing to greater vegetative and habitat diversity. The small patch

fires will maintain vegetative and habitat diversity across the landscape, serve as fuel breaks during large fire events, and help prevent widespread insect and disease activity.

Table3-2. Summary of Existing Vegetation Types and Potential Treatments

Community	Existing Acres	DC	Disturbance Cycle	Acres to Treat next 10 years	Possible Mgmt Practices
Sagebrush/Grassland	114,000	25% early seral 25% late seral 50% crown cover of 9-20%	20 to 40 years	30,000 - 50,000	Prescribed fire Wildland fire use Herbicides
Aspen	30,000 - 40,000	20-30% maintained in early seral stage	Mixed severity every 50-80 years	10,000	Prescribed fire Wildland fire use Mechanical
Engelmann Spruce/ Subalpine fir	50,000 - 60,000	maximum of 50% is mature (>200 years) for Engelmann Spruce, >150 for subalpine fir	Mixed severity burns every 75-100 years. Stand replacing fires 175 to 300 years	1,000	Harvest Prescribed fire Wildland fire use
Lodgepole	70,000 - 80, 000	10 to 20% seedling saplings	Mixed severity 70 to 20 years with high severity fire every 200- 300 years	2,000	Harvest Prescribed fire wildland fire use
Douglas-fir	3,000 - 5,000	Maximum of 70% > 250 years	Low to mixed severity every 50 to 100 years	500 - 750	Harvest Prescribed fire Wildland fire use
Limber Pine Whitebark pine	3,200	Balanced range of structures, sizes	Whitebark mixed severity every 100 to 250 years Limber mixed severity every 100 years	100 - 200	Wildland fire Prescribed fire
Riparian	6,000	20% early seral	Mixed severity 40-60 years	300 - 500	Prescribed fire Wildland fire
Mountain Mahogany	500-700	Balanced range of structural stages, sizes, and ages *	unknown at this time	unknown	Wildland fire

Legend for **Table3-2. Summary of Existing Vegetation Types and Potential Treatments**

Existing Vegetation is estimated based on data from the 1990 Forest Plan Data and the 1998 Utah State Vegetation Classification.

Desired Conditions and **disturbance regimes** are **general guidelines** and actual conditions may be influenced by climate and human caused events.

Treat next 10 years is an estimate of acres that would be disturbed to move the vegetation towards DC. Treatment would include scheduled treatment (harvest and prescribed fire) and unscheduled treatment (wildland fire).

Possible management practices would be selected based on project level analysis. Harvest areas would be scheduled in DFC 10 and 1B and considered in DFC 12. A fire management plan would identify all areas where wildland fire use, prescribed fire and levels of suppression response.

*Because of the small area of Mountain Mahogany, a true balanced range is likely not possible.

Douglas-fir

Characterization/Reference Condition
Douglas-fir is found throughout the analysis area, though often as a minor component of forested stands. Some stands are dominated by Douglas-fir. These stands typically include dryer, high-elevation sites, such as the Deadline Ridge area up Big Fall Creek and the slopes overlooking Coal Creek. In many of the lower elevations where Douglas-fir occurs, it is often found as single trees. It is also found in small clumps, mixed with aspen, subalpine fir, spruce, and lodgepole pine.

Douglas-fir fire regimes are separated into "cool dry Douglas-fir" and "moist Douglas-fir" regimes. In the **cool, dry types**, stands remain scattered to open and do not develop dense overstory canopies. The combination of widely spaced, thick-bark trees and the usually sparse undergrowth results in a low fire hazard for most open stands of old-growth Douglas-fir (Crane and Fisher 1986). However, individual Douglas-fir trees often have branches close to the ground, and if sufficient ground fuels are available, torching can occur. Fires in this type were normally low-to-moderate intensity and rarely killed mature Douglas-firs. The typically open forests characteristic of this fire group generally sustain low-intensity thinning fires. Only when very low fuel moistures and high winds coincide are crown fires likely to occur. Fire frequency is estimated to be 30-70 years.

Fires in the **moist type** tend to be more variable in frequency and intensity. A complete range of fire behavior is represented in this type, from light surface fires to stand-replacement fires. A mosaic of fire effects probably occurred across the historical landscape, with much variability also existing within a single fire (Arno 1980). Stands are thinned or replaced, and the potential dominance of one species over another is altered. Thinning fires favor Douglas-fir because mature trees are relatively fire resistant. Stand-replacement fires favor seral lodgepole pine or aspen on sites where seeds or suckering roots are available. The success of aspen regeneration depends partly on the severity of the fire. A high-severity burn may retard or reduce suckering if shallow roots are exposed to lethal heating. On some habitat types, shrubs have the potential to dominate stands if fire removes the Douglas-fir overstory.

Existing Condition
Based on the Bridger-Teton National Forest PFC (properly functioning condition) Assessment of September, 1997, it is estimated that Douglas-fir is presently within its historic range of occurrence. Additionally, it is noted that this species, which is maintained by fire, is primarily in mature-to-old age classes (up to 70 percent). The PFC Assessment process identified a moderate risk for dryer site Douglas-fir and a low risk for wetter site trees.

Management of this species has been limited. Recently, a mix of Douglas-fir and lodgepole pine has been planted in harvested units on the Salt Creek Timber Sale (17 acres). In 1993, Nugent Park Unit 3 (26 acres) was cut as a seedtree harvest. Douglas-fir and lodgepole seedtrees were left during harvest activities. A 1995 stocking survey showed that within this unit, approximately 205 Douglas-fir trees per acre have come in by natural regeneration. Approximately 2,500 trees per acre total have seeded in, including lodgepole pine, subalpine fir, and Douglas-fir.

The Deadline Timber Sale included harvest units toward upper Big Fall Creek (55 acres) during the late 1960s. Many of these stands were predominately Douglas-fir stands but were planted back with lodgepole pine.

Douglas-fir beetle has been actively killing trees in the stand overlooking Coal Creek. Some harvesting of dead trees has taken place (mid 1990s) but has been limited due to the steep slope of the area. This stand is somewhat isolated. Across the analysis area, insects and diseases affect less than 10 percent of the trees. Most activities are noted in the older age classes of this species.

The effect of fire exclusion in the Douglas-fir types has been mixed, with more dramatic effects in the drier sites, such as along the Tunp Ridge area. Frequent low-elevation fires likely burned into these areas, reducing the understory and thinning smaller trees, leaving the older, fire-resistant trees. While previously there were fewer but older trees, stands now average higher stocking with more trees per acre along with more understory and dead and down material. In the wetter Douglas-fir types, with longer fire intervals, the effect of fire exclusion has been less pronounced.

Desired Condition
A variety of age classes and stand densities exist throughout the analysis area as described in the Forest PFC document. Stands are maintained through frequent, low intensity fires, and management occurs with a variety of silvicultural tools, including prescribe burning and timber harvest. Stands appear to be healthy with only minor insect and disease activities occurring. An available seed source exists for this species, which can be utilized for reforestation in the event of disturbance, such as fire, harvest activities, and/or other disturbance events.

In the dry (xeric) sites, low-severity burns or their surrogates occur every 50 to 100 years. These sites are sufficiently open so that fire is generally not necessary to create conditions for successful regeneration. They will maintain vegetative and habitat diversity, reduce susceptibility to western spruce budworm, and maintain the park-like appearance of these sites.

In the wetter (mesic) sites mixed-severity burns every 50 to 100 years, with a possibility of some stand-replacing fires occurring every 100 to 200 years.

Limber Pine/Whitebark Pine

Characterization/Reference Conditions
Limber and whitebark pine species can be found throughout the assessment area, although they typically appear at high elevations on dry, rocky exposed sites. Often, these occur in widely spaced clumps or in sparse stands.

Limber pine climax stands typically occur on sites where fuels are light, sparse, and discontinuous. Greater flammability may be encountered where both limber pine and Douglas-fir share site dominance. The greatest fire hazard for this fire group is its proximity to more flammable vegetation. This may be dense forest vegetation or sagebrush steppe, either of which has heavier and more continuous fuel loads. Fire intensity in limber pine habitat types usually remains low, and flames are unlikely to enter tree crowns even on sites where there is enough fine fuel available to carry a fire. The scattered distribution of the trees themselves inhibits fire spread.

Whitebark pine sites are often on dry, exposed slopes where trees are widely spaced and there is little live fuel. In normal fire years fire is ordinarily restricted to single lightning-struck trees and the area of litter and duff around it. Small groups of trees will torch where spruce and fir are a

significant part of the understory. In Wyoming, Chapman (1990) observed fire in whitebark pine stands in the Teton Wilderness during the extreme 1988 fire season when large areas of whitebark pine burned despite their location on scree slopes with little or no ground fuel between individual trees. Whitebark pine trees in the upper reaches of these sites were consumed by a combination of ignited litter at their bases and exposure to intense heat radiated from downslope; lower portions of whitebark pine stands were ignited by crown fires encroaching from downslope; while trees lacking accumulated litter did not burn (Chapman 1990).

Fire is relatively infrequent in much of the high country. Although the incidence of lightning strikes may be relatively high, stand-replacing fires are rare. Estimates of fire-free intervals range from 50 to 300 years (Arno 1986, 1989; Heinselman 1981). Fire has its greatest impact when occasional high-intensity fires invade from lower elevation forests during periods of high winds and low fuel moistures when fire conditions are severe.

Existing Conditions

The PFC Assessment process identified a downward trend for these species and rated them at a high risk of loss across the forest. This rating was based primarily on the limited habitat, anticipated increase of blister rust, the dominance of older-aged trees, and the lack of regeneration.

According to the Forest's PFC Assessment, over 90 percent of these species are found in an old-age state (averaging about 180 years old). Typically, fire intervals for these species are about 200 years.

Because of the historic long fire intervals, the effect of fire exclusion has not been dramatic in these types. Many of the single snag fires in these types are still likely to burn for a day or two and then go out without detection. Fires that are detected are almost always held to under an acre. Fire exclusion should not be discounted since these scattered fires do provide small patches of young trees, which brings some diversity of age class.

Blister rust, which has not historically affected these species, is now estimated to be present in just under 10 percent of the subject area. Although not significant at this point, a considerable increase is anticipated as the communities move into the over-mature or decadent age classes.

Currently, there is no active management addressing these species. However, since they often occur with other species, they are occasionally removed during harvest operations. Wildland fires and prescribed burning may affect individual trees or groups of trees, but only on a very limited basis.

Desired Condition
Disturbance occurs within areas where these species exist. This provides for regeneration, so stands have a variety of age classes. Blister rust occurs in fewer than 10 percent of the trees. A seed source is readily available to address reforestation needs in the event of intense wildfire, wind storms, and/or other disturbances.

In the limber pine habitat, mixed-severity burns occur about every 100 years. On sites where Douglas-fir is co-dominant with limber pine, more frequent fires favor limber pine while less frequent fires tend to favor Douglas-fir. Fire intervals in the whitebark pine habitats are longer, with mixed severity burns every 100 to 250 years.

Engelmann Spruce/Subalpine Fir

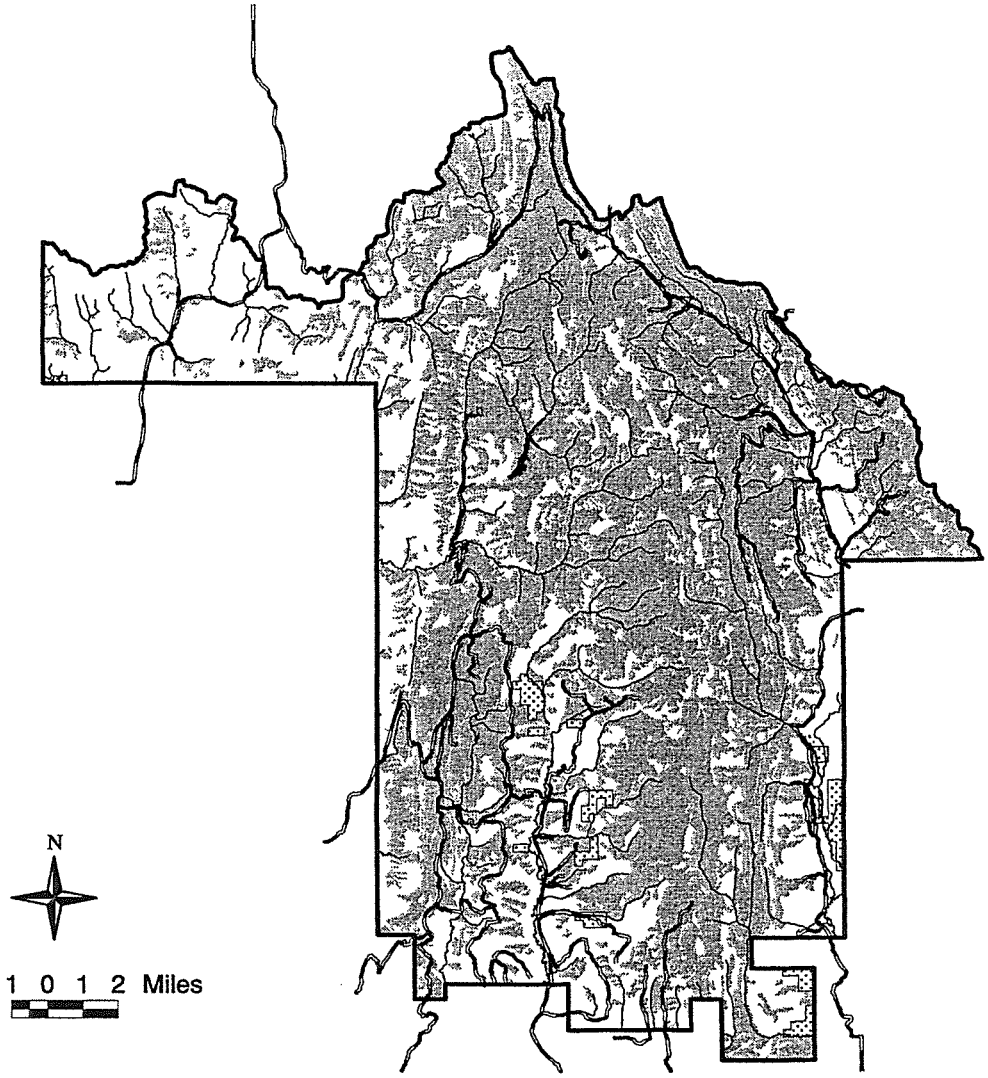
Characterization/Reference Condition
These species are found across the analysis area, often occurring together, mixed with other species (lodgepole, aspen, Douglas-fir), or in pure spruce and pure fir stands **(see Map 3-1).** These species, or a combination of these species, often make up the characteristic old-growth stands that occur within the area.

> "Came for quite a number of miles through the forest of pine, spruce, and fir, such beautiful trees as the firs are with their purple balls at the top, the top runs to a point, I would like to have some of them in a dooryard." Jane Gould, Lander Trail Emigrant in LaBarge Creek, 1862

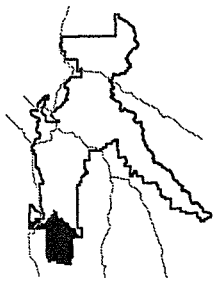
The subalpine fir and Engelmann spruce habitats are also classified as dry and wet habitats. The mesic sites contain the bulk of subalpine fir and Engelmann within this area. Lodgepole pine is the dominant seral species in these forests. Douglas-fir is important in warmer exposures on sites with calcareous soils. Engelmann spruce may be a long-lived seral species or a climax or co-climax dominant with subalpine fir. Aspen often persists on the periphery of older stands, or it may exist with conifer species in the early-to-middle stages of succession. While aspen is retained on a site, it has the potential to become a seral dominant after fire (Steele *et al.* 1983). The understory makeup is variable. Some habitat types may be dominated by shrub growth. In others, shrubs may contribute only minor amounts of cover. Seral aspen stands within this fire group often have a species-rich understory.

Historically, fire led to dominance by one or more seral species created by openings in dense stands, and created a mosaic of different ages and species compositions in spruce-fir forests. Where aspen is seral, encroachment of conifers make sites increasingly susceptible to fire as succulent forbs are

Map 3-1. Conifer Communities
Commissary Ridge/Tunp Range Landscape Scale Assessment



Vicinity Map



LEGEND

- Streams
- Roads
- Private Lands
- Conifer Communities

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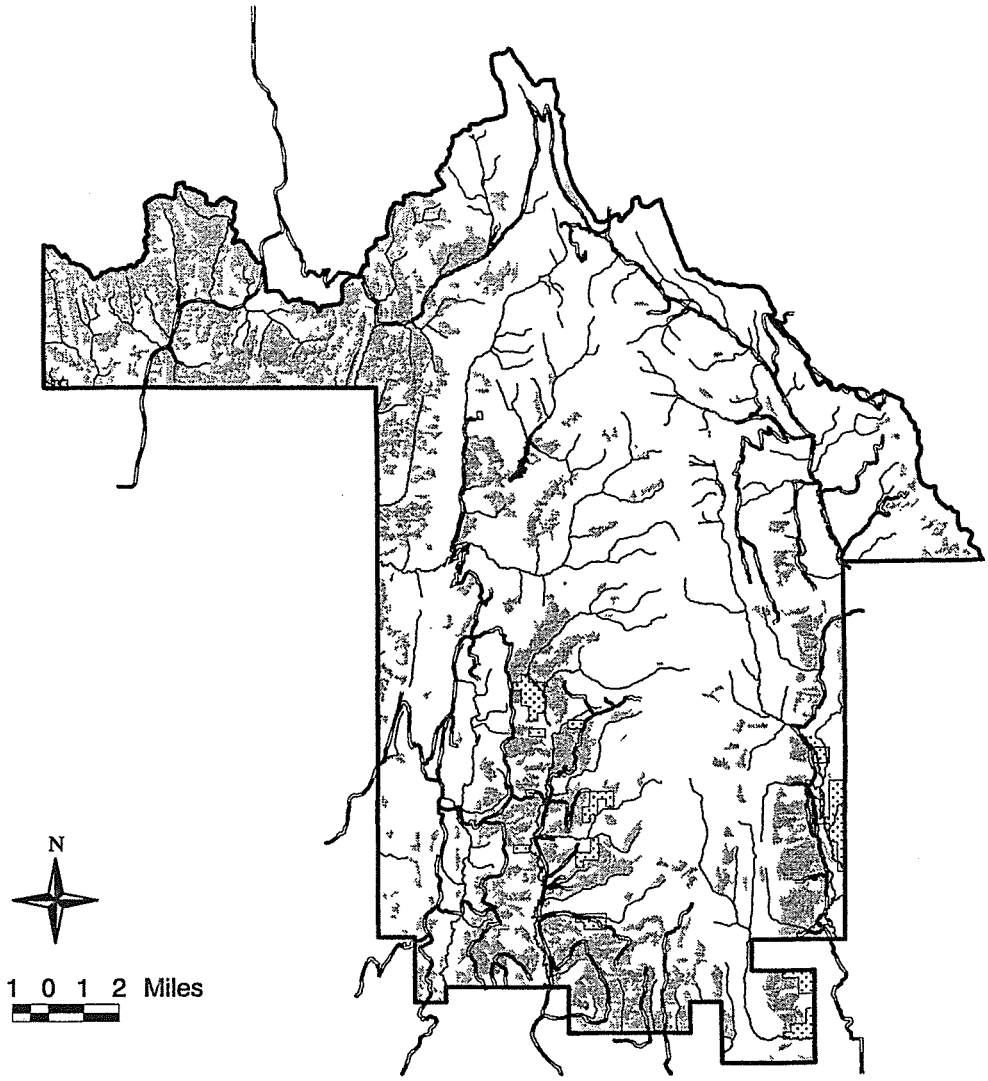
Map 3-2. Aspen Communities
Commissary Ridge/Tunp Range Landscape Scale Assessment



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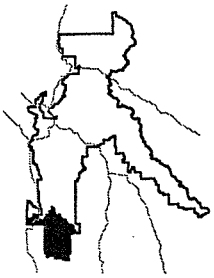

LEGEND
- Streams
- Roads
- Private Lands
- Aspen Communities

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National Forest

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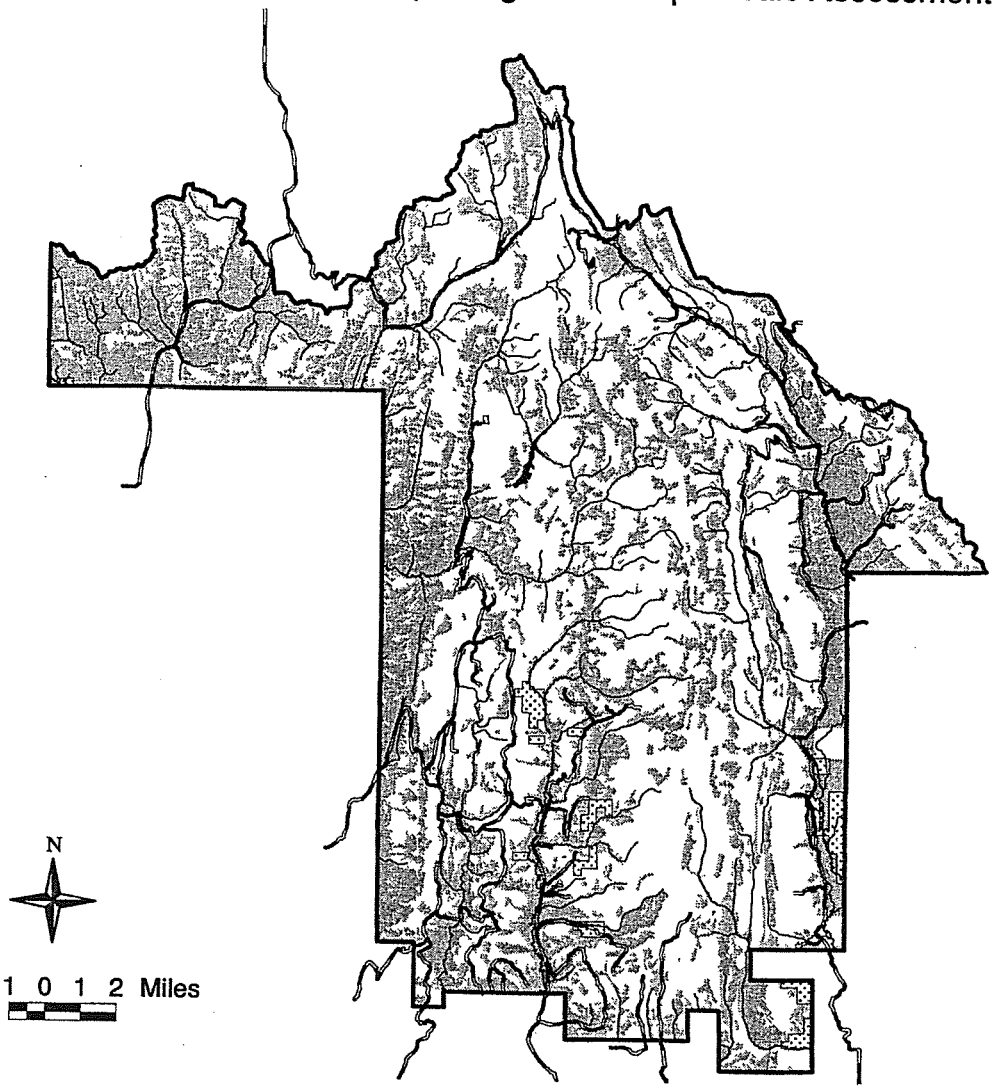
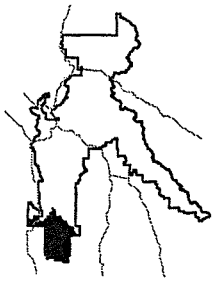
Map 3-3. Non-forested Communities
Commissary Ridge/Tunp Range Landscape Scale Assessment



Vicinity Map



LEGEND
- Streams
- Roads
- Private Lands
- Non-forested Communities

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National Forest

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Plot Date: March 27, 2001
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succeeded by woody fuel and litter. Generally moist conditions and slower rates of fuel accumulation make large fires unlikely except during periods of drought and high wind. Most fires that consume significant acreage in subalpine fir and spruce habitats are high-intensity crown fires during dry, windy conditions that accompany cold fronts (Crane 1982, Fryer and Johnson 1988). Lightning starts fewer fires in subalpine habitat types than it does in drier, warmer forests types. Fire frequency in this type was likely mixed severity burns every 75-125 years. High severity fires occurred approximately every 175 to 300 years.

The Mesic Subalpine Fir and Engelmann Spruce Habitats are composed of subalpine fir and Engelmann spruce habitat types occurring in seasonally moist or wet conditions, or where soils are sub-irrigated and water tables remain high year-round. Fire frequency in these types is not well understood, but is estimated to be 200 to 300 years.

Engelmann spruce also occurred in high, cold subalpine fir, Engelmann spruce, or whitebark pine habitat types that occur at or near timberline. The low productivity of timberline sites decreases the rate of fuel accumulation, and average diameters of large woody fuels are usually smaller than those on sites at lower elevation. This is countered, however, by the slow rate of decomposition. In normal fire years fire is ordinarily restricted to single lightning-struck trees and the area of litter and duff around it. Small groups of trees will torch where spruce and fir are a significant part of the understory.

Fire is relatively infrequent in much of the high country, and fire history data is generally lacking. Although the incidence of lightning strikes may be relatively high, stand-replacing fires are rare. Estimates of fire-free intervals range from 50 to 300 years (Arno 1986, 1989; Heinselman 1981). Fire has its greatest impact when occasional high-intensity fires invade from lower elevation forests during periods of high winds and low fuel moistures when fire conditions are severe.

Existing Conditions

The Bridger-Teton National Forest PFC Assessment rates the Engelmann spruce and subalpine fir types as low risk. Over the analysis area, it is estimated that up to 75 percent of these types are in the mature-to-old-age classes (over 150 years old).

Endemic populations of insects and diseases exist within these forest types, and subalpine fir has experienced dieback across the entire area since the early 1990s. These individual trees and groups of trees (of several hundred) have been documented with annual Aerial Detection Surveys. This decline has been identified as a combination of factors (subalpine fir complex). With this many dead standing fir trees, the potential for increased fire activity exists.

Management of these species has primarily been indirect. Often, these species occur in lodgepole pine- dominated stands, which has been a management-emphasis species. Several exceptions exist for spruce management. During 1992 within the Tri-Basin Sale, approximately 50 acres of shelterwood harvest was utilized for spruce regeneration; 22 acres of individual trees were marked (ITM) sanitation/salvage harvest, favoring spruce; and nine acres of ITM as a light shelterwood was cut to favor spruce. Other timber sales have included spruce management. For example, in the North LaBarge Sale in the late 1970s, approximately 30 acres were treated as a shelterwood to favor spruce. This sale had limited success for spruce regeneration as a result of windthrow in the harvest units. More recently, the Rock Creek Sale (1995) provided for natural regeneration of an aspen and

spruce mix in approximately 30 acres. Subalpine fir has not been planted in harvested areas, but it naturally sprouts back into units where harvest activities have occurred throughout the analysis area.

Fire exclusion has moved many of the lodgepole stands towards late successional subalpine fir and Engelmann spruce types. Because the stands are often older, more homogeneous stands, they are now more likely to burn in larger areas under favorable burning conditions. Large subalpine and Engelmann spruce are susceptible to torching, in turn causing short-to-moderate range spotting, which can dramatically increase fire size. Subalpine fir has encroached many aspen and lodgepole stands, increasing the flammability of these stands.

Desired Condition
These species are widespread across the analysis area. Naturally occurring and management activities are providing for a diversity of age classes as described by the Forest PFC document.

There will be mixed-severity burns about every 75 to 100 years with some high-severity stand replacement fires every 200 to 300 years. Mechanical harvest or treatment may be substituted for fires in appropriate management areas. These disturbances will maintain vegetative and habitat diversity across the landscape, prevent conifer encroachment into aspen sites and meadows, serve as fuel breaks during large fire events, and help prevent widespread insect and disease activity.

In the timberline areas naturally-ignited fires that spread up-slope from their more flammable neighbors can be allowed to burn freely, provided the fuel build-up in these down-slope stands is judged not to be excessive, resulting in unnaturally severe fires being carried up-slope.

Aspen

Characterization/Reference Conditions
Quaking aspen is found throughout the analysis area, often as single trees in mixed conifer stands, as clumps, mixed with spruce, subalpine fir, Douglas-fir, or lodgepole pine stands, and as nearly pure stands. Within the assessment area, aspen is more predominant in the southern half. Aspen communities are among the most biologically diverse community types and are important wildlife habitat. **See Map 3-2**. A fire history study of two aspen-conifer sites in the Fontenelle Creek drainage estimated the mean fire-free interval to be 40 and 41 years, respectively (Arno 1981). The disturbance cycle was estimated to be mixed severity fires every 50-80 years. In the lower elevation, sagebrush fire frequency is more frequent, possibly 30 to 60 years.

Existing Condition
In 1997, the Bridger-Teton National Forest PFC Assessment rated this community as a high risk of loss. This rating is based on the concern that significant acreage of aspen will continue on a path of succession to other vegetation types.

Aspen tends to be a pioneer species. Disturbance maintains this species on a site. Without disturbance, other tree species, especially shade tolerant conifers, will become established in the understory and eventually overtop and shade out the aspen trees. Much of the aspen acreage within the analysis area is in a declining state, due to conifer competition.

It is estimated that 60 percent of the aspen stands are in a mature state. This high percentage of mature stands can be attributed to the lack of fire across the area. Aspen is a relatively short interval fire type; the effects of fire exclusion have been significant.

Conifer encroachment, which would normally be held in check by recurring fires, has changed the structure of many stands. Stands that now appear to be conifer have old stands of aspen underneath or intermingled. Disturbance is normally required for aspen suckering. Removal of this disturbance has lead to the reduction of young age classes in aspen types.

Some management has occurred within aspen stands, including some burning since the mid 1970s. Mechanical treatments, including timber harvest and chaining, have been made to encourage aspen regeneration. Harvest activities encouraging aspen regeneration have included 24 acres in the Dry Hole Sale (1989-1990), less than 10 acres in the Dancing Cow Sale (1995), and 30 acres in the Rock Creek Sale (1995). Two hundred and thirty acres were chained in the Indian Creek Ridge area to stimulate aspen sprouting in 1990. Additionally, several timber sales have been awarded but not yet harvested, which include an emphasis for aspen regeneration. These sales include Little Hornet (272 acres), Dry Fork (122 acres), and Tunp (129 acres).

Insects and diseases have recently caused large-scale defoliation in many aspen communities. It is suspected that due to the older age class and genetic composition of the aspen, insects and diseases are affecting 80 percent of the aspen in the assessment area.

Desired Condition
There is a balance of age aspen age classes. 20 to 30 percent of the aspen stands are classified as early seral. These young aspen stands that have regenerated average greater than 3,000 stems per acre in the three to 10 foot range. Browsing by wildlife and livestock doesn't successful regeneration. In areas where fire is acceptable, mixed severity burns occur every 50 to 100 years.

Non-Forested Vegetation

Mountain Shrub, Sagebrush, and Grassland

The mountain shrub community type is found in small pockets across the district, inhabiting approximately less than one percent of the vegetative land base **(See Map 3-3)**. Sites are typically adjacent to riparian areas, under conifer, and on rocky sites. The range of mountain shrub has been shrinking, due to longer fire intervals and grazing pressure. These areas may be dominated by chokecherry, serviceberry, mountain maple, elderberry, wild rose, snowberry, and/or bitterbrush. These species may occur as relatively pure types, but most often they are found growing together, representing most any combination of these species. Mountain shrub is found in slightly higher moisture regimes than sagebrush since it is often located where snow drifting occurs. A wide variety of shrubs, grasses, and forbs are associated with this community type. This cover type is found intermingled with sagebrush at mid elevations and conifer/aspen forests at higher elevations. Mountain maple occurs in canyon bottoms, on deep soils, and on more moist sites.

The sagebrush/grass community type makes up approximately four percent of the vegetation across the landscape. The sagebrush sites are in advanced succession with densities ranging from 25-40 percent canopy cover. The increase in big sagebrush canopy cover has replaced the historic mosaic of structure and age classes with very large patches of uniformly dense sagebrush. Spraying and roto-beating these landscapes have replaced the natural mosaic with large uniform stands. Low production of grasses and forbs remain for watershed protection and forage use. Big sagebrush occurs on south aspects and other exposed areas where snow is lost to sublimation and blowing. Species present include subalpine big sagebrush (*artemisia tridentata ssp. speciformis*), vasey big sagebrush (*A.t. var. vaseyana*), mountain big sagebrush (*A.t. var. pauciflora*), basin big sagebrush (*A.t. ssp tridentata*), and Wyoming big sagebrush (*A.t. ssp. wyomingensis*).

These sagebrush communities have been altered due to fire suppression, climatic conditions, and grazing pressure. The historic fire frequency of 20 to 40 years has been interrupted by the recent fire suppression practices. The large areas of 40-year-old and older sagebrush burn readily and intensely under favorable weather and fuel conditions. Because of the homogeneity of the stands, potential fire size is larger and the ability for fire managers to control is more difficult.

