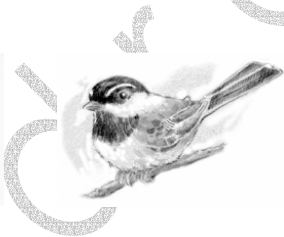


# SHOSHONE NATIONAL FOREST

DRAFT

## FOREST PLAN COMPREHENSIVE EVALUATION REPORT

VERSION 1.0



MAY 2005

Prepared by the  
Shoshone National Forest  
Planning Staff

draft

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# Introduction

This report evaluates the current social, economic, and ecological conditions and trends as they relate to implementing the 1986 Shoshone National Forest Land and Resource Management Plan (Forest Plan). Forest staff are beginning the process of revising the 1986 Forest Plan. New planning regulations that guide the revision process were released in December 2004. Those regulations direct that as part of the initial stages of revision, a comprehensive evaluation report be produced that evaluates the current social, economic, and ecological conditions and trends that contribute to sustainability. In preparation for revision, the Shoshone planning team began working on a similar type of report prior to December 2004. In order to continue our process, we have adjusted that report to fulfill the requirements of the new planning rule.

## Document organization

This report starts with a description of the setting for the Shoshone National Forest. This description provides background on the history, environment, and resources of the Forest.

Following the setting discussion there is a general discussion on management direction for the Forest. This discussion presents a landscape level view of the Forest and focuses on broad elements of Forest Plan management direction.

The main body of the report includes discussions for various resource areas. The information contained in this completed report will provide the starting point for discussions on revision of the Forest Plan. This report will be supplemented and the recommendations will change as we work with the public during the revision process.

**Existing Forest Plan management direction.** Each resource discussion begins with a summary of direction from the 1986 Forest Plan. This discussion provides more details than in the landscape level section. Though not inclusive of all Forest Plan direction, the summary provides the highlights for the various resource areas. This direction is a mix of desired conditions and objectives. Some of the direction is broken down by management emphasis area.

The concepts of desired conditions and objectives have evolved over the years, so it is not possible to directly translate 1986 Plan direction into language that will be used in the revised forest plan. The focus of any evaluation of existing plan direction should be on the intent of that direction and not directly on the specific words used.

**Activity and condition trends.** Following the management direction summary are discussions on conditions and trends that relate to Forest Plan direction. The discussions provide context for what has happened to the resource during Forest Plan implementation and are based on available information, including monitoring information, surveys, assessments, analyses, and other studies.

Performance measures, listed at the beginning of each section, are used to determine what progress has been made toward meeting Forest Plan direction.

The concept of performance measures is introduced here because it will be a key element in measuring how well the revised plan meets our expectations. These measures need to be evaluated to determine if they are appropriate in determining desired outcomes. This will also be useful in comparing plan options and focusing the public discussion on what should be in the final plan.

**Projections if existing Forest Plan direction continues.** The next section projects what is likely to happen if implementation of the current Forest Plan continues. The projections are based on the trends that have occurred over the last 15 years and the knowledge of our resource professionals of known and expected changes in budgets, laws, and regulations.

**Need for change in Forest Plan direction.** The final section for each resource is identification of changes in Forest Plan direction that Forest personnel thought should be considered during the revision process. The

need for change focuses on two aspects of the management direction. In the first case, the intent of the direction is appropriate, but the specific application of that direction is not having the intended outcome. In this case, the need for change is to find a different way to accomplish the intended outcome. The second type of need for change is where a different outcome is desired than exists in the existing Forest Plan. In this circumstance, the need is for a different desired condition.

### **Need for change for all resources**

Specific needs for each resource are identified within each resource section. Some, more overall needs encompass a number of program areas or forest management in general and are addressed here.

The desired conditions and objectives in the revised forest plan need to incorporate/address the resource concerns that were not present or fully realized when the Plan was signed in 1986. Examples of these are:

- Increasing spread of invasive species
- Increasing off-highway vehicle use
- Increasing fuels loads and large wildfires
- Increasing home development in the forest/urban interface

In reexamining the concerns on the Forest, these new concerns will be incorporated into the context of all concerns, so that management priorities and direction for the Forest can be defined.

The revised plan's desired conditions and objectives need to consider the availability of budget and personnel resources, so that expectations are not greater than what can be implemented.

Another area that will require change is the monitoring section. The monitoring plan will be directed toward addressing the most important resource concerns on the Forest. These concerns will be identified throughout the planning process and are likely to require a change in the current monitoring items and protocols. Staffs have identified a number of areas that need to be considered in this process.

Other things that persons may want to see changed include increased budgets, more personnel, or specific on-the-ground activities. These items fall under the areas of budget and management and are not part of Forest Plan direction. Needs for change for these items are not included here, though they may be discussed in relationship to some need for change in Forest Plan direction. Revision of the Forest Plan is not the correct avenue for addressing these types of needs.

## **Forest setting**

The Shoshone National Forest is in the northern Rocky Mountains in northwest Wyoming. Part of the Forest was set aside in 1891 as part of the Yellowstone Timberland Reserve, making the Shoshone the first national forest in the United States. With Yellowstone National Park on its western border, the Shoshone extends more than 180 miles from the Montana state line to South Pass near Lander. It is bordered by the Custer and Gallatin National Forests on the north and by Yellowstone National Park and the Bridger-Teton National Forest on the west. The Forest is set within the lee of the massive Absaroka, Beartooth, and Wind River Mountains.

The Forest consists of 2.4 million acres in Park, Fremont, Hot Springs, Sublette, and Teton Counties. The Shoshone National Forest is a part of the Greater Yellowstone Area, which consists of the Beaverhead, Bridger-Teton, Caribou-Targhee, Custer, and Gallatin National Forests and Grand Teton and Yellowstone National Parks.

The Shoshone offers outstanding wilderness opportunities with over half the Forest (1.4 million acres) designated as wilderness (Washakie, North Absaroka, Absaroka-Beartooth, Popo Agie, and the Fitzpatrick Wilderness Areas).

The terrain varies widely from sagebrush flats to rugged mountains because the Forest is situated on the western edge of the Great Plains and the eastern side of the continental divide. Elevations on the Shoshone range from 4,600 feet at the mouth of the spectacular Clarks Fork Canyon to 13,804 feet on Gannett Peak, Wyoming's highest point. The higher mountains are snow-clad most of the year with immense areas of exposed rock interspersed with meadows and forests. No region in Wyoming is provided with a more diverse landscape—from lush grasslands to alpine meadows, from crystal-clear lakes to glacial carved valleys, from rolling hills to sheer mountain walls.

The Forest is the eastern access to Yellowstone National Park. There are several recreation trails and scenic drives including the Beartooth Loop National Recreation Trail, the Beartooth scenic byway, Wyoming Centennial Byway, Buffalo Bill Scenic Highway, and the Chief Joseph Scenic Highway.

Most of the Forest is within the upper Missouri River Basin, subdivided by the Wind/Big Horn, and Clarks Fork river basins. The southern tip of the Forest is in the Sweetwater drainage, which flows into the Platte River system. Principle rivers within the Forest boundary are the Clarks Fork of the Yellowstone River, North and South Fork of the Shoshone River, and the Greybull, Wind/Big Horn, and Popo Agie Rivers.

As part of the Yellowstone ecosystem, the Shoshone provides habitat for and supports populations of many wildlife species, including grizzly bear, wolf, elk, deer, moose, bald eagles, and Yellowstone cutthroat trout.

The annual precipitation varies with topography and elevation, ranging from 15 to 70 inches. The higher elevations receive from 30 to 40 percent of their annual precipitation during the winter in the form of snow, roughly 40 percent as rain and snow in the spring, and 20 to 30 percent as rain in summer and fall.

The Shoshone National Forest is named for the Shoshoni. The Arapahoe, Blackfeet, Comanche, Crow, Nez Perce, Northern Cheyenne, and Sioux tribes also hunted, traveled, traded, and fought in the area. Mountain men John Colter and Jim Bridger were early visitors as well. The ghost town of Kirwin, an early-day mining town, is a window to the past, recalling one of the colorful eras in Wyoming's history. The remains of tie hack flumes and cabins on the southern end of the Forest are reminders of another era during which millions of railroad ties were produced. The Civilian Conservation Corps was active in the 1930s in portions of the Forest, constructing all-purpose roads that have become Forest arterials.

Compared to the 150,000+ domestic animals that grazed on the Forest at the beginning of the 20<sup>th</sup> century, today's levels of about 27,000 cattle, sheep, and horses are comparatively low.

Multi-generations of families, as well as those recently arrived, have strong ties to this area through tourism, business, recreation, and other resource use activities. Today, people's connections to the Forest are through activities and service-oriented livelihoods such as scenic and wildlife viewing, wilderness trekking, camping, hunting, fishing, snowmobiling, traveling to adjacent national parks, dude ranching, historic lodging, and many other recreation activities. The scenery, wildlife, and the land itself create a distinct and direct tie to people's sense of place.

The character of the Shoshone's landscape has changed little over the last 100 or so years. It has remained in a rugged, pristine, primitive state, especially when compared to other western national forests.

## Landscape Management

This section displays management variations across the Forest. Figure 1 provides a display of the management direction cross the Forest. The general themes represent wilderness, non-motorized recreation, motorized recreation, and managed lands. Differences and similarities between activities can occur in these broad categories. The differences are addressed in the management direction sections included for each resource in the main body of this document. The discussion is intended to provide a broad description of management of the Forest and it does not account for the numerous variations that occur within each area.

The map shows four different categories of management.