The grassland community types are found on open, grassy ridge tops, high-elevation grass and forb lands, dry meadows, and open grassy hillsides. Typical species found in this area include Idaho fescue, bluebunch wheatgrass, bluegrasses, needlegrasses, wheatgrasses, tufted hairgrass, timothy, a few dryland sedges, bistort, cinquefoil, clover, geranium, and/or lupine. Intensive grazing by both cattle and elk has been the largest single influence in this community type. Continued cattle grazing along with extremely elevated elk populations are causing this type to be concentrated in smaller and smaller areas. Also, undesirable and noxious weed invasion and establishment has facilitated the decline of this community type.

Historic Fire Regime: Miscellaneous Habitats

These are dominated by sagebrush steppe vegetation within the subsection and also include riparian communities, wet meadows, curlleaf mountain-mahogany, and mountain brush and meadows. These sites are predominantly big sagebrush and mountain big sagebrush interspersed with antelope bitterbrush, and several grass (bluebunch wheatgrass, Idaho fescue) and forb species (arrowleaf balsamroot, creeping Oregon grape).

Sagebrush is not a fire-resistant species and is easily killed by wildfire. Mountain big sagebrush stores seeds in the soil, which germinate as a result of fire-induced heating. Depending upon climatic conditions and grazing patterns, mountain big sagebrush usually requires 20 to 30 years before returning to pre-fire levels. Bitterbrush, as well as grasses and forbs are scattered within this community. Antelope bitterbrush is generally a weak sprouter, but most grasses and forbs sprout readily and dramatically increase their abundance following a fire.

Fire history for this group is generally lacking. Barrett (1994) estimated a mean fire return interval of 19 years for sagebrush-grasslands and mountain brush on the Caribou National Forest in southeastern Idaho. A conservative estimate of fire frequency of 20 to 40 years for mountain big sagebrush has been used on the Caribou National Forest (1997) and 10 to 30 years on the Bridger-Teton National Forest (1997).

Desired Condition
These community types will have species composition, age class and diversity that provide a mosaic pattern across the landscape of shrubs, forbs, and grasses. A balanced range would be:25 percent at early seral; 25 percent is maintained at late seral; and 50 percent is maintained at sagebrush crown cover between nine to 20 percent. Litter and other ground cover will exist that result in less than five percent bare ground.

DC: Miscellaneous Habitats
Mixed-severity burns every 20 to 40 years in the sagebrush-steppe ecosystem.

Riparian (25 year floodplain)

Characterization/Existing Conditions
Riparian habitat is abundant across the district landscape. The riparian habitat is defined as those areas with perennial surface water flows such as streams, creeks, and ponds. A wide variety of plant species exist and can be characterized as a mixture of trees, shrubs, grasses, and forbs. Riparian communities are the most biologically diverse terrestrial communities. Primary riparian vegetation includes water-loving plants such as willows, sedges, rushes, and some grasses. Other seasonally wet areas occur throughout the landscape but for the purpose of this analysis are not considered riparian areas. Overall condition and trend of the riparian areas is unknown.

Riparian conditions have been impacted by a variety of human-and-management-induced activities such as roads, recreation, livestock, tie hacking, and, to a lesser extent, wildlife. It is unknown whether riparian conditions are static, declining, or improving. However, it is evident at certain locations that impacts have adversely affected these resources. A reduced water table, changes in mesic vegetative species, compaction, and establishment of undesirable plant species has resulted. The degree to which these changes occur vary from drainage to drainage and is characterized by the changing vegetation, such as the presence of silver sage and cinquefoil. **Table 3-3** displays the areas of concern and indicators of change.

Table 3-3. Riparian Areas of Concern and Indicators of Change

Location	Concern
LaBarge Creek (most tributaries)	Lack of riparian vegetation Presence of noxious weeds Soil compaction from dispersed camping sites Unnatural active erosion/head cutting Poor road location (LaBarge Meadows)
Fontenelle Creek	Lack of riparian vegetation Presence of noxious weeds Soil compaction Lack of species diversity Off-road damage Braided roadways Many sediment sources associated with roadway Poor road drainage
Hams Fork	Lack of species diversity (vegetation) Dispersed recreation sites causing soil compaction

Location	Concern
Smiths Fork	Roadway encroaches riparian areas Sediment sources associated with road present
Dry Fork	Poor road drainage Sediment sources associated with road present
Hobble Creek	Road encroaches on riparian and wetland areas
Lake Alice	Outfitter camp in riparian area Dispersed camp sites damaging lakeshore) Sediment source areas associated with recreation sites Loss of vegetation diversity along lakeshore

Prescribed burning has influenced only a few riparian communities across the district. In 1989, willows were burned in Fontenelle Creek for regeneration and enhancement. No other prescribed burning has been targeted specifically for riparian areas, although often fires in the sagebrush/grass types contain some riparian vegetation in the burn perimeter.

Desired Condition
Riparian flood plains store water during high flows and release it back to the stream during dry periods. Stream banks are well-knitted with vegetation, providing overhanging banks that shelter fish and shade water. The streams meander through the flood plain and are deep and narrow. Vegetation age class distribution and diversity are within the Forest PFC assessment.

Mountain Mahogany

Curlleaf mountain mahogany is the primary type of mahogany found along Mahogany Ridge and scattered parcels near Porcupine Ridge, Hobble Creek/Ferney Gulch, Coal Creek/Sams Creek. The community established along Mahogany Ridge is situated on the western fringe of a greater population to the east of the Forest. Population levels are sparse, of an older age class, and, in most cases, high lined because of the palatability for browse by wildlife and livestock. The species are in successional climax with little vegetative understory and minimal regeneration.

Because of the small area of this vegetation type, the influence of fire suppression is not well understood, but it appears that little or no regeneration is occurring, due to lack of disturbance.

Desired Condition
Mountain Mahogany exists within the age class distribution identified in the Forest PFC assessment.

Sensitive Plants

Reference Condition
Natural processes sustained the habitat conditions necessary to support populations of these sensitive plants. Their specialized habitat requirements limited their distribution to isolated populations.

Existing Conditions

Sensitive species are identified by the Regional Forester for which population viability is a concern due to downward trends in population or habitat capability. The Endangered Species Act requires protection of sensitive species to reduce the need for Federal listing.

Three sensitive plant species are known to occur within the assessment area: creeping twinpod (*Physaria integrifolia var. monticola*), Payson's milkvetch (*Astragalus paysonii*), and starveling milkvetch (*A. jejunus var. jejunus*). The Nature Conservancy's Wyoming Natural Diversity Database (WYNDD) identifies three Payson's milkvetch populations within the assessment area and four adjacent to the area's northern boundary (USFS 1996). The populations within the assessment area include one in the West Fork Hams Fork drainage and two in the La Barge Creek drainage. The WYNDD identifies six starveling milkvetch populations in southern Lincoln County, some of these populations may be within the assessment area (Fertig et al. 1994). Information on creeping twinpod locations is not available.

Creeping twinpod is found on barren rocky calcareous hills and slopes from 6,600 feet to 8,600 feet. The flowering period is June and July, with fruiting from June through August. Payson's milkvetch inhabits disturbed areas on sandy soils from 6,700 to 9,600 feet in elevation. It flowers from June through August and fruits from July to October. Starveling milkvetch prefers dry, barren ridges and bluffs comprised of shale, stone, clay, or cobblestone at elevations between 6,000 and 7,100 feet. Its flowering season lasts from May to July. Management implications for these sensitive plants are outlined in **Table 3-4**.

Table 3-4. Summary of Sensitive Plant Species Within the Assessment Area

Species	Succession Stage	Palatability	Disturbance Sensitivity	Vulnerability Rating
Creeping twinpod	Mid	Very low	Low	Very low
Payson's milkvetch	Early	Low for cattle and sheep	Requires disturbance	Low
Starveling milkvetch	Early to late	Low for cattle and sheep	Probably low	Moderate to high

Desired Condition

All suitable habitats are surveyed for sensitive plants potentially occurring within the assessment area. Sufficient habitat exists to sustain viable populations of all sensitive plants. Protection measures are in place, if necessary, for known populations. Prescribed fires and other disturbances promote Payson's milkvetch population expansion.

Opportunities

Survey barren hills and ridges for creeping twinpod and starveling milkvetch. Use prescribed fire near known Payson's milkvetch populations to promote population expansion.

Undesirable Plants

Infestation and spread of noxious weed came with expanding road systems, recreation use, and ground-disturbing activities. It is undetermined when the first noxious weed infestation occurred on the district, yet an approximation can be made sometime around the early 1900s.

Existing Conditions
Noxious weed populations and infestation levels vary across the landscape. Dyer's woad and Canada thistle are the species of most concern. Other species present include musk thistle, black henbane, hounds tongue, yellow toadflax, and leafy spurge. The county weed and pest district chemically treats these weeds annually through a cooperative agreement with the Forest. Herbicide application is generally made along roadways, trail heads and areas of ground-disturbing activities. On occasion, backpacks are used to access plantation sites and isolated areas of infestation. Noxious weed and infestation levels are shown in **Table 3-5**.

Table 3-5. Noxious Weed and Infestation Level

Weed	*Acres*
Dyers Woad	100
Canada Thistle	500
Musk Thistle	100
Black Henbane	20
Hounds Tongue	5
Yellow Toadflax	5
Leafy Spurge	1

Wyethia is an undesirable plant with increasing population and rate of spread. Wyethia dominates much of the sagebrush, forb, and grass community types. The flower of this species is very palatable to sheep while in the full bloom stage. Consequently, the use can be heavy, resulting in increased population levels and rate of spread.

Tarweed (*Amsinckia sp*) is another undesirable plant that has populated several hundred acres. Sites where this plant is located are now characterized as areas with declining species diversity, low vegetation. productivity, and increasing bare ground.

The Forest has adopted a Special Order/Policy for using only weed-seed-free feed while on the Bridger-Teton National Forest. This district enforces this policy by requiring all livestock permittees (grazing and special use) to use certified weed-seed-free feed for all forage or bedding used on National Forest lands.

Desired Condition
Implement the 1999 Bridger-Teton National Forest Noxious Weed Environmental Assessment to prevent, control, and/or contain the spread of noxious weeds and undesirable plants, i.e. Wyethia and tarweed. Infested sites have contained the noxious weeds' spread, have decreased in size, and are eventually nonexistent. An aggressive monitoring plan is developed and followed to ensure implementation strategies are successful.

Wildlife

Existing Conditons
The Bridger-Teton National Forest supports 74 mammal species and 355 bird species, and most of these species are present within the assessment area. Big game and trophy wildlife including black

bear (*Ursus americanus*), elk (*Cervus elaphus*), moose (*Alces alces*), mountain lion (*Felis concolor*), and mule deer (*Odocoileus hemionus*) are found in all assessment area watersheds. No Threatened or Endangered species reside within the assessment area, but several species including bald eagle (*Haliaeetus leucocephalus*), peregrine falcon (*Falco peregrinus*), and whooping crane (*Grus americana*) may migrate through.

Desired Condition
The Commissary Ridge/Tunp Range Landscape Scale Assessment area provides habitat adequate to meet the needs of resident wildlife populations, including those of Federally listed Threatened, Endangered, and Sensitive Species. Suitable habitat exists for Federally listed species that could potentially utilize or reestablish populations within the assessment area. Forest-wide resource management goals, prescriptions, standards, and guidelines established in the Bridger-Teton National Forest Land and Resource Management Plan (Forest Plan) to meet wildlife needs are followed.

Big Game

Existing Conditions
The assessment area provides habitat for several ungulate big-game species including elk, moose, and mule deer. A small but increasing number of pronghorn (*Antilocapra americana*) summer within the assessment area; pronghorn are expanding their summer range in the Fontenelle, Hams Fork, and La Barge drainages. Bighorn sheep (*Ovis canadensis*) from a small reintroduced population in the Wyoming Range occasionally use the north-east quarter of the assessment area (USFS 1993). The herd units described in **Table 3-6** occupy a much larger area than the assessment area, and more specific data is not available.

Table 3-6. Wyoming Game and Fish Herd Management Objectives and Current Populations

Species	Herd Unit	Population Objective	1998 Post-hunt Population
Elk	West Green River	3,100	4,000 - 5,000
Moose	Lincoln	1,500	1,500
Mule deer	Wyoming Range	50,000	35,000
Pronghorn	Sublette	48,000	45,000

Concern has been raised that the over-objective elk population is utilizing much of the spring forage, leaving little available for livestock.

Crucial Winter Range is defined as the areas occupied by 80 percent of the big game population during eight of ten winters.

Elk crucial winter range is distributed along the eastern and western edges of the assessment area along the west side of the Tunp Range, south end of Porcupine Ridge, the lower Fontenelle Creek drainage, and southwest slope of Deadline Ridge. These areas comprise nearly 15,000 acres and are composed of shrubland communities (52 percent), conifer forests (40 percent), aspen communities (six percent), and riparian communities (two percent). There are no elk feedgrounds associated with the West Green River elk herd. Wyoming Game and Fish Department long-term brucellosis

surveillance has detected only one elk seropositive for brucellosis exposure, indicating very little exchange with brucellosis-effected elk herds.

Moose crucial winter range is distributed throughout many of the drainages in the southern half of the assessment area, including Cliff Creek, Smiths Fork tributaries, West Fork of the Hams Fork, the Hams Fork, Fontenelle Creek, and La Barge Creek. These areas include 31,100 acres and are composed of shrubland communities (46 percent), conifer forests (31 percent), aspen communities (13 percent), and riparian communities (nine percent) **(See Map 3-4).**

Pronghorn and most mule deer generally do not winter on National Forest system lands. A few pronghorn have wintered in the Pomeroy Basin area when snow free, and some mule deer do winter along the edges of the assessment area. However, these areas are not considered crucial winter range.

Winter range concerns include: dense over-mature sagebrush communities lacking in high quality and abundant forage, aspen communities being encroached by conifers, and disturbance from snowmachines.

Parturition Ranges are birthing areas. Portions of the assessment area are classified by the WGFD and the BTNF as elk parturition range, including portions of the Hams Fork, LaBarge, Trespass, and Porcupine watersheds. During the calving season (May 15 through June 30) elk prefer shrublands and grasslands and adjacent forested areas, particularly aspen and mixed aspen-conifer stands. The BTNF database for elk parturition range is incomplete, only containing a single calving area between LaBarge Creek and Big Fall Creek.

Parturition range has not been formally classified for the other big game species, although moose and mule deer do calve within the assessment area.

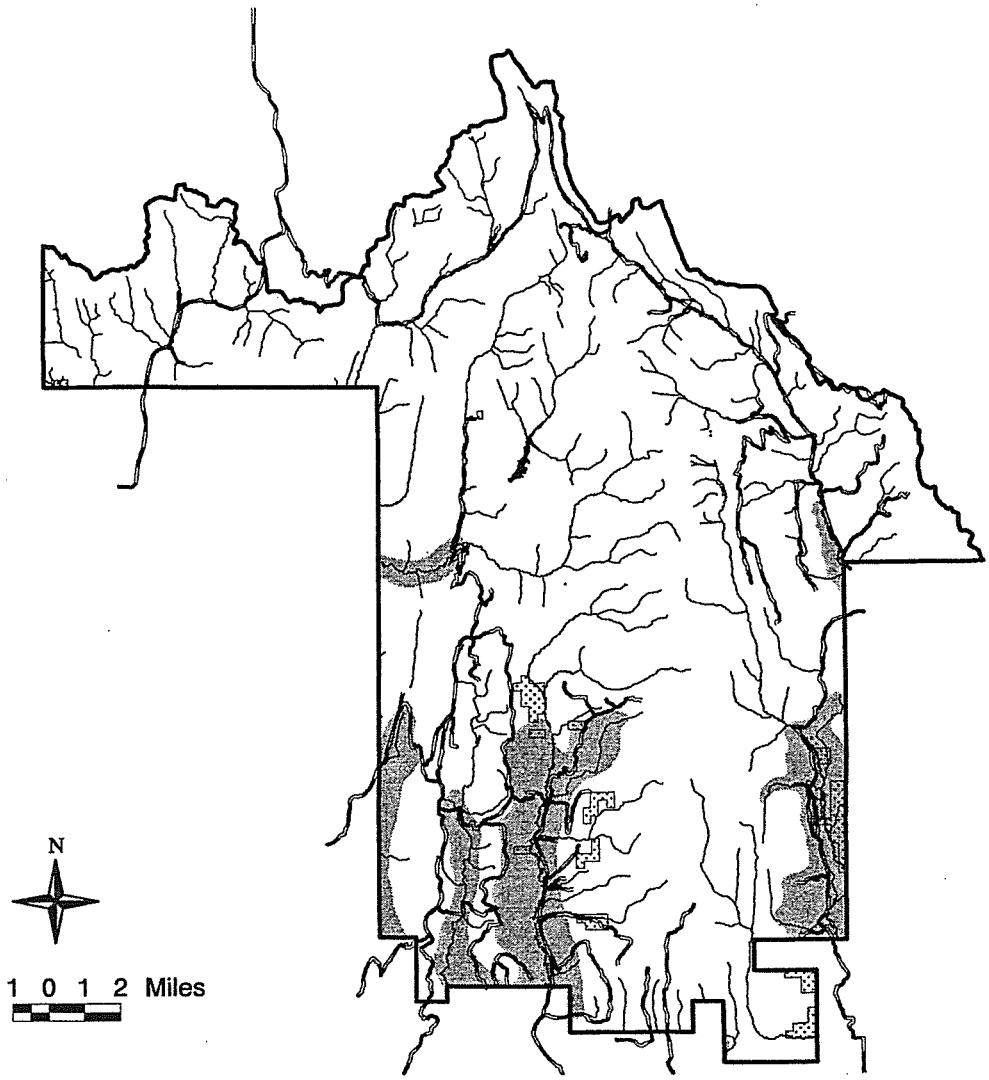
Parturition range concerns include: dense over-mature sagebrush communities lacking in high quality and abundant forage and aspen communities being encroached by conifers.

Security Areas are areas in which big game retreat for safety when disturbance in their usual range is intensified by activities such as logging or during hunting season. The value of a security area depends upon the distance from an open road and the amount of cover. To qualify as a security area, for elk, there must be at least 250 contiguous acres that are more than one-half mile from open roads (Leege 1984).

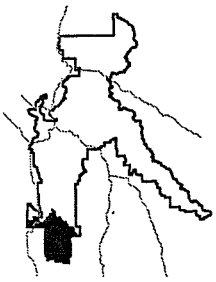
The assessment area contains 187,203 acres of security range distributed throughout the area **(Map 3-5).**

Desired Condition
Maintain existing habitat amounts while improving the vigor of winter, parturition, and transitional ranges. Big-game numbers are within their established population objectives, as set by the Wyoming Game and Fish Department (WGFD) and agreed to by the BTNF, and within the ability of the habitat to sustain them. Forage within spring transition range remains for livestock. Elk cover to forage is maintained at a 40:60 ratio.

Map 3-4. Moose Crucial Winter Range
Commissary Ridge/Tunp Range Landscape Scale Assessment



Vicinity Map



LEGEND

- Streams
- Roads
- Private Lands
- Moose Crucial Winter Range

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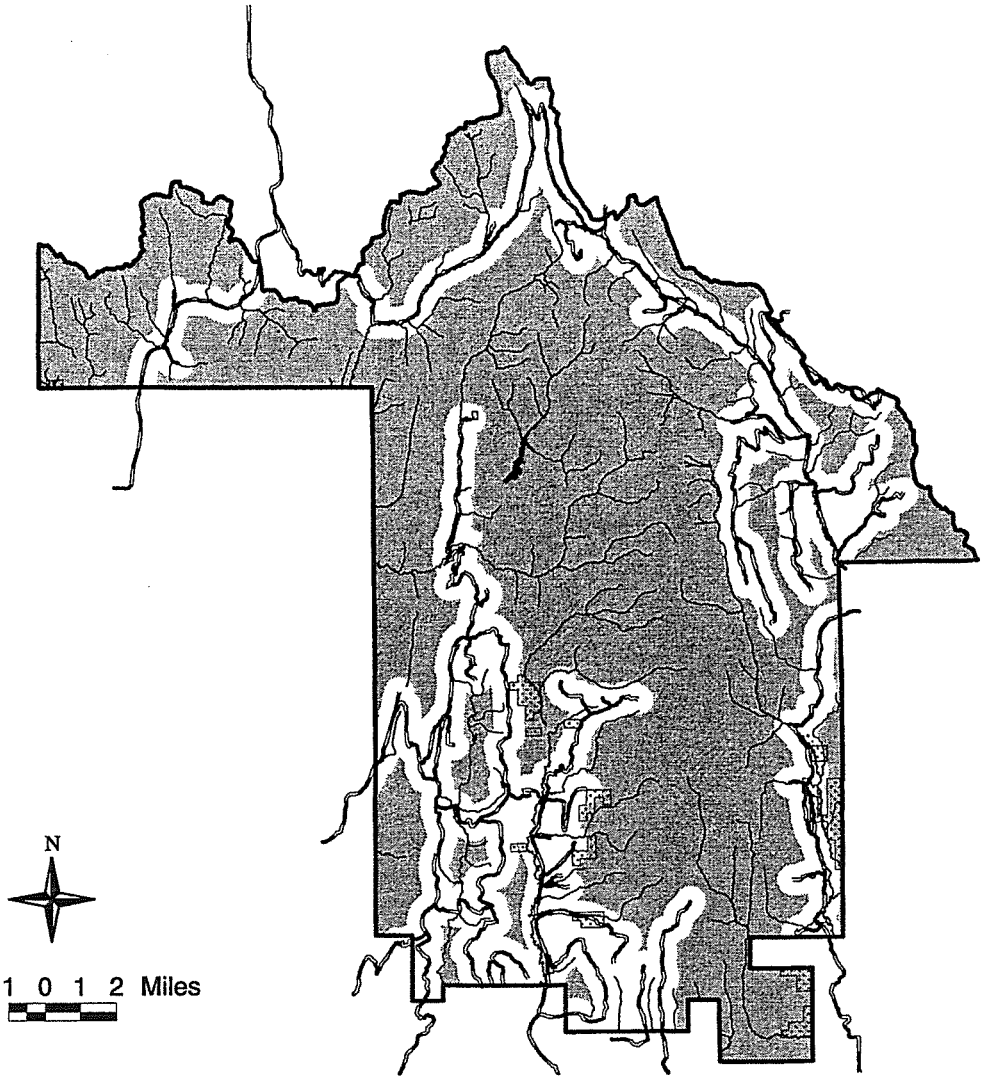
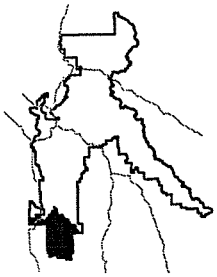
Map 3-5. Big Game Security Areas
Commissary Ridge/Tunp Range Landscape Scale Assessment



Vicinity Map



LEGEND
- Streams
- Roads
- Private Lands
- Big-game Security Areas

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National Forest

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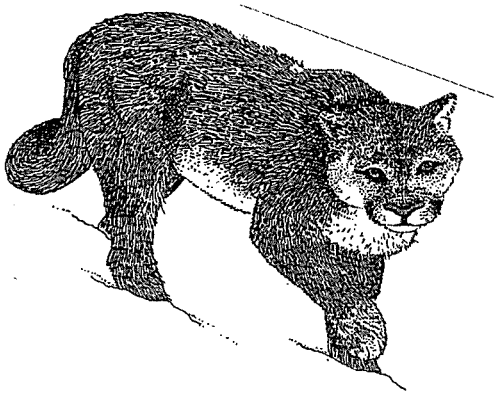
Winter travel within crucial big game winter ranges is confined to designated routes. Human activity and disturbance in crucial big game winter range is restricted from November 15 to April 30 when big game is present. Stipulations restricting oil and gas development are applied to crucial big game winter range as identified and agreed upon by the USFS and the WGFD. Stipulations from the BTNF Land and Forest Plan including a timing stipulation, a no-surface-occupancy stipulation within one mile of the Commissary Ridge crest, a no-surface-occupancy stipulation within the Mahogany Ridge crucial elk winter range, and leases issued within the Tunp Ridge crucial elk winter range requiring off-site production facilities. Elk using the assessment area continue to winter naturally, and unassociated with artificial feeding.



Human activity and disturbance are restricted in elk calving areas from May 15 to June 30 when elk are present in the area. Fences within elk calving areas are designed so they do not create barriers to calf movement. Roads through elk parturition range have seasonal restrictions to protect calving area integrity.

Big game security areas are maintained, particularly adjacent to concentrated human activity areas. Open roads have not increased. All new road construction for management activities is either closed to vehicle access or obliterated after administrative use.

Opportunities
Areas previously identified for habitat enhancement include: elk parturition range on the east slopes of Indian and Absaroka Ridges and the Minnie Holden area; crucial elk winter range between Hobble Creek and Trespass Creek, and Rock Creek; and moose crucial winter range on Mahogany Ridge and Fontenelle Creek. A winter travel plan is developed restricting travel through crucial winter range to designated routes.

Ecological Indicator Species

Existing Conditions
Ecological indicator species represent species narrowly restricted to a key habitat and species with important requirements provided by a key habitat. Key habitats are those habitats likely to be significantly affected by National Forest management. Key habitats include riparian, old-growth forest, aspen, mountain meadows, wetlands, and sagebrush.

American marten
Marten (*Martes americana*) are commonly associated with old-growth forests, where downed woody material provide den sites and, in winter, access beneath the snow surface. The assessment area contains large areas of conifer forest, portions of which are considered to be old growth. Although no formal survey work has been conducted, martens are known to be present within the assessment area.

Brewer's sparrow
The Brewer's sparrow (*Spizella breweri*) is associated with shrubland habitats, particularly sagebrush. A mosaic of different sagebrush-age classes provides optimum habitat. Mature shrubs provide secure nest sites while more open early-seral sagebrush communities provide foraging habitat. Brewer's sparrow is considered to be a common summer resident throughout the Rocky Mountains (Fisher 1997). They migrate to Central and South America to winter. The assessment area contains over 114,000 acres of shrubland. Sagebrush communities are the predominant component of the shrubland class. Although no formal survey work has been conducted, Brewer's sparrows are probably common within the assessment area.

Desired Condition
Ecological indicator guilds rather than individual species have been selected for habitats with a high risk of being effected by management activities. Guilds may provide better indicators than single species. American marten require vertical structure diversity, which is characteristic of old-growth forest, but may also be present in younger stands including second growth. Brewer's sparrows may depend upon shrubland communities, but not necessarily sagebrush; they will also nest in krummholz, avalanche chute shrubbery, and willow habitats (Fisher 1997). Ecological indicators are used to monitor USFS management.

Opportunities
Habitat types where ecological indicators have not been identified include riparian, aspen, mountain meadows, and wetlands. Habitat monitoring strategies will be developed for each habitat. This may be accomplished by monitoring population trends for the ecological indicator guilds or species and by tracking trends in habitat health and diversity by total acres, amount of each seral stage, condition, and age class.

Non-Game Species

Existing Conditions
Approximately 200 non-game species including 150 birds, 50 mammals, and 10 reptiles and amphibians occur throughout the assessment area. Most of these species can be expected to utilize the assessment area at least during part of their life cycle. Many species are associated with riparian habitats, early to mid-seral stages of conifer and mixed conifer-aspen communities, and all seral stages of aspen communities. Several species including American marten are dependent upon mature-to-old-growth spruce-fir forests, especially those containing snags, downed woody debris, and multi-layered canopies (USFS 1997).

Protecting sufficient suitable habitat, particularly old growth, aspen, and riparian communities, is the principal concern for non-game wildlife.

Desired Condition
Habitat diversity and quantities are managed to support non-game wildlife. The habitat monitoring strategies developed for the ecological indicators ensure adequate habitat exists to support non-game species.

Predator control adheres to the BTNF Forest Plan animal-caused damage control standard. The USFS advises and consults U.S. Animal and Plant Health Inspection Service (APHIS) on predator control needs, control methods, and special precautions needed for each grazing allotment. Control is based upon an analysis of losses and the need for control. Where need is demonstrated, control efforts are directed towards offending animals. APHIS provides information on livestock losses, predators removed, and control method effectiveness. The use of traps and other control devices is prohibited within 100 feet of system trails to protect hikers and domestic pets.

Opportunities
The current predator control program should be reviewed. Does it meet the Forest Plan animal-caused damage control standard?

Threatened, Endangered, and Sensitive Species

Existing Conditions
National Forests are recognized in both the Endangered Species Act (ESA) and the National Forest Management Act as critical to the survival of plants and animals and the conservation of biotic diversity. The ESA prohibits the USFS from taking any actions that might threaten the continued existence of a federally listed species and requires the agency to seek to conserve and improve the status of these species to the point of full recovery. The ESA requires protection of sensitive species to reduce the need for Federal listing.

Species listed as endangered by the ESA are in danger of extinction throughout all or a significant portion of their range. Species considered threatened by the ESA are likely to become an endangered species within the foreseeable future throughout all or a significant portion of their range. Sensitive species are identified by the USFS Regional Forester as species for which population viability is a concern due to downward trends in population or habitat capability (USFS 1991).

There is no occupancy of threatened or endangered species with the assessment area. Based on historical evidence, the assessment area is peripheral to the range of several listed species including bald eagle, gray wolf (*Canis lupus*), grizzly bear (*Ursus arctos horriblus*), peregrine falcon, and whooping crane. For most of these species, there have been limited or no formal surveys.

Reference Condition
Natural processes sustained the habitat conditions necessary to support populations of resident wildlife, including many of those listed as Federally Endangered, Threatened, or Sensitive species. Species such as gray wolf and grizzly bear were historically common in the assessment area. Sufficient suitable habitat was likely never present for species such as bald eagles and peregrine falcons to reside within the assessment area.

Desired Condition
Sufficient habitat is present to meet the requirements of all Threatened, Endangered, and Sensitive species residing or capable and likely to reside within the assessment area.

Opportunities
Surveys are performed for the Threatened, Endangered, and Sensitive species where little information is available. Many species can be included in a single survey for efficiency, such as one survey for owls, another for forest carnivores (American marten, Canada lynx (*Lynx canadensis)*, fisher, and wolverine). Surveying cliff sites for peregrine falcons and spotted bats may also be performed concurrently.

The Forest Plan's snag management guideline should be reviewed. Is it being practiced, and is it sufficient to provide habitat for snag dependent species?

Bald eagle

Existing Conditions
The U.S. Fish and Wildlife Service (USFWS) classifies bald eagles as threatened. Bald eagles are closely associated with water, with nest sites commonly less than one mile from a lakeshore or river bank. Large trees are necessary to support eagle nests, particularly cottonwoods and several conifer species. Nest trees are often the largest tree in the stand, providing access to the nest. Typically, there are alternate nests within or in close proximity to the nest stand. Snags and open-canopied trees near the nest site and foraging areas provide favorable perch sites. Old-growth stands with their structural diversity and open canopies are an important habitat for bald eagles.

Bald eagles may migrate through the assessment area but are neither winter nor summer residents. **Appendix A-5** lists bald eagle sightings in the WGFD wildlife observation system database. There are no documented nest sites within the assessment area. Limited nesting habitat for bald eagles exists along the Hams Fork River and along other water courses within the assessment area. There is little cottonwood forest within the assessment area suitable for nesting habitat. The conifer forests within the assessment area may offer nest sites. Possibly further restricting the assessment area's suitability for bald eagles is the lack of perch sites along the major streams.

Desired Condition
Site-specific management plans are developed for any bald eagle territory established within the assessment area. Management of bald eagle habitat protects nest sites, foraging areas, and roost sites by restricting human activity in these areas when eagles are present.

Boreal owl

Existing Conditions
The USFS classifies boreal owls (*Aegolius funereus*) as sensitive. Within the Intermountain Region the owl occurs in low-density isolated populations with low growth rates. Boreal owls are closely associated with high elevation spruce-fir forests, which they use year-round for foraging (Hayward and Verner 1994). A 1994 study in the Greys River drainage found all boreal owls were above 2,100 meters in elevation (Clark 1994). Nesting habitat consists of boreal forests with a relatively high density of large trees for nesting, with an open understory and a multi-layered canopy. Cavities

excavated by woodpeckers are commonly used for nesting. Although they will use forest edges, boreal owls avoid open areas, such as open meadows and clear cuts. They may migrate elevationally in winter, moving to lower elevation conifer forests.

Boreal owls were detected frequently during audio surveys for the Upper Greys River Timber Sale, adjacent to the assessment area's northern boundary. The WGFD wildlife observation system database contains two boreal owl records **(Appendix A-5)**. Boreal owls are expected to occur dispersed throughout the spruce-fir and lodgepole forest within the assessment area. Nest boxes were installed along the Smiths Fork Road in 1998 to research boreal owl dispersal and population connectivity.

Desired Condition

Nesting habitat is managed through snag, large woodpecker, and aspen management. Snags over 12 inches DBH are part of intact forest stands. Maintaining a dispersion of small aspen stands with large diameter trees provides adequate nesting habitat. Timber management that is compatible with abundant small mammal populations is practiced.

Canada lynx

Existing Conditions

In May 1998, the USFWS found protection of Canada lynx under the Endangered Species Act "warranted but precluded." This finding means the USFWS will reexamine lynx status in 12 months, and the species is now considered a candidate species. As a candidate species, the USFWS recommends that the lynx be taken into consideration during environmental planning; however, the lynx receives no protection under the Act. The USFS classifies lynx as sensitive. Lynx are considered rare by Wyoming and classified as nongame.

Canada lynx live in subalpine/coniferous forests. Mature forests with downed logs and windfalls provide cover for denning sites, escape, and protection from severe weather. Early successional stages of forests provide habitat for the lynx's primary prey, snowshoe hare (*Lepus americana*). Fire suppression has allowed forests to mature, thereby reducing the mosaic habitat pattern needed by Canada lynx. They are capable of moving extremely long distances in search of food; the range of a lynx can include 94 square miles or more.

There have been several lynx sightings within the assessment area in the past twenty years, including two in the WGFD wildlife observation system database **(Appendix A-5).** Most sightings have been in the northern and southern thirds of the assessment area. Sightings in the Hams Fork area are believed to be the southern extent of lynx distribution in Wyoming. The Hams Fork drainage also has a stable snowshoe hare population (Walker pers. comm). The assessment area contains large amounts of conifer forest.

Desired Condition

Vegetation management practices are modified to benefit lynx, achieving mosaics of early successional forest and mature conifer forest, ideal for snowshoe hare and Canada lynx. Lynx recovery strategy will be followed.

Fisher

Existing Conditions
This rare forest carnivore is classified as sensitive by the USFS. Fishers (*Martes pennanti*) prefer continuous forest cover, particularly mature to old-growth spruce-fir forests with high canopy closure. They generally avoid open areas such as meadows, grasslands, and clear cuts. Fisher distribution may be limited by snow depth (USFS 1991). Forests with a dense understory of young conifers, shrubs, or herbaceous cover are important during summer.

The WGFD wildlife observation systems database does not contain any fisher sightings nor have there been any formal surveys.

Desired Condition
Fishers are most threatened by forest fragmentation. By protecting big game security areas and maintaining a diversity of age classes, sufficient fisher habitat is protected. Surveys are performed to determine if fisher are present within the assessment area.

Flammulated owl

Existing Conditions
Flammulated owls (*Otus flammeolus*) are classified as sensitive by the USFS. This small forest owl favors mature mixed pine forests with open canopies and an abundance of nocturnal insects (Hayward and Verner 1994). Aspen stands and second growth pine forests are also used. Flammulated owls avoid young dense pine stands where foraging is difficult. Large diameter snags, greater than 20 inches DBH, with cavities are important for nesting. Dependence on cavities for nesting and its avoidance of cut-over areas suggest flammulated owls may be threatened by timber activities. Preying primarily on insects, flammulated owls migrate to Central America for the winter.

Flammulated owls are likely present within the assessment area. The assessment area contains 138,420 acres of conifer forest and 23,700 acres of aspen.

Desired Condition
Maintaining adequate amounts of old-growth forest and big game security areas provides suitable foraging habitat. Adhering to the Forest Plan's snag habitat guideline provides sufficient nesting habitat. Surveys are performed to evaluate flammulated owl occurrence within the assessment area.

Gray wolf

Existing Conditions
Although listed as Endangered, wolves within Wyoming come under the experimental population clause of the Endangered Species Act, which provides greater management flexibility. The USFS must analyze impacts to wolves along with other wildlife populations when complying with National Environmental Policy Act requirements. Wolves are habitat generalists; large areas isolated from human disturbance and available prey are the primary characteristics of suitable wolf habitat.

There have been sporadic reports of wolf sightings within the assessment area throughout the 1970s and 1980s. Surveys were conducted during 1986 and 1987. Various methods were used in the surveys, including foot, helicopter, snowmachine, and recorded wolf howls. A large canid foot print, measuring 2.75 x 3.25 inches, was discovered along Fontenelle Creek in March 1987.

With the recent wolf reintroductions to Yellowstone National Park and central Idaho, sightings are increasing. A wolf-like canid killed near Kemmerer in September 1998 appears to have been a released captive wolf or a very high percentage wolf hybrid (Bangs 1999). Investigations indicated it had a wolf-like skull, its DNA pattern was wolf-like, but its gene pattern didn't match any of the reintroduced wolves or any other wild wolves from western North America.

Desired Condition
No additional land use restrictions or habitat manipulations are necessary for gray wolves, should they colonize the assessment area.

Great gray owl

Existing Conditions
Generally uncommon throughout their range, great gray owls (*Strix nebulosa*) are listed as sensitive by the USFS. Semi-open areas, where small rodents are abundant, near dense coniferous forest, for roosting and nesting, is optimum habitat for great grays. Great grays rely on old hawk and raven nests, broken-topped snags or stumps, dwarf-mistletoe platforms or similar platforms for nest sites (Hayward and Verner 1994). During winter some birds stay near their breeding territories while others make irregular movements in search of more favorable foraging conditions. Within the assessment area, great grays are associated primarily in lodgepole pine, Douglas-fir, and aspen communities and adjacent open areas.

Desired Condition
Management for great grays includes protection of nest sites by reducing human activity near nests during the nesting period. Intensive timber harvesting and firewood cutting near nest sites is managed carefully to prevent elimination of nest sites. Maintaining habitat diversity provides sufficient great gray habitat.

Grizzly bear

Existing Conditions
The USFWS classifies the grizzly bear as threatened. Optimum grizzly bear habitat consists of large areas with diverse vegetative communities free from human disturbance. White bark pine nuts are an important fall food source. Ungulate winter ranges, which provide carrion and elk calves, are important spring-time food sources.

The southern extent of occupied grizzly bear range is sixty miles north of the assessment area within the Gros Ventre Wilderness. In the mid-1980s there was a confirmed grizzly bear sighting within the Indian Creek drainage (USFS 1996). Annually there are unconfirmed grizzly bear sightings within the assessment area (Rustad pers. comm).

Desired Condition

The Special Order for Sanitation in Occupied Grizzly Habitat is extended to include areas occupied by black bears. Following the order reduces conflicts between humans and black bears, increasing protection of grizzly bears should they recolonize the assessment area. If grizzly bears occupy the assessment area, Interagency Grizzly Bear Management Guidelines are followed.

Northern goshawk

Existing Conditions
The northern goshawk (*Accipiter gentilis*) is listed as a sensitive species by the USFS and as a candidate for Threatened or Endangered species status by the U.S. Fish and Wildlife Service. These listings were prompted by a concern that goshawk populations are declining in the western United States (Reynolds et al. 1982).

Goshawks use a variety of forest types, ages, structural conditions, and successional stages over a large area while foraging. Nesting habitats are more restrictive. Nests are typically located in structurally diverse, mature, and older forest stands, low on gentle to moderate slopes (0-30 percent) with northerly aspects (Hayward and Escano 1989, Patla 1997, Reynolds et al. 1982). Nests are generally within one of the largest trees in the stand. In the nearby Targhee National Forest, Douglas-fir and lodgepole pine were the most common nest tree species.

Potential goshawk nesting habitat was modeled using a geographic information system. Factors modeled were conifer vegetation, northerly aspects between 270 and 90 degrees, and slope less than 30 percent **(See Map 3-6).** Given the assessment area's steep topography, slope may be the factor most limiting potential nesting habitat. **Table 3-7** provides acreages by potential habitat suitability. The WGFD wildlife observations systems database contains 38 northern goshawk records for the assessment area vicinity since 1979. These sightings were throughout the 1980s and 1990s.

Table 3-7 Goshawk Nesting Habitat Summary

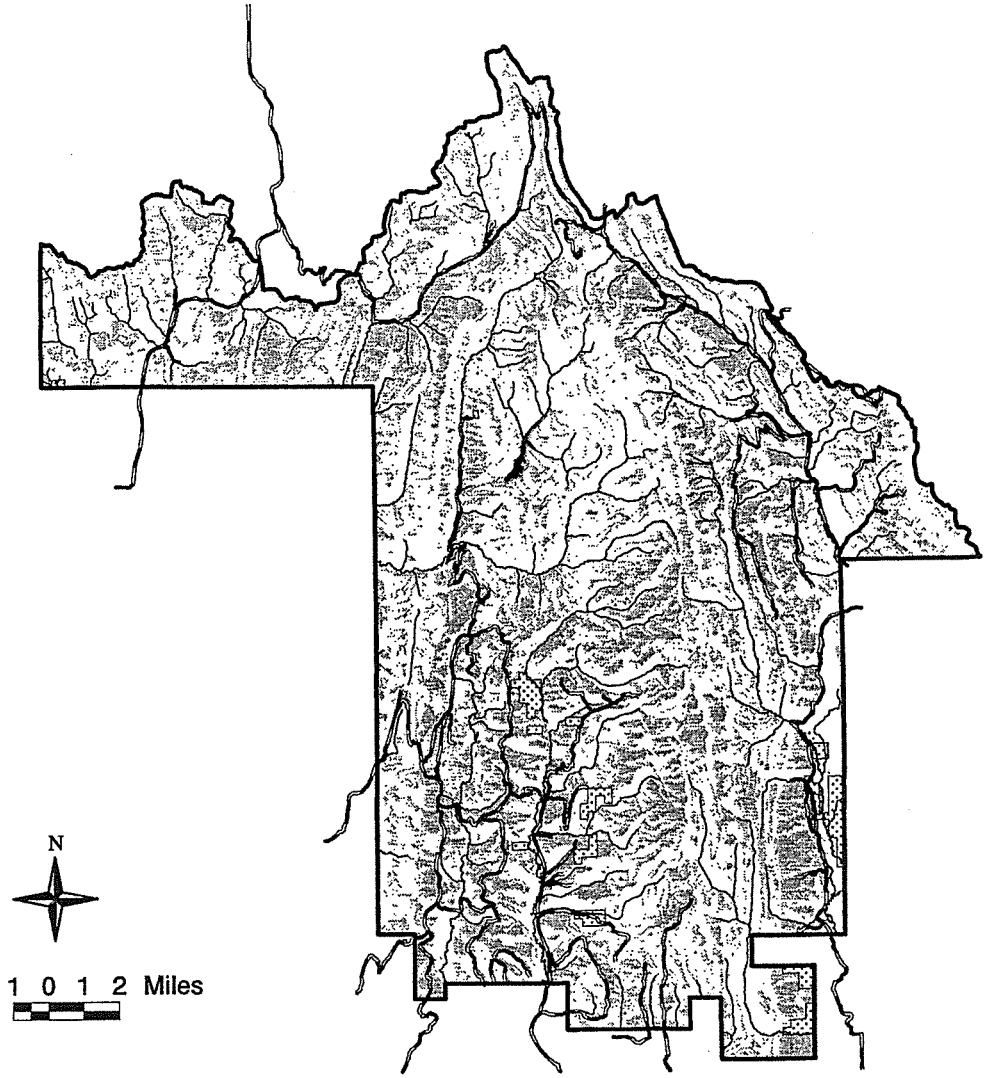
Nesting Habitat Factors	Acres
Conifer vegetation	138,420
Conifer plus north aspect	76,470
Conifer plus slope < 30%	4,749
Conifer plus aspect & slope	4,141

Desired Condition
Prior to land disturbing activities, potential breeding habitat is surveyed according to USFS Intermountain Region protocol. The protocol recommends surveys be performed a minimum of two years, as goshawks frequently change nest locations. Foraging habitat is protected by maintaining big game security areas and habitat diversity.

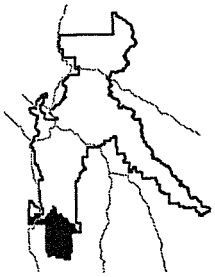
Peregrine falcon

Existing Conditions
Classified by the USFWS as Endangered, the peregrine was proposed for removal from the Endangered Species list in August 1998. If removed from the Endangered Species list, the falcon's

Map 3-6. Potential Northern Goshawk Nesting Habitat
Commissary Ridge/Tunp Range Landscape Scale Assessment



Vicinity Map



LEGEND
- Streams
- Roads
- Private Lands
- Goshawk Habitat

BRIDGER-TETON
National Forest

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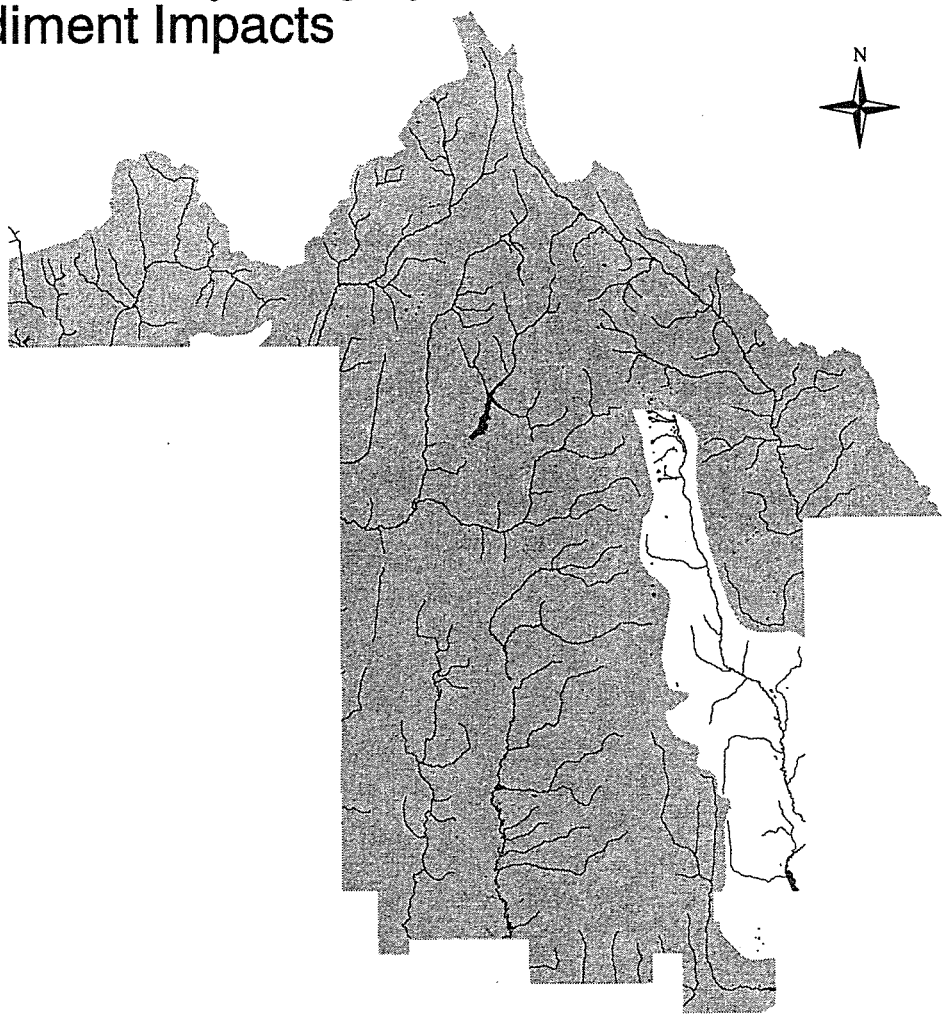
Water Quality Integrity
Sediment Impacts



Primary source of change
Secondary source of change

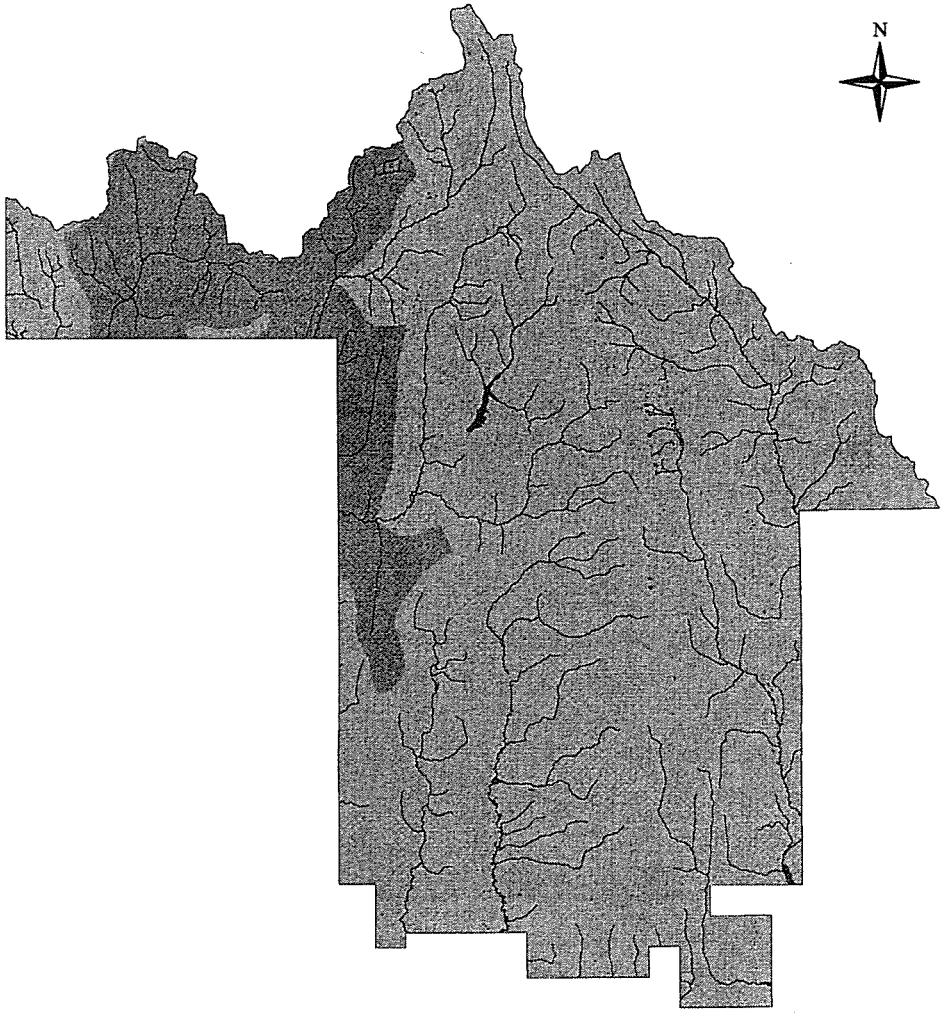
Perennial Streams

BRIDGER-TETON
National Forest

Intended Use: Kemmerer LSA
Plot Date: 4/19/99
By: Kurt Nelson

Map 3-7. Excessive sediment production and deposition is believed to be a primary impact to aquatic habitats throughout the assessment area.

Water Quality Integrity
Channel Modifications



Stream segments damaged by channel modifications

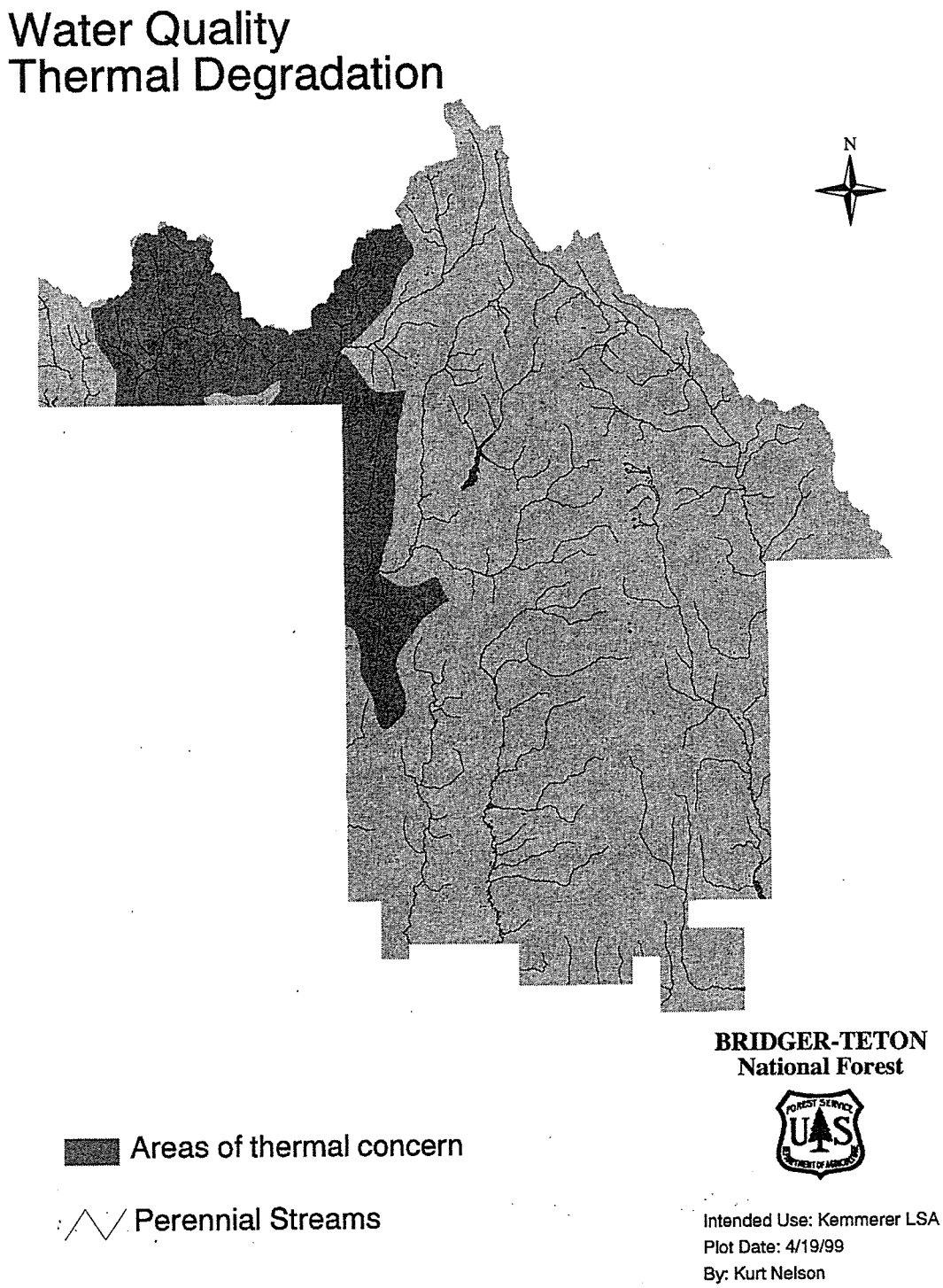
Stream segments not damaged by channel modifications

Perennial Streams

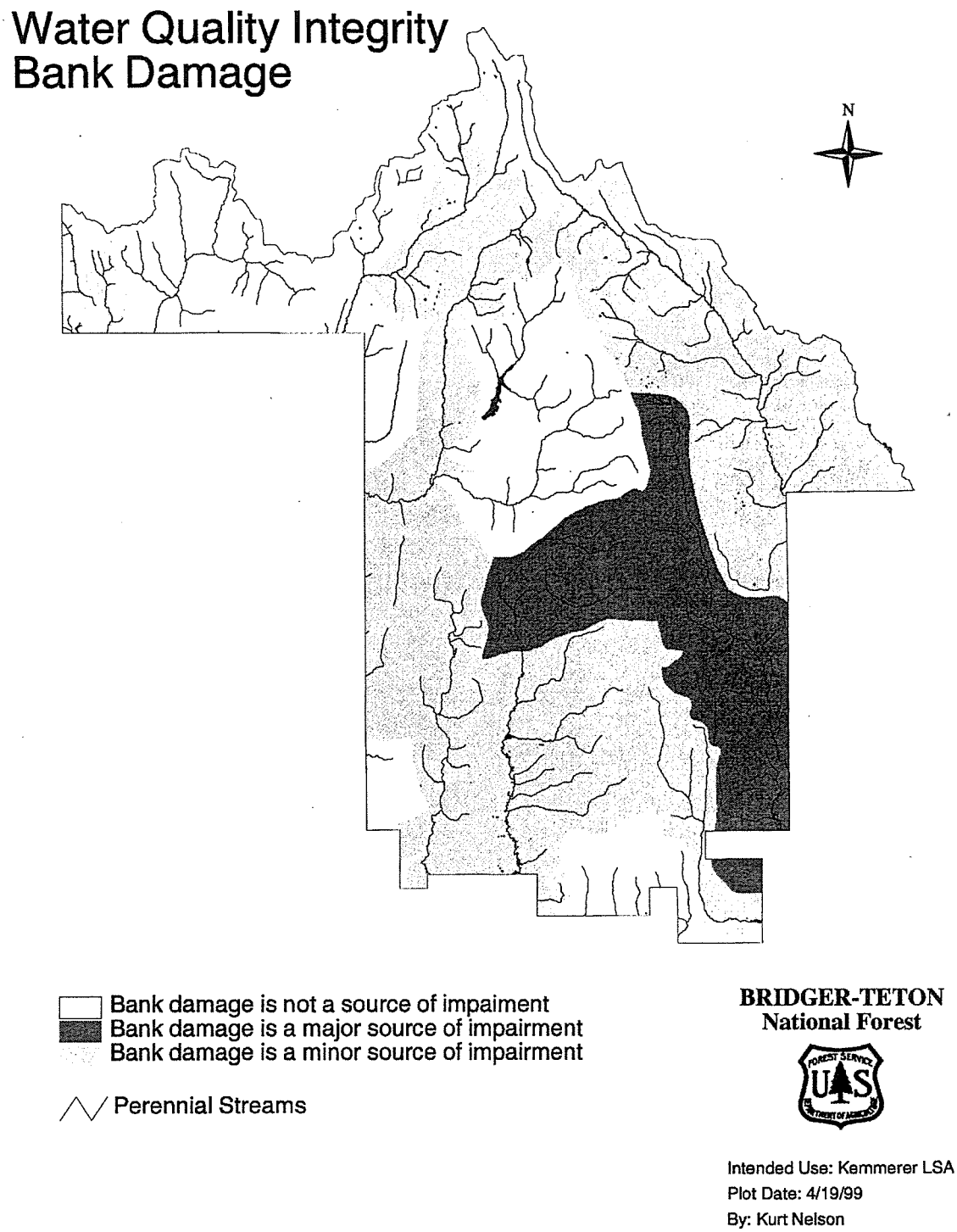
BRIDGER-TETON
National Forest

Intended Use: Kemmerer LSA
Plot Date: 4/19/99
By: Kurt Nelson

Map 3-8. Channel modifications are a primary reason for damaged stream segments within the Central Bear River subbasin.

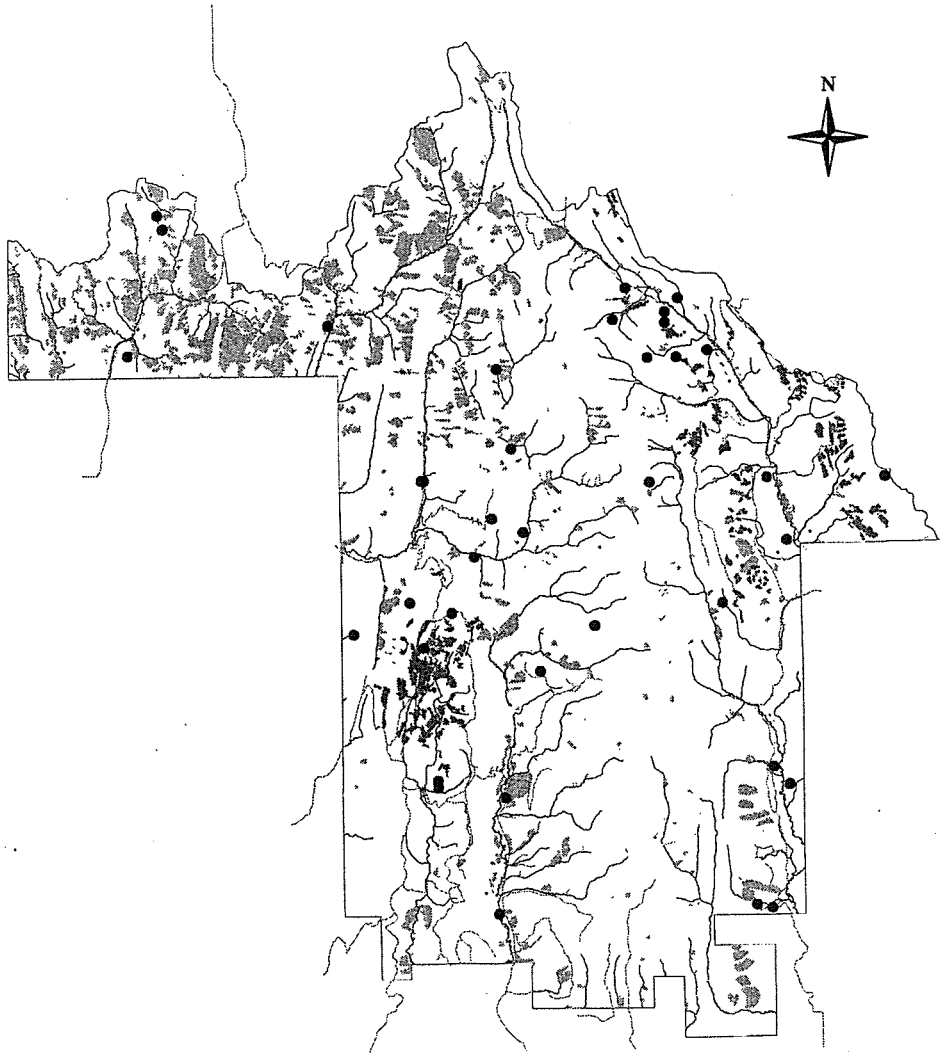


Map 3-9. Increased water temperature within some streams of Central Bear River impacts aquatic production. Thermal degradation is associated with decreased riparian vegetation vigor and distribution, and channel modifications.



Map 3-10. Aquatic impacts are primarily seen as increased bank damage and excessive sediment In the Fontenelle and Upper Hams Fork watersheds.