**Special areas.** This area includes designated wilderness areas, proposed and designated research natural areas, the Clarks Fork Wild and Scenic River, the Dunoir Special management area, and the High Lakes Wilderness Study area. Normally there are no vegetative management activities and natural processes are dominant. There is also generally no motorized activity, with the exception that some areas allow snowmobile access.

**Non-motorized recreation.** The primary emphasis for this area is recreation. Motorized access is generally prohibited. Some vegetative treatment may occur for other resource objectives.

**Motorized recreation.** The primary emphasis for this area is recreation. Motorized access is permitted and often encouraged. Some areas emphasize access suitable for passenger cars while other areas emphasize more of a backcountry experience. Vegetative treatment may occur for other resource objectives.

**Managed lands.** Various vegetative treatments and other activities commonly occur on these lands. The treatments are designed to emphasize different resources in different areas. Some of the lands are primarily managed for wildlife and big game winter range while other areas are managed for wood fiber production. Generally, motorized access is allowed in these areas, though there may be seasonal closures for some wildlife areas. The areas are also available for recreation.

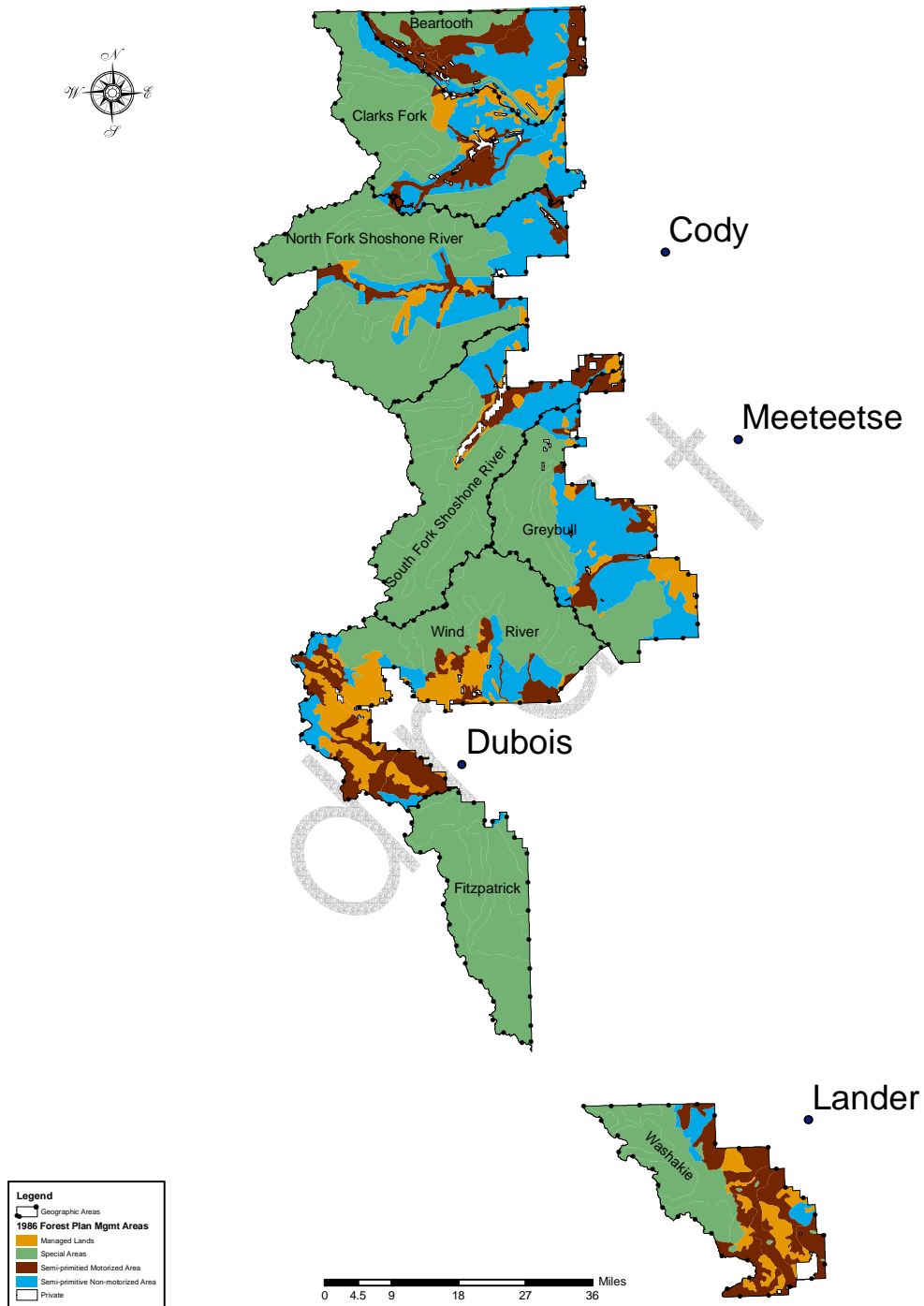
The map illustrates that the mix of management themes varies in the different areas across the Forest. All geographic areas of the Forest have some special areas.

All geographic areas of the Forest, except the Fitzpatrick, have some portion of managed lands. Most of the geographic areas have less than 10 percent managed lands, except the Washakie and Wind River areas, where 13 percent and 21 percent of the geographic area consists of the managed land category.

Similarly, all geographic areas of the Forest have some form of motorized recreation category, except the Fitzpatrick. These areas are generally less than 10 percent of the acres in a geographic area. The geographic areas that do not follow this general trend are the Beartooth, Washakie, and Wind River areas where the acres in the motorized recreation theme account for 20 to 37 percent of the geographic area.

The geographic areas shown in Figure 1 have no special significance other than they represent easily definable geographic areas across the Forest. They are used to help provide reference for discussing how management varies across the Forest.

*Figure 1. Management areas from the 1986 Forest Plan.*





# Air

## Existing Forest Plan management direction

*Establish an air resource management program (Forest Plan III-10).*

*Evaluate and protect wilderness air quality and air quality related values (Forest Plan III-10).*

*Provide air quality compatible with federal and state laws (Forest Plan III-10).*

*Comply with State and Federal air quality standards (Forest Plan III-97).*

## Activity and condition trends

### Performance measures

- Alpine lakes monitoring data
- National Atmospheric Deposition Program monitoring data
- Interagency Monitoring of Protected Visual Environment site data

Program management has evolved over time and includes budget planning and execution, intra- and interagency coordination, membership with the Greater Yellowstone Area Clean Air Partnership and, when necessary, reviews of Prevention of Significant Deterioration permits. Program management is supported by an air quality specialist located on the Pinedale Ranger District of the Bridger-Teton National Forest. This individual assists with annual updates to agreements, database management (Natural Resource Information System), technical review of Prevention of Significant Deterioration permits, and project level environmental (National Environmental Policy Act) analysis.

Direct project activity includes weekly monitoring of the South Pass National Atmospheric Deposition Program site and thrice-yearly monitoring of air quality related values at Ross and Saddlebag Lakes.

Indirect project activity includes support for the Dead Indian Pass Interagency Monitoring of Protected Visual Environment site, which is maintained by the Wyoming Department of Environmental Quality Air Quality Division; support for bulk deposition monitoring conducted on the Bridger-Teton National Forest; and support to Forest programs that have the potential to affect air quality, such as prescribed fire projects.

Data have been collected at the South Pass National Atmospheric Deposition Program site since 1985.<sup>1</sup> This site has been funded primarily by Simplot Phosphates LLC as part of their Wyoming Department of Environmental Quality Prevention of Significant Deterioration permit. Their requirements under this permit are expiring; the Forest Service is pursuing alternative funding sources to ensure continued monitoring of this important site.

Data have been collected at Ross Lake in the Class I Fitzpatrick Wilderness and at Saddlebag Lake in the Class II Popo Agie Wilderness since 1982. This monitoring is being conducted to assess the effects of acid deposition on air quality related values such as water quality.

Data have been collected at the Dead Indian Pass Interagency Monitoring of Protected Visual Environment site since 2000 to monitor air quality and visibility in the North Absaroka Wilderness.<sup>2</sup>

Since 1986, bulk deposition data have been collected at Hobbs and Black Joe Lakes on the Bridger-Teton National Forest. These data, which are used as a surrogate for conditions on the Shoshone National Forest, are displayed in annual summary reports submitted to the Wyoming Department of Environmental Quality. The Forest is represented at the annual Greater Yellowstone Area Clean Air Partnership meetings. These meetings occur to identify and address key issues relating to air quality in the Greater Yellowstone Area

<sup>1</sup> Data are available at <http://nadp.sws.uiuc.edu>.

<sup>2</sup> Data are available at <http://vista.cira.colostate.edu/improve/>.

(GYA). The partnership allows for exchange of information and dialogue between numerous state and federal agencies responsible for air quality in the GYA. The partnership produced an assessment in 1999 that identifies GYA air quality issues, conditions, pollution sources, and monitoring sites. This document is available at the Supervisor's Office in Cody. The partnership recently agreed that the assessment should be updated, with a target release date of mid-2005.

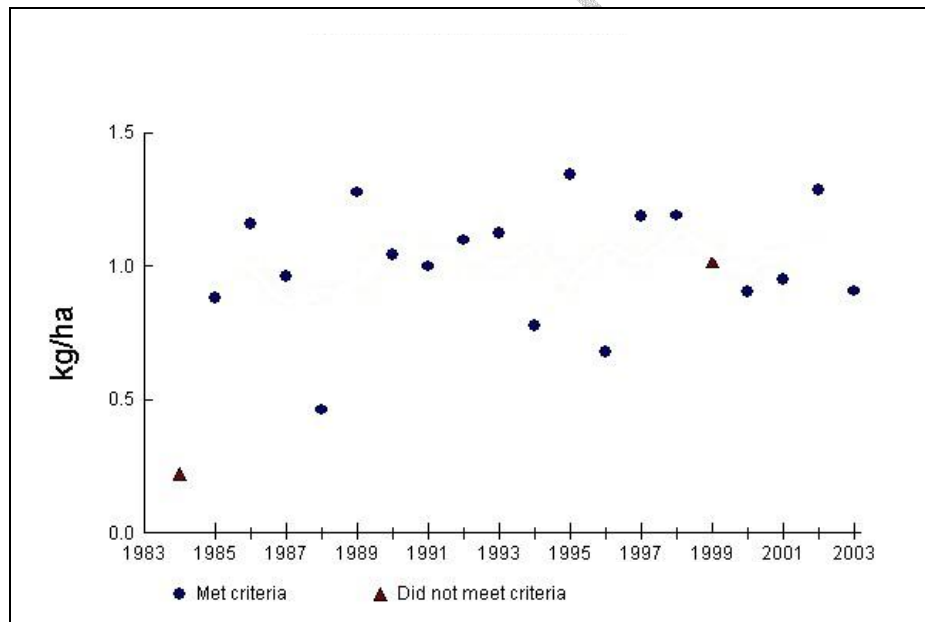
The Forest, through technical support from the Bridger-Teton National Forest, continues to be involved in environmental review of projects being analyzed by the Bureau of Land Management in southwest Wyoming. This off-Forest support also provides monitoring of active industrial development in the area.

#### **Air quality monitoring**

Analysis of National Atmospheric Deposition Program data collected between 1985 and 2004 shows a slight trend toward increasing levels of nitrate and inorganic nitrogen in recent years, as shown in Figure 2 and Figure 3. In addition to Forest Service needs, Wyoming Department of Environmental Quality and other agencies continually analyze data collected from this site. These data, along with data from other National Atmospheric Deposition Program sites in Wyoming, are used to model and track emissions and acid deposition across southwest Wyoming, which includes the Class I Fitzpatrick and Class II Popo Agie Wilderness Areas on the Forest. Because of industrial development in southwest Wyoming and growth of several major cities upwind of the Forest, continued monitoring of this site is important relative to Forest managers being able to demonstrate compliance with the Clean Water Act.

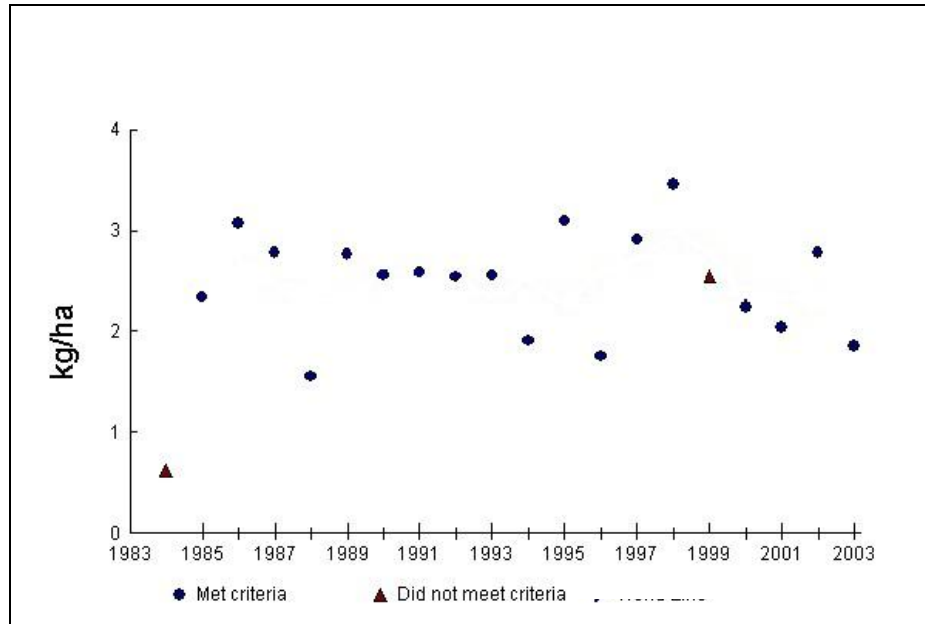
Data from the Bridger-Teton National Forest's bulk deposition sampling indicate a general trend of increasing total nitrate deposition as shown in Figure 4.

**Figure 2. National Atmospheric Deposition Program/National Trends Network site (WY97 South Pass City) annual inorganic nitrogen wet deposition, 1985 through 2004.<sup>3</sup>**

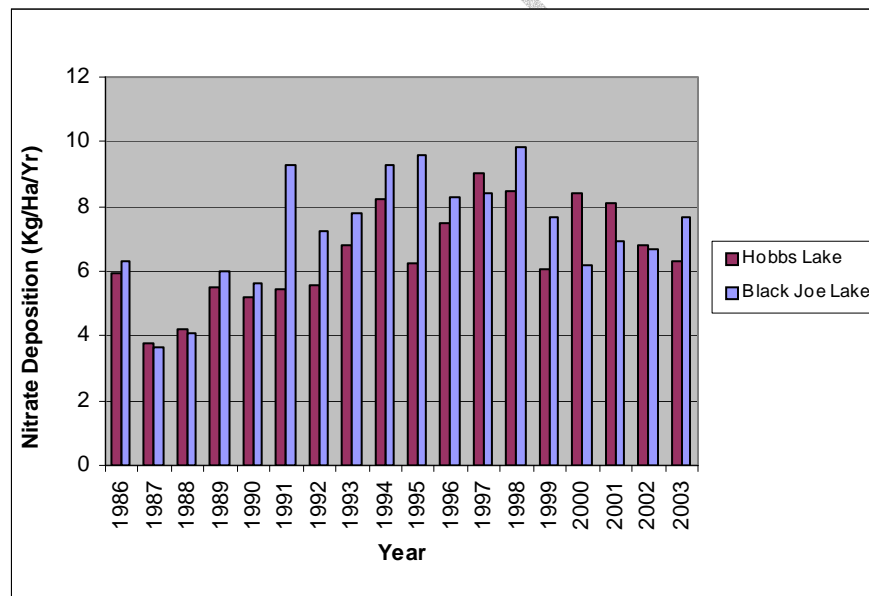


<sup>3</sup> Source <http://nadp.sws.uiuc.edu/sites/siteinfo.asp?net=NTN&id=WY97>

**Figure 3. National Atmospheric Deposition Program/National Trends Network site (WY97 South Pass City) annual nitrate wet depositions, 1985 through 2004.<sup>4</sup>**



**Figure 4. Nitrate deposition data, Bridger-Teton National Forest, 1986 through 2003.**



Analysis of lake data collected between 1984 and 1993 (Baron 1996) for air quality related values indicates there does not appear to be a trend in chemical composition. Even though a trend was not identified, a decision was made after receipt of the report to continue the monitoring program because these lakes are susceptible to change from acid deposition due to their low buffering capacity. Data collected between 1994 and 2003 are being analyzed and a report is expected in early 2005.

Analysis of Interagency Monitoring of Protected Visual Environment site data collected at Dead Indian Pass from 2000 through 2003 is occurring and will be used as a baseline as additional data are collected in

<sup>4</sup> Source <http://nadp.sws.uiuc.edu/sites/siteinfo.asp?net=NTN&id=WY97>

the future. Continued monitoring will help detect changes in air quality and visibility once the baseline has been established. It is too early in the monitoring program to determine trends in air quality.<sup>5</sup>

### Projections if existing Forest Plan direction continues

Air quality issues and concerns are expected to increase over time due to increased emissions from upwind sources. As air quality data are collected, analysis will occur to determine if wilderness air quality and air quality related values are being protected. If protection is not being afforded, potential corrective actions will be discussed.

### Need for change in Forest Plan direction

Current management direction is adequate; there is no need for change in management direction.

## Fire management

### Existing Forest Plan direction

*Reduce the accumulation of natural fuels (Forest Plan III-8).*

*Provide cost-effective fire protection to minimize the combined costs of protection and damages, and prevent loss of human life (Forest Plan III-10).*

*The Washakie and North Absaroka Fire Management Plans will be applied as written. Fire management for all other wildernesses will be:*

- *Control all man-caused unplanned ignitions*
- *Control all unplanned ignitions with [sic] one-half mile of the boundary between wilderness and non-wilderness*
- *Confine natural unplanned ignitions to less than 1,000 acres from June 20 to September 30*
- *Confine natural unplanned ignitions to less than 2,000 acres from October 1 to June 19 (Forest Plan III-41)*

*Reduce the risk from wildfire to its consequences to life and property within wilderness or to resources, life, or property outside wilderness using trained professionals in a cost effective manner (Forest Plan III-41).*

*Protect life, property, and resource values from wildfire in a cost-efficient manner that maximizes the benefits of shared resources and developing technologies (FSM 5100) (Forest Plan III-95).*

*Take suppression action on all escaped fires considering the following:*

- *The values of the resources threatened by the fire (both positive and negative)*
- *Management objectives for the threatened area(s)*
- *The fuelbeds the fire may burn in*
- *The current and projected weather conditions that will influence fire behavior*
- *Natural barriers and fuel breaks*
- *Social, economic, political, cultural, and environmental concerns*
- *Public safety*
- *Firefighter safety*

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<sup>5</sup> Data collected to date are available on the Interagency Monitoring of Protected Visual Environment Web site at <http://vista.cira.colostate.edu/improve/>.