Kemmerer Landscape Assessment
Land Disturbances



- Fires
- Timber Harvest Areas
- Roads
- Landslides
- Perennial Streams

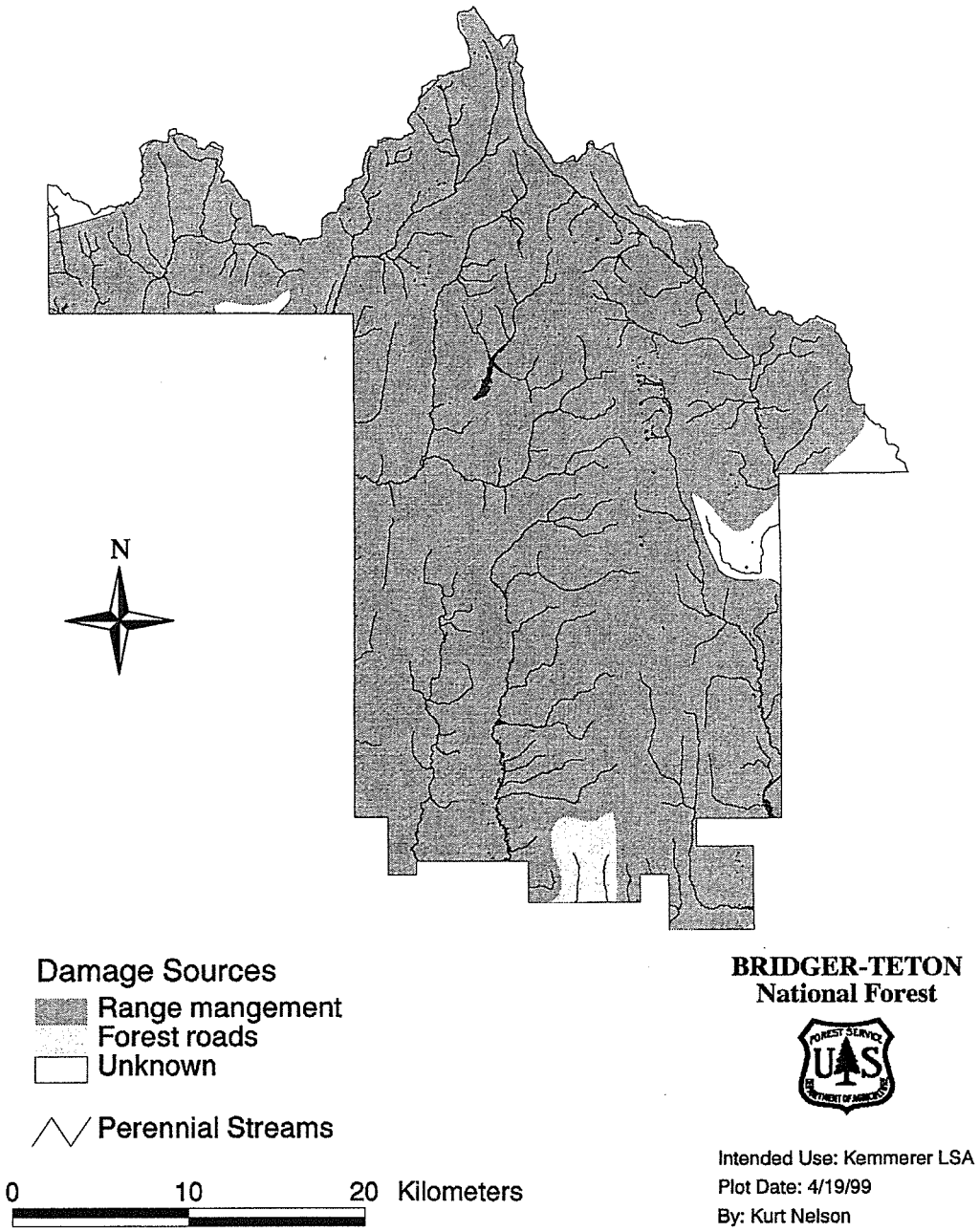
0 4 8 12 16 Kilometers

BRIDGER-TETON
National Forest

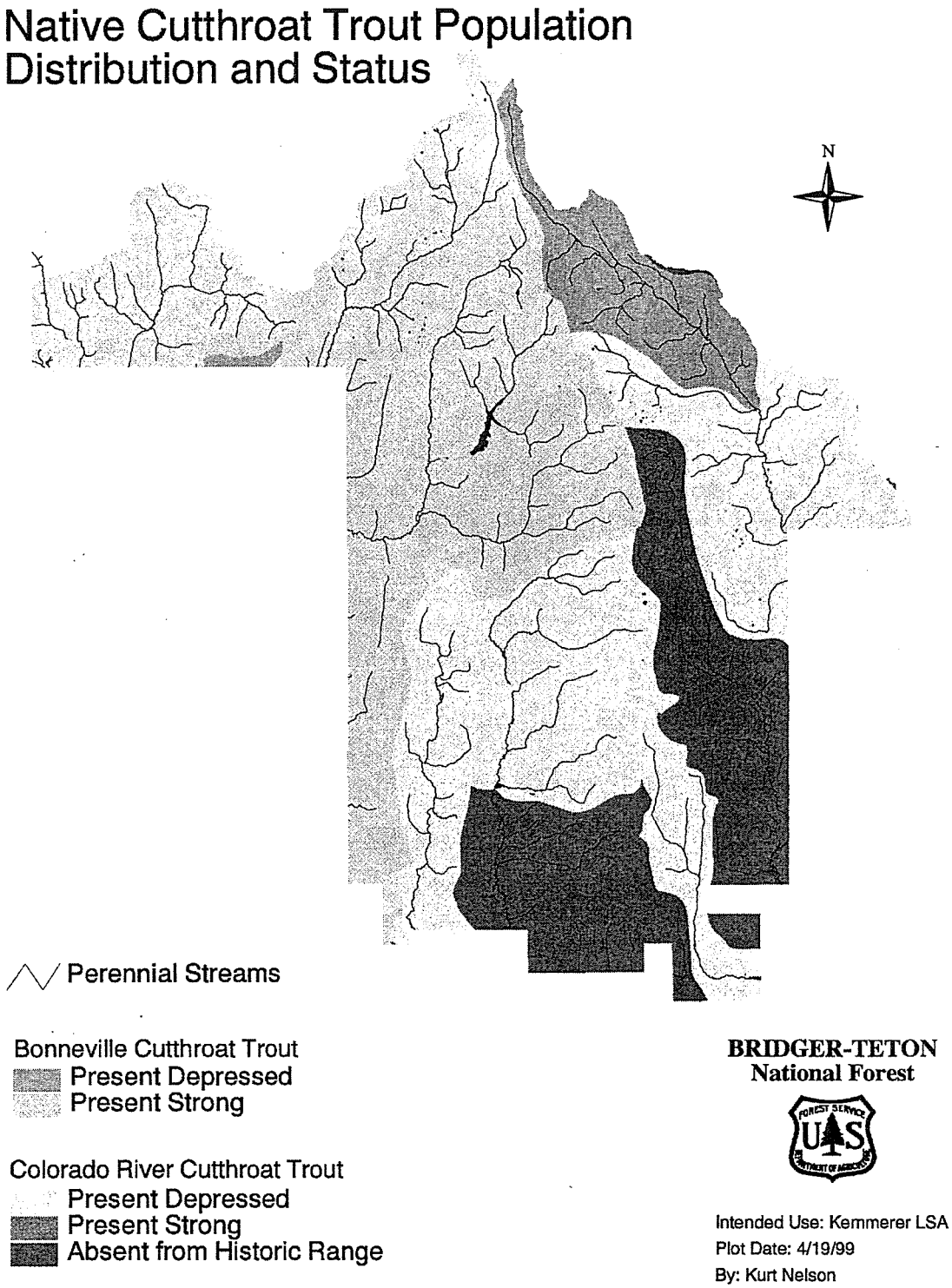
Intended Use: Kemmerer LSA
Plot Date: 4/19/99
By: Kurt Nelson

Map 3-11. Roads, timber harvest and livestock impacts are the primary sources of damage to aquatic habitats within the Commissary ridge/ Tunp Range Landscape Analysis Area. Natural landslides within the Bear River drainages have added to management disturbances.

Geomorphic Integrity
Primary Source of Damage



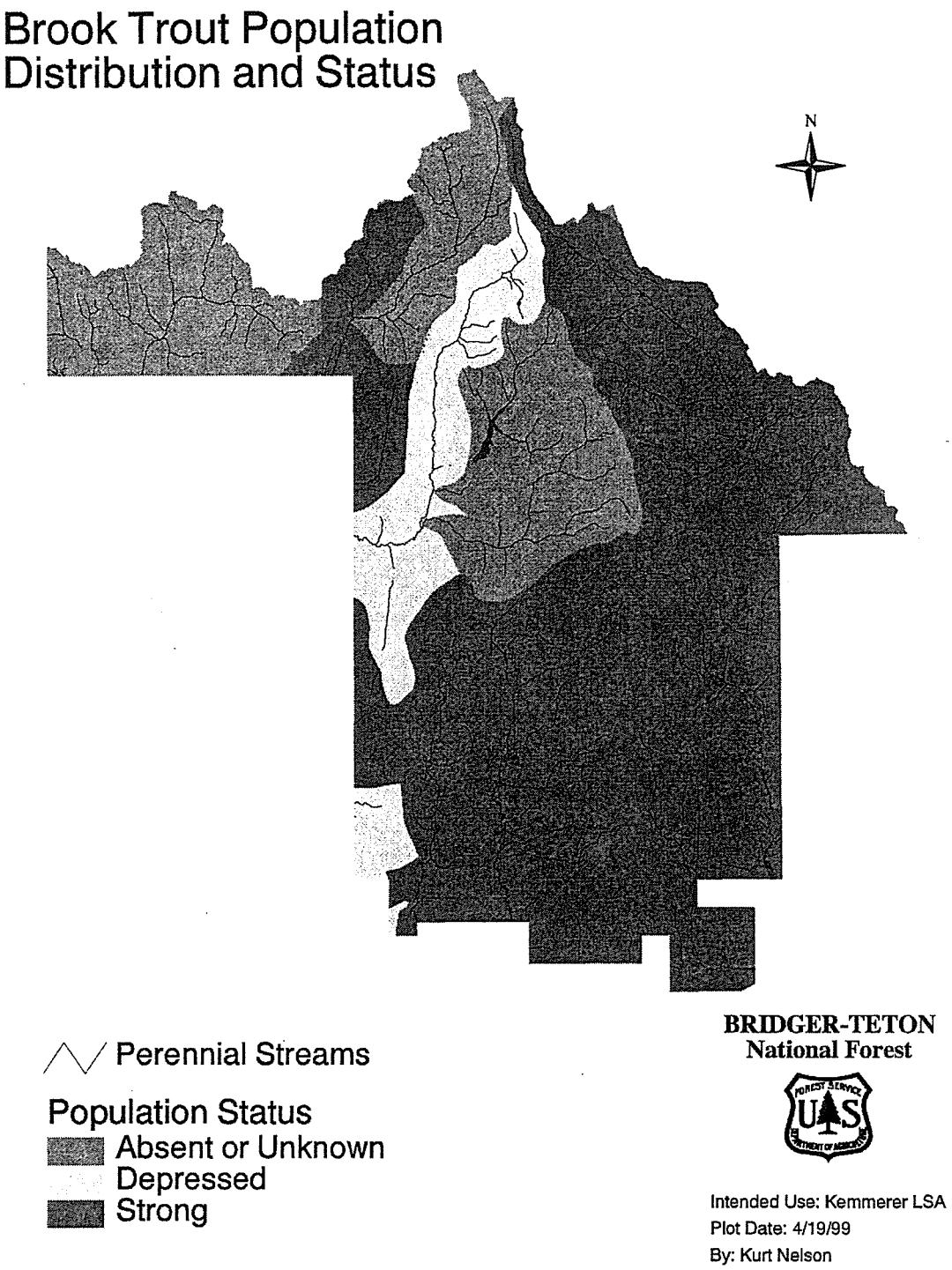
Map 3-12. Range management (domestic livestock impacts) was identified as a primary source of damage to aquatic habitats throughout the entire Commissary Ridge/ Tunp Range assessment area (1998 Watershed Reconnaissance).



Map 3-13. The Bonneville cutthroat trout occupies 100 percent of its historical habitat and the Colorado River cutthroat trout has strong populations is a small portion of its historical range.

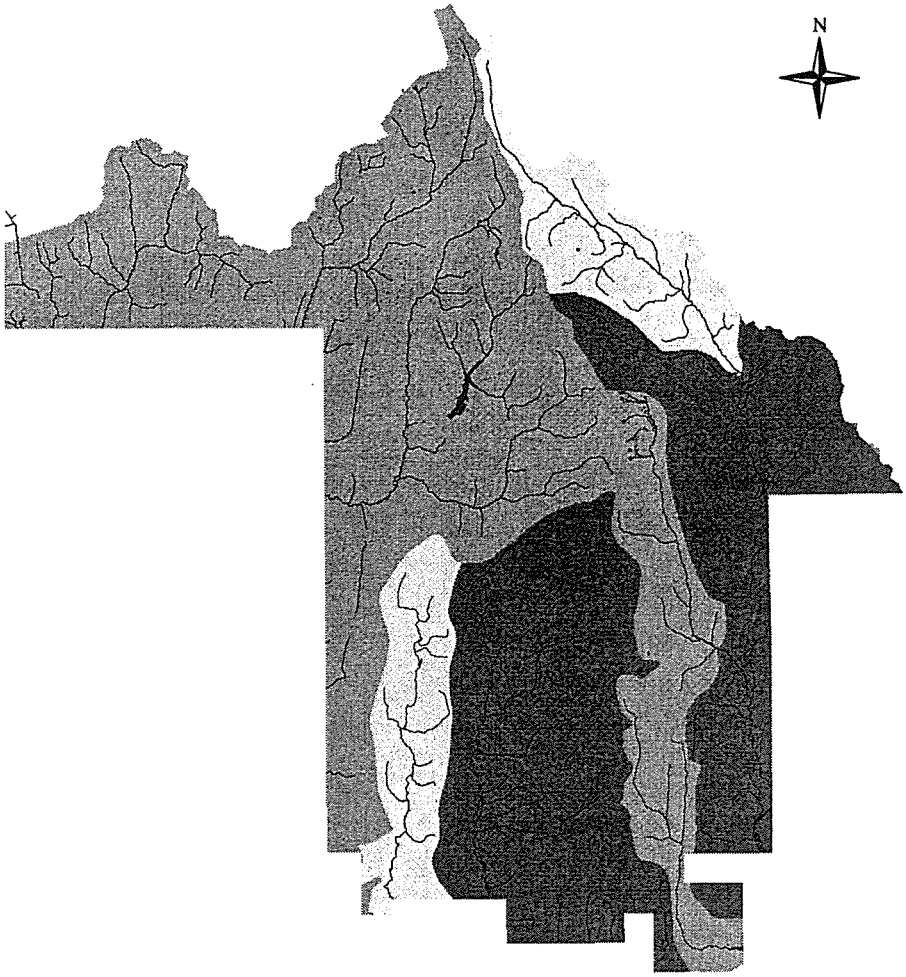
Brown Trout
Distribution and Status

Map 3-14. Non-native brown trout populations are strong within the lower reaches of the Smiths Fork drainage.



Map 3-15. Strong populations of eastern brook trout *Salvelinus fontinalis* are present throughout the Green River portion of the Commissary Ridge/Tunp Range LSA. These non-native fishes are also detrimental to native cutthroat trout by directly competing for available habitat.

Rainbow Trout Population Distribution and Status



Perennial Streams

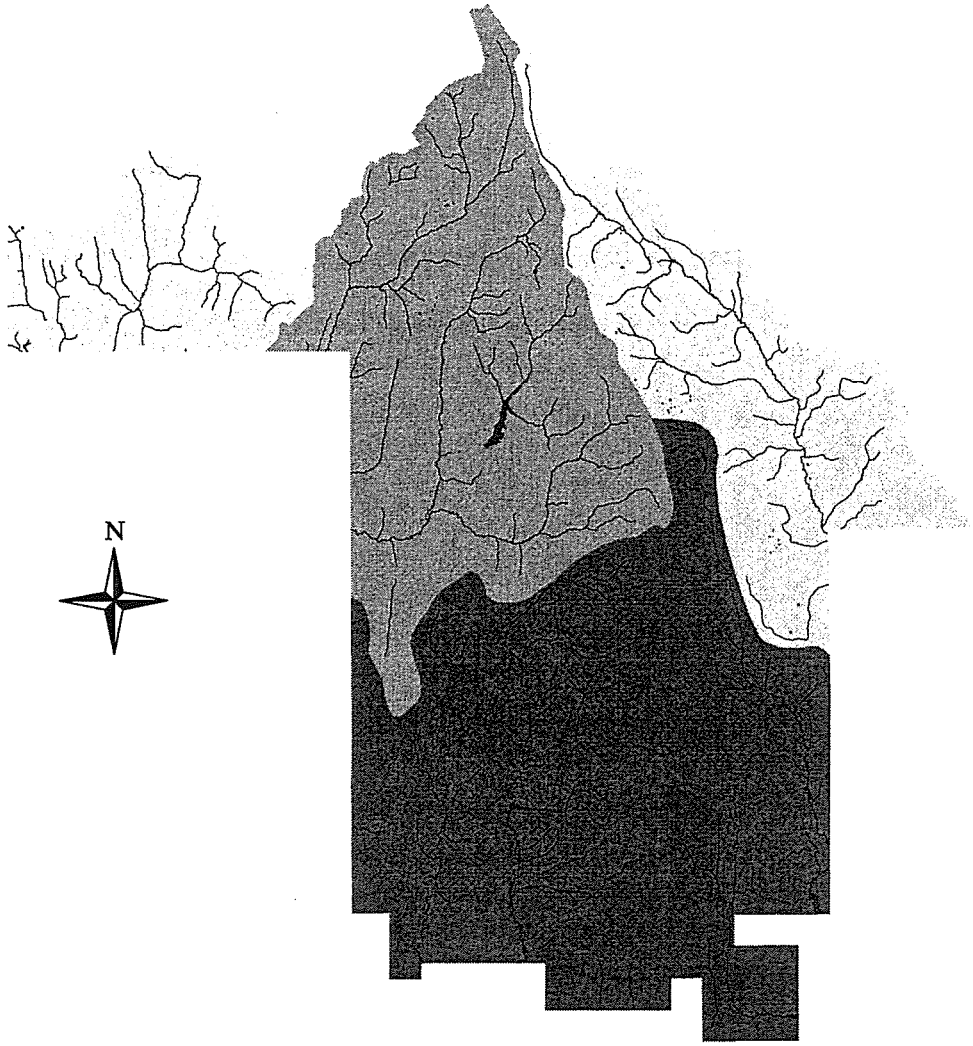
Population Status
- Absent or Unknown
- Depressed
- Strong

BRIDGER-TETON
National Forest

Intended Use: Kemmerer LSA
Plot Date: 4/19/99
By: Kurt Nelson

Map 3-16. Rainbow trout are not present within the Bear River drainage and headwaters of Fontenelle Creek, but exhibit strong populations in Hams Fork and the mid to lower reaches of LaBarge Creek.

Kemmerer Landscape Assessment
Fisheries Conservation Strategy



Watershed Management Priorities
- Conservation Watershed
- Restoration Watershed, 1st priority
- Restoration Watershed, 2nd priority

Perennial Streams

BRIDGER-TETON
National Forest

Intended Use: Kemmerer LSA
Plot Date: 4/19/99
By: Kurt Nelson

Map 3-17. High priority watershed for conservation designation in the Commissary Ridge/Tunp Range LSA is the Upper Smiths Fork; Thomas Fork and LaBarge watersheds are recommended for restoration designation.

status will be monitored for a minimum of five years, as required by the ESA. Statewide and Greater Yellowstone goals for peregrine falcon recovery have been met.

Although peregrines occupy a wide variety of habitats, they are typically found in open country near water bodies. Cliffs are preferred nesting sites. The average hunting area is within a ten mile radius of the nest, with 80 percent of foraging occurring within a mile of the nest. Most peregrines migrate to Central America or the southwestern United States for the winter. However, if there is an adequate food supply, some birds may remain on their breeding territories through the winter.

Peregrine falcons may migrate through the assessment area but are not residents. Cliff sites within the assessment area suitable for nest sites are limited. There are potentially some suitable nest sites near the south end of Lake Alice and along Commissary Ridge.

Desired Condition
Site-specific management plans are developed for any falcon territory established. Human activities are restricted within 0.5 miles of occupied eyries between March 1 and July 31. Land use practices or developments which eliminate falcon habitat within one mile of nest sites are not allowed. Cliff areas have been evaluated for nesting suitability.

Spotted bat

Existing Conditions
Spotted bats (*Euderma manculatum*) are considered sensitive by the USFS. A variety of habitats are utilized for foraging, including open conifer forests, desert shrublands, and open fields. Suitable roosting sites may be the limiting habitat factor. Narrow crevices high on steep limestone or sandstone cliffs appear to be critical. Spotted bats are highly territorial, avoiding each other while foraging and roosting alone.

Roosting habitat within the assessment area is probably very limited. There are potentially a few cliff sites near Lake Alice and along Commissary Ridge. The WGFD wildlife observation system does not contain any sightings nor have any formal surveys been conducted.

Desired Condition
Cliff areas have been evaluated for their potential to offer suitable roosting sites. Occupied roost sites are protected.

Three-toed woodpecker

Existing Conditions
The USFS classified three-toed woodpeckers (*Picioides triadactylus*) as sensitive. Their densities are very low and there is little population information available. They require snags, in coniferous forests, for feeding, nesting, perching, and roosting. Three-toed woodpeckers are usually found below 9,000 feet elevation. Fire-killed trees are important foraging sites as they forage mainly in dead trees. Their dependence upon snags for feeding, nesting, and roosting leaves three-toed woodpeckers vulnerable to clear cutting and firewood gathering. For maximum population levels, snags with DBH of 12-16 inches and heights of 19.6-39.4 feet should be present at a density of 42-52 snags per 100 acres and in clumps rather than individual snags (USFS 1991). Three-toed

woodpeckers are probably present within the assessment area. The WGFD wildlife observation system does not contain any sightings nor have any formal surveys been conducted.

Desired Condition
Protecting sufficient numbers of snags ensures their availability to woodpeckers and other snag-dependent species. Firewood permit holders are educated of the value of snags to wildlife. Within a vegetative treatment area, forest stands containing dead, down, and green trees are provided to serve as wildlife snag patches. Only silvicultural practices that achieve desired snag attributes are used in stands managed as wildlife snag patches. The snag patches are five acres or more in size and well distributed. An average of 60 acres per section is retained and unavailable for timber harvest or firewood cutting. A mixture of snag species and diameters is maintained for diversity. Retention of snag groups in and adjacent to timber harvest units is considered when opportunities are available.

Townsend's big-eared bat

Existing Conditions
Although widely distributed across the Intermountain Region, Townsend's big-eared bats (*Plecotus townsendii*) are considered sensitive by the USFS. This species is also commonly referred to as the western big-eared bat. A variety of habitat types are used, including conifer forest, shrublands, and meadows. During winter they hibernate singly or in small clusters in caves, mine shafts, rocky outcrops, and occasionally in abandoned buildings. The bats are sensitive to human disturbance and will abandon a roost site if disturbed. Low reproductive rates and limited roost sites make this species vulnerable.

There are not any documented roost sites within the assessment area. A mine shaft in Ferney Gulch was surveyed by the WGFD in June 1997. Three bat species were documented, but no big-eared bats were found.

Desired Condition
Potential roost and hibernacula sites have been evaluated. These include caves, mine shafts, rock outcrops, and abandoned buildings. Cave exploration and similar activities is regulated at known roost sites.

Whooping crane

Existing Conditions
The USFWS lists whooping cranes as Endangered. Whooping crane breeding habitat contains wetlands, potholes, and lakeshores with abundant emergent vegetation and the adjacent uplands. Whooping cranes are sensitive to human disturbance and will abandon their nests if disturbed.

No breeding population of whooping cranes exists in the Greater Yellowstone Area, but a few individual cranes do summer within the Greater Yellowstone Area. If the assessment area were utilized by whooping cranes it would most likely be by one of these few surviving cranes during the spring or fall migration. The WGFD wildlife observations systems database contains 20 whooping crane reports for the assessment area vicinity **(Appendix A-5)**. These reports were all during the mid-1980s, mostly in the spring and a few during early fall.

Desired Condition
If a whooping crane population becomes established within the Greater Yellowstone Area and utilizes the assessment area, high levels of human disturbance such as building activities and low-level helicopter activity does not occur when cranes are present. Transmission lines through important whooping crane habitat are identified and modified to help reduce crane mortality.

Wolverine

Existing Conditions
Wolverines (*Gulo gulo*) are considered to be scarce or rare within the Intermountain Region and are classified as sensitive by the USFS. They are essentially a wilderness animal, requiring large tracts with diverse vegetative communities. Wolverines generally summer at higher elevations, moving to lower elevations during the winter, with riparian areas possibly being an important winter habitat. They appear to prefer hunting around small meadows, in timber, along cliffs, and in riparian and ecotonal areas. They apparently avoid large open areas such as parks, meadows, and clear cuts.

The WGFD wildlife observations systems database contains two wolverine records for the assessment area vicinity, and the dates for these sightings were not recorded **(Appendix A-5)**.

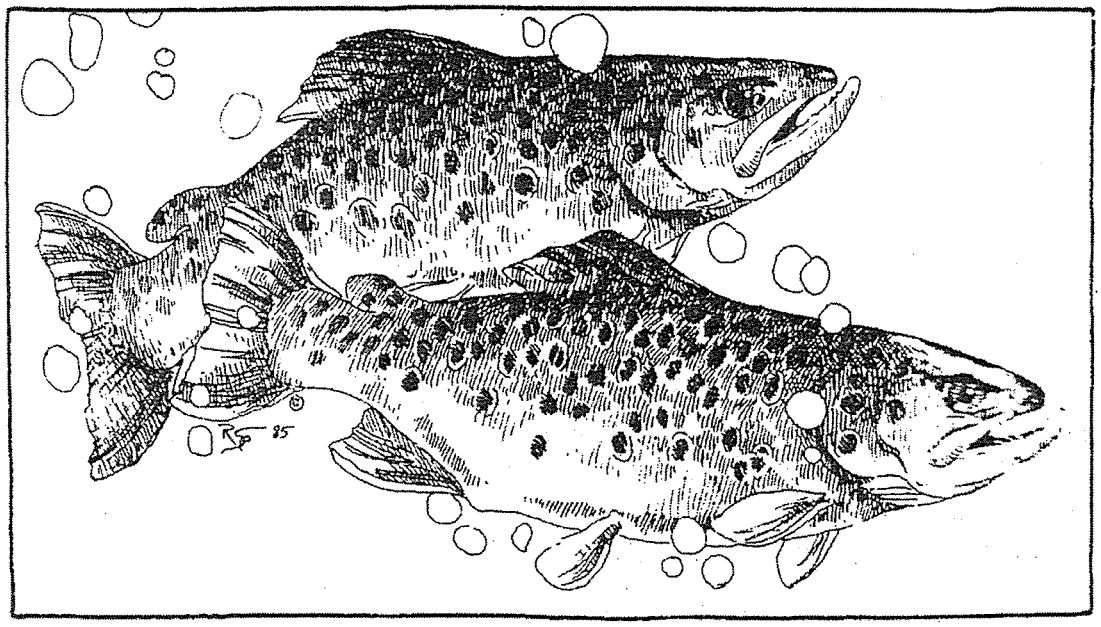
Desired Condition
Wolverines use a variety of habitats over a large area and are sensitive to disturbance. Maintaining habitat diversity and big game security areas provides suitable wolverine habitat. A survey has been conducted to document wolverine presence.

Aquatic Habitat/Fisheries

Existing Conditions
This section of the LSA examines the existing aquatic characteristics, changes from historic conditions, and recommended projects for the area. For ease of analysis, the LSA area is divided into three subbasins, hydrologic units within the USGS watershed classification scheme (Seaber et.all 1987). Subbasin review is intended for conservation assessment of native fish and other aquatic species. However, this assessment area contains only portions of three subbasins and thus is not a complete review of conditions and solutions necessary to conserve native cutthroat trout.

Habitats

Existing Conditions
Within streams of Central Bear River, aquatic impacts are associated with excessive sediment production and deposition, loss of habitat complexity, decreased riparian vegetation vigor and distribution, channel modifications, and increased water temperature **(Maps 3-7, 3-8, and 3-9)**. In the Blacks Fork and Upper Green River subbasins, aquatic impacts are primarily seen as increased bank damage and excessive sediment **(Maps 3-7 and 3-10)**.



Damaged stream segments occur within each watershed **(Table 3-8)**. These damaged areas typically occur in the lower gradient stream segments, less than four percent grade. The habitat relationships between damaged streams and fish production is not clearly defined for this area, but it is assumed to be a significant cause of decline of native fish populations.

Table 3-8. Damaged Stream Segments Within the Assessment Area

Stream Name	Damaged Segment	Primary Damage
Giraffe/Robinson	Entire	Bank damage
Salt Creek	Lower 1/2	Excess Sediment
Smiths Fork	Middle Section	Excess Sediment
Porcupine Creek	Entire	Excess Sediment
Lander Creek	Lower 1/2	Excess Sediment
Coantag Creek	Upper 1/2	Excess Sediment
Howland/Sawmill	Entire	Bank Damage
Hams Fork	Lower 1/2	Bank Damage
Fontenelle Creek	Lower 1/2	Bank Damage
Aspen Creek	Lower 1/2	Bank Damage
LaBarge Creek	Meadows	Bank Damage
Nameless Creek	Entire	Bank Damage

Notes: Damaged stream segments are defined as management-caused modifications to stream variables beneficial to salmonoid fishes. These damaged stream segments do not meet Forest Plan standards and guidelines.

Road crossing streams within the analysis area are a chronic source of sediment. Culvert inventory completed in 1998 indicated that only four out of the 50 culverts inspected were not a sediment point source (**Appendix A-6.**). This inventory included only permanent streams; therefore, the number of culverts that are sediment point sources is expected to be much higher. Virtually all of the stream

crossings inspected could be easily corrected through installation of cross drainage and proper road maintenance practices.

Improperly installed culverts act as barriers to fish passage creating fragmented fish populations. This population isolation has potential to reduce the probability of persistence of native cutthroat populations (Young 1995). Of the 50 culverts surveyed in 1998, 21 passage barriers to adult or juvenile salmonids are recommended for immediate replacement **(Appendix A-6)**.

Causes for Current Habitat Conditions
Roads, timber harvest, and livestock impacts are the primary land management activities that cause damage to aquatic habitats within the assessment area **(Maps 3-11 and 3-12)**. Within the Bear River drainages, natural landslides and soil instability have compounded management disturbance. Trampling of banks by livestock along with changes in streamside vegetation to those species less desirable to maintain bank stability is a commonly observed cause of bank damage. Recognizing the inherent bank instability from the livestock-caused damage can be difficult without reference streams (there are none in this analysis area). The best indicator for differentiating natural from livestock bank damage is direct evidence. Obvious trampled banks, streamside gazing, and dominant non-native plant communities are common indicators.

Excessive sediment delivery to streams is the second most damaging to channel conditions beneficial to coldwater fish. The major sources of stream sedimentation are eroding stream banks, surface erosion from the uplands, and roads. Surface erosion of the uplands is a major contributor to stream sedimentation, especially in the Thomas Fork, where a large portion of the uplands are bare ground because of pioneer vegetation (Wyethia sp.). It is widely believed that past over-grazing caused the presence of this pioneer vegetation and the observed increase in bare ground. These upland conditions can be found throughout the assesment area in smaller patches.

Desired Conditions
Degraded habitat complexity and biological productivity from excessive sediment, bank damage, and channel modifications is well documented throughout the assessment area from stream survey data. The desired habitat conditions are as follows:

1) no stream segments are damaged by management activities and stream segments damaged by channel modifications are fully mitigated **(Map 3-7). (See Appendix A-6 road crossings);**
2) critical components of the aquatic environment are well represented to maintain a diversity of aquatic organisms;
3) no 6th code hydrologic unit is rated with bank damage or sediment as a major source of change **(Maps 3-7 and 3-9)**.

Forest Plan goals and objectives and supporting standards and guidelines affirm maintaining healthy aquatic habitats and provide a framework for implementation and monitoring. In fact, we are required by the National Forest Management Act to manage the land to provide ecological conditions that will maintain viable populations of plants and animals.

Fish

Existing Conditions

Colorado River cutthroat trout are present in approximately 17 percent of its historically occupied habitat. They are also present in other portions of the assessment area as depressed populations or not self-sustaining **(Map 3-13)**. Colorado River cutthroat trout historically occupied the entire assessment area where non-native fish exist today. Bonneville cutthroat trout occupy almost 100 percent of its historical habitat. These populations are strong but are under pressure from habitat modifications, fishing pressure, and from non-native trout.

The current fish distributions and native cutthroat status is a result of fish stocking and fish management. Non-native trout were widely distributed (stocked) since the turn of the century in almost all waters of the assessment area. Fortunately, the Thomas Fork and Smiths Fork Bonneville cutthroat trout have been able to genetically persist in light of past stocking. The reason for this may be the native fishes' ability to survive in highly variable environments compared to stocked fish. The Colorado River cutthroat trout has not been as fortunate; the current distribution of pure populations in the high altitude headwaters reflects the interbreeding with other cutthroat subspecies and rainbow trout throughout most of its historic range.

The presence of non-native trout has had the most influence on distribution and abundance of native cutthroat trout within the analysis area. With the exception of the Thomas Fork drainage and the headwaters of the Smiths Fork watershed, non-native trout populations are strong in all other occupied waters of the area. Brown trout (*Salmo trutta*) are within the lower reaches of the Smiths Fork drainage **(Map 3-14).** These non-native fishes complete with Bonneville cutthroat trout for available habitat and prey on young trout and other native, non-game fishes (Binns 1981).

Strong populations of eastern brook trout (*Salvelinus fontinalis*) are present throughout the Green River portion of the assessment area **(Map 3-15)**. These non-native fishes are also detrimental to native cutthroat trout due to direct competition for available habitat. Replacement of native cutthroat trout by brook trout has been well documented (Behnke 1992). Behnke believes the persistence of native cutthroat trout in small, high altitude headwater streams in the presence of brook trout is because the native cutthroat trout function better in colder waters.

Rainbow trout are not present within the Bear River drainage and headwaters of Fontenelle Creek, but they exhibit strong populations in Hams Fork and the mid-to-lower reaches of LaBarge Creek **(Map 3-16)**. Both Bonneville and Colorado River cutthroat trout are highly susceptible to hybridization with rainbow trout wherever the two species coexist (Binns 1981, Behnke 1992).

All of the above mentioned trout species, both indigenous and introduced, provide a sport fishing opportunity within the assessment area. Wyoming Game and Fish Department estimate the fishing pressure for the Smiths and Thomas Forks to be about 430 angler days per year; the annual angler days in the Green River portion of the assessment area is estimated at 780 days. The economic value of this resource return to local economy[1] is estimated at $68,500 per year.

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[1]Based on 1989 Hunting and Fishing Expenditure Estimates for Wyoming, University of Wyoming

Desired Conditions
Maintaining connected local populations and resilient habitats minimizes extinction risks to Bonneville and Colorado River cutthroat trout persistence. One cutthroat population attribute desired to minimize extinction risk is presence of metapopulations. These metapopulations are a collection of local populations that interact through an exchange of individuals (Rieman et. al. 1993). Metapopulations provide a source of individuals to re-establish a local population if a catastrophic event (biological or physical) removes that population. Watersheds where the maintenance of metapopulations is necessary include the Thomas Fork and the Upper Smiths Fork. There is a proposal to re-establish a metapopulation in the LaBarge Creek watershed.

Because non-native trout pose risks to the native cutthroat trout, removal of all non-native fishes from the Thomas Fork, Upper Smiths Fork, and LaBarge Creek watersheds is needed to meet the native fish desired conditions. In the Hams Fork River and Fontenelle Creek watersheds where the dominant trout species are non-native, recreation angling and harvest may be appropriate management strategies. However, there are isolated populations of Colorado River cutthroat trout in both these watersheds (South Fontenelle Creek and Devils Hole Creek) that require protection.

Domestic Livestock

Existing Conditions
There are 25 grazing allotments covering almost 100 percent of the land base on the district. Of these 25 allotments, approximately 20,000 ewes with lambs and 2,300 cow-calf pairs are authorized to graze. Also, 94 head of horse are permitted in conjunction with sheep operations.

Table 3-9 Assessment Area Allotments and Schedule of Allotment Management Plan Revision as of 5/00

Allotment Name	Status of AMP	Scheduled Revision
LaBarge Creek C&H	1960	2006
Little Hornet C&H	1952	2006
Fontenelle C&H	1968	2006
Spruce Creek S&G	*	2010
Aspen Springs S&G	1972	2008
Indian Creek S&G	1976	2010
Green Knoll S&G	1978	2010
Basin Creek S&G	1952 (1978)	2010
Little White Creek S&G	1986	2002
Buckskin Knoll C&H	1982	2004
Trespass Creek C&H	1952	2004
Porcupine Creek S&G	1955	2004
Sams-Allen S&G	1984	2010
Sheep Mountain C&H	1988	2006
South Fontenelle S&G	1987	2006
Poison Hollow C&H	1983	2008
Devils Hole S&G	1984	2010
Pole Creek S&G	1984	2010
Hams Fork C&H	1987	2008

Allotment Name	Status of AMP	Scheduled Revision
Elk Creek S&G	1985	2010
Giraffe Creek S&G	1983	2002
Lower Salt Creek S&G	1983	2002
Smith Fork S&G	1979	2004
Lake Alice S&G	1955 (1979)	2004
Lake Mountain S&G	1980	2010

* Used for trailing only, no AMP

The schedule for updating allotment management plans is displayed in the above table. The district has not been able to complete the plans because resources have not been available. The allotment management planning process is an interdisciplinary effort with resource values represented such as soil, watershed, wildlife, fishery, vegetation, and grazing interests.

Typically, livestock grazing begins mid-June and ends around the first week of October. These time frames are dependent upon weather and plant growth stage. The actual dates of use are dynamic and change year to year.

The range condition within most of the upland sagebrush and grass community types is poor to fair. These conditions are a result of fire suppression, grazing pressure, and climatic factors. Sagebrush species dominate these sites. The high density of sagebrush results in low forb and grass production. Livestock numbers determined in the 1950s, as depicted in most grazing permits today, reflect forage available for livestock at that time. Today, with livestock numbers remaining static overtime and forage production declining, the condition and trend for this community type will continue to decline. Furthermore, this situation causes livestock distribution problems, primarily cattle, stemming from lack of forage available in the uplands. Consequently, livestock impacts can be seen along streams, creeks, and other water sources. Cattle tend to congregate within these areas, causing adverse impacts at certain locations.

Bands of sheep are herded across the landscape and generally utilize the higher elevation ranges. Forage preference by this class of livestock is forbs, although sheep are known to graze grasses as well. On most sheep allotments, wyethia, (*Wyethia amplexicaulis*), is present and is most desirable by both the livestock and operator. As a result, communities with wyethia receive moderate to heavy grazing pressure, enhancing population growth and expansion. Early summer as these bands are moved onto the forest, competition exists between elk and sheep for utilization of available forage. As elk migrate to summer range, timing is such that bands of sheep are moved onto the Forest at or near the time elk leave. Concern has been expressed by permittees that little forage remains for the sheep. And, district resource specialists are concerned about the impact to the vegetation.

Livestock trespass occurs between Forest Service administered lands and lands administered by the BLM and private landowners. Cooperative efforts have been taken to reduce livestock trespass by installation of cattleguards and construction of fences in strategic locations regardless of land ownership. Problem areas include Coal Creek, Beaver Creek, Hams Fork Creek, and West Branch Hams Fork Creek.

Stock driveways lie along the western edge of the district. The driveways are used on an annual basis to access respective allotments. An average of 6,000-8,000 ewes and lambs are driven along these routes twice a year. Generally less sheep are trailed along these routes in the fall. Actual routes have changed over time. Historically, sheep were trailed along the ridge tops. Overtime, with livestock numbers ranging in the thousands, resource conditions deteriorated dramatically. Today, to enhance rehabilitation efforts, sheep are trailed along roads to reduce adverse impacts to natural resources.

Table 3-10 shows other areas experiencing degraded resource condition.

Table 3-10. Areas of Resource Concern Within the Assessment Area

Location	Concern
LaBarge Meadows	Decline in species diversity Decline in forage production Increase mole activity Lower water table
Upper LaBarge Creek	Low vegetation diversity & productivity Soil exposure Location of roadway Poor road drainage
Green Knoll	Low vegetation diversity & productivity Soil exposure Roadway damage/road widening Excessive erosion occurring
Big Park	Tarweed monoculture present Low vegetation diversity & productivity Soil exposure
Fontenelle Lakes	Loss of topsoil Evidence of accelerated soil erosion
Devils Hole Lakes	Soil exposure Abandoned road not reclaimed Evidence of accelerated erosion Rill erosion present
Red Park	Loss of topsoil Excessive bare ground Rills and gullies present Low vegetation diversity & productivity
Upper Basin Creek	Abandoned roadways not reclaimed Acceleration erosion evident Rill erosion present Excessive bare ground

Desired Condition

Livestock grazing occurs without degrading resource conditions. Administration and management of the allotments reflect proper use and allocation with other resource uses. No livestock trespass occurs. Degraded resource conditions are alleviated.

Chapter 4 - Recreation and Social Environment

Human Uses

Recreation Settings

Reference Condition
Reference conditions for the Social Environment in Recreation do not exist. Recreational use within the assessment area began in the early 1920s due to the post World War I industrial revolution developments of the automobile and free time available to the general public.

Existing Conditions
The Recreation Opportunity Spectrum (ROS) settings within the assessment area vary from **primitive** to **roaded natural**. Table displays the ROS settings across the assessment area. Certain major recreation corridors and backcounty areas have been described, and a summary of their attributes follows. The DC columns represent the future ROS classes as a result of all the DCs described in this document.

Table 4-1. Existing and Desired Condition ROS Classes Within the Assessment Area

ROS class	existing acres	existing %	DC acres	DC %
Primitive	78,000	27.6	78,600	27.5
Semi-Primitive Non-Motorized	76,600	26.8	77,600	27.1
Semi-Primitive Motorized	43,200	15.1	42,700	15.0
Roaded Natural	87,400	30.6	87,100	30.5
Total	**286,000**	**100.1**	**286,000**	**100.1**

Features of Major Roads Within the Assessment Area

Salt River Pass/Allred Flat	• Only campground in the area • Serves visitors to Yellowstone area from several directions • Primarily **roaded natural** setting
Hams Fork	• Remote but easy access from Kemmerer • Serves mostly local visitors with weekend and day use • Snowmobiling in winter • Small quiet campground • Elk Creek Guard Station historic site • Access to backcountry trails and Hobble Creek
LaBarge Creek	• Remote but easy assess via through-route with Greys River and Smiths Fork roads • Lander Trail historic area with interpretive sites • Many dispersed sites • Big Fall Creek unique cold water springs and travertine deposits • Historic ranger station at LaBarge Meadows
Hobble Creek	• Access to Lake Alice • Best Backcountry access • Accessed from Cokeville • Developed Campground and trailheads
Smiths Fork Road	• Remote, low development level, low use • Access to Commissary Ridge • Through route with LaBarge and Greys River roads • Some semi-developed and undeveloped roadside camp sites • On low end of *roaded natural* class • Use low except hunting season • Snowmobiling in winter • Wildlife viewing
Commissary Ridge and Lake Alice Area	• Large backcountry area • Non-motorized travel • Lake is major attraction with developed campsites • Remote area, *primitive* setting, low use • Limited developed trailheads

Outfitter-Guides

Existing Condition

There are currently 14 Outfitter-Guides operating in the assessment area. Of those eight are hunting, two fishing, three horseback trail rides, and one backpacking.

Hunting Outfitter-Guide use is limited to a maximum of 2,000 service days per year. Actual use since 1991 has never exceeded 1,142 service days and the amount of actual use has been declining

during the previous eight years. The species primarily hunted are Elk, Mule Deer, Moose, Mountain Lion, Black Bear, and Antelope. There are four outfitter-guide assigned sites on the district.

Fishing Outfitter-Guide use is limited to a maximum of 600 service days per year. The actual use since 1991 has been steadily increasing with use in 1998 at approximately 400 service days.

The Trail Ride Special Use Permits have been authorized a total of 300 service days, but the actual use has not occurred. The Backpacking Permit has been authorized 150 service days of use.

Desired Condition
There are seven outfitter/guide hunting camps scattered across the district such that one does not interfere with any of the others. The average occupancy is 75 percent of the maximum service days allowed. Service days above the limit of 2,000 is based on the increase of license sales.

There are two fishing outfitter camps on Lake Alice. Both camps average 600 service days.

Summer trail rides are normally conducted out of outfitter camps. If an outfitter chooses not to have this activity another user may take that slot and may or may not use the outfitter camp. The quantity of summer trail rides do not interfere with the experience of other Forest users.

Progressive backpacking permit users are distributed evenly across time and the district so they do not conflict with each other.

Other Recreation Permitted Activities

Existing Condition
There are two recreation events permitted in the area. One is for a snowmobile club winter activities and the other is under a Forest-wide permit for the International Rocky Mountain Stage Stop Sled Dog Race.

Desired Condition
Recreation event permits are issued in a timely manner for those activities that do not conflict with existing uses taking place on the Forest

Non-Recreation Special Uses

Existing Condition
Table 4-2 displays the 20 non-recreation special uses within the assessment area.

Table 4-2 Non-Recreation Special Use within the Assessment Area

Number of Special Use Permits	Type of Special Use
1	Barn, Shed
1	Agricultural Residence
1	Convenience enclosure
1	Construction camp and residences (WY G&F)
2	FLPM (P&M Mining, WYDOT) roads, Highways
5	Resource monitoring sites (Snotel)
4	Irrigation water ditches
2	Water transportation pipes
1	Stock water
2	Private Mobile Radio Service

Desired Condition
Non-recreation special uses are combined when possible, easy to issue, administer and they are handled in a timely manner so that the permittee is pleased as punch and satisfied.

Land Acquisition

Existing Condition
Within the Forest boundary there are approximately 1,640 acres of P&M Coal Company lands, approximately 1,280 acres of State of Wyoming lands and approximately 1,280 acres of private land that are prioritized, in the Bridger-Teton National Forest Landownership Adjustment Plan, for acquisition. There is also one section of State of Wyoming lands outside the Forest boundary that has been identified in the above-mentioned plan.

Priority is:
1. P&M Coal lands
2. State of Wyoming inside Forest boundary
3. Private land
4. State of Wyoming outside the Forest boundary.

Desired Condition
All lands within the National Forest boundaries are National Forest lands. There are no private or other agency inholdings.

Cadastral Surveys

Existing Condition
There are 12 miles of land lines identified in the Lands program of work.

Desired Condition
All landlines have been surveyed.
The forest boundary is well marked and has appropriate signs in appropriate places.

Ditch Bill

Existing Condition
There are four special use permits for ditches that are in the process of being converted into the Ditch Bills.

Desired Condition
All ditches are handled easily and efficiently under the Ditch Bill act or whatever is in place.

Cabins

Existing Condition
There are four cabins on the District: The Elk Creek Cabin is maintained for its historic value and is used as a temporary shelter. The other three cabins (Kelly, Scaler, and LaBarge) are used by seasonals and are rented out to the public on a daily basis. All three cabins have a wood burning kitchen range and a propane cook stove. They have propane refrigerators and lights, spring fed water system in the summer, and an outhouse in the winter. Kelly Cabin has a propane heater. During the summer of 1998, Kelly Cabin had some major improvements, including all new: bathroom, floor, shower stall, sink, stool and plumbing, insulation and sheetrock ceiling, propane pipes from the tank, refrigerator, hot water heater, kitchen faucet, linoleum floor, and other items. This was accomplished by a volunteer couple.

Scaler and LaBarge cabins are in need of similar types of improvements.

There is also a small cabin at the head of Indian Creek that was left behind by an outfitter when he turned the camp back to the Forest Service. It is used as an administrative site and designated as an emergency shelter. The cabins and shelter locations are shown on the map and detailed information on the cabins can be found in the Facilities Plan.

Desired Condition
Kelly, Scaler, and LaBarge cabins are up to code, clean, well-maintained, function properly and are a joy to stay in.

The Elk Creek cabin looks just like it did in 1927.

There is an administrative/ emergency use cabin in Jack Splatt Flatt along the picturesque, murmuring Alice Creek and another cabin at the head of Indian Creek. These cabins have a small wood-burning stove, sleeping cots/beds, a cache of food, candles, tools, corrals, and other administrative and emergency use items.

Other Facilities

Existing Condition
There is a one half block area in the middle of Kemmerer that has a garage/warehouse and fenced-in area with lots of equipment and supplies stored there.

There is a trailer in the trailer court that has all the conveniences of home and can accommodate people, if we had the money for a bunk bed.

Desired Condition
The office complex in town is co-located with the BLM and there is a small pasture is just outside of town. There is a nice modern bunkhouse adjacent to the office complex that adequately accommodates all the seasonals and their vehicles.

Special Areas

Existing Condition
Areas of special concern within the assessment area include the Lander Cutoff trail and Elk Creek Guard Station, two historic sites where there is signing and interpretive information. Big Fall Creek is a unique spring-fed stream, which has been found eligible as a Scenic River. The Big Fall Creek area was designated as a Special Geologic Area in 1998, but there is no management plan for the area. La Barge Creek and the South Fork Fontenelle are also Wild and Scenic River Eligible. Lake Alice is a large landslide lake in the heart of the backcountry. Crystal Springs is a small pond near the Smith's Fork Road that is easily accessible to the public. North of Lake Alice is Graham Peak (10,330 ft.), the highest point within the assessment area. Tri-Basin Divide is a geographic landmark, where waters flow into the Green River, Great Basin, and Columbia systems.

Desired Condition
The Big Fall Creek Special Geologic Area has a well built, well drained, surfaced road that accesses several camp and picnic sites that have been hardened and located a distance from the stream so that the stream is not impacted. There are no domestic livestock within the designated area.

Summer Use

Campgrounds/Picnic Areas

Existing Conditions
There are three developed fee campgrounds in the assessment area: Allred Flat, Hobble Creek, and Hams Fork. There is a non-fee, limited-service campground at Lake Alice. Hobble Creek and Allred Flat also have developed picnic sites. There are three other developed picnic sites: Big Spring, Crystal Lake, and Lake Alice. The campgrounds are full service for summer use. Visitor occupancy has been low and relatively constant over the past 10 years, except for Allred Flat campground which is adjacent to a paved highway. Allred Flat Campground has been experiencing increasing use over the past five years and primarily serves visitors en route to Yellowstone National Park.

Allred Flat and Hams Fork campgrounds were built in the 1960s and were designed for small vehicles and tents. Current recreational vehicles and large trailers have great difficulty maneuvering and finding an adequate campsite spur. Most of the spurs are backwards from the one-way traffic flow and more than half the spurs have the picnic table and the fire grate on the wrong side of the

spur. None of the spurs and campsites are hardened-use areas. Major reconstruction is needed to meet current user needs and desires.

The Allred Flat Campground spring water system was unable to meet water quality standards and was directed to be closed in 1998 by the Environmental Protection Agency (EPA). Current water needs for campers are only marginally met by two hand water pumps. A new water system is needed for the campground. Many picnic tables are deteriorated with broken benches and loose boards; extensive heavy maintenance to reconstruction is needed. Fire grates are in good condition. There are three toilets in the campground, one is an SST (Sweet Smelling Toilet) and the other two are in poor condition and need to be replaced. Extensive planting of many different tree and shrub species has been accomplished in the campground since the late 1980s, resulting is a good diversity of species and age classes.

The Hams Fork Campground water system is adequate and in good condition. There is only one toilet in the campground, and it is in poor condition and needs replacing with an SST.

Hobble Creek Campground was built in 1989 and is generally adequate for current user needs, except for fire grates, which are in poor condition. There are several spurs that are too short and receive little use. A stock corral was built in 1990 and some replacement of rotten posts is needed.

The non-fee Lake Alice Campground has campsites located at three locations along the lakeshore. Facilities available include picnic tables, fire grates, water spigots, and pit toilets. **Table 4-3** displays recreation sites within the assessment area.

Table 4-3. Existing Recreation Sites Within the Assessment Area

Campground	Sites	PAOT	Season of Use
Hobble Creek	14*	80	7/1 to 10/31
Hams Fork	13*	65	5/25 to 10/31
Allred Flat	32*	160	5/25 to 10/31
Lake Alice	9	45	7/1 to 10/31
Picnic Area	**Sites**	**PAOT**	**Season of Use**
Hobble Creek	2	15	7/1 to 10/31
Big Spring	3	15	5/25 to 10/31
Lake Alice	2	10	7/1 to 10/31
Allred Flat	2**	70	5/25 to 10/31
Crystal Lake	2	10	5/25 to 10/31
Total 9	**79**	**470**	

* - fee campgrounds

** - fee charged for group reservations

PAOT - People At One Time - It is the capacity of the parking area times 3.2 people per vehicle.

Estimated total recreation use within the assessment area during 1998 was approximately 226,000 recreational visitor days with most of this use being in dispersed recreation. Dispersed camping is the largest component of dispersed recreation in the area.

Desired Condition

There are four developed campgrounds: Allred Flat, Hobble Creek, Hams Fork and LaBarge Creek. There is a non-fee, walk in campground at Lake Alice and developed dispersed sites in Big Fall Creek. Picnic sites are located at Allred Flat, Hobble Creek, LaBarge Creek, Big Spring, Crystal

Lake, Lake Alice, LaBarge, and Big Fall Creek. The campgrounds are full service during the summer use season with occupancy at 40 percent.

Table 4-4 DC Recreation Sites Within the Assessment Area

Campground	Sites	PAOT	Season of Use
Hobble Creek	14*	80	7/1 to 10/31
Hams Fork	13*	65	5/25 to 10/31
Allred Flat	32*	160	5/25 to 10/31
LaBarge	10*	50	5/25 to 10/31
Lake Alice	9	45	7/1 to 10/31
Big Fall Creek	3	15	5/25 to 10/31
Picnic Area	**Sites**	**PAOT**	**Season of Use**
Hobble Creek	2	15	7/1 to 10/31
Big Spring	3	15	5/25 to 10/31
Lake Alice	2	10	7/1 to 10/31
Allred Flat	4**	80	5/25 to 10/31
Crystal Lake	2	10	5/25 to 10/31
Big Fall Creek	3	15	5/25 to 10/31
Total 12	**91**	**530**	

* - fee campgrounds ** - fee charged for group reservations

The developed campgrounds and picnic areas meet current National Standards and the standards in *Planning Parks for People* by Dr. John Hultsman & Richard L. Cottrell. In all these sites:

- Water systems work & are safe.
- Toilets are clean and sweet smelling.
- Camp spurs are designed with the one-way access road.
- Campsites (table & fire grate) are hardened and on the correct side of the spur.
- Roads and spurs are surfaced and drain perfectly.

Dispersed Camping

Existing Condition

Dispersed camp sites have a wide variety of settings, from heavy used sites right next to high traffic roads to very isolated spots that are tucked away where there is little chance of meeting anyone outside of their party. The heavy used sites have bare ground, a fire ring, and some sites have user built structures that are appropriate for the setting. The least used sites are naturally vegetated and there is little to no evidence of use.

There are 16 dispersed camping sites that have been improved for non-fee public use. Of these, 13 are located along the LaBarge road and three along the Hams Fork road. These improvements include picnic tables, fire/grill rings, and barriers. Some of these sites are located in riparian areas and/or in close proximity to streams. In addition there is estimated to be approximately at least 200 non-improved dispersed camping sites within the assessment area along system roads. There is estimated to be 300 or more dispersed camping sites located along system trails. The largest amount of dispersed camping occurs during the fall hunting seasons. Local area hunters plus a large percentage of Wyoming, Utah, and Colorado state residents utilize the area. Starting in 1994,

dispersed site inventories have been done on 145 sites along the main road corridors (Hams, Fontenelle, LaBarge - Smiths Fork). Because of easy access, these sites have the highest use. Of these 145 sites, 15 percent have a high impact rating on proximity to water (closer than 25 feet), four percent have a high rating on vegetation (500 feet or more of bare ground), and two percent have a high impact rating of cleanliness (significant amounts of garbage, manure, human waste.

Off-road Vehicle Recreation

Existing Condition
Summer use includes recreational vehicle and tent camping, recreational off-highway vehicle (OHV) use by families, recreational firewood cutting, hiking, and horseback riding.

In general, OHV popularity and use by the public has dramatically increased within the past five years and has been increasing within the assessment area. There are no trails open to OHVs within the assessment area; but OHV use is occurring on Forest Development Roads where they are required under state law to be licensed motor vehicles. Significant illegal use of OHVs has been occurring on trails not open to OHVs and cross-country predominately during hunting seasons. Enforcement of the Travel Plan within the assessment area has been little to none during the last five years due to a reduced Forest Service field presence. In addition, little to no signage has occurred to educate the public. There is demonstrated public need for motorized trails.

Desired Condition
Summer use includes recreational vehicle and tent camping, OHV use by families, firewood cutting, hiking, horseback riding, viewing scenery, photography, fishing, hunting, historical observations, and a host of other fun recreational activities. There are a variety of OHV trails (see Trails section).

Trails

Existing Condition
Lake Alice is a very popular destination for day hikes and overnight camping due to its scenic, dark blue water and Bonneville cutthroat trout. It is accessed by two trails by stock, backpackers and mountain bikers. During the summer months, 75-100 day hikers per-weekend day make the short 1.5 mile hike into the southern end of the lake. Use is accommodated at the south end of the lake by two picnic sites and nine non-fee camping sites that include hitching rails. In general, use by the public occurs primarily at the south end of the lake and use by outfitters is at the north end of the lake accessed by a different trail system. The topography of the area precludes use of the entire lakeshore and effectively separates the users.

In the Hams Fork drainage a moderate amount of summer use occurs primarily from local users from the communities of Kemmerer and Evanston. The La Barge drainage receives moderate use too, primarily from the communities of Rock Springs, Green River, and La Barge. A significant amount of summer use on the west side of the district (Lake Alice) is from residents of Utah, primarily the Salt Lake area.

There are five developed trailheads **(Table 4-5)** within the assessment area. Almost all the current system trails were designed and developed for stock use. Current uses are limited to stock, hikers, and mountain bikes, although as stated earlier there is a significant amount of illegal OHV use of the

trails. Most system trails have not been regularly maintained due to funding and staffing. Some trail clearing have been accomplished by volunteers and outfitter-guides. Signing and marking of trails is generally inadequate for users unfamiliar with the area and trail system. Currently the overall tread condition of the trail system is good to fair. However, there are numerous sections of trails that need heavy maintenance to reconstruction and pose significant safety risks to users. User-developed trails develop quickly to bypass sections of system trails that are blocked. In addition there are about 90 miles of non-system user developed trails that have been identified and mapped. The condition of these trails are comparable to system trails.

Table 4-5. Existing Developed Trailhead Capacity (Summer)

Trailhead Name	Parking Capacity Vehicles	PAOT
Hams Fork CG	10	32
Poker Creek	20	64
Absaroka	35	112
Clear Creek	20	64
Hobble Creek CG	5	16
Total 5	**90**	**288**

Table 4-6. Developed Trailhead Capacity Desired Conditions

Trailhead Name	Names, numbers of trails TH serves.	Parking Capacity Vehicles	PAOT
Little Bear	Little Bear Crk (1001) Bluejay - Indian Mtn(1016)	8	26
Big Park	Big Pk - Red Pk (1004) Way Crk (1008)	6	19
Fontenelle	Roaring Crk(1007) West Bear Trap(1017) Bear Trap Crk (1018) Lost Horse Crk (1039)	10	32
Hams Fork Campground	Hams Fk - Red Pk (1009) Elk Crk Ridge (1035)	15	48
Contag	Big Pk - Contag (1010)	6	19
Poker Creek (Little Corral Creek)	Poker Crk (1011) Commissary Ridge(1171)	20	64
South LaBarge	South LaBarge(1019) Graham Peak (1027)	8	26
Absaroka	Shafer Crk (1020) Little Fall Crk(1021)	35	112
Clear Creek	Clear Crk - Fontenelle Lakes (1022)	20	64
Hobble Creek Campground	Lake Alice(1025) Lake Mountain(1002)	5	16
Elk Creek Ridge	Elk Crk Ridge (1035)	10	32
LaBarge Cabin	Lander Trail (1175) Commissary Ridge(1171)	5	16
Total 12		**148**	**474**
Sheep Pass*	Sheep Pass (3171)	15	48

PAOT - People At One Time is the capacity of the parking area times 3.2 people per vehicle.

- * - This is the trailhead for the Sheep Pass trail which accesses the Greys River Ranger District trail system.

- A developed trailhead has a parking area, corral, signs, and maybe an outhouse, picnic tables, log benches, or hitchrails. Where needed, the parking areas are surfaced. Everybody packs out their own garbage.

Table 4-7. Existing Non-motorized, Snow-free Trails Within the Assessment Area

Trail Name	No.	Mi.	TH	In	An	Cl	Tr.	Dr	Sign	Mark	Comments
Little Bear Creek	1001	3	U		1	1					Trail Head designed and approved. re: Road Closure EA
Lake Mtn.(B)	1002	9	U		1	1			1		Sign at Trail Head
S. Fontenelle	1003	13	U	13							
Big Park - Red Park	1004	6	U						2	2	
Bull Moutain	1005	2	--	2							
Mt. Isabel Cutoff	1006	2	--	2							
Roaring Crk	1007	6	U				1				Tr needed in Sec. 27 & 29. Trailhead designed & approved. re:Road Closure EA
Way Creek	1008	3	U	3							
Hams Fk - Red Park	1009	14	D		1	1			2	2	sign where trail leaves rd & TH at Hams Fk CG
Big Park - Contag	1010	17	U	17	1	2					TH designed & approved re: road closure EA
Poker Creek	1011	9	D		9*						
White Saddle	1012	5	--	5	4*		1				steep, hazardous section
Hobble Creek	1013	8	U	8	4*						
Buckskin Knoll	1014	9	U	4* 1	1	1	1				
Trail Creek	1015	3	U	3		1			1		
Bluejay - Indian Mt.	1016	10	--	5							
West Bear Trap	1017	3	--	3							
Bear Trap Creek	1018	4	--	4							
South LaBarge (B)	1019	6	U								
Shafer Creek (B)	1020	1	D*								
Little Fall Creek	1021	10	D* U			1				1	2 THs - one at each end
Clear Crk - Font. Lakes	1022	7	D		3*						
Coppermine-LaBarge	1023	10	U	1							
Lake Alice Ovelook	1024	3	D❁		3						
Lake Alice	1025	4	D❁		4						2 parallel trails for 1 mile. 1 for Hike & bike only
Spruce Creek	1026	2	--	2							
Graham Peak	1027	5	U								
Devils Hole Lakes	1028	1	--								
Poker Creek Cutoff	1029	2	--								
Water Canyon	1030	4	U								

Trail Name	No.	Mi.	TH	In	An	Cl	Tr.	Dr	Sign	Mark	Comments
North Smiths Fork	1031	7	U								
Packstring Creek	1032	4	U								
Wagner Mt - Poker Hollow	1033	5	U								
Indian Crk Ridge	1034	2	U								
Elk Crk Ridge	1035	4	U								Approved TH & trial reroute re: P&M Coal EA
Hobble Creek - Lake Mountain.	1036	0									Combined w/ (1002) Lake Mountain
Commissary Ridge	1171	33	U								
Mount Isabel	1174	3	--								
Lander Trail	1175	10	U		6*						
Coantag Ridge	1176	4	--								
Hams Fork Cutoff	1177	1	--								
Porcupine Creek	1191	5	--	5							
TOTAL		**259**	**5-D 22U**	**72**	**30* 11**	**7**	**4**	**1**	**6**	**5**	

The trails below access Greys River Ranger District (D3). The first two have a D3 designation. The third is in the Kemmerer Ranger District.

Trail Name	No.	Mi.	TH	Comments
Mink Crk	3049	1	U	This is a D3 trail with some on D1. An Undeveloped trailhead is on D1. Mtc & admin done by D3.
Sheep Pass	3171	3	U	Same thing. D3 feels there should be a Developed TH on the switchback on Smiths Fk Road near Wolverine Sprgs.
N. Smiths Fk Ridge	1031a	5	U	User developed trail that goes down the ridge on the district boundary between D1 & D3. Undeveloped trailhead needs more space for parking. Low use trail. Need to designate.
TOTALS		**9**	**3U**	**Need to coordinate all this with Greys R. District.**

Legend:

TH - Trail Head ;
U - Undeveloped - May have only a sign and some parking space.
D - Developed - Has a parking area, corral, signs, and may have outhouse.
-- = There is no trailhead - a link between two trails.
In - Inventory - We don't know what all the needs are and must check them on the ground
An - Annual - Trail is maintained on an annual basis.
Cl - Clearing - Trail needs clearing. If (An) is filled in this means annually; if not, it needs it now.
Tr - Treadwork - The trail needs some ground moving work.
Dr - Drainage - This are areas that do not need treadwork but need some drainage structures.
Signs - Directional signs are needed at the trailhead or other places along the trail.
Marks - These are areas of the trail that are hard to find and need blazes, cairns, or something.
* - Miles maintained by outfitter.
D❁ - The same trailhead.
(B) - Bike - The trail has been checked out for mountain bike use.

Table 4-8. Desired Condition Non-motor, Snow-free Trails Within the Assessment Area

NAME	NO.	MI.	TH	1YR	3YR	OT	COMMENTS
Little Bear Crk	1001	3	D	1	2		
Lake Mountain	1002	9	U		9		
South Fontenelle	1003	13	U		13		
Big Pk - Red Pk	1004	6	D*	6*			Same TH as Way Crk (1008)
Bull Mountain	1005	2	--	2*			
Mt Isabel Cutoff	1006	2	--	2*			
Roaring Creek	1007	6	D		6		
Way Creek	1008	3	D*	3*			Same TH as Big Pk-Red Pk
Hams Fk-Red Pk	1009	14	D❁	1	10	3	
Big Pk - Contag	1010	17	D	5*	12		1**
Poker Crk	1011	9	D	9*			
White Saddle	1012	5	--	5*			
Hobble Crk	1013	8	U	4*	4		
Buckskin Knoll	1014	9	U	4*	5		1**
Trail Crk	1015	3	U	1	2		
Bluejay-Indian Mt.	1016	10	--		10		
West Bear Trap	1017	3	--		3		
Bear Trap Crk	1018	4	--		4		
South LaBarge	1019	6	D❊		6		Share TH w/ Grham Pk (1027)
Shafer Crk	1020	1	D	1			D**
Little Fall Crk	1021	10	U/D		10		D**, TH at both ends of trail
Clear Crk-Font Lks	1022	7	D	7*			
Coppermine-LaBarge	1023	10	U	1	9		
Lake Alice Overlook	1024	3	D☆	3			
Lake Alice	1025	4	D☆	4			
Spruce Crk	1026	2	--		2		
Graham Peak	1027	5	D❊		5		Share w/ S. LaBarge (1019)
Devils Hole Lakes	1028	1	--			1	
Poker Creek Cutoff	1029	2	--			2	
Water Canyon	1030	4	U			4	
North Smiths Fk	1031	7	U		3		
Packstring Crk	1032	4	U			4	
Wagner Mt-Poker Hollow	1033	5	U			5	
Indian Crk Ridge	1034	2	D❁		3		TH at Hams Fk CG
Elk Crk Ridge	1035	4	D		4		
Electric Crk	1036	6	--	6*			
Outfitter	1037	1	U	1*			
Hobble Crk Cutoff	1038	5	--	5*			
Lost Horse Crk	1039	8	--		8		
Campfire Crk	1040	6	--			6	
Beaver Crk	1041	6	U			6	
Elbow Crk	1042	4	--	4*			

NAME	NO.	MI.	TH	1YR	3YR	OT	COMMENTS
Commissary Ridge	1171	33	U	6*		27	
Mount Isabel	1174	3	--		3		
Lander Trail	1175	10	D	6*	4		
Contag Ridge	1176	4	--		4		
Hams Fk Cutoff	1177	1	--		1		
Porcupine Creek	1191	5	--		5		
TOTAL		**295**	**12D 14U**	**12 75***	**147**	**58**	

The following trails are Greys River Ranger District designated.

NAME	No.	MI.	TH	COMMENTS
Mink Crk	3049	1	U	Mtc. & admin done by D3.
Spring Crk	3171	3	D	Mtc. & admin done by D3, TH by coordinated effort.
N. Smiths Fk Ridge	3031a	5	U	Mtc. & admin done by D3.
TOTALS		**9**	**1D 2U**	

Legend:

No. - Trail number
MI - Total miles in that trail
TH - Trail Head - -
D - Developed Trailhead - parking, corral, signs, maybe outhouse.
U - Nothing or may have small signs.
1YR - Trail is maintained every year.
3YR - Trail is maintained every Three years.
OTHER - Trail does not need regular mtc. Just need to check it every 5 yrs or so. Rocky ridges that seldom, if ever, need maintenance.
D* - Two different trails that have the same trailhead.
D** D❁, D✻, D✯ - The same trailhead.
* - Miles of trail that are maintained by outfitters.
** - Miles that have to be maintained yearly if the outfitter does not do it.