- *Costs of alternative suppression strategies. Use the escaped fire situation analysis to make this determination (FSM 5130.31) (Forest Plan III-96)*

*Reduce or otherwise treat activity fuels so the potential fireline intensity of an area will not exceed 400 BTUs/sec/ft on 90 percent of the days during the regular fire season, or break up continuous fuel concentrations exceeding the above standard into manageable units with fuel breaks or fire lands, ... (Forest Plan III-96).*

*Primitive recreation area, High Lakes Wilderness Study Area, and the Dunoir Special Management area*

*Maintain fire-dependent ecosystems using prescribed fires or fires ignited naturally (Forest Plan III-144, III-244).*

*Wildlife emphasis (management indicator species) areas*

*Maintain fuel conditions which permit fire suppression and prescribed fire to maintain habitat needed for selected species or species population levels (Forest Plan III-152).*

*Aspen emphasis areas*

*Apply prescribed burning to regenerate aspen and to benefit wildlife (Forest Plan III-157).*

*Whiskey Mountain portion of Fitzpatrick Wilderness*

*Prescribed fire will be utilized as a management technique where it is the most cost-efficient and acceptable alternative to achieve bighorn sheep habitat objectives (Forest Plan III-206).*

*Research Natural Areas*

*Extinguish wildfires endangering the RNA. Allow fires within the RNA to burn undisturbed unless they threaten persons or property outside the area, or the uniqueness of the RNA (Forest Plan III-233).*

*Do to reduce fire hazard within the RNA (Forest Plan III-233).*

## Activity and condition trends

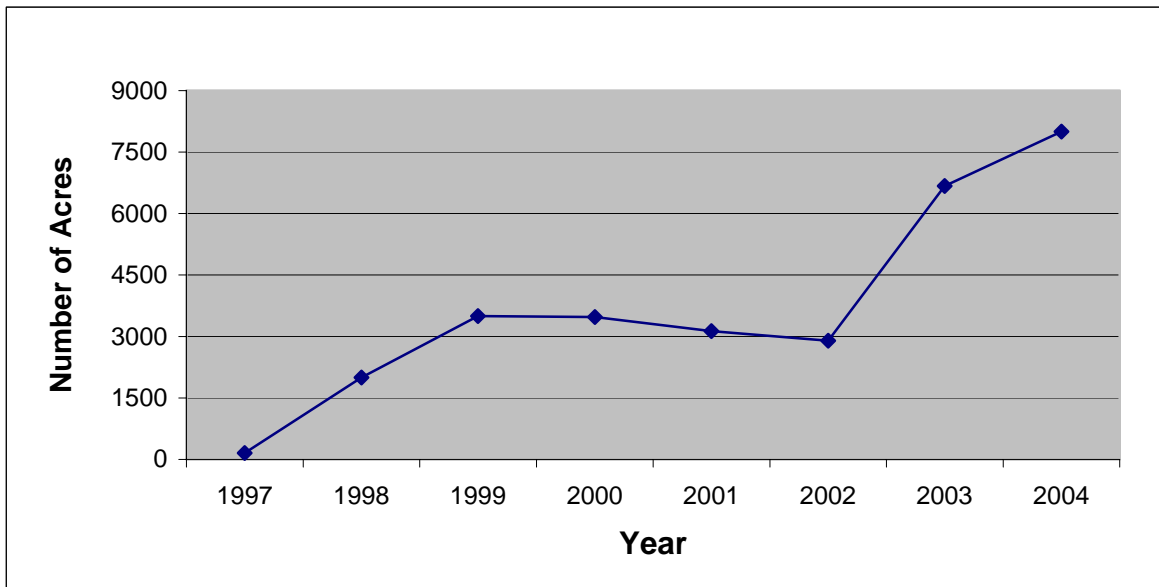
### Performance measures

- Acres of fuels treatment
- Acres of wildfire
- Numbers of wildfires

In 1998, the Forest increased its prescribed burn program as part of the overall fire management program. With the 2000 National Fire Plan, funding increased to facilitate increases in staffing and equipment to further support the fire program. During the fall of 2002, the Forest engaged in a Forest-wide vegetation analysis, resulting in an integrated vegetation management program. The 2003 Healthy Forests Initiative and the Healthy Forests Restoration Act combined to provide the tools, funding, and expectation to treat hazardous fuels and improve fire regime/condition class.

The Forest has completed fire management guides for all five wilderness areas.

**Figure 5. Acres of fuels treated, 1997 through 2004.**



Since 1970, the Forest has averaged 26 wildfires annually, averaging 49 percent from natural ignition, 32 percent from escaped campfires, and 19 percent from all other causes. Excluding 1988, lightning-caused fires burned 87 percent of the acreage, campfires burned 5 percent, and all other human causes burned 8 percent.

Over the last century, the Forest's fire management program has been focused on fire suppression, with efforts to keep fires as small as possible. Due to persistent drought, the trend in acreage burned since 1998 has been increasing, with the exception of 2004.

**Figure 6. Number of fires by size, 1970 through 2003.**

Size in acres	Number of fires
0 to 0.25	652
0.25 to 9.9	58
10 to 99.9	129
100 to 299.9	8
300 to 999.9	4
1,000 to 4999.9	9
> 5,000	5

Figure 7. Annual number of wild fires, 1970 through 2003.

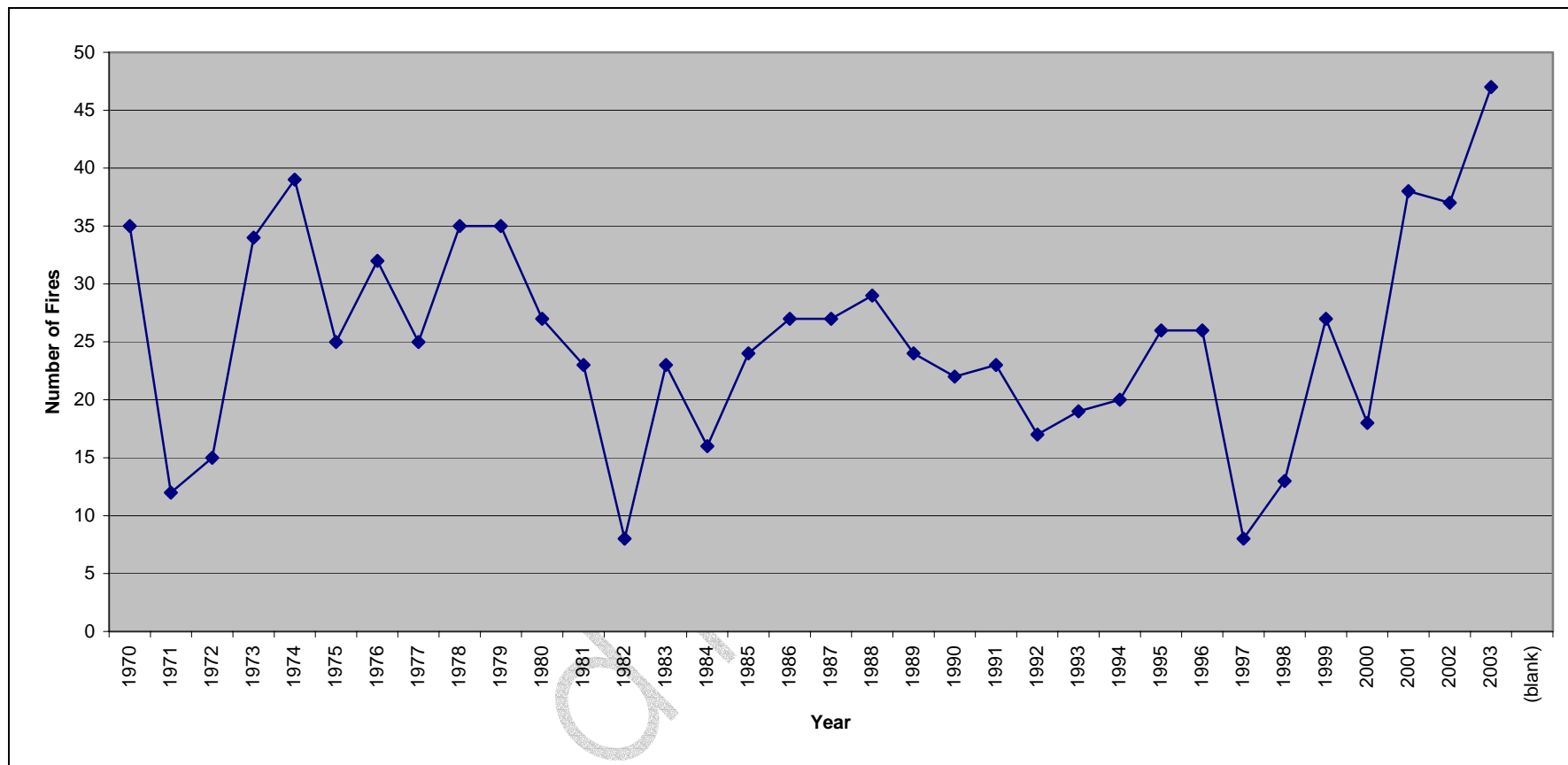
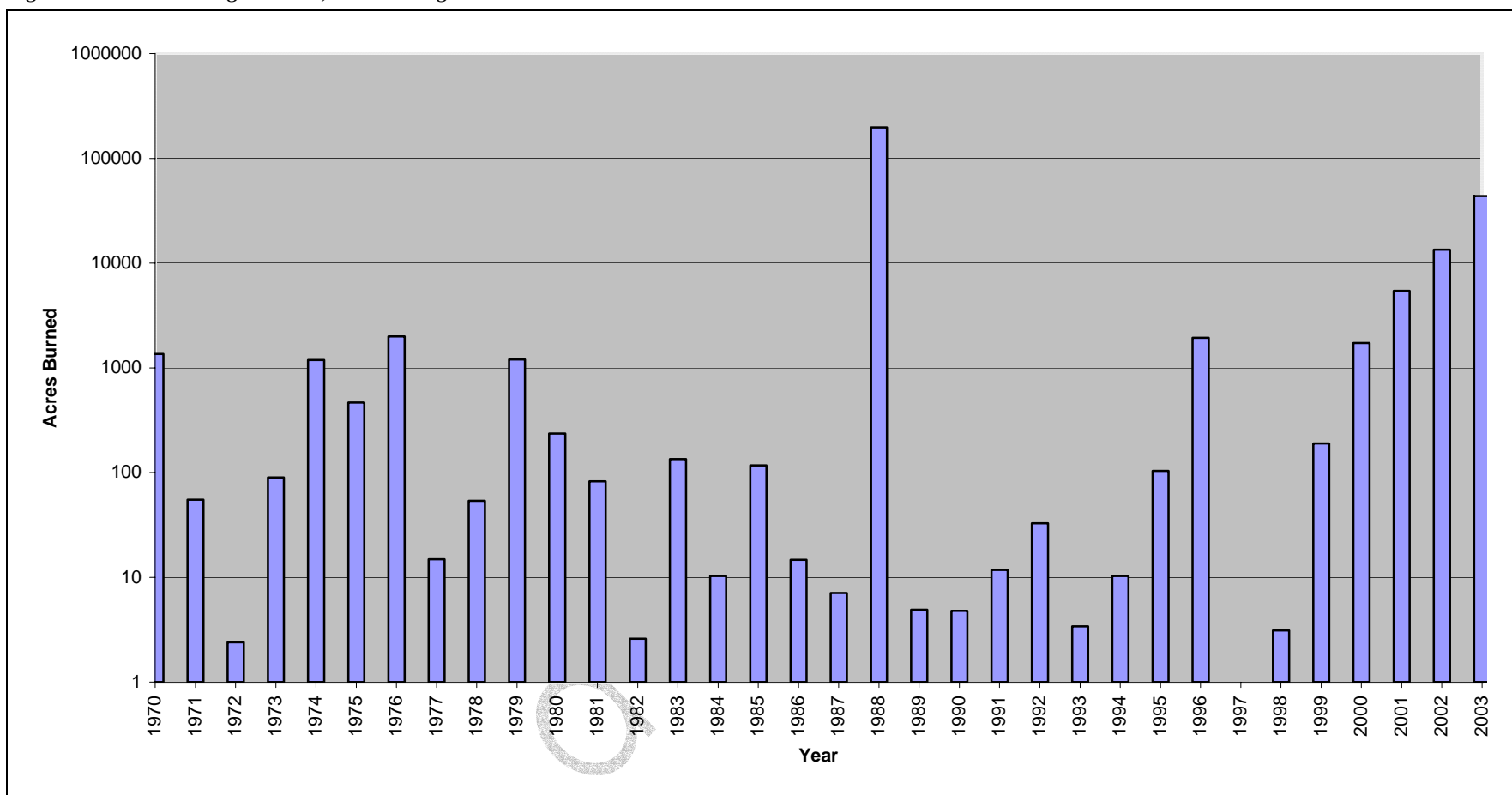