Three miles of the Lake Alice Trail are maintained to a level of user comfort.
All other trails on the district are maintained to a level of user safety.

There are bike trails across the district that are designated (along with other compatible uses) and have all difficulty levels.

Miles of trails that are maintained every year = 147 miles/3years + 12 mi/yr = **61 miles per year.**

Winter Use

Existing Condition
Winter use has been increasing in the assessment area. Snowmobile, or Over Snow Vehicle (OSV) use has been steadily increasing over the past 10 years. Trail riding and cross-country riding is extremely popular with local and non-local populations.

Cross country skiing and snowshoeing are other activities occurring in the assessment area to a much lesser degree than snowmobiling. Ice fishing is limited to Lake Alice with little actual use dependent upon snow conditions, which determine access by snowmobile.

Desired Condition
The Hams Fork road is plowed on a regular basis up to the Forest boundary, where there is an adequate snowpark, there are well groomed cross country ski trails and adequate areas for snowshoeing, sledding, tubing and all kinds of snowplay activities.

Snowplay activities are confined to a designated area to minimize disturbance of moose winter range.
Snowmobiling occurs off of designated trails in popular play areas outside of crucial big game winter range.

Trails

Current Conditions
There are a total of 94 miles of trails within the assessment area that are designated, marked, and groomed on a regular schedule. There are an additional 43 miles of designated and marked, but un-groomed trails, although some infrequent grooming does take place. There are also 37 miles of user developed trails that are used primarily by local expert riders but not marked or maintained. The majority of these OHV trails utilize existing Forest Development Roads (FDR). Trail counts on groomed trails were started in 1993 to monitor OHV use in the northwest section of the assessment area; data from these counts has demonstrated a very marked increase in OSV use. A very popular route is the Smiths Fork snowmobile trail that begins outside of the assessment area near Salt River Pass. This trail is groomed under contract with the State of Wyoming. A significant portion of the users are from southeastern Idaho and northeastern Utah. The Smiths Fork trail provides access to the Dry Fork and Commissary Ridge/Wyoming Range trails, and to the LaBarge Meadows area, which is an extremely popular OSV play area. There are other groomed OSV trails in the assessment area that receive moderate use: Viva Naughton, Green Knoll Ridge, Greys River, Big Park, and Coal Creek/Pine Creek. Grooming is performed by the State of Wyoming under contract. Marking and signing of these trails is accomplished by the Kemmerer Snow Bears Snowmobile Club under an MOU with the Forest Service. The majority of use is on weekends and is predominantly day-use.

The main OSV trailheads are at LaBarge Creek, Viva Naughton, Salt Pass, Pine Creek Ski Area, and Smiths Fork. Access to play areas and remote trails is achieved from these trailheads with these main OSV trunk trails receiving moderate to heavy use. Depending upon weather conditions and

use, these main trails become very rough within several days of grooming. In general, the public desires increased grooming frequency due to the trail roughness.

Approximately 6 miles of cross-country skiing trails are marked and maintained by the Forest Service in the Salt Pass area. This maintenance includes breaking and compacting trail and utilizing a drag; cross-country ski tracks are not set. (See snowmobile trail map).

Table 4-9. Existing Snowmobile Trails Within the Assessment Area

State Designated Trail	Total Miles	LSA Area Miles	Status	Remarks
A	96	23	Groomed, scheduled, signed, maintained	Access from Salt Creek Pass to Commissary Ridge, LaBarge Meadows, and the headwaters of the Greys River
B	59	19	Groomed, scheduled, signed, maintained	Access from Lake Viva Naughton to trails F, J, P, Nugent Park, Kelly Guard Station and Dry Fork to Trail A.
F	17	17	Groomed, scheduled, signed, maintained	Trail B loop trail accessing Big Park (play area) and 4 undesignated trails
G	2	2	Groomed, scheduled, signed, maintained	Link trail from Trail F to Hams Fork Campground and 3 undesignated trails
H	54	17	Groomed, scheduled, signed, maintained	Access from Snider Basin into LaBarge Measows, headwaters of Greys River, and Trail A
J	11	7	Groomed, scheduled,, signed maintained	Access from Trail B (Mayfields) to Trail F (near Basin Creek)
L	16	9	Groomed, UM scheduled, signed maintained	Access up LaBarge Creek to Trail H.
P	5	0	Groomed scheduled, signed maintained.	Access from Pine Creek Ski area to Trail B near Forest boundary.
Subtotal	260	94		Subtotal
Hams Fork	20	7	Marked, ungroomed maintained.	Access from Beaver Trail Head to Trail G about 60% of all users use this trail in place of using Trail B to access the high country.
Commissary Ridge	34	25	Marked, ungroomed not maintained.	Low use trail that follows Commissary Ridge from the Beaver Creek Trail Head to Fontenelle Lakes.
Indian Creek	10	7 3	Marked, groomed, unscheduled maintained. Marked, ungroomed maintained.	Access to popular play area and Commissary Ridge Trail. Also accesses Indian Creek Cabin.
Elk Creek	9	9	Marked, maintained	Access to popular play area and Commissary Ridge Trail. Also accesses Indian Creek Cabin.
Big Park-Red Park	11	11	Not marked, not maintained.	Link between Trail F (Big Park) and Commissary Ridge Trail, Red Park is a popular play area. Low use, very experienced riders.
Sawmill-West Fork	7	7	Not marked, not maintained.	Low use, high experience level trail within the Trail F loop.

State Designated Trail	Total Miles	LSA Area Miles	Status	Remarks
A	96	23	Groomed, scheduled, signed, maintained	Access from Salt Creek Pass to Commissary Ridge, LaBarge Meadows, and the headwaters of the Greys River
Sams Creek-Lake Alice	13	13	Not marked, not maintained	Low use, high experience level avalanche hazard areas access from Trail B to Lake Alice.
Hobble Creek	7	7	Not marked, not maintained.	Link from Trail F (Big Park) to Hobble Creek (Sams Creek-Lake Alice Trail)
Sub total	111	89		
Grand Total	371	183		

Desired Conditions

The groomed trails are smooth, safe, and move the experienced and inexperienced rider through the majestic landscape of sculptured. Travel is restricted to designated routes through crucial big game winter range. There is a warming hut on the north end of Nugent Park and the north end of Big Park and a cabin at Elk Creek and at the head of Indian Creek. All the bridges on the groomed trails are wide enough to accommodate the groomer.

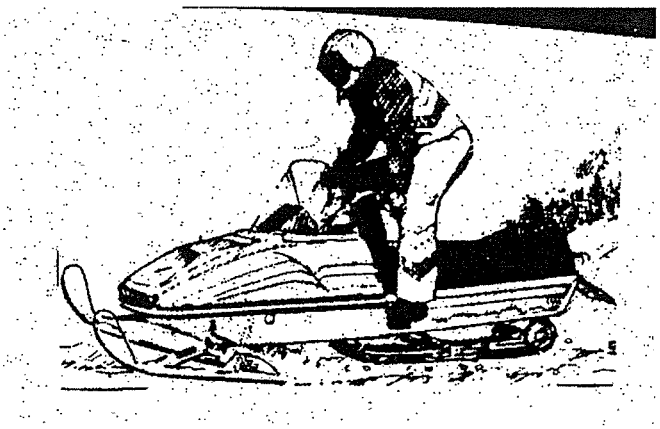

Table 4-10. Assessment Area Desired Conditions – Snowmobile Trails

State Designated Trail	Total Miles	LSA Area Miles	Status	Remarks
A	96	23	GS, S, M	Access from Salt Creek Pass to Commissary Ridge, LaBarge Meadows, and the headwaters of the Greys River
B	59	19	GS, S, M	Access from Lake Viva Naughton to trails F, J, P, Nugent Park, Kelly Guard Station and Dry Fork to Trail A. **A warming hut at Nugent Park.**
F	17	17	GS, S, M	Trail B loop trail accessing Big Park (play area) and 4 undesignated trails. **Warming hut at Big Pk.**
G	2	2	GS, S, M	Link trail from Trail F to Hams Fork Campground and 3 undesignated trails
H	54	17	GS, S, M	Access from Snider Basin into LaBarge Measows, headwaters of Greys River, and Trail A
J	11	7	GS, S, M	Access from Trail B (Mayfields) to Trail F (near Basin Creek)
L	16	9	GS, S, M	Access up LaBarge Creek to Trail H.
P	5	0	GS, S, M	Access from Pine Creek Ski area to Trail B near Forest boundary. (2)
(T) Hams Fk	20	7	GS, S, M	Access from Beaver trailhead to Trail G. (1)
(U) Indian Crk	10	7	GS, S, M	Access To popular play area and Commissary Ridge Trail. Accesses Indian Creek Cabin.
(V) Elk Crk	9	9	GS, S, M	Access to popular play area and Commissary Ridge Trail. Access to Indian Creek Cabin.
(W) Fontenlle	35	14	GS, S, M	Access from Pomery Basin TH to Trail L at LaBarge Crk
Subtotal	**334**	**131**		
Commissary Ridge	34	25	mk, ug, nm	Low use trail that follows Commissary Ridge from the Beaver Trailhead to Fontenelle Lakes.
Big Park-Red Park	11	11	mk, ug, nm	Link between Trail F (Big Park) and Commissary Ridge Trail, Red Park is a popular play area. Low use, very experienced riders.
Grindstone-West Fork	7	7	mk, ug, nm	Low use, high experience level trail within the Trail F loop.
Sams Creek-Lake Alice	13	13	mk, ug, nm	Low use, high experience level avalanche hazard areas access from Trail B to Lake Alice.
Hobble Creek	7	7	mk, ug, nm	Link from Trail F (Big Park) to Hobble Creek (Sams Creek-Lake Alice Trail)
Sub total	**72**	**72**		
Grand Total	**406**	**203**		

Status - GS = Groomed on a schedule, ie. once a week, twice a week, etc.
S = signed, directional and informational
M = maintained, Hazards removed, downfall removed, etc.
mk = marked, blazes, flags, paint, diamonds - no signs
ug = ungroomed, a groomer never goes over the trail.
nm = not maintained, no hazards removed, downfall left, not cleared.

(1) - Groomed trail goes through moose winter range, snowmobile travel is resticted to groomed trail.

(2) - Groomed trail goes through moose winter range, snowmobile travel restricted to groomed trail and travel permitted only between the hours of 8 am and 4pm.

Environmental Education

Reference Condition
The Kemmerer District staff has been involved in various, but limited, environmental education efforts in the past. The Boy Scouts, through different projects, have improved facilities at Big Springs and Crystal Lake and managed an aspen stand at the East Fork of the Hams Fork. An educational video and projects focusing on the Lander Trail were created. Fire prevention and ecology programs have also taken place in schools near the analysis area. Other efforts have taken place sporadically through the years.

Existing Conditions
Beginning in 1994, an ongoing program has taken place where Kemmerer Middle School (KMS) 6th graders, with Forest Service specialists, develop a management plan for the KMS Middle School Demonstration Forest. This project takes place on 600 acres in the Hams Fork drainage along Elk Creek. Once the management plan is developed with resource specialists from the Forest Service, it is presented by the children to the signing official and public. After being accepted and signed by the forest official, projects are chosen and NEPA is implemented. After this process is completed, the students, teachers, and forest specialists gather at the site and implement the projects selected.

Desired Condition
The Kemmerer Middle School Demonstration Forest continues to be an ongoing project between the Kemmerer Middle School and the Bridger-Teton National Forest. There are IE programs from K-12th grade and for the adults in the community. There are IE (campfire) talks scheduled in all the campgrounds.

Heritage Resources

Reference and Existing Conditions
Heritage Resources include prehistoric sites, historic sites, and traditional cultural properties. These sites are collectively known as historic properties. The Forest Service is mandated by the National Historic Preservation Act (NHPA), as amended, to take into account the effect an undertaking will have on historic properties. In addition, the Goals and Objectives outlined in the Forest Plan for Heritage Resources call for the study and interpretation of historic and prehistoric sites for the public, and to find and protect heritage resources so that their scientific, historic, and social values are retained.

Within the study area a total of 49 heritage resources have been recorded. Of these, 25 are prehistoric sites while the remaining 24 are historic. A majority of the prehistoric sites are small lithic scatters indicative of temporary campsites utilized by nomadic hunters and gatherers. Artifacts recovered from these sites suggest that most of them date to the last 3,000 of prehistoric; however, one site contained material suggesting an age of over 8,000 years.

Historic sites are generally more visible than prehistoric sites. A number of historic structures are located in the study area, including the Scaler, Kelly, LaBarge and Elk Creek Guard Stations. A number of deteriorating cabin remains are also present, which are generally related to early tie hack or trapping operations. A number of old saw dust and slash piles related to tie hack operations can

also be found in the study area. The Lander Cut-off of the Oregon Trail also traverses the assessment area. There are a number of locations where trail ruts, graves, and the names and dates of emigrants carved on trees can still be seen along the trail.

Desired Condition
All archeological and historical sites are protected, excavated, inventoried, and interpreted.

The Lander Trail is a special historical item that is protected, all known graves are marked and there is information and interpretation at various points along the trail. A special interpretive display is located at the LaBarge Campground.

Public Comments and Issues

Since 1991 the Kemmerer Ranger District has been developing plans to implement the Bridger-Teton National Forest Land and Resource Management Plan (Forest Plan). The following comments were received concerning earlier plan implementation efforts. Five Plan Implementation Studies were initiated including:

- LaBarge Creek, 1991
- Fontenelle/Devils Hole, 1996
- Lake Alice/Smiths For, 1993
- Hams Fork, 1996
- Management Area 12, 1997

The underlying purpose of these plant implementation studies was to examine resource conditions within the planning unit and determine what projects were needed to bridge the gap between the desired condition for a particular resource and their respective existing conditions. One public meeting was conducted during the LSA process and those comments have also been included in the summary. A second public meeting is scheduled to present findings from the LSA.

Many comments were received from the public. Those comments have been summarized and are displayed in **Table 4-11**.

Table 4-11. Summary of Public and Agency Comments for the LSA Process

Planning Area	General Natural Resource Subject	Specific Resource Concern/Comment
Fontenelle/ Devils Hole	Cultural Resources	Protection of prehistoric and historic sites
	Utilities and Pipelines	Providing access to utility corridors Concern about feasibility of Forest Plan standard to bury new powerlines on the Bridger-Teton NF
	Range Management	Administration of allotment appears to be adequate Restrict domestic livestock in DFC 12 (wildlife emphasis)
	Wildlife Management	Wyoming Game and Fish requests to be involved in planning and implementation of projects that occur in DFCs 2A, 10, and 12 Identified elk calving area and crucial moose winter ranges
	Fisheries Management	Identified Colorado cutthroat trout streams and recommended habitat improvement projects
	Water Quality	Sedimentation from road construction
	Transportation System	Protection of backcountry for wildlife Reduce roads in DFC 12
	Land Management	Support of multiple- use on public lands: Domestic livestock and timber sales
	Mineral Management	Provide for oil and gas and mining operations
	Recreation	Protect backcountry for recreation
Lake Alice/ Smiths Fork	Vegetation Management	Sagebrush burns Fire management plan Firewood sales
	Recreation Management	Snowmobile trails - increase Hosrseback riding Fishing Opportunities Llama use Allred Flats Concessionaire
	Range Management	LaBarge Allotment Sams/Allen Allotment
	Wildlife Management	Elk winter and calving range
	Transportation System	Road closure re-evaluation
	Water Quality	Protect aquatic habitat
Hams Fork	Mineral Management	Provide for oil and gas and mining operations
	Water Quality	Protect aquatic habitat Protect wetlands
	Wildlife Management	Protect endangered species Protect elk habitat Elk winter and calving range
	Recreation	Trail rides

Planning Area	General Natural Resource Subject	Specific Resource Concern/Comment
	Management	Llama use on Lander Trail Fishing opportunities Snowmobile trails - increase
	Vegetation Management	Small timber sale opportunities Firewood sales Sagebrush burns Fire management plan
	Transportation System	Road closure re-evaluation
	Cultural Resources	Protection of prehistoric and historic sites
MA 12	Cultural Resources	Protection of prehistoric and historic sites
	Wildlife Management	Survey Threatened, Endangered, Sensitive and Management Indicator Species (2) Protect wildlife security areas from oil and gas development (2) Concern for non-game species from impacts from recreation
	Vegetation Management	Need an old growth survey to ensure old-growth-dependent species have enough habitat. (2) Need aspen community inventory Noxious weed documentation and projects Livestock overgrazing in riparian areas and winter range is a problem Consider historic range of variability of insects and disease and stay within it (2) Existing fuel loadings vs. historic fuel loadings should be examined What is the potential for catastrophic wildfire?
	Watershed	Coordinate with WYDEQ for TMDL study (2) Analysis should include riparian health (2) Analysis should discuss fisheries' health (2) Analysis should discuss Clean Water Act's anti-degradation requirements (2)
	Transportation	Consider roads' impact on watershed (2)
	Air Quality	What is status of air quality monitoring? (2)

Chapter 5 – Summary of Resource Concerns, Desired Conditions, and Project Identification

Resource Concerns

The process permitted the assessment team to look at all resources within the assessment area and integrate resource concerns to formulate potential solutions. Three key areas that are crucial to conducting balanced ecosystem management within the assessment area:

- Vegetation Management
- Recreation Management
- Transportation System

Vegetation Management is divided into two broad categories, i.e., non-forested and forested vegetation types.

Non-forested vegetative types consist of mountain shrub, sagebrush, grass, riparian and mountain mahogany. The assessment concentrated on livestock management and administrative issues including noxious weeds. All allotment management plans need to be revised over the next ten years. Many of the allotment stocking numbers were established in the 1950s and have not been revised even though the amount of available forage has steadily decreased. The primary cause of forage reduction is the loss of early and mid-seral plant communities. Fire suppression has played a significant role in the shift in the age of the non-forested vegetation.

Forested vegetative types consist of lodgepole pine, Engelmann spruce/subalpine fir, Douglas fir, limber pine/whitebark pine, and aspen. As with the non-forested vegetation discussion, the age-class distribution is out of balance with historic age class, i.e., predominately old age classes. The early and mid-seral age classes are associated with recent fire events and clearcut areas. Earlier discussions provide a description of past management and the challenges ahead **(See Table 3-2.)** Summary of Existing Vegetation Types and Potential Treatments). Fire suppression is the primary cause of the imbalance of the age types. The Resource Concerns Chart provides an in-depth review of associated resource concerns, causes, ecological/social processes and resources at risk.

Recreation Management/Transportation System

Recreation management has several aspects: resource damage from increasing dispersed camping, increasing illegal OHV use, and an increasing occurrence of illegal roads. Generally, increases in recreation visitors on the Forest have strained the existing infrastructure and maintenance funds have not kept up with the user demand. Dispersed camping sites are being occupied earlier and visitors are staying longer, giving the associated natural resources fewer and fewer days to recover. Of increasing concern, is the lack of law enforcement, especially within the arena of regulation of designated travel routes.

The transportation system has come under scrutiny over the last eight years. Many of the existing roads were never properly engineered to protect off roadway resources. Associated safety concerns exist especially in the spring and during rain events when roads are slick and recovery areas absent. Over the past three years some progress has been made to add surfacing to the transportation system

roadways along with some relocation. The Resource Concerns Chart provides an in-depth review of associated resource concerns, causes, ecological/social processes and resources at risk.

Desired Conditions

Landscape scale DCs were developed by the assessment team. They are broad and are meant to provide overall direction of the LSA. They are:

- Vegetation: Age class distribution is within the BTNF properly Functioning Condition age distribution.

- Recreation: Dispersed camping does not degrade resources and provides a high quality experience.
  Campgrounds meet current national standards

- Transportation System: All system roads comply with Forest Service standards.
  Motorized use occurs on designated routes.
  A variety of motorized recreation opportunities is provided.

- Watershed: Maintain integrity of water systems, aquatic habitat, soil quality, and terrestrial ecosystems.
  All watersheds are fully functional.

The Summary of Resource Concerns (**Table 5-1**) provides an in-depth review of associated resource concerns, causes, ecological/social processes, and resources at risk.

Commissary Ridge/Tunp Range LSA
Table 5-1. Summary of Resource Concerns

Resource Concerns Recreation	Causes	Ecological/Social Processes	Resource @ Risk	Desired Conditions
Dispersed Camping	• People want to get closer to nature • Privacy/Control • Campgrounds don't meet users' needs • Livestock use not accommodated	• Riparian area impacts • Concentrated use in popular sites: compaction, erosion (trails to water), waste • Vegetation trampling/scarring • Tree cutting, nails • Hunting season: hard to find sites to use • Assoc OHV Trails	• Vegetation loss* • Water quality • Lack of FS regulation *Minor compared to grazing, timber	• Dispersed camping does not degrade resources and provides a high quality recreation experience. • Campground meet current national standards.
Illegal OHV	• No designated trails • More OHVs • Increased capability to use OHVs • No barriers/signs • Lack of legal opportunity • No legal place to go: back-country closed/Roads strict requirements • Two-tracks OK if forest development road has road #: Street Legal (Not enforced on two-tracks) • Displacement from other areas • Anti-OHV (horse-bias)-Agency/Forest/Not LSA?	• Non-motor folks upset • Forces people to a life of crime • Losing hydrologic function • Wildlife distribution • Hunting patterns	• Vegetation • Wildlife (Noise/presence) • Recreation experience • Soil	• Opportunities are provided for OHV use.
Legal Roads/Illegal Roads (more closed roads, more pioneered roads)	• More SUVs • Freedom • Lack of education, enforcement, signing • Displacement from enforced closed areas • Controversial to enforce (Politically too sensitive)	• See Illegal OHV • Bigger vehicle impact • Technical ability of vehicles	• See Illegal OHV	• All system roads are at Forest Service standards. • Motorized use is occurring only on designated routes. • A variety of motorized recreation opportunities is provided.

Commissary Ridge/Tunp Range LSA
Table 5-1 cont…Summary of Resource Concerns

Resource Concerns Vegetation	Causes	Ecological/Social Processes	Resource @ Risk	Desired Conditions
Decrease Aspen	• Lack of disturbance (fire suppression) • Conifer encroachment	• Late seral succession • Change in fire behavior • Potentially larger, bigger fires • Change in community/ habitat type • Changing soil types • Biological diversity: Lynx, Owls, Grouse, Goshawk • Change in transitional ranges	• Aspen • Recreation Experience • Biodiversity	The age class distribution is within the Forest PFC.
Increase Vegetation Older Age Class	• Lack of disturbance (fire suppression) • Conifer encroachment	• See Aspen • Increase insect and disease • Old-growth species benefit/others loss • In or out of historic range of variance • Potential for larger fire • Big successional change • Change in hydrography/effects riparian communities and stream dynamics	• Vegetation	The age class distribution is within the Forest PFC for each vegetation community.
Increase Age Class Sagebrush/decrease in grass forb	• Lack of disturbance (fire suppression) • Conifer encroachment • Grazing: reduction of • vigor of forbs/grasses • Consumption of "fines" reduces fire spread	• Crown fire with longer fire frequency and/or where fire fuels present • Accelerated soil erosion	• Grassland community	The age class distribution is within the Forest PFC.

Commissary Ridge/Tunp Range LSA
Table 5-1 cont…Summary of Resource Concerns

Resource Concerns Vegetation	Causes	Ecological/Social Processes	Resource @ Risk	Desired Conditions
Increase of Noxious Weeds and undesired species	• Vehicle access • Livestock and stock feed • Disturbance: roadside, harvest sites fire and landslides areas	• Disturbance ecology (regimes)	•Native Biodiversity •Watershed stability	1999 Noxious Weed EA is implemented.
Wood products decreasing	• Change is management direction • Changing social values • Past management	• Changing Social Values • Woody biomass cycling	• Local (Regional) economy • Lifestyle • Local timber receipts • Infrastructure • Loss of tool in "Tool Box"	A variety of forest products are provided.
Fire Frequency: size/intensity	• Suppression • Social Values: protect timber, watershed • Lack of expertise • No guts!	• Disturbance ecology • Succession • See Age class	• Biodiversity • Watershed Stability • Hydrologic function	Fire plays its ecological role within management constraints.
Aquatic habitat degraded	• Increased sedimentation • Roads located too close to stream reaches and stream crossings limiting fish passage • Overgrazing	• Accelerated soil erosion • Steep topography • Declining fish habitat complexity	• Water Quality • Aquatic Habitat • Increase in indigenous fish extinction •Increase in non-native fish populations	Water quality meets Wyoming DEQ surface water beneficial use designation Native indigenous fish populations viable and sustainable

Project Identification

The project identification phase of the assessment focused on watershed areas within the Commissary Ridge and Tunp Range subsections. Resource concerns were reviewed for each of four broad watersheds Labarge Creek, Fontenelle Creek, Hams Fork and Smiths Fork. These watersheds were prioritized for treatment areas. Broad DCs were defined and prioritized for each of the resource concerns within the watershed and projects identified to address resource deficiencies. **Figure 5-2** displays LSA areawide projects, while **Figures 5-3, 5-4, 5-5, 5-6** break down the watersheds by priority.

Figure 5-2. LSA Areawide Resource Projects

LSA Area Desired Conditions	Resource Project *Listed in Priority by Resource Area*
Vegetation: Age class distribution is with BTNF Properly Functioning Condition age distribution	***Vegetation:*** *1.* Develop a Fire Management Plan for the assessment area. Amend Forest Plan standards and guidelines to allow wildland fire use (resource management of unscheduled natural ignitions) in all areas of the LSA. After Forest plan amendment, revise Forest Fire Management Plan to allow managers to use natural fires for resource benefit. **Purpose and Need:** Naturally occurring wildland fires are recognized as an important disturbance in the assessment area and could be managed to move the plan area closer to properly functioning condition. Current Forest Plan standards and guidelines do not specifically allow natural ignitions occurring outside of wilderness to be managed for resource benefit and should be amended. *2.* Conduct old-growth surveys. Delineated old-growth stands within the assessment area have not been verified since the approval of the Forest Plan, 1990. Inventories will be conducted to validate old-growth designation of forest. **Purpose and Need:** Forest Plan designated old-growth stands were identified to protect associated wildlife species for Biodiversity conservation. Inventory will validate assumptions associated with the Forest Plan process. Any adjustments will be recommended and refined for inclusion in the Forest Plan revision process. *3.* Conduct TES surveys. Surveys for some species are required for ground-disturbing projects. Getting ahead of proposed projects will facilitate future project implementation. Surveys have not been conducted for some species and little information is available on their distribution. **Purpose and Need:** As required by the Endangered Species Act, threatened, endangered, and sensitive species surveys are required prior to ground-disturbing activities. These inventories, if conducted prior to project proposals, will ensure that recognized species will be protected and projects can be implemented in a timely manner. *4.* Select and monitor Ecological Indicator Species. Forest Plan recognized the need for Ecological Indicator Species to assist land managers by monitoring important species whose purpose is to provide indications of ecosystem health. **Purpose and Need:** Maintaining the health of an ecosystem is essential to sound land stewardship. Monitoring of Ecological Indicator Species for various vegetation types is specified in the Forest Plan, 1990 and will assist in the determination of overall resource conditions, especially in light of the upcoming Forest Plan revision process. *5.* Review snag guidelines for adequacy in protecting TES species. **Purpose and Need:** The Endangered Species Act requires TES species be protected during ground-disturbing activities, specifically removal of timber. Snag guidelines will be reviewed to ensure that associated TES species are adequately protected.

Figure 5-2. LSA Areawide Resource Projects Cont…

LSA Area Desired Conditions	Resource Project *Listed in Priority by Resource Area*
Vegetation, cont…	*6.* Update noxious weed inventories and implement Noxious Weed EIS. **Purpose and Need:** Implementation of the Noxious Weed EIS requires an accurate inventory of noxious weeds. Information collected across the analysis area will be incorporated into the Forest GIS along with the annual program of work for noxious weed treatment.
Wildlife:	***Wildlife:*** **1.** Review the predator control program. **Purpose and Need:** The Forest Plan, 1990 contains an animal-caused damage control standard. The standard requires the Forest to review APHIS control activities. The Forest will resolve concerns about compliance with the standard. **2.** Update elk parturition range database. **Purpose and Need:** The Forest database is incomplete. Elk are sensitive to disturbance during calving. A complete database is important for protecting these areas.
Fisheries/Watershed: Maintain integrity of water systems, aquatic habitat, soil quality, and terrestrial ecosystems All watersheds are fully functional	***Fisheries/ Watershed:*** **1.** Pre-project assessment of potential aquatic impacts is mandatory. **Purpose and Need:** Proposed projects that have potential to impact aquatic habitats by increasing stream sedimentation, removing of streamside vegetation, or modifying channel profile are evaluated and fully mitigated prior to project implementation. Examples of projects include road construction or reconstruction, bridge and culvert replacements, prescribed fire, other vegetation treatments, timber harvest, range improvements, etc. **2.** Ensure existing range utilization standards are implemented. **Purpose and Need:** Monitoring of existing Forest Plan range utilization standards is necessary to protect soils, water, and aquatic resources. When utilization standards are exceeded, long-term aquatic impacts are expected. Where bank damage has or is occurring, require a minimum 6-inch streamside stubble height until banks are fully recovered. Research has shown that channel characteristics move closer to those beneficial to salmonid fisheries when a minimum residual 6-inch stubble height is present at the end of the grazing period (Clary 1999). Where uplands grazing has removed the protecting vegetation layers, livestock should be removed when bare ground is 25 percent or greater. Funding source is NFIM, inventory and monitoring. **3.** Eliminate point sediment sources from Forest roads. **Purpose and Need:** Watershed, soils, and engineering personnel should coordinate to correct sediment from entering live streams at crossings. Cross drainage, vegetative filters, settling ponds, and proper road maintenance practices would eliminate an estimated 95 percent of the point sediment sources. **4.** Mitigate channel modifications. **Purpose and Need:** Fully mitigate channel modifications and loss of riparian habitats by removal of roads from streamside locations and restoration of damaged stream channels. Where road removal is not practical, instream rehabilitation of damaged channels could be investigated as mitigation.

Figure 5-2. LSA Areawide Resource Projects Cont…

LSA Area Desired Conditions	Resource Project *Listed in Priority by Resource Area*
Fisheries/ Watershed: Maintain integrity of water systems, aquatic habitat, soil quality, and terrestrial ecosystems All watersheds are fully functional	***Fisheries/ Watershed (coninued):*** **5**. Protect fish movement and reconnect populations. **Purpose and Need:** We have reduced native trout populations by fragmenting salmonid populations through inadvertently creating barriers to fish passage. In the case of the Colorado River cutthroat trout, some of these fish barriers may be beneficial in the short term by restricting non-native trout movement into headwaters where native fishes reside. The Bonneville cutthroat trout are not subject to the same pressures from non-native trout and should have connected populations within the Forest. Evaluation of crossings within the analysis area indicates that 21 stream crossings are fish migration barriers and should be considered for replacement immediately **(Appendix -).** **6**. Encourage the State to adopt fishing regulations that could encourage removal of non-native trout from identified restoration watersheds. **Purpose and Need:** The State of Wyoming has special regulations to protect native cutthroat trout on almost all streams and lakes within the LSA area, and non-native trout harvest is limited to 6 fish per day in these waters. Elimination of all non-native trout could be encouraged by changing regulations to allow unlimited harvest of non-native trout within the special regulation areas. **7**. Validate viability model parameters. **Purpose and Need:** Analyzing native cutthroat viability in relation to aquatic and biotic conditions may enhance decisions on fish management and forest planning. Research has provided fisheries managers with the theory and tools in the form of viability assessment procedures (Lee and Rieman 1997). However, there is high degree of uncertainty in the model input nodes used in BayVAM, a Bayesian Viability Assessment Model. This model could be a useful tool in assessing existing status of native cutthroat trout populations provided the model inputs were validated. **8**. Complete watershed assessments. **Purpose and Need:** Detailed assessment at the watershed scale would identify the hydrologic, soil, vegetation, and biological conditions in sufficient detail to implement defensible changes in management strategies. Additional soil and water restoration projects, allotment management plan revision, and monitoring would be the expected products. Schedule watershed assessment based upon native cutthroat trout species conservation agreement priorities (in progress) and implement following interagency framework (McCammon et al 1998). **9**. Amend Forest Plan to include fisheries restoration and conservation desired conditions. **Purpose and Need:** Continued persistence of native fish populations may require additional actions and protection measures than those listed in the current (1990) Forest Plan. A recommended project is to amend the Forest Plan to recognize areas of special management to preserve and restore the last remaining strongholds of the Colorado River and Bonneville cutthroat trout and their habitats. These conservation and restoration watersheds would be amended into the Forest Plan with specific goals, objective, standards, and guidelines to each watershed. High priority watershed for conservation designation in the Kemmerer LSA is the Upper Smiths Fork; Thomas Fork and LaBarge watersheds are recommended for restoration designation **(Figure 16)**. **10.** Allotment Management plan review and revision. **Purpose and Need:** Forest allotment plan revision schedule reflects that allotments containing Colorado River and Bonneville cutthroat trout are the top priority for revision. Review of existing allotment management plans (AMP), annual operating plans, and monitoring reports and amend AMP upon completion of conservation agreements.