Figure 8. Annual acreage burned, 1970 through 2003.





## Projections if existing Forest Plan direction continues

Under current direction, suppression would continue as the primary focus of fire management to protect life, property, and resources. Recent policy changes and the National Fire Plan emphasize hazardous fuels treatments, especially on National Forest System land associated with communities at risk, municipal watersheds, threatened and endangered species habitat, and other important local features where conditions favor uncharacteristically intense fires.

Under current conditions, suppression costs will continue to increase, particularly on land where homes are built next to the national forest. Investments such as resources and developments may be at risk. Additional costs may be incurred to reduce post-wildfire threats to life and property from floods, debris flows, and landslides.

Historically, wildfire leaves a patchwork of uneven aged stands and diverse habitats. When an uncharacteristically large fire takes place, the patchwork of diversity is replaced with a more homogenous stand. The complexity and diversity of the uneven aged patterns in the ecosystem are reduced. Critical fish and wildlife habitats may also be impacted by uncharacteristic fire.

The use of wildland fire for resource benefit is expected to become a major component in the future.

All smoke management decisions under current direction are made in accordance with the State of Wyoming air quality regulations. The number of fires, location, elevation, extent, duration of smoke, atmospheric conditions, and public sentiment are some factors that influence decisions to use prescribed burns. These factors also influence decisions to allow wildland fire to achieve ecosystem management objectives within the parameters of social and economic concerns. Smoke emissions from prescribed fire and wildland fire are likely to increase.

## Need for change in Forest Plan direction

Agency fire management policies have been through significant change. Some of the factors influencing these changes include the 1995 Federal Wildland Fire Management Policy Review, the Healthy Forests Initiative, the Healthy Forests Restoration Act, and the National Fire Plan. Additionally, changes on the ground with regard to the burning conditions have affected our ability to protect public and private values while at the same time being able to suppress fires safely and cost effectively. Given these changes, several items need to be incorporated through forest plan revision with regard to fire management. These items include:

- Changes in agency fire management policy, direction, and terminology
- Emphasis on reduction of hazardous fuels and improvement of fire regime condition class
- Smoke management
- Integrated fire and fuel management direction, and desired conditions and objectives that enhance firefighter and public safety

Fire management direction has been based primarily on a model of appropriate *suppression* response rather than the appropriate *management* response. Current Forest Plan direction incorporates a mix of the two models, resulting in some inconsistencies and perhaps lost opportunities to more cost effectively manage wildland fire, sustain ecological functions, or achieve resource benefits. For example, maintaining fire dependent ecosystems is part of current Forest Plan direction; however, it is limited to natural ignitions in the five designated wilderness areas on the Forest and requires a suppression response in all other management areas.

While there are widespread additional opportunities for wildland fire use, there are resources of significant value that are in need of protection, including wildland urban interface, high use recreation areas, timber and grazing, municipal watersheds, heritage resources, and critical wildlife and fish habitats. The desired conditions and objectives in the Plan need to better reflect the values at risk to be protected and provide a fire and fuels management strategy that is more refined, adaptive, and comprehensive.

Fire Regime Condition Class (FRCC) is an interagency, standardized tool for determining the degree of departure from reference condition vegetation, fuels, and disturbance regimes. The greater the deviation from the historic fire occurrence, the greater the risk of loss of ecological function because of uncharacteristic fire behavior. The revised forest plan needs to incorporate the concept of FRCC within the desired conditions and objectives for overall management of the Forest. This consideration should include a strategic approach to prioritizing and managing hazardous fuels accumulations. In addition, a performance measure should be added for fuels treatment acres within each Fire Regime Condition Class that are outside the historic fire occurrence.

The current Forest Plan provides limited guidance on smoke management. Prescribed fire and wildland fire use have increased and will continue to increase—resulting smoke emissions from these sources will increase. The revised Forest Plan needs to consider potential smoke emissions from these sources, air quality standards, and visibility/regional haze regulations.

The revised plan's desired conditions and objectives need to incorporate the direction from the Wilderness Fire Management plans that have been prepared.

The revised plan should determine what areas of the Forest are suitable for wildland fire use.

**Performance measures**

- Acres of wildland fire use
- Acres of fuels treatment

## Heritage

### Existing Forest Plan direction

*Locate historical and archaeological sites; evaluate them for significance; and preserve, protect and/or interpret for public information a representative sample of sites associated with and typifying the economic and social history of western Wyoming (Forest Plan III-7).*

*Maintain existing facilities (e.g., ranger stations) of historic significance in their original rustic character (Forest Plan III-10).*

*Protect, find an adaptive use for, mitigate according to an approved mitigation plan, or interpret all cultural resources on National Forest System lands which are listed on the National Register of Historic Places, the National Register of Historic Landmarks, or have been determined to be eligible for the National Registers (Forest Plan III-23).*

*Nominate or recommend cultural resource sites to the National Register of Historic Places by 1990 in the following priority:*

- *Sites representing multiple themes*
- *Sites representing themes which are not currently on the National Register within the state*
- *Sites representing themes which are currently represented by single sites (Forest Plan III-23)*

*Protect and foster public use and enjoyment of cultural resources (Forest Plan III-23).*

### Activity and condition trends

**Performance measures**

- Number of sites recorded
- Acres surveyed for heritage resources

Quantifiable items for cultural resources are acres surveyed and sites recorded and evaluated since 1986. These numbers are estimates and are used to reflect trend rather than exact numbers of acres or sites.

In Figure 9, note the increase in the number of new sites recorded since 2001. This trend will most likely level off between 150 and 200 new sites recorded yearly.

**Figure 9. Number of new sites recorded since 1986.**

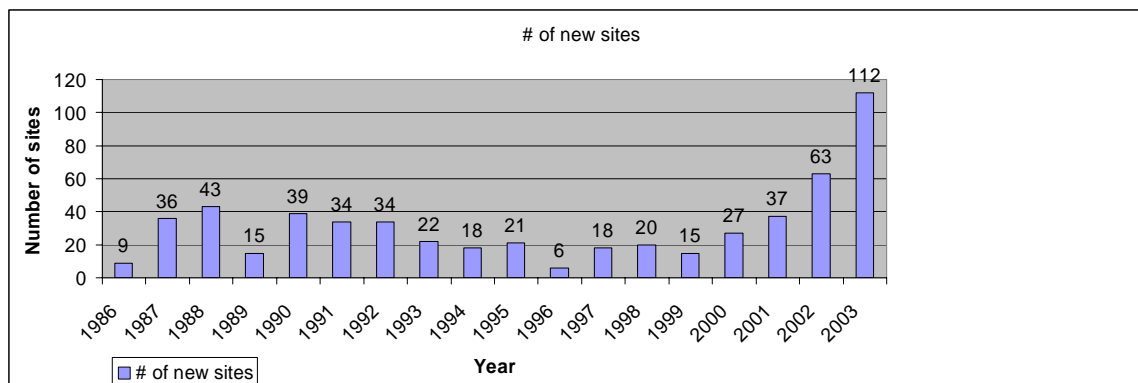
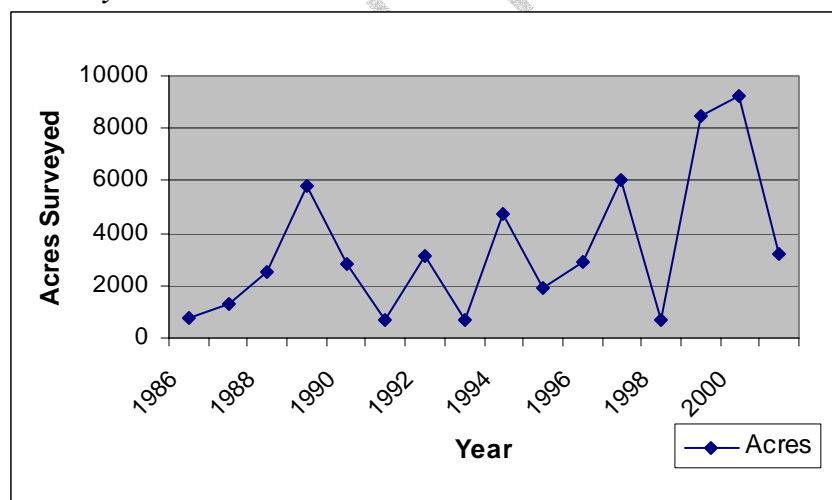


Figure 10 shows the number of acres surveyed since 1986. The trend for the last several years has been an increase in survey acres. This trend is expected to continue in the short term (2 to 5 years) to keep up with National Fire Plan projects. In the longer term, the number of acres surveyed should start to decrease to an average level of perhaps 4,000 to 5,000 acres per year.

**Figure 10. Number of acres surveyed since 1986.<sup>6</sup>**



### Projections if existing Forest Plan direction continues

The number of acres and sites surveyed is dependent on the number of projects implemented or planned on the Forest. That is, when more projects are implemented, more acres are surveyed and more sites are recorded. As we continue to implement the National Fire Plan, the number of acres surveyed will continue to increase.

<sup>6</sup> Not all 2002 to 2004 data are shown.

## Need for change in Forest Plan direction

The revised plan needs to incorporate the direction provided by new laws such as Executive Order 13084 Consultation and Coordination with Indian Tribal Governments, and the Native American Graves Protection and Repatriation Act, and others.

# Lands—ownership and uses

## Existing Forest Plan direction

*Acquire private lands within wilderness. Consolidate national forest ownership patterns (Forest Plan III-9).*

*Pursue land ownership adjustments to improve management efficiency for both National Forest System land and intermingled private land and to meet high priority resource management objectives (Forest Plan III-9).*

*Provide increased public access to National Forest System lands, appropriate to the management objective of the areas served (Forest Plan III-7).*

*Acquire necessary rights-of-way to facilitate management of the Forest including public access to National Forest System lands (Forest Plan III-9).*

*Classify lands or interest in lands for acquisition where lands are valuable for NFS [National Forest System] purposes according to the following priorities:*

- *In designated wilderness areas and other Congressionally classified areas*
- *Where lands or rights-of-way are needed to meet resource management goals and objectives*
- *Lands which provide habitat for threatened and endangered species of animals and plants*
- *Lands which include floodplain or wetlands*
- *On lands of the National Grasslands that provide opportunities for demonstration of multiple uses in grassland agriculture*
- *On lands having historical or cultural resources, outstanding scenic values or critical ecosystems, when these resources are threatened by change of use or when management may be enhanced by public ownership (Forest Plan III-83)*

*Classify lands for disposal according to the following priorities:*

- *To states, counties, cities, or other federal agencies when disposal will serve a greater public interest*
- *In small parcels intermingled with mineral or homesteads patents*
- *When suitable for development by the private sector, if development (residential, agricultural, industrial, recreational, etc.) is in the public interest*
- *When critical or unique resource (wetlands, floodplains, essential big game winter range, threatened or endangered species habitat, historical or cultural resources, critical ecosystems, etc.) effects are mitigated by reserving interests to protect the resource, or by exchange where other critical resources to be acquired are considered to be of equal or greater value*
- *In National Grasslands, when they offer no opportunity to meet National Grassland demonstration objectives (Forest Plan III-84).*

*Effect jurisdictional transfers, which achieve the following objectives:*

- *Reduce duplication of efforts by users and agencies in terms of time, cost, and coordination*
- *Improve or maintain user access to the administering agency*
- *Decrease travel and enhance management*
- *Improve public understanding of applicable laws, regulations, policies, and procedures*
- *Develop more effective and efficient work units*

- Reduce administrative cost (Forest Plan III-84)

Where appropriate and necessary, acquire rights-of-way on existing National Forest System roads and trails (Forest Plan III-83).

## Activity and condition trends

### Performance measures

- Acres of land disposed
- Acres of land acquired
- Number of rights-of-way

### Landownership adjustment

Land ownership adjustment through purchase and exchange is an important tool for meeting the goal of improving the efficiency of land management and meeting resource management objectives.

The landownership pattern on the Shoshone National Forest is highly consolidated, with few inholdings of private land within the Forest boundary. Acquisition projects in the last fifteen years have further improved this pattern with the acquisition of a large number of inholdings on the Greybull Ranger District.

Acquisition of other inholdings is desired, but limited by other Forest priorities, the willingness of sellers, and the ability to obtain funding for acquisition of high priority parcels.

**Figure 11. Shoshone National Forest acreage for 1986, 1991, and 2003.**

Year	Acres
1986	2,433,125
1991	2,432,990
2003	2,437,218

**Figure 12. Acres of land disposed.**

Year	Transaction	Acres
1986	Wyoming Game and Fish	161
1988	Goodyear	3
1989	Julien	1
1991	Stuart	3
1991	B4 Ranch	1
1996	South Fork exchange	157
1997	Les Terry	<1
1998	TE Ranch exchange	55
	Total	382

**Figure 13. Acres of land acquired.**

Year	Transaction	Acres
1986	Wyoming Game and Fish	160
1991	Deer Creek trailhead	1
1992	Kirwin	3,843
1996	South Fork exchange	103
1998	TE Ranch exchange	365
2002	Dunrud	589
	Total	4,530

### Number of rights-of-way

Increased public access to National Forest System lands was identified in the 1986 Forest Plan as a Forest goal. Obtaining access rights necessary for both management of and access to Forest lands by the public is extremely challenging.

Most landowners are unwilling to grant access rights in perpetuity on a voluntary basis. The majority of perpetual, full, access rights obtained in the past fifteen years has been obtained through the landownership adjustment program. Some access rights for timber management activities have been obtained on a temporary basis. While this solves an immediate access need, it also often has the effect of decreasing the ability to obtain access rights in perpetuity.

**Figure 14. Rights-of-way needed per year.**

Years	Rights-of-way
1985 through 1990	3
1991 through 2000	2
2000 forward	2

### Projections if existing Forest Plan direction continues

The availability of privately held lands identified for acquisition will decrease as inholdings become developed. Obtaining legal access to Forest lands through land-ownership adjustment will become more important.

Acquiring full legal access to Forest lands to support resource management as well as public recreation will continue. The ability to obtain access by purchase will continue to decrease.

### Need for change in Forest Plan direction

Current management direction is adequate; there is no need for change in management direction.

## Minerals

### Existing Forest Plan direction

*Direct minerals area management toward the use of minerals related activities to enhance surface resource programs, to facilitate the uninterrupted flow of National Forest System mineral resources while ensuring adequate protection of the surface resources and the environment (Forest Plan III-9).*

*Prevent or control adverse impacts on surface resources in accordance with 36 CFR 228 (Forest Plan III-74).*

### Forest Plan amendment 96-001 direction

Direction from the 96-001 amendment will be added.

### Activity and condition trends

#### Performance measures

- Numbers of permits
- Number of leases
- Acres leased

The Forest Service's role in minerals management is to protect and manage surface resources while encouraging and facilitating mineral and energy exploration and development.

In the last decade, activities in mineral materials averaged less than 30 permits per year and resulted in the removal of several hundred tons of rock. Some free use is allowed. Management of mineral materials is expected to continue at a low level for the Forest, with interest increasing in the use of decorative rock.

For locatable minerals, Notices of Intent and Plans of Operations are the mechanisms used to authorize mining ventures. In the past six years, the Forest has averaged less than one Notice of Intent per year. Recreational activities for locatables, such as panning for gold, have increased in the past several years. There is a growing interest in recreational dredging.

Most oil and gas wells near the Shoshone National Forest would be considered mature wells (over 40 years old). Often these wells are involved in tertiary recovery (the last phase of recovery), which requires stimulation materials to increase or maintain production. Stimulation materials, such as carbon dioxide, help increase the flow of oil underground. These wells have an additional recovery expectancy of over 20 years. To enhance recovery, companies are now directional drilling from the original drilling pad. Directional drilling requires fewer infrastructures, such as new roads and pipelines. Recently, due to high oil and gas prices, drilling has increased adjacent to the Forest. Less than 10 percent of exploratory wells result in production of oil and gas. Some success in the Clark area has initiated interest in seismic exploration on areas adjacent to the Forest.

There are no active wells on the Forest. Of the 34 wells drilled, 31 have not produced and three have been capped due to low production. Nonetheless, with the increase in oil and gas prices in 2003 and 2004, interest in leasing on the Forest has increased in the form of several new lease applications. If oil and gas prices remain relatively high, interest in oil and gas leasing would continue where there is a moderate or high potential for oil and gas and where surface occupancy is allowed, which is about 11 percent of the Forest (USDA Forest Service 1992). The chances for full field development are low (20 percent) and most likely would be less than 640 acres (USDA Forest Service 1996).

*Figure 15. Acres of oil and gas leased per year.*

Year	Acres leased
1970	6,719
1973	33,883
1974	6,375
1975	5,168
1976	17,609
1977	11,289
1978	6,858
1979	3,093
1980	34,903
1981	111,424
1982	129,628
1983	94,086
1984	37,032
1985	6,329
1986	27,694
1987	28,000
1988	70,934
1989	56,520
1990	2,119
1998	2,775
1999	0
2000	1,950
2001	0
2002	0
2003	0

### **Projections if existing Forest Plan direction continues**

Development of locatables will continue under the provisions of the 1872 Mining Law on Public Domain Lands. Management of locatable minerals, based on statutory rights, may affect management of other

resources. The Forest Service will minimize these effects to the fullest extent of its regulatory authority. Some impacts may be occurring on riparian habitat from recreational dredging.

Adequate protection for grizzly bear habitat was a key part of the Record of Decision for oil and gas leasing (USDA Forest Service 1996). While protection appears to be adequate during the exploration phase, full field development would impact the grizzly bear unless adequate mitigation is in place. A lease notice protecting threatened and endangered species is attached to every lease.

## Need for change in Forest Plan direction

The revised forest plan should

- Reflect the limitation on management options for locatable minerals given the provisions contained within the 1872 Mining Law
- Contain adequate management direction to address impacts from recreational dredging
- Incorporate direction on oil and gas leasing that may be provided by the Forest Plan Amendments for Grizzly Bear Conservation for the Greater Yellowstone Area National Forests scheduled to be completed in 2005
- Incorporate direction on oil and gas leasing and minerals management in the Canada Lynx Conservation Assessment and Strategy

The revised plan should contain identify areas that are generally suitable for oil and gas considering the revised plan desired conditions and objectives.

# Rangeland management

## Existing Forest Plan direction

*Develop, protect, and manage the rangeland resource (as authorized by the basic laws, Secretary's regulations, Forest Service policy, and the Chief's and Regional Forester's goals and objectives) to maintain it in fair or better condition status with an upward trend (Forest Plan III-8).*

*Provide for grazing of livestock to maintain dependent existing industry (Forest Plan III-8).*

*Provide forage to sustain local dependent livestock industry as well as wildlife populations agreed to in Statewide Comprehensive Wildlife Management Plans for National Forest System lands (Forest Plan III-53).*

*Achieve or maintain satisfactory range conditions on all rangelands (Forest Plan III-57).*

*Exclude grazing of recreation stock and livestock in developed recreation sites during the managed recreation use season (Forest Plan III-106).*

*Non-forested and forested big game winter range emphasis areas*

*Maintain vegetation in fair or better range condition (Forest Plan III-160, III-167).*

## Forest Plan amendment 91-002 direction

*[In Management Situation 1 areas] On sheep allotments where grizzly-livestock depredation has been authenticated, adjustments will be made for the primary purpose of grizzly bear conservation. The following options are available*

- *Change the season of use, bedding practices, or grazing area to avoid known problem areas or other habitat important to grizzlies in time and space*
- *Change the class of livestock from sheep to cattle if the range is suitable for cattle*
- *Remove all livestock and close the allotment. Vacant sheep allotments will not be restocked with sheep (USDA Forest Service 1991)*



## Activity and condition trends

### Performance measures

- Authorized animal unit months (AUMs)
- Condition of vegetation transects
- Condition trend of vegetation transects

A number of dramatic changes in commercial livestock grazing activities have occurred on the Forest over the past 70 years and have accelerated in the past 10.

From a high point in the early 1900s, commercial sheep grazing has been in a steady decline on the Forest. The initial decline in sheep numbers was primarily due to adjustments to stocking rates that reflected a more sustained use of the range resource. The decline in sheep animal unit months continued through the 1970s. It continued to decline in subsequent decades, though at a slower rate, reflecting declining demand and increased importation of wool and mutton from overseas. The last 10 years have seen the removal of all but one commercial sheep-grazing permit due to an increase in predator/livestock conflicts and concern over the potential for disease transmission from domestic sheep to bighorn sheep.

In contrast to commercial sheep use, the levels of permitted<sup>7</sup> cattle grazing and demand for allotments have changed little for many decades. The influence of cattle grazing on the rangeland resource has lessened considerably. Improved livestock management, consolidation with vacant sheep allotments, where applicable, and construction of off site water sources have all led to improved conditions of both upland and riparian rangeland.

In the past five years, drought has resulted in a dramatic decrease in actual use animal unit months—a trend reflected in Figure 16. However, permitted cattle use animal unit months are not affected by this.

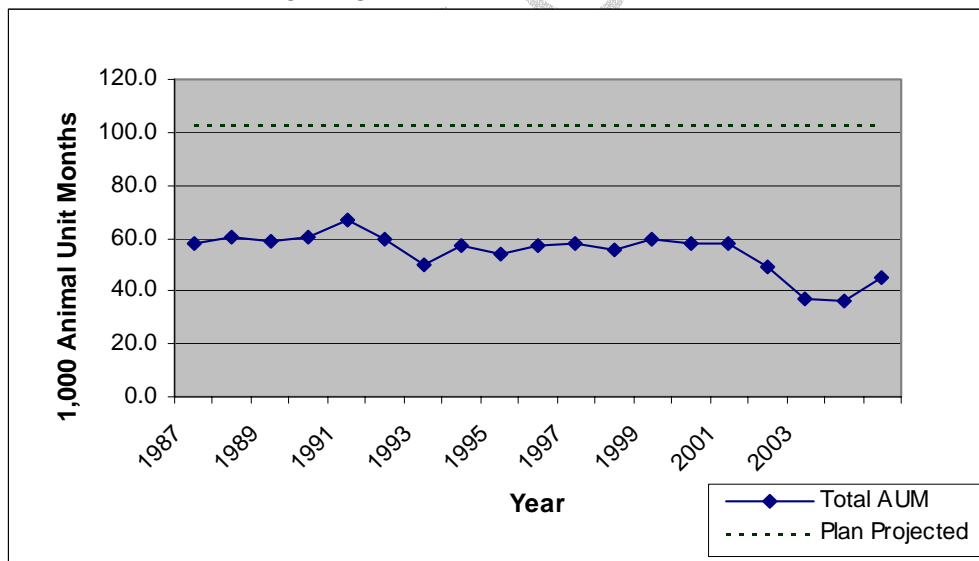
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<sup>7</sup> Permitted levels are set for a ten-year period in the allotment management plan. Authorized use levels are set annually in the permittees' operating instructions and may or may not be the same as the permitted use. The difference between permitted and authorized use constitutes non-use.

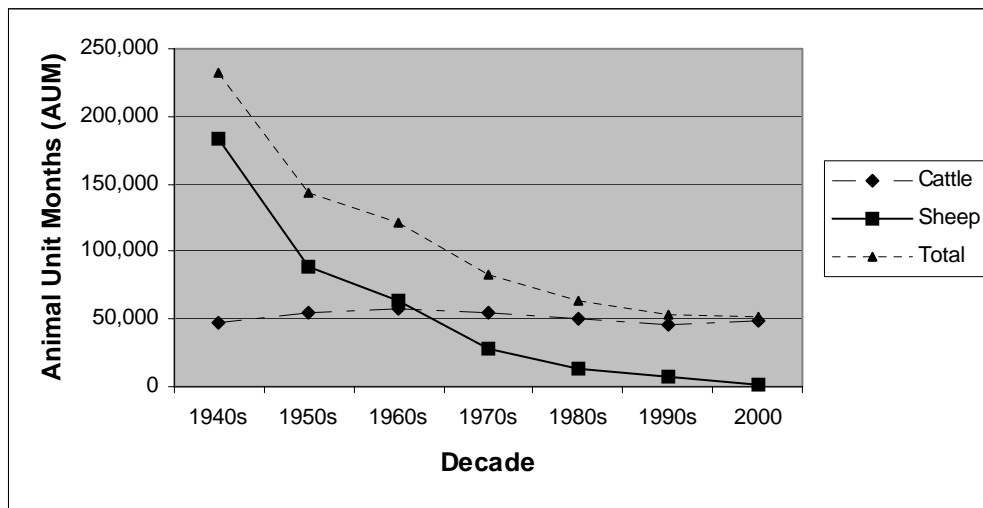
**Figure 16. Authorized commercial livestock grazing use since 1986, 1,000 animal unit months (numbers were rounded).**