Figure 5-3. Green River Basin/LaBarge Creek Watershed – 1st priority Area

LSA Area Desired Conditions	Resource Project *Listed in Priority*
Vegetation: Age class distribution is with BTNF Properly Functioning Condition age distribution	***Vegetation:*** **1.** Develop LaBarge Allotment Management Plan to establish stocking numbers that ensure long-term species diversity and proper forage utilization. **Purpose and Need:** There is no AMP for LaBarge Allotment; we desire to take actions to protect Colorado cutthroat trout, assuming listing is eminent; there appears to be a decline in species diversity and forage production; density of sagebrush is increasing. *2.* Reduce sagebrush density in the Big Fall Creek, Little Hornet Creek, Turkey Creek, Bald Hornet Creek, Coyote Park Creek areas from 40% canopy cover to 25%. **Purpose and Need:** Increase early and mid-seral sagebrush habitat types to enhance age diversity and improve forage production. *3.* Inventory all DFC 1B and other project areas to determine treatment needs, including insect & disease (mountain pine beetle) in the LaBarge Creek drainage. **Purpose and Need:** Update timber stand inventories to determine future management opportunities for commercial harvest, promote forest productivity, and reduce fire severity. *4.* Rejuvenate lodgepole pine, spruce-fir, and mixed conifer stands in the Turkey Creek, Sheep Creek, Pack Saddle Creek, and Deadline Ridge areas to younger age class types for Biodiversity enhancement, to reduce fuel accumulation, and to bring age class distribution in-line with the BTNF Properly Functioning Condition age distribution: 10 - 20% Seedling/Sapling, 40% Young/Mid-aged, 40% Mature/Old age. Priority treatment areas: DFC 1B, DFC 10, and/or areas treated > 20 years ago. **Purpose and Need:** Increase early and mid-seral lodgepole community types to enhance age class diversity and reduce fuel loadings. **On-going**: Complete Little Hornet Timber Sale *5.* Rejuvenate limber pine dominated stands in the upper LaBarge area above LaBarge Guard Station to create a balanced range of stand structures, sizes, and age classes. The balanced range: 10 - 20% seedling/sapling, 30 - 50% young, mid, and mature, 20 - 40% old forest. **Purpose and Need:** Most limber pine stands are in the older age classes and regeneration is not occurring fast enough to retain this community type. *6.* Provide for commodity extraction, i.e., post and poles, firewood, timber sales, Christmas trees, to meet resource objectives and provide for local public needs. **Purpose and Need:** There is a demand for wood products especially pole and posts. The current density of lodgepole pine in old clearcut areas is higher than what would occur naturally, and the condition of individual trees and fuel loading are of concern. By treating these closed-canopy, young forests, the vigor of stands will be improved and products will be available to the local public. *7.* Inventory aspen clones throughout the LaBarge drainage. **Purpose and Need:** Current information does not provide knowledge necessary to determine what treatments would be appropriate to create the desired effects. The inventory would provide better resolution of management prescriptions. *8.* Rejuvenate aspen clones for elk parturition and migration areas in the Big Fall Creek area. **Purpose and Need:** Since the early 1900s aspen has become conifer encroached and is dominated by older aged, more decadent stands which have contributed to a decrease in wildlife habitat quality for species such as deer, elk, and neotropical birds.

Figure 5-3. Green River Basin/LaBarge Creek Watershed – 1st priority Area Cont…

LSA Area Desired Conditions	Resource Project *Listed in Priority*
Transportation System: All system roads are at Forest Service standards Motorized use occurs on designated routes A variety of motorized recreation opportunities is provided ***Recreation:*** Dispersed camping does not degrade resources and provides a high quality experience Campgrounds meet current national standards ***Watershed:*** Maintain integrity of water systems, aquatic habitat, soil quality, and terrestrial ecosystems All watersheds are fully functional	***Transportation System:*** *9.* Reconstruct LaBarge Creek Road, gravel 14.6 miles: single lane with intervisible turnouts to provide safe access within the LaBarge Creek area that meets Forest Service standards and reduces off-road resource degradation. **Purpose and Need:** Existing maintenance on the LaBarge Creek Road is not adequate to provide for a safe running surface and protect off-roadway resources. Even with maintenance, the road subgrade, drainage structures, and road surface are inadequate to support current types and volumes of traffic. *10.* Relocate LaBarge Creek road in LaBarge Meadows to the northern bench. **Purpose and Need:** Current alignment of the LaBarge Creek Road crosses though the middle of LaBarge Meadows and in non-compliance with Forest Plan riparian and stream related standards and guidelines. This location damages riparian and wetland areas and contributes sediment into tributaries that flow into LaBarge Creek. The new route would comply with Forest Plan standards and guidelines and enhance water quality in the LaBarge Creek drainage. ***Recreation:*** *11.* Trail conditions are deteriorating due to a lack of stable trail maintenance funding and increasing visitor use, causing negative impacts to associated resources and visitor safety. (See **Table 4-8.** DC of Non-motorized, Snow-free Trails for specific needs.) **Purpose and Need:** Annual clearing and other maintenance, i.e., waterbars, stream crossings, is not keeping up with resource demands and visitor safety. A strategy is needed to determine which trails are needed to provide visitor and administrative access. Those trails that are not needed will be removed from the Forest trail system and rehabilitated. Open trails will be prioritized for maintenance needs. *12.* Evaluate where designated dispersed camp sites away from LaBarge Creek are needed. **Purpose and Need:** Dispersed camping is increasing in the LaBarge Creek area, especially along perennial steams. Resource damage is occurring in areas where soils are soft and prone to rutting and compaction. Forest Plan riparian and stream standards and guidelines prohibit resource damage within riparian areas and stream channels. *13.* Develop and implement Big Fall Creek Special Geologic Area recreation management plan. **Purpose and Need:** This popular recreation area has fallen into disrepair over that last few years. The access road is highly rutted with potholes and is the only motorized access into associated dispersed camping and day use sites. Water quality of Big Fall Creek is being degraded and road conditions are unsafe, especially for low clearance vehicles. *14.* Develop LaBarge Creek Campground at Trail Creek. **Purpose and Need:** The increase of dispersed camping along LaBarge Creek and other tributaries is degrading riparian areas and streambanks. An alternative site is needed to relieve visitor use in the LaBarge Creek drainage.

Figure 5-4. Green River Basin/ Fontenelle Creek Watershed – 2nd Priority Area

LSA Area Desired Conditions	Resource Project *Listed in Priority*
Transportation System: All system roads are at Forest Service standards Motorized use occurs on designated routes A variety of motorized recreation opportunities is provided ***Vegetation:*** Age class distribution is with BTNF Properly Functioning Condition age distribution	***Transportation System:*** *1.* Reconstruct Fontenelle Creek Road, gravel 13.6 miles: single lane with intervisible turnouts to provide safe access within the Fontenelle Creek area that meets Forest Service standards and reduces off-road resource degradation. **Purpose and Need:** Existing maintenance on the Fontenelle Creek Road is not adequate to provide for a safe running surface and protect off-roadway resources. Even with maintenance, the road subgrade, drainage structures, and road surface are inadequate to support current types and volumes of traffic. ***Vegetation:*** *2.* Reduce sagebrush density in the Pomeroy Basin and Little Fall Creek areas from 40% canopy cover to 25%. **Purpose and Need:** Increase early and mid-seral sagebrush habitat types to enhance age diversity and improve forage production. *3.* Inventory aspen clones throughout the Fontenelle Creek drainage. **Purpose and Need:** Current information does not provide knowledge necessary to determine what treatments would be appropriate to create the desired effects. The inventory would provide better resolution of management prescriptions. *4.* Rejuvenate aspen clones for elk parturition and migration areas in the Fontenelle Front and Indian Ridge areas. **Purpose and Need:** Since the early 1900s aspen has become conifer encroached and is dominated by older aged, more decadent stands which has contributed to a decrease in wildlife habitat quality for species such as deer, elk, and neotropical birds. *5.* Rejuvenate willow community types to enhance moose crucial winter range in the Fontenelle Creek bottomlands. **Purpose and Need:** Willows are showing signs of old age, i.e., dead branches and slow regrowth, and need to be treated to help restore their vigor and productivity. Fire has been successfully used in the past to help in their rejuvenation by removing decadent willow branches. Burning has also been shown to have a fertilizing effect on vegetation by releasing nitrogen and phosphorous held in organic debris. *6.* Develop Allotment Management Plans (AMP) in the Fontenelle Creek area to revise outdated AMPs that comply with Forest Plan standards and guidelines along with National Forest System Lands' regulations. The process will be expedited by grouping the AMPs into a cow/horse allotment environmental analysis and a sheep/goat allotment environmental analysis to take actions to protect Colorado cutthroat trout, assuming listing is eminent. **Purpose and Need:** Cow/horse allotments appear to be declining in species diversity and forage production with sagebrush density increasing. Sheep/goat allotments are showing signs of losing species diversity, increasing in bare ground, and decreasing forage productivity.

Figure 5-4. Green River Basin/ Fontenelle Creek Watershed – 2nd Priority Area Cont…

LSA Area Desired Conditions	Resource Project *Listed in Priority*
Recreation: Dispersed camping does not degrade resources and provides a high quality experience Campgrounds meet current national standards	***Recreation:*** *7.* Trail conditions are deteriorating due to a lack of stable trail maintenance funding and increasing visitor use, causing negative impacts to associated resources and visitor safety. _(See **Table 4-8.** DC of Non-motorized, Snow-free Trails for specific needs.) **Purpose and Need:** Annual clearing and other maintenance, i.e., waterbars, stream crossings, is not keeping up with resource demands and visitor safety. A strategy is needed to determine which trails are needed to provide visitor and administrative access. Those trails that are not needed will be removed from the Forest trail system and rehabilitated. Open trails will be prioritized for maintenance needs. *8.* Design and implement the Little Bear Creek trailhead. **Purpose and Need:** Resource damage is occurring in the riparian area where the current trailhead is located. With the increase in visitor use, the situation has also developed into a safety concern. The new facility will comply with Forest Plan recreation and riparian standards and guidelines and provide better information for the backcountry visitor. *9.* Resolve the trespass and lands issues in the Minnie Holden Creek area. **Purpose and Need:** Forest Service regulations require the resolution of trespass issues in an expeditious manner. The cabin in question has been in violation for a number of years. Previous discussions with the owner have not resolved the problem.

Figure 5-5. Green River Basin/ Hams Fork Watershed – 3rd Priority Area

LSA Area Desired Conditions	Resource Project Listed in priority
Vegetation: Age class distribution is with BTNF Properly Functioning Condition age distribution ***Watershed:*** Maintain integrity of water systems, aquatic habitat, soil quality, and terrestrial ecosystems All watersheds are fully functional	***Vegetation:*** *1.* Inventory aspen clones throughout the Hams Fork drainage. **Purpose and Need:** Current information does not provide knowledge necessary to determine whether what treatments would be appropriate to create desired effects. The inventory would provide better resolution of management prescriptions. *2.* Rejuvenate aspen clones for elk parturition and migration areas in the in the Hams Fork, West Fork and Basin Creek areas. **Purpose and Need:** Since the early 1900s aspen has become conifer encroached and is dominated by older aged, more decadent stands which have contributed to a decrease in wildlife habitat quality for species such as deer, elk, and neotropical birds. *3.* Reduce sagebrush density in the Hams Fork and West Fork areas from 40% canopy cover to 25%. **Purpose and Need:** Increase early and mid-seral sagebrush habitat types to enhance age diversity and improve forage production. *4.* Inventory all DFC 1B and other project areas to determine treatment needs, including insect and disease (mountain pine beetle) in the Big Park and Nugent Park areas. **Purpose and Need:** Update timber stand inventories to determine future management opportunities for commercial harvest, promote forest productivity, and reduce fire severity. *5.* Rejuvenate lodgepole pine, spruce-fir, and mixed conifer stands in the Big Park and Nugent Park areas to younger age class types for Biodiversity enhancement, reduced fuel accumulation, and bringing age class distribution in line with the BTNF Properly Functioning Condition age distribution: 10 - 20% Seedling/Sapling, 40% Young/Mid-aged, 40% Mature/Old age. **Purpose and Need:** Increase early and mid-seral lodgepole community types to enhance age class diversity and reduce fuel loadings. *6.* Develop Allotment Management Plans (AMP) in the Hams Fork area to revise outdated AMPs that comply with Forest Plan standards and guidelines along with National Forest System Lands' regulations. The process will be expedited by grouping the AMPs into a cow/horse allotment environmental analysis and a sheep/goat allotment environmental analysis to take actions to protect Colorado cutthroat trout, assuming listing is eminent. **Purpose and Need:** Cow/horse allotments appear to be declining in species diversity and forage production with sagebrush density increasing. Sheep/goat allotments are showing signs of losing species diversity, increasing in bare ground, and decreasing in forage productivity.
Recreation: Dispersed camping does not degrade resources and provides a high quality experience Campgrounds meet current national standard	***Recreation:*** *7.* Trail conditions are deteriorating due to a lack of stable trail maintenance funding and increasing visitor use, causing negative impacts to associated resources and visitor safety. (See **Table 4-8** DC of Non-motorized, Snow-free Trails for specific needs.) **Purpose and Need:** Annual clearing and other maintenance, i.e., waterbars, stream crossings, is not keeping up with resource demands and visitor safety. A strategy is needed to determine which trails are needed to provide visitor and administrative access. Those trails that are not needed will be removed from the Forest trail system and rehabilitated. Open trails will be prioritized for maintenance needs.

Figure 5-5. Green River Basin/ Hams Fork Watershed – 3rd Priority Area Cont…

LSA Area Desired Conditions	Resource Project *Listed in priority*
Recreation: Dispersed camping does not degrade resources and provides a high quality experience	*8.* Maintain and enhance existing winter recreation opportunities while meeting other resource objectives. (See **Table 4-10.** DC for Snowmobile Trails for specific needs.) **Purpose and Need:** Visitor use is increasing and their safety is a growing concern. Wildlife impacts from increased snowmobile use are also a concern. Warming huts are needed to provide for emergency situations and to provide for visitor comfort.
Campgrounds meet current national standard	*9.* Maintain and enhance existing campground and picnic facilities while meeting other resource objectives. **Purpose and Need:** Hams Fork Campground is antiquated and currently does not meet visitor needs, especially the larger mobile homes and recreational vehicles. Campsites and access need to be reviewed and adjusted where needed to ensure adequate turning radiuses. The water system also needs to be updated to ensure the pumping mechanism is easily used by the Forest visitor.
	10. Off-highway Vehicle (OHV) trails will be designated in areas in the assessment area, e.g., Nugent Park and Big Park areas, and will incorporate associated resource protection. **Purpose and Need:** OHV use is increasing and is a popular recreational activity in the LSA area. Although the current travel management plan provides vehicular access by licensed and properly equipped vehicles, there are no designated trails identified for OHV use.
Transportation System: All system roads are at Forest Service standards	***Transportation System:***
Motorized use occurs on designated routes	*11.* Reconstruct Hams Fork Road, gravel 19.6 miles: single lane with intervisible turnouts to provide safe access within the Fontenelle Creek area that meets Forest Service standards and reduces off-road resource degradation. **Purpose and Need:** Existing maintenance on the Fontenelle Creek Road is not adequate to provide for a safe running surface and protect off-roadway resources. Even with maintenance, the road subgrade, drainage structures, and road surface are inadequate to support current types and volumes of traffic.
A variety of motorized recreation opportunities is provided	*12.* Reconstruct Nugent Park Road, gravel 7.3 miles: single lane with intervisible turnouts to provide safe access within the Fontenelle Creek area that meets Forest Service standards and reduces Off-road resource degradation. **Purpose and Need:** Existing maintenance on the Fontenelle Creek Road is not adequate to provide for a safe running surface and protect off-roadway resources. Even with maintenance, the road subgrade, drainage structures, and road surface are inadequate to support current types and volumes of traffic.

Figure 5-6. Bear River Basin/Smiths Fork Watershed - 4th Priority Area

LSA Area DCs	**Resource Project** *Listed in Priority*
Vegetation: Age class distribution is with BTNF Properly Functioning Condition age distribution ***Watershed:*** Maintain integrity of water systems, aquatic habitat, soil quality, and terrestrial ecosystems All watersheds are fully functional	***Vegetation*** *1.* Rejuvenate willow community types to enhance streambank stability and riparian zones in the Smiths Fork, Salt Creek, Dry Fork, Porcupine Creek drainages in concert with the Bonneville cutthroat trout conservation strategy. **Purpose and Need:** Willows within the riparian zones are showing signs of deterioration and old age, i.e., dead branches and slow regrowth, and need to be treated to help restore their vigor and productivity. Fire has been successfully used in the past to help in their rejuvenation by removing decadent willow branches. Burning has also been shown to have a fertilizing effect on vegetation by releasing nitrogen and phosphorous held in organic debris. *2.* Reduce sagebrush density in the Salt Creek, Tunp Ridge, Dry Fork, and Hobble Creek areas from 40% canopy cover to 25%. **Purpose and Need:** Increase early and mid-seral sagebrush habitat types to enhance age diversity and improve forage production. *3.* Inventory aspen clones throughout the Salt Creek, Tunp Ridge, Dry Fork, and Hobble Creek areas. **Purpose and Need:** Current information does not provide knowledge necessary to determine what treatments would be appropriate to create desired effects. The inventory will provide better resolution of management prescriptions. *4.* Rejuvenate aspen clones for elk parturition and migration areas in the in the Tunp Ridge, Dry Fork, and Hobble Creek areas. **Purpose and Need:** Since the early 1900s aspen has become conifer encroached and is dominated by older aged, more decadent stands which have contributed to a decrease in wildlife habitat quality for species such as deer, elk, and neotropical birds. *5.* Rejuvenate lodgepole pine, spruce-fir, and mixed conifer stands in the Tunp Ridge, Poker Hollow, and Dry Fork areas to younger age class types for Biodiversity enhancement, to reduce fuel accumulation, and to bring age class distribution in line with the BTNF Properly Functioning Condition age distribution: 10 - 20% Seedling/Sapling, 40% Young/Mid-aged, 40% Mature/Old age. **Purpose and Need:** Increase early and mid-seral lodgepole community types to enhance age class diversity and reduce fuel loadings. *6.* Develop Allotment Management Plans (AMP) in the Salt Creek, Smiths Fork, Dry Fork, and Tunp Ridge areas to revise outdated AMP that comply with Forest Plan standards and guidelines along with National Forest System Lands' regulations. The process will be expedited by grouping the AMPs into a cow/horse allotment environmental analysis and a sheep/goat allotment environmental analysis to take actions to protect Colorado cutthroat trout, assuming listing is eminent. **Purpose and Need:** Cow/horse allotments appear to be declining in species diversity and forage production with sagebrush density increasing. Sheep/goat allotments are showing signs of losing species diversity, increasing in bare ground, and decreasing in forage productivity.

Figure 5-6. Bear River Basin/Smiths Fork Watershed - 4th Priority Area

LSA Area DCs	**Resource Project** *Listed in Priority*
Transportation System: All system roads are at Forest Service standards Motorized use occurs on designated routes A variety of motorized recreation opportunities is provided	***Transportation System*** *7.* Reconstruct Smiths Fork Road, gravel 24.4 miles: single lane with intervisible turnouts to provide safe access within the Fontenelle Creek area that meets Forest Service standards and reduces off-road resource degradation. **Purpose and Need:** Existing maintenance on the Fontenelle Creek Road is not adequate to provide for a safe running surface and protect off-roadway resources. Even with maintenance, the road subgrade, drainage structures, and road surface are inadequate to support current types and volumes of traffic. *8.* Reconstruct Dry Fork Road, gravel 3 miles: single lane with intervisible turnouts to provide safe access within the Fontenelle Creek area that meets Forest Service standards and reduces off-road resource degradation. **Purpose and Need:** Existing maintenance on the Fontenelle Creek Road is not adequate to provide for a safe running surface and protect off-roadway resources. Even with maintenance, the road subgrade, drainage structures, and road surface are inadequate to support current types and volumes of traffic. *9.* Reconstruct Hobble Creek Road, gravel 3 miles: single lane with intervisible turnouts to provide safe access within the Fontenelle Creek area that meets Forest Service standards and reduces off-road resource degradation. **Purpose and Need:** Existing maintenance on the Fontenelle Creek Road is not adequate to provide for a safe running surface and protect off-roadway resources. Even with maintenance, the road subgrade, drainage structures, and road surface are inadequate to support current types and volumes of traffic.
Recreation: Dispersed camping does not degrade resources and provides a high quality experience Campgrounds meet current national standards	***Recreation:*** *10.* Trail conditions are deteriorating due to a lack of stable trail maintenance funding and increasing visitor use, causing negative impacts to associated resources and visitor safety. _(**See Table 4-8**. DC of Non-motorized, Snow-free Trails for specific needs.) **Purpose and Need:** Annual clearing and other maintenance, i.e., waterbars, stream crossings, is not keeping up with resource demands and visitor safety. A strategy is needed to determine which trails are needed to provide visitor and administrative access. Those trails that are not needed will be removed from the Forest trail system and rehabilitated. Open trails will be prioritized for maintenance needs. *11.* Maintain and enhance existing campground and picnic facilities while meeting other resource objectives. **Purpose and Need:** Allred Flat and Hobble Creek Campgrounds are antiquated and currently does not meet visitor needs, especially the larger mobile homes and recreational vehicles. Campsites and access need to be reviewed and adjusted where needed to ensure adequate turning radiuses. The water system also needs to be updated to ensure the pumping mechanism is compatible to the Forest visitor. *12.* Off-highway Vehicles (OHV) trails will be designated in areas in the assessment area, e.g., Tunp Ridge and Salt Creek areas, and will incorporate associated resource protection. **Purpose and Need:** OHV use is increasing and is a popular recreational activity in the LSA area. Although the current travel management plan provides vehicular access by licensed and properly equipped vehicles, there are no designated trails identified for OHV use.

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Appendix

Soils

Table A-1. Soil Interpretations

Map Unit Number	Total Acreage	Stability Rating	Erosion Hazard Rating	Compaction Hazard Rating	Revegetation Limitation
101	6,300	Stable	Moderate	Moderate	Severe
102	1,544	Stable	High	Moderate	Severe
***121**	**1,001**	**Stable**	**High**	**High**	**Severe**
131	227	Stable	Moderate	Moderate	Severe
***202**	**13,048**	**Stable**	**High**	**High**	**Severe**
206	1,861	M.Unstable	Low	Low	Slight
***212**	**1,131**	**Stable**	**High**	**High**	**Severe**
***214**	**5,313**	**Unstable**	**High**	**High**	**Severe**
***222**	**2,829**	**M.Unstable**	**High**	**High**	**Severe**
223	15,478	Stable	High	Moderate	Severe
***224**	**1,739**	**M.Unstable**	**High**	**High**	**Severe**
226	11,635	M.Stable	High	Moderate	Severe
232	8,135	M.Stable	High	High	Moderate
***233**	**8,169**	**Unstable**	**High**	**High**	**Severe**
***235**	**4,563**	**Unstable**	**High**	**High**	**Severer**
236	20,625	M.Stable	High	Moderate	Severe
243	219	M.Unstable	High	High	Severe
246	13,354	M.Unstable	High	Moderate	Severe
256	16,766	M.Stable	High	High	Severe
***276**	**1,005**	**M.Stable**	**High**	**High**	**Severe**
282	5,697	Stable	Moderate	Moderate	Severe
***286**	**8,200**	**M.Unstable**	**High**	**High**	**Severe**
302	3,521	Stable	High	Moderate	Severe
***303**	**4,371**	**M.Unstable**	**High**	**High**	**Severe**
304	2,056	M.Unstable	High	Moderate	Severe
***306**	**3,241**	**M.Unstable**	**High**	**High**	**Severe**
312	321	Stable	High	Moderate	Severe
314	9,461	M.Unstable	High	Moderate	Severe
322	8,295	Stable	High	Moderate	Severe
323	1,202	M.Unstable	High	Moderate	Severe
324	2,325	M.Stable	High	Moderate	Severe
325	3,171	Stable	High	Moderate	Severe
326	2,928	M.Stable	High	Moderate	Severe
333	10,311	Stable	High	Moderate	Severe
336	9,784	Stable	High	Moderate	Severe
343	2,895	Stable	High	Moderate	Severe
***345**	**1,053**	**M.Unstable**	**High**	**High**	**Severe**

Map Unit Number	Total Acreage	Stability Rating	Erosion Hazard Rating	Compaction Hazard Rating	Revegetation Limitation
346	9,518	Stable	High	Moderate	Severe
353	10,150	Stable	High	Moderate	Severe
355	3,155	M.Unstable	High	Moderate	Severe
356	953	M.Stable	High	Moderate	Severe
***365**	**313**	**M.Stable**	**High**	**High**	**Severe**
***375**	**606**	**M.Unstable**	**High**	**High**	**Severe**
***402**	**1,659**	**Stable**	**High**	**High**	**Severe**
***403**	**703**	**M.Stable**	**High**	**High**	**Severe**
***405**	**6,447**	**M.Unstable**	**High**	**High**	**Severe**
406	3,826	M.Unstable	High	Moderate	Severe
412	4,503	Stable	High	Moderate	Severe
423	1609	Stable	High	Moderate	Severe
***432**	**4,179**	**Stable**	**High**	**High**	**Severe**
***435**	**3,096**	**M.Unstable**	**High**	**High**	**Severe**
442	8,693	M.Unstable	High	Moderate	Severe
445	7,147	M.Stable	High	Moderate	Severe
***452**	**5,943**	**Unstable**	**High**	**High**	**Severe**
W	239	Stable	Low	Low	Slight

***Sensitive Ground**

Watershed

Table A-2. IWWR Geomorphic Integrity Ratings Summary

Watershed Name	Hydrologic Unit Code	Fully Functional Acreage	Functioning at Risk Acreage	Non-Functional Acreage
Green River Watershed				
S. Fork Fontenelle	140401010305		10,716	
N. Fork Fontenelle	140401010306		3,754	
Aspen	140401010307			10,008
Roaring	140401010308		14,733	
Little Fall Creek	140401010604		5,639	
Big Fall Creek	140401010605		20,712	
S. LaBarge Creek	140401010606		6,215	
Nameless Creek	140401010607		19,198	
Hams Fork	140401071601		4,245	
W. Branch Hams Fork	140401071602		18,115	
Burke Creek	140401071603		15,724	
Indian Creek	140401071604		15,975	
Devils Hole Lakes	140401071605		15,508	
Beaver Creeks	140401071606		4,850	
Bear River Watershed				
Chappel Creek	160401020302		3,990	
Sawmill Creek	160401020306		4,946	
Giraffe Creek	160401020601		4,870	
Salt Creek	160401020602		19,112	
Water Canyon	160401020603			718
Smiths Fork	160401020701		14,321	
Upper Smiths Fork	160401020702		15,281	
Porcupine Creek	160401020703		8,251	
Hobble Creek	160401020704		16,891	
Lake Alice	160401020705		12,791	
Coantag Creek	160401020706		17,267	

Table A-3. IWWR Water Integrity Quality Ratings Summary

Watershed Name	Hydrologic Unit Code	Fully Functional Acreage	Functioning at Risk Acreage	Non-Functional Acreage
Green River Watershed				
S. Fork Fontenelle	140401010305		10,716	
N. Fork Fontenelle	140401010306		3,754	
Aspen	140401010307			10,008
Roaring	140401010308		14,733	
Little Fall Creek	140401010604		5,639	
Big Fall Creek	140401010605		20,712	
S. LaBarge Creek	140401010606		6,215	
Nameless Creek	140401010607		19,198	
Hams Fork	140401071601		4,245	
W. Branch Hams Fork	140401071602		18,115	
Burke Creek	140401071603		15,724	
Indian Creek	140401071604		15,975	
Devils Hole Lakes	140401071605		15,508	
Beaver Creeks	140401071606		4,850	
Bear River Watershed				
Chappel Creek	160401020302		3,990	
Sawmill Creek	160401020306		4,946	
Giraffe Creek	160401020601		4,870	
Salt Creek	160401020602			19,112
Water Canyon	160401020603			718
Smiths Fork	160401020701		14,321	
Upper Smiths Fork	160401020702		15,281	
Porcupine Creek	160401020703		8,251	
Hobble Creek	160401020704		16,891	
Lake Alice	160401020705		12,791	
Coantag Creek	160401020706		17,267	

Table A-4. IWWR Watershed Vulnerability Ratings Summary

Watershed Name	Hydrologic Unit Code	Low Risk	Moderate Risk	High Risk
Green River Watershed				
S. Fork Fontenelle	140401010305		10,716	
N. Fork Fontenelle	140401010306		3,754	
Aspen	140401010307		10,008	
Roaring	140401010308		14,733	
Little Fall Creek	140401010604			5,639
Big Fall Creek	140401010605		20,712	
S. LaBarge Creek	140401010606		6,215	
Nameless Creek	140401010607			19,198
Hams Fork	140401071601			4,245
W. Branch Hams Fork	140401071602		18,115	
Burke Creek	140401071603			15,724
Indian Creek	140401071604		15,975	
Devils Hole Lakes	140401071605			15,508
Beaver Creeks	140401071606			4,850
Bear River Watershed				
Chappel Creek	160401020302		3,990	
Sawmill Creek	160401020306		4,946	
Giraffe Creek	160401020601			4,870
Salt Creek	160401020602			19,112
Water Canyon	160401020603			718
Smiths Fork	160401020701			14,321
Upper Smiths Fork	160401020702			15,281
Porcupine Creek	160401020703		8,251	
Hobble Creek	160401020704		16,891	
Lake Alice	160401020705		12,791	
Coantag Creek	160401020706		17,267	

Historic Fire Regimes

The Commissary Ridge/Tunp Range subsection is a large and diverse area, encompassing 280,500 acres in southwest Wyoming. The fire ecology and historic fire regimes of the area have been described in *Fire ecology of the forest habitat types of eastern Idaho and western Wyoming* (Bradley *et al.* 1992), which identified nine fire groups, all of which are represented within the subsection, based on the habitat type (Daubenmire and Daubenmire 1968) or potential natural vegetation.

The following descriptions of the natural vegetation and the role of fire within fire groups are taken or adapted from Bradley *et al.* (1992), supplemented with information from reports on file at the Caribou National Forest or the Bridger-Teton National Forest.

Fire Group Zero	Miscellaneous Habitats (includes sagebrush and grasslands)
Fire Group One	Limber Pine Habitats
Fire Group Two	Xeric Douglas-fir Habitats
Fire Group Three	Mesic Douglas-fir Habitats
Fire Group Four	Aspen-Dominated Communities
Fire Group Five	Persistent Lodgepole Pine Communities
Fire Group Six	Xeric Subalpine Fir and Engelmann Spruce Habitats
Fire Group Seven	Mesic Subalpine Fir and Engelmann Spruce Habitat
Fire Group Eight	Timberline Habitats

A. Fire Group Zero Miscellaneous Habitats

Fire group zero is dominated by sagebrush steppe vegetation within the subsection, and also includes riparian communities, wet meadows, curlleaf mountain-mahogany, and mountain brush and meadows. These sites are predominantly big sagebrush (*Artemisia tridentata* var. *vaseyana* and *A. t.* var. *pauciflora*) interspersed with antelope bitterbrush, and several grass (bluebunch wheatgrass, Idaho fescue) and forb species (arrowleaf balsamroot, creeping Oregon grape). A non-native species, cheatgrass, may be present, especially if adjacent lands have been seeded with non-natives, which occasionally occurs after a wildfire.

Sagebrush is not a fire-resistant species and is easily killed by wildfire. Mountain big sagebrush stores seeds in the soil, which germinate as a result of fire-induced heating. Depending upon climatic conditions and grazing patterns, mountain big sagebrush usually requires 20 to 30 years before returning to pre-fire levels. Bitterbrush, as well as grasses and forbs, are scattered within this community. Antelope bitterbrush is generally a weak sprouter, but most grasses and forbs sprout readily and dramatically increase their abundance following a fire.

Fire history for this group is generally lacking. Barrett (1994) estimated a mean fire return interval of 19 years for sagebrush-grasslands and mountain brush on the Caribou National Forest in southeastern Idaho. A conservative estimate of fire frequency of 20 to 40 years for mountain big sagebrush has been used on the Caribou National Forest (1997) and 10 to 30 years on the Bridger-Teton National Forest (1998?).

B. Fire Group One Limber Pine Habitats

Fire group one consists of limber pine habitat types that occur on drier exposures between 6,000 and 10,000 feet. Limber pine, or limber pine together with Douglas-fir dominate these sites. Lodgepole

pine, subalpine fir, and aspen may be minor seral components. These types can occur on drier sites adjacent to forests of Douglas-fir, lodgepole pine, subalpine fir, and Engelmann spruce; or they may form the forest ecotone with sagebrush steppe vegetation. The distribution of limber pine is strongly affected by its dependence on Clark's nutcracker, which choose open or treeless areas to cache limber pine seeds for future consumption (Lanner 1980). These sites do not develop dense overstory canopies but support a scattered to open forest.