Year	Cattle/horse animal unit months	% Forest Plan	Sheep animal unit months	% Forest Plan	Total animal unit months	% Forest Plan
Forest Plan	78	100	25	100	103	100
1986	55	70	4	17	58	56
1987	59	75	2	10	61	59
1988	56	72	2	11	59	57
1989	58	74	2	11	60	58
1990	64	82	2	11	67	64
1991	58	75	9	8	59	57
1992	49	62	1	5	50	48
1993	56	71	1	7	54	56
1994	54	68	<1	2	54	52
1995	57	72	<1	1	57	55
1996	57	72	1	7	58	56
1997	54	69	2	8	56	54
1998	58	74	1	7	60	58
1999	57	72	1	7	58	56
2000	57	72	1	7	58	56
2001	48	62	1	4	49	48
2002	37	47	<1	2	37	36
2003	36	45	1	2	36	35
2004	45	58	1	2	45	44

**Figure 17. Commercial livestock grazing use since 1986.**



**Figure 18. Historic commercial livestock use, by decade.**

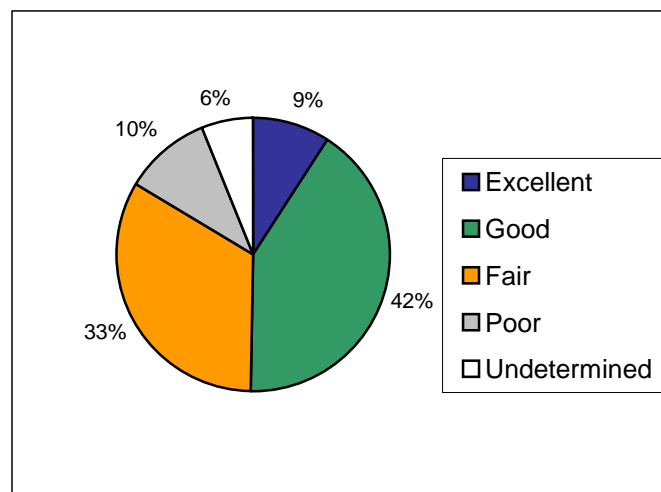


#### **Vegetative condition and trend**

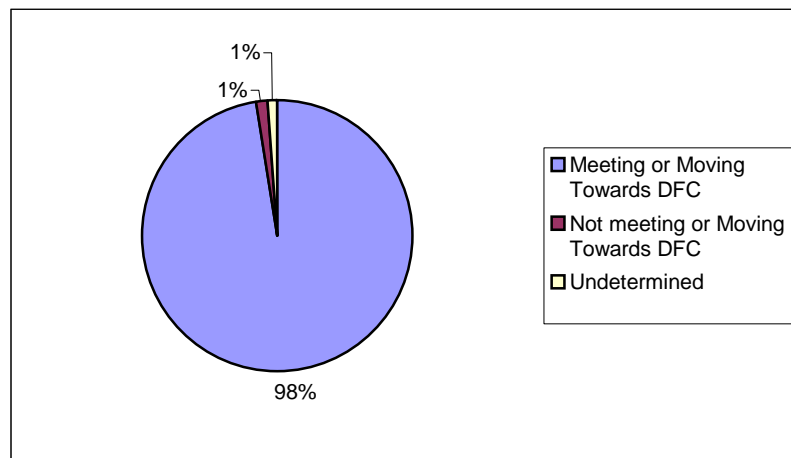
Figure 19 and Figure 20 reflect the vegetative condition and trend of the suitable acres found within active livestock grazing allotments. Rangelands outside of grazing allotments have been determined to be in similar or better condition due to the lack of livestock related impacts. As a result of range management, rangelands within commercial livestock allotments show the same general trend toward desired conditions and/or a stable vegetative state. There are isolated locations where the vegetation is not moving toward desired conditions or a stable vegetative state because the site is heavily impacted. These impacts occur for a variety of reasons, including:

- Concentrated use by commercial livestock around human-made and natural water sources (i.e., springs, seeps, riparian areas, stock tanks/ponds, etc.), salt grounds, and containment structures (i.e., fence corners, corrals, etc.)
- Concentrated use by recreational livestock near natural water sources, popular campsites, and high country meadows where available grazing is limited
- Concentrated use by wildlife in highly preferred upland winter ranges and riparian areas or winter range that has been reduced due to urban development

**Figure 19. Summary of vegetation condition transects.**



**Figure 20. Vegetation condition trend.**



### Projections if existing Forest Plan direction continues

Demand for cattle allotments will likely remain stable. The introduction of large predators to the Yellowstone Ecosystem has decreased the demand for sheep permits and applications on the Shoshone NF. In some cases, the USFS has decided not to issue sheep permits due to the potential problems associated with sheep/predator conflicts.

The rangeland vegetation area of the program will be influenced by implementation of vegetation modification projects resulting from the Healthy Forests Initiative. The primary vegetative change in the Forest's rangelands has been the gradual encroachment of conifers into grassland, aspen-forb, and meadow vegetation types. The primary cause of this encroachment has been exclusion and suppression of fire. However, this situation is rapidly changing due to increased wildfires resulting from disease and drought-stressed timber and prescribed fires designed to meet the objectives of the Healthy Forests Initiative.

### Need for change in Forest Plan direction

Current management direction is adequate; there is no need for change in management direction.

## Recreation

### Existing Forest Plan direction

*Provide a broad spectrum of dispersed and developed recreation opportunities in accordance with identified needs and use trends (Forest Plan III-7).*

*Provide adequate trails and trailheads for both motorized and non-motorized use in both winter and summer seasons (Forest Plan III-7).*

*Ensure that national forest developed sites are appropriate for the surrounding forest setting and do not compete with the private sector or unnecessarily duplicate other public land facilities and services (Forest Plan III-7).*

*Provide appropriate development facilities where the private sector is not meeting the demand (Forest Plan III-33).*

*Maintain cost-effective developed recreation facilities which complement non-Forest Service developments (Forest Plan III-33).*

*Construct, reconstruct, and maintain developed sites in accordance with the established Recreation Opportunity Spectrum (ROS) classification for the management area (Forest Plan III-34).*

*Provide a broad spectrum of dispersed recreation opportunities in accordance with the established Recreation Opportunity Spectrum (ROS) classification for the management area (Forest Plan III-35).*

*Provide facilities which are accessible to handicapped persons (Forest Plan III-33).*

*Prohibit motorized vehicle use (except over-snow vehicles operating on snow) off of Forest System roads and trails in alpine and Krummholz ecosystems (Forest Plan III-38).*

*Classify areas as to whether off-road vehicle use is permitted (Forest Plan III-88).*

*Maintain all trails for foot and horse travel unless specifically closed to either or both class of user (Forest Plan III-91).*

*Provide a full range of trail opportunities in coordination with other federal, state, and municipal jurisdictions and private industries both on and off NFS lands (Forest Plan III-92).*

#### *Semi-primitive motorized recreation areas*

*Emphasize semi-primitive motorized recreation opportunities. Increase opportunities for primitive road and motorized trail use (Forest Plan III-119).*

*Manage use to allow low to moderate contact with other groups and individuals (Forest Plan III-119).*

*Maintain existing motorized routes or construct new routes needed as part of the transportation, system.... (Forest Plan III-123).*

*Do not exceed an average motorized trail density of 4 miles per square mile on fourth-order watersheds (Forest Plan III-123).*

*Do not exceed an average motorized trail density of 2 miles per square mile in non-forested areas of fourth-order watersheds (Forest Plan III-123).*

#### *Roaded natural recreation areas*

*Provide roaded natural or rural recreation opportunities along Forest arterial, collector, and local roads which are open to public motorized travel (Forest Plan III-127).*

*Manage recreation use to provide moderate to high incidence of contact with other groups and individuals (Forest Plan III-127).*

*Maintain existing motorized routes or construct new routes needed as part of the transportation, system.... (Forest Plan III-123).*

*Do not exceed an average motorized trail density of 4 miles per square mile in non-forested areas of fourth-order watersheds (Forest Plan III-123).*

#### *Semi-primitive non-motorized recreation areas*

*Emphasize semi-primitive non-motorized recreation opportunities (Forest Plan III-134).*

*Manage use to allow low to moderate contact with other groups and individuals (Forest Plan III-124).*

#### *Primitive recreation areas and primitive wilderness*

*Emphasize primitive recreation opportunities requiring a high degree of isolation, solitude, self-reliance and challenge while traveling cross-country or on system trails (Forest Plan III-141).*

*Manage use to provide a low incidence of contacts with other groups or individuals...(forest Plan III-141).*

#### *Wildlife emphasis (management indicator species) areas*

*Manage human recreational activities so they do not conflict with habitat needs of selected indicator species (Forest Plan III-146).*

*Prohibit motorized vehicle use (including snowmobiles) off Forest System roads and trails in alpine shrub and Krummholz ecosystems (Forest Plan III-148).*

*Aspen emphasis areas*

*Prohibit development of new developed recreation sites (Forest Plan III-154).*

*Non-forested and forested big game winter range emphasis areas*

*Design, construct, and operate only those developed sites which are needed to meet summer season management objectives, and are appropriate for the established ROS designation. Close all developed sites during the winter management season (Forest Plan III-159, III-164).*

*Manage summer use season for appropriate ROS opportunities. Provide roaded