Limber pine climax stands typically occur on sites where fuels are light, sparse, and discontinuous. Greater flammability may be encountered where both limber pine and Douglas-fir share site dominance. The greatest fire hazard for this fire group is its proximity to more flammable vegetation. This may be dense forest vegetation or sagebrush steppe, either of which has heavier and more continuous fuel loads. Fire intensity in limber pine habitat types usually remains low, and flames are unlikely to enter tree crowns even on sites where there is enough fine fuel available to carry a fire. The scattered distribution of the trees themselves inhibits fire spread.

Arno and Gruell (1983) reported a mean fire interval of 74 years for a limber pine site at a grassland ecotone in southwestern Montana. Keown (1977) reported a free-for-all interval of about 100 years for another limber pine site in Montana.

C. Fire Group Two Xeric Douglas-fir Habitats

Fire group two is composed of cool, dry, relatively unproductive Douglas-fir habitat types. Douglas-fir is often the climax species at the lowest forested elevations. Rocky Mountain juniper may be a seral species, and lodgepole pine is occasionally present on some noncalcerous soils. These sites do not develop dense overstories but support a scattered to open forest.

The combination of widely spaced, thick bark trees and the usually sparse undergrowth results in a low fire hazard for most open stands of old-growth Douglas-fir (Crane and Fisher 1986). However, individual Douglas-fir trees often have branches close to the ground and if sufficient ground fuels are available, torching can occur.

Douglas-fir forests near Jackson, Wyoming probably experienced fires about every 50 to 100 years (Loope and Gruell 1973). Douglas-fir adjacent to sagebrush steppe vegetation both near Jackson, Wyoming and the valleys of northern Yellowstone National Park appear to have shorter fire-free intervals. Houston (1973) reported fire-free intervals of 20 to 25 years in Yellowstone's northern valleys. The typically open forests characteristic of this fire group generally sustain low-intensity thinning fires. Only when very low fuel moistures and high winds coincide are crown fires likely to occur.

D. Fire Group Three Mesic Douglas-fir Habitats

Fire group three consists of relatively moist Douglas-fir habitat types where lodgepole pine, aspen, or Douglas-fir are major seral species. These habitat types occur on cooler or moist exposures between 5,700 and 8,500 feet in elevation. Limber pine may occur in small amounts on drier microsites within these habitat types.

Fire regimes of Douglas-fir and lodgepole pine are variable over their distribution (Kilgore 1981). Topography, weather, stand structure, and fuel loading (and arrangement) all contribute to different patterns of fire intensity and frequency. A complete range of fire behavior is represented in this type, from light surface fires to stand-replacement fires. A mosaic of fire effects probably occurred across the

historical landscape, with much variability also existing within a single fire (Arno 1980). Stands are thinned or replaced, and the potential dominance of one species over another is altered. Thinning fires favor Douglas-fir because mature trees are relatively fire resistant. Stand-replacement fires favor seral lodgepole pine or aspen on sites where seeds or suckering roots are available. The success of aspen regeneration depends partly on the severity of the fire. A high-severity burn may retard or reduce suckering if shallow roots are exposed to lethal heating. Large areas of aspen, lodgepole pine, ceanothus, or pinegrass may indicate a recent history of severe or repeated burning (Steele *et al.* 1983.) On some habitat types, shrubs have the potential to dominate stands if fire removes the Douglas-fir overstory.

Arno (1980) reported a mean fire-free interval of 15 to 30 years for the Douglas-fir series in the northern Rocky Mountains. Houston (1973) estimated a presettlement fire frequency of 20 to 25 years for the conifer/sagebrush steppe vegetation in northern Yellowstone Park. In the Jackson area of Wyoming, Loope and Gruell (1973) estimated a fire frequency between 50 to 100 years for lower elevation conifer forests, which, although moister, appear to reasonably comparable with those in Houston's study. Loope and Gruell (1973) estimated a fire frequency of 25 to 100 years for a Douglas-fir forest with seral aspen on Blacktail Butte in Grand Teton National Park. In southwestern Montana, stands of Douglas-fir on the ecotone between forest and sagebrush-grassland had presettlement fire-free intervals of 35 to 40 years (Arno and Gruell 1983). Barrett (1994) reported a mean fire return interval of 54 years in Douglas-fir stands on the Caribou National Forest in southeastern Idaho.

E. Fire Group Four Aspen-Dominated Communities

Fire group four is composed of community types where aspen appears to be the climax or long-term seral dominant. Aspen is able to tolerate a wide range of environmental conditions and is associated with a diverse number of understory shrub and herbaceous species.

Aspen stands in the west may be even-aged or uneven-aged. Uneven-aged stands are more characteristic of situations where aspen is the climax dominant. Here, regeneration takes place as a gradual process, with new suckers establishing as older stems die from age or disease. Uneven-aged structure also occurs where aspen clones are invading surrounding grassland or shrubland. The role of fire here is not clear. Where aspen forms even-aged stands, it is generally seral to one or more conifer species and results from rapid suckering after disturbance. Fire plays a significant role in maintaining and regenerating aspen on these sites.

A fire history study of two aspen-conifer sites in the Fontenelle Creek drainage of the Bridger-Teton National Forest in Wyoming estimated the mean fire-free interval to be 40 and 41 years, respectively (Arno 1981). Barrett (1994) reported a mean fire return interval of 45 years in aspen-conifer sites on the Caribou National Forest in southeastern Idaho.

F. Fire Group Five Persistent Lodgepole Pine Communities

Fire group five consists of communities dominated by lodgepole pine that frequently persists for long periods of time and, in some cases, appears to be climax. These communities may be the seral stages in habitat types in the Douglas-fir, subalpine, Engelmann spruce, and whitebark pine habitat type series. They may be found in areas of cold air drainage, or where soils and topography favor lodgepole pine over other species. Large acreages of persistent lodgepole pine develop in acidic soils made up of coarse, alluvial materials with gently sloping to nearly level topography. Drought or nutrient stress may inhibit competition from other conifer species on these sites. The understory of persistent lodgepole pine sites is not usually diverse or dense.

Fire perpetuates or renews stands of lodgepole pine. Where it is a seral species, without fire or other disturbance shade-tolerant trees will replace lodgepole pine because of its shade-intolerance and mineral seedbed requirement. Lodgepole pine may have serotinous (closed) or open cones. The degree of serotiny can affect the age distribution on a site. Seed from open-coned trees tend to produce uneven-aged stands, where seedlings establish over a period of years. Closed-cone trees generally produce even-aged stands which develop from the flush of seedlings that arises following the fire-induced release of large numbers of seeds on the freshly prepared mineral seedbed. Fires in lodgepole pine sites tend toward one of two extremes. They may smolder and creep slowly on the soil surface consuming litter and duff, or act as high-intensity, stand-replacing fires. Most are low-intensity fires due to the generally sparse undergrowth and stand growth habit. Cool, moist conditions prevail under a dense closed canopy, and fires that start here usually remain on the ground, smoldering for days. Such smoldering fires have been observed in Yellowstone National Park (Brown 1975, Despain and Sellers 1977). High-intensity fires are most likely to occur where there are concentrations of dead fuels or mixed dead and live fuels, individual trees or groups of trees may torch, and fire can continue to travel through the crowns aided by steep slopes and high winds. Though much less common, high-intensity crown fires account for most of the acres consumed by fire. Summer wildfires may exhibit both types of behavior, depending on the diurnal weather fluctuations. Stand conditions determine the fire potential, and this, in turn is the result of the disturbance history of the site (Brown 1975).

Reported fire frequencies for lodgepole pine stands vary from 22 years in the Bitterroot Valley of Montana (Arno 1976) to over 300 years in Yellowstone National Park (Romme 1982). Chapman (1990) believed that fires may occur as frequently in western Wyoming as they do in the northern Rocky Mountains, but that they may be less detectable because the majority are short-lived and consume relatively little fuel. In most years, the even distribution of annual precipitation, year-round freezing temperatures, and generally low wind velocities tend to limit fire potential in the Teton Wilderness in Wyoming. However, there is evidence that "periodic, extensive fires" occurred in the Teton Wilderness in the past, as evidenced by fire scars and the large acreages presently dominated by lodgepole pine (Reese *et al.* 1975). Large fires may occur during dry, windy weather regardless of stand age (Brown 1975) or fuel type. The overriding effect of weather was demonstrated in the large-scale fires that occurred in the Greater Yellowstone fires in northwestern Wyoming in 1988.

G. Fire Group Six Xeric Subalpine Fir and Engelmann Spruce Habitats

Fire group six contains the bulk of subalpine fir and Engelmann spruce habitat types found in eastern Idaho and western Wyoming, and within the subsection. Lodgepole pine is the dominant seral species in these forests. Douglas-fir is important in warmer exposures on sites with calcareous soils. Engelmann spruce may be a long-lived seral species or a climax or co-climax dominant with subalpine fir. Aspen often persists on the periphery of older stands, or it may exist with conifer species in the early-to-middle stages of succession. While aspen is retained on a site, it has the potential to become a seral dominant after fire (Steele *et al.* 1983). The understory makeup is variable. Some habitat types may be dominated by shrub growth. In others, shrubs may contribute only minor amounts of cover. Seral aspen stands within this fire group often have a species-rich understory.

Historically, fire led to dominance by one or more seral species created by openings in dense stands and created a mosaic of different ages and species compositions in spruce-fir forests. Where aspen is seral, encroachment of conifers make sites increasingly susceptible to fire as succulent forbs are succeeded by woody fuel and litter. Generally moist conditions and slower rates of fuel accumulation make large fires unlikely except during periods of drought and high wind. Most fires that consume significant acreage in

subalpine fir and spruce habitats are high-intensity crown fires during dry, windy conditions that accompany cold fronts (Crane 1982, Fryer and Johnson 1988). Lightning starts fewer fires in subalpine habitat types than it does in drier, warmer forests types.

In the northern Rocky Mountains, Arno (1980) estimated fire intervals of 50 to 130 years for subalpine fir habitat types. Lodgepole pine-dominated subalpine fir forests in the Little Firehole River drainage of Yellowstone National Park experienced large (10 acres) stand-replacement fires probably once in 300 to 350 years (Romme 1982). Barrett (1994) characterized these forests as having a mixed-severity fire regime with a moderately-long fire return interval. He reported a mean fire interval range of 25 to 113 years southeastern Idaho (Barrett 1994). In general, sites with aspen or Douglas-fir are represented by the short end of reported fire return intervals for xeric subalpine forests (*e.g.*; Barrett 1994), while sites with lodgepole pine typically report longer fire return intervals (*e.g.*; Romme 1982).

H. Fire Group Seven Mesic Subalpine Fir and Engelmann Spruce Habitats

Fire group seven is composed of subalpine fir and Engelmann spruce habitat types occurring in seasonally moist or wet conditions, or where soils are subirrigated and water tables remain high year-round. Engelmann spruce is a persistent seral or climax species, and Colorado blue spruce may co-dominate on some sites. Lodgepole pine is the other important seral species, while Douglas-fir and whitebark pine are considered minor seral species. Understory vegetation is often lush and diverse. Although shrub cover is often scanty in many of the types, there is usually a diversity of low and tall forbs.

Fires are infrequent due to the moist environment and lush understory. Large woody fuels make up the bulk of the fuel loading, and there may be much rotten material and duff on the forest floor. In colder, high elevation habitat types the proportion of sound to rotten fuel may be greater because of slow decomposition rates. These sites are susceptible to high-intensity burns when droughts occur. Forests may be killed by either surface fire or crown fire that encroach from surrounding stands. Thin bark and shallow roots make spruce especially susceptible to mortality from hot surface fires that consume the duff and litter layer around trees.

Fire history is poorly understood for this fire group. At higher elevations, slower decomposition rates increase the amount of fuels available on a site. Low, smoldering fires of restricted area probably occur most often. This type of surface burn removes one or a small group of trees, rather than an entire stand or drainage. Severe fires occur only during extremely dry conditions, when fires starting on drier sites are of high intensity and more likely to spread. Crane (1982) estimated 325 to 335 as the fire return interval for moist spruce sites on the Shoshone National Forest in Wyoming. Romme and Knight (1981) found fire return intervals of 300 to 400 years on the Medicine Bow National Forest in southeastern Wyoming. The mean fire-free interval was estimated to be 130 years for a mesic subalpine fir site in northwestern Montana (Sneck 1977).

I. Fire Group Eight Timberline Habitats

Fire group eight is made up of high, cold subalpine fir, Engelmann spruce, or whitebark pine habitat types that occur at or near timberline. These three climax species may also serve as the principal seral species on some sites, while on others whitebark pine, lodgepole pine, or occasionally limber pine may co-dominate. Trees may grow in more or less continuous stands, but at timberline they frequently grow in strings or isolated groups interspersed with alpine vegetation. The short growing season reduces the potential productivity of the understory. Where the overstory is dense, scattered shrubs and forbs may

be restricted to canopy gaps. At timberline, or in open mature stands of whitebark pine the understory is more lush.

Whitebark pine sites are often on dry, exposed slopes where trees are widely spaced and there is little live fuel. Subalpine fir sites are more productive and may have a well developed understory of spruce or fir that can serve as ladder fuel under extreme fire weather conditions. The low productivity of timberline sites decreases the rate of fuel accumulation, and average diameters of large woody fuels is usually smaller than those on sites at lower elevation. This is countered, however, by the slow rate of decomposition. In normal fire years, fire is ordinarily restricted to single lightning-struck trees and the area of litter and duff around it. Small groups of trees will torch where spruce and fir are a significant part of the understory. In Wyoming, Chapman (1990) observed fire in whitebark pine stands in the Teton Wilderness during the extreme 1988 fire season when large areas of whitebark pine burned despite their location on scree slopes with little or no ground fuel between individual trees. Whitebark pine trees in the upper reaches of these sites were consumed by a combination of ignited litter at their bases and exposure to intense radiated from downslope; lower portions of whitebark pine stands were ignited by crown fires encroaching from downslope, while trees lacking accumulated litter did not burn (Chapman 1990).

Fire is relatively infrequent in much of the high country, and fire history data are generally lacking. Although the incidence of lightning strikes may be relatively high, stand-replacing fires are rare. Estimates of fire-free intervals range from 50 to 300 years (Arno 1986, 1989; Heinselman 1981). Fire has its greatest impact when occasional high-intensity fires invade from lower elevation forests during periods of high winds and low fuel moistures when fire conditions are severe.

Table A-5. Threatened, Endangered, and Sensitive Wildlife Species

Threatened, Endangered, and Sensitive Wildlife Species Records in the Commissary Ridge/Tunp Range Landscape Scale Assessment area vicinity, from the Wyoming Game and Fish Department's Wildlife Observation System database.

DATE	SPECIES	HABITAT	TOWN.	RANGE	SEC
10/28/78	bald eagle	cottonwood-riparian	25	118	17
10/28/78	bald eagle	cottonwood-riparian	25	118	17
11/20/78	bald eagle	spruce-fir	29	116	6
12/27/79	bald eagle		27	115	6
12/27/79	bald eagle	lodgepole pine	27	115	6
10/29/80	bald eagle		26	116	25
12/01/80	bald eagle		26	119	14
05/27/81	bald eagle		26	115	10
10/24/81	bald eagle		26	117	24
10/24/81	bald eagle		26	117	24
11/17/81	bald eagle	aspen-conifer	28	117	36
11/17/81	bald eagle	willow	28	117	36
11/21/81	bald eagle	willow	28	117	36
11/21/81	bald eagle	willow	28	117	36
02/05/82	bald eagle		25	119	0
03/04/82	bald eagle	mixed conifer	25	118	34
03/05/82	bald eagle	Douglas fir	25	118	33
10/18/82	bald eagle	willow	26	117	8
10/22/82	bald eagle	willow-other shrubs	29	116	22
10/28/82	bald eagle		26	116	9
10/28/82	bald eagle	willow	27	116	18
11/27/82	bald eagle		27	118	9
12/11/82	bald eagle	grain field	26	119	31
01/07/83	bald eagle		25	118	0
01/14/83	bald eagle	riparian-cottonwood	25	118	30
01/14/83	bald eagle	riparian-cottonwood	25	119	28
01/14/83	bald eagle	willow	28	118	28
10/08/83	bald eagle	aspen-conifer	28	118	27
10/21/83	bald eagle		25	115	9
10/22/83	bald eagle	conifer forest	25	118	36
11/26/83	bald eagle	aspen	29	119	26
12/12/83	bald eagle	sagebrush-grassland	28	119	21
03/01/84	bald eagle	willow	25	119	27
03/10/84	bald eagle	willow	25	118	20
03/10/84	bald eagle	willow	26	118	5

Table A-5. Threatened, Endangered, and Sensitive Wildlife Species
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DATE	SPECIES	HABITAT	TOWN.	RANGE	SEC
03/10/84	bald eagle	willow	27	118	33
08/16/84	bald eagle	maple-ash	27	118	16
10/16/84	bald eagle	spruce-fir	29	116	7
10/20/84	bald eagle	sagebrush-grassland	26	115	10
10/27/84	bald eagle	spruce-fir	25	117	13
10/29/84	bald eagle		25	116	23
10/30/84	bald eagle		25	116	26
11/11/84	bald eagle		28	115	14
11/17/84	bald eagle	riparian-cottonwood	27	118	9
11/19/84	bald eagle	water	26	118	10
11/21/84	bald eagle	running water	28	119	27
11/28/84	bald eagle	water	28	119	19
12/01/84	bald eagle	sagebrush-grassland	28	119	20
02/03/85	bald eagle	willow	27	115	6
09/29/85	bald eagle		27	116	25
10/08/85	bald eagle		25	116	19
10/30/85	bald eagle		25	116	22
11/09/85	bald eagle		28	119	27
11/10/85	bald eagle	sagebrush-grassland	25	118	10
11/19/85	bald eagle		26	119	31
11/22/85	bald eagle	grain field	26	119	31
11/22/85	bald eagle	grain field	27	120	12
12/22/85	bald eagle		26	119	6
01/10/86	bald eagle		25	119	27
01/10/86	bald eagle	mountain mahogany-sagebrush	25	119	22
01/11/86	bald eagle	riparian shrub	25	118	31
01/11/86	bald eagle	riparian shrub	27	118	28
01/29/86	bald eagle	juniper-sagebrush	25	118	20
10/15/86	bald eagle		25	115	15
10/25/86	bald eagle	agricultural land	28	116	0
11/07/86	bald eagle		28	118	9
11/07/86	bald eagle	riparian shrub	29	118	24
12/05/86	bald eagle	riparian shrub	28	119	27
12/24/86	bald eagle	riparian shrub	28	119	19
12/24/86	bald eagle	riparian shrub	28	119	28
01/30/87	bald eagle	cottonwood-dry land	26	119	31

Table A-5. Threatened, Endangered, and Sensitive Wildlife Species
Threatened, Endangered, and Sensitive Wildlife Species Records in the Commissary Ridge/Tunp Range Landscape Scale Assessment area vicinity, from the Wyoming Game and Fish Department's Wildlife Observation System database.

DATE	SPECIES	HABITAT	TOWN.	RANGE	SEC
02/04/87	bald eagle	riparian-cottonwood	26	120	24
02/07/87	bald eagle		25	118	20
02/07/87	bald eagle		27	119	34
02/07/87	bald eagle		28	118	33
02/07/87	bald eagle		28	119	34
03/25/87	bald eagle		26	119	31
06/17/87	bald eagle		25	117	24
10/06/87	bald eagle	lodgepole pine	26	117	28
10/16/87	bald eagle		25	116	22
10/22/87	bald eagle		25	116	22
10/26/87	bald eagle		26	117	13
10/27/87	bald eagle	willow	29	116	8
10/31/87	bald eagle		26	119	17
11/09/87	bald eagle	roadside	29	119	24
11/30/87	bald eagle	riparian shrub	26	118	0
11/30/87	bald eagle	riparian shrub	27	118	0
12/02/87	bald eagle		27	120	36
01/17/88	bald eagle	agricultural land	27	120	25
02/08/88	bald eagle		25	118	30
02/14/88	bald eagle		25	119	3
03/01/88	bald eagle		26	119	5
03/27/88	bald eagle		28	119	19
04/01/88	bald eagle	water	27	118	28
10/16/88	bald eagle		28	117	4
01/13/89	bald eagle	sagebrush-grassland	25	119	0
01/13/89	bald eagle	sagebrush-grassland	25	119	0
03/22/89	bald eagle	sagebrush-grassland	26	118	2
03/23/89	bald eagle		26	119	6
11/18/89	bald eagle	riparian shrub	28	118	34
11/18/89	bald eagle	riparian-cottonwood	26	118	16
11/18/89	bald eagle	riparian-cottonwood	26	118	32
03/18/90	bald eagle		27	115	17
03/18/90	bald eagle		27	115	27
10/16/90	bald eagle	aspen-conifer	29	116	8
10/16/90	bald eagle	conifer forest	29	119	17

Table A-5. Threatened, Endangered, and Sensitive Wildlife Species
Threatened, Endangered, and Sensitive Wildlife Species Records in the Commissary Ridge/Tunp Range Landscape Scale Assessment area vicinity, from the Wyoming Game and Fish Department's Wildlife Observation System database.

DATE	SPECIES	HABITAT	TOWN.	RANGE	SEC
10/24/90	bald eagle		27	118	15
10/24/90	bald eagle	sagebrush-grassland	27	118	15
10/31/90	bald eagle	aspen	26	117	12
11/04/90	bald eagle		29	118	26
11/04/90	bald eagle	riparian-cottonwood	26	118	4
11/04/90	bald eagle	riparian-cottonwood	27	118	16
02/07/91	bald eagle		26	118	4
02/07/91	bald eagle		27	118	22
02/07/91	bald eagle	riparian shrub	25	118	31
02/07/91	bald eagle	riparian shrub	25	118	33
02/07/91	bald eagle	riparian shrub	26	118	9
02/07/91	bald eagle	riparian shrub	26	118	16
02/07/91	bald eagle	willow	28	117	25
03/20/91	bald eagle	willow-other shrubs	25	118	31
07/05/91	bald eagle	standing water	28	117	17
10/15/91	bald eagle		27	116	22
10/15/91	bald eagle		27	116	28
02/08/92	bald eagle		29	119	31
03/06/92	bald eagle	willow	27	115	21
03/14/92	bald eagle	riparian-cottonwood	26	118	32
03/14/92	bald eagle	riparian-cottonwood	26	119	32
10/22/92	bald eagle		27	118	1
01/20/93	bald eagle	agricultural land	26	120	13
10/20/93	bald eagle		27	115	34
02/25/94	bald eagle	roadside	26	119	31
02/03/95	bald eagle	riparian shrub	26	117	13
10/27/95	bald eagle		25	115	32
10/28/95	bald eagle	conifer forest	29	117	26
10/29/95	bald eagle		26	116	10
11/19/95	bald eagle	water	25	118	33
01/29/96	bald eagle		25	119	21
02/06/96	bald eagle		25	118	15
02/06/96	bald eagle		27	119	31
02/06/96	bald eagle		27	119	33
02/06/96	bald eagle		28	117	25

Table A-5. Threatened, Endangered, and Sensitive Wildlife Species
Threatened, Endangered, and Sensitive Wildlife Species Records in the Commissary Ridge/Tunp Range Landscape Scale Assessment area vicinity, from the Wyoming Game and Fish Department's Wildlife Observation System database.

DATE	SPECIES	HABITAT	TOWN.	RANGE	SEC
02/06/96	bald eagle	riparian shrub	26	118	16
02/06/96	bald eagle	riparian shrub	26	118	29
02/06/96	bald eagle	shrub steppe	25	119	15
09/25/96	bald eagle	shrub steppe	28	116	20
03/09/97	bald eagle	dry pasture	25	119	29
03/10/97	bald eagle	agricultural land	28	120	24
09/20/82	boreal owl	Douglas fir	29	116	15
09/21/82	boreal owl	Douglas fir	26	116	15
06/23/85	Canada lynx	conifer forest	26	118	36
10/23/93	Canada lynx		26	117	28
10/05/86	gray wolf		29	116	23
05/02/79	northern goshawk	Douglas fir	29	115	20
05/24/79	northern goshawk	big sagebrush	29	115	26
05/25/79	northern goshawk	wet meadow	29	115	19
06/04/80	northern goshawk	spruce-fir	29	115	22
06/05/80	northern goshawk	spruce-fir	29	115	15
07/29/80	northern goshawk	willow	27	118	23
05/25/81	northern goshawk	spruce-fir	28	116	14
06/05/81	northern goshawk	sagebrush-grassland	29	115	12
06/11/81	northern goshawk	spruce-fir	25	118	11
10/16/81	northern goshawk		26	117	9
10/16/81	northern goshawk		26	117	9
02/11/82	northern goshawk	spruce-fir	25	118	33
10/18/82	northern goshawk	rabbitbrush	26	117	8
07/22/83	northern goshawk	sagebrush-grassland	29	115	20
10/28/83	northern goshawk	aspen-conifer	25	118	24
10/29/83	northern goshawk	conifer forest	27	117	7
11/06/83	northern goshawk	spruce-fir	27	116	35
07/26/84	northern goshawk	sagebrush-grassland	25	116	13
10/01/84	northern goshawk	sagebrush-grassland	27	115	22
10/26/84	northern goshawk	spruce-fir	27	117	7
05/19/85	northern goshawk	spruce-fir	27	116	31
07/29/85	northern goshawk	mixed conifer	29	115	16
08/03/85	northern goshawk	spruce-fir	26	116	27
09/21/85	northern goshawk	spruce-fir	28	117	4

Table A-5. Threatened, Endangered, and Sensitive Wildlife Species
Threatened, Endangered, and Sensitive Wildlife Species Records in the Commissary Ridge/Tunp Range Landscape Scale Assessment area vicinity, from the Wyoming Game and Fish Department's Wildlife Observation System database.

DATE	SPECIES	HABITAT	TOWN.	RANGE	SEC.
08/13/88	northern goshawk	conifer forest	27	118	36
10/28/88	northern goshawk	aspen-conifer	25	116	1
02/13/90	northern goshawk	spruce-fir	27	117	34
05/10/90	northern goshawk	spruce-fir	28	115	20
10/25/90	northern goshawk	mountain mahogany	26	118	23
10/15/91	northern goshawk		27	116	30
06/06/93	northern goshawk	aspen	27	115	26
07/28/93	northern goshawk	conifer forest	28	117	34
09/23/93	northern goshawk	conifer forest	29	116	18
02/12/94	northern goshawk	conifer forest	29	119	31
06/21/94	northern goshawk	lodgepole pine	29	116	22
10/05/95	northern goshawk	conifer forest	28	117	35
07/01/96	northern goshawk	mixed conifer	28	117	17
07/23/78	three-toed woodpecker		29	116	22
08/10/82	whooping crane	sedge/grass meadow	26	120	13
08/20/82	whooping crane	sedge/grass meadow	26	120	25
08/27/82	whooping crane	grain field	26	119	31
08/28/82	whooping crane	grain field	26	119	31
09/02/82	whooping crane	cattail wetland	26	120	36
09/08/82	whooping crane	grain field	26	119	31
04/11/83	whooping crane	grain field	27	120	36
04/13/83	whooping crane	grain field	27	120	36
04/15/83	whooping crane	sedge/grass meadow	26	120	36
04/15/85	whooping crane	grain field	26	120	12
04/15/85	whooping crane	grain field	26	120	13
04/11/86	whooping crane	grain field	26	120	36
04/12/86	whooping crane	grain field	26	119	31
04/16/86	whooping crane	grain field	27	120	12
04/17/86	whooping crane	irrigated meadow	27	120	13
04/17/86	whooping crane	sedge/grass meadow	27	120	12
04/17/86	whooping crane	willow	27	120	12
05/29/86	whooping crane	cattail/sedge wetland	26	120	36
09/15/86	whooping crane	grain field	26	120	13
04/07/89	whooping crane	wet meadow	26	120	36
	wolverine	alpine grassland	29	116	32
	wolverine	wet meadow	28	116	4

A-6. Road crossing streams sediment and fish migration barriers within the analysis area

Fontenelle Road	Road Number 10103					
Location Description	**Stream Name**	**CMP Type**	**Diameter (in)**	**Length (ft)**	**Fish migration**	**Sedimentation**
0.5mi north of forest boundary	Blue Jay creek	round	24	20	No	Yes
2.1mi north of forest boundary	Little Bear Creek	round	24	30	No	Yes
2.5mi north of forest boundary	Unnamed Tributary	round	30	23	No	Yes
4.7mi north of forest boundary	Unnamed Tributary	arch	54	28.5	No	Yes
5.3mi north of forest boundary	Unnamed Tributary	round	24	18	No	Yes
5.4mi north of forest boundary	Minnie Holden Creek	round	42	17.5	No	Yes
9.0mi north of forest boundary	Unnamed Tributary	round	24	39	No	Yes
9.7mi north of forest boundary	Stepp Creek	round	18	24	No	Yes
10.4mi north of forest boundary	Little Fall Creek	round	36	25	Yes	Yes
11.4mi north of forest boundary	Camp Creek	round	36	38.2	Yes	Yes
12.1mi north of forest boundary	Unnamed Tributary to Fall Creek	round	24	32	No	Yes
12.2mi north of forest boundary	Unnamed Tributary to Fall Creek	round	18	26.3	No	Yes
Kelly - Hams Fork Road	**Road Number 10062**					
Location Description	**Stream Name**	**CMP Type**	**Diameter (in)**	**Length (ft)**	**Fish migration**	**Sedimentation**
South of Kelly G.S.	Unnamed Tributary	round	24	28	No	Yes
0.6mi east of Kelly G.S.	Kelly Creek	round	48	60	No	Yes
5.7mi from forest boundary	Unnamed Tributary	round	24	40	No	Yes
5.6mi from forest boundary	Unnamed Tributary	squash	48	40	No	Yes
4.0mi from forest boundary	Shingle Mill Creek	arch	72	45	No	Yes
3.5mi from forest boundary	Sawmill Creek	squash	52	39	No	Yes
2.9mi from forest boundary	Burke Creek	squash	48	45	No	Yes
2.4mi from forest boundary	East Fork	squash	72	45	Yes	Yes
1.1mi from forest boundary	Unnamed Tributary	round	18	38	No	Yes
0.4mi from forest boundary	Poison Hollow	round	36	57	No	Yes
forest boundary	Unnamed Tributary	round	18	55	No	Yes

Upper LaBarge Creek and Smiths Fork Road	Road Number 10072					
Location Description	**Stream Name**	**CMP Type**	**Diameter (in)**	**Length (ft)**	**Fish migration**	**Sedimentation**
1.5mi past LaBarge Mdws Guard Station	LaBarge Creek #1	squash	54	40	Yes	Yes
1mi. before first switchback on 10072	LaBarge Creek #2	squash	42	23	Yes	Yes
0.2mi. before first switchback on 10072	LaBarge Creek #3	round	32	27	Yes	Yes
1/10 mi. before bottom of second switchback	Unnamed Tributary	round	24	21	No	Yes
at the bottom of the second switchback	Smith's Fork Creek	round	48	33	Yes	Yes
2/10mi. past first crossing of Smith's Fork	Smith's Fork Creek #2	squash	62	36	Yes	Yes
1 1/2mi. down from Crystal Lake	Unnamed Tributary	round	18	30	Yes	Yes

Upper LaBarge Creek and Smiths Fork Road		Road Number 10072				
1/2mi. after bridge	Unnamed Tributary	round	18	30	No	Yes
0.5mi. N. of Emigrant Trail	Unnamed Tributary	2 round	24	28	Yes	Yes
0.5mi. N. of Emigrant Trail	Unnamed Tributary	2 round	24	28	Yes	Yes
1mi. past Crystal Lake	Unnamed Tributary	round	24	29	Yes	Yes
LaBarge Creek Road		**Road Number 10138**				
Location Description	**Stream Name**	**CMP Type**	**Diameter (in)**	**Length (ft)**	**Fish migration**	**Sedimentation**
1mi. past Indian Cr.	Shafer Creek	round	30	42	No	Yes
2 1/2mi. past forest boundary	Indian Creek	round	36	43	Yes	Yes
0.2 mi past Scaler Guard Station rd	South LaBarge Creek	round	78	63	No	Yes
1 1/2mi. after jct. w/10013	Unnamed Tributary	round	30	23	No	Yes
jct. w/ 10128	Coyote Park Creek	round	36	26	Yes	Yes
1mi past jct. w/10128	Witherspoon Creek	round	24	43	Yes	No
0.4mi. past Witherspoon Cr.	Cabin Creek	round	18	29	No	No
1mi. past Cabin Cr.	Spring Creek	2 round	30	25	Yes	Yes
1mi. past Cabin Cr.	Spring Creek	2 round	30	26	Yes	Yes
1/4 mi. past Spring Cr.	Unnamed Tributary	round	18	25	No	Yes
jct. w/ 10180	Clear Creek	squash	54	45	No	Yes
jct. w/ 10179	Little Clear Creek	round	30	25	No	Yes
1/2 mi. down from La Barge Cr.	Crystal Creek	round	24	30	Yes	Yes
jct. w/ 10181	Little Corral Creek	2 round	30	24	Yes	Yes
jct. w/ 10181	Little Corral Creek	2 round	30	24	Yes	Yes
1/2mi. before jct. w/ 172	LaBarge Creek	round	62	32	Yes	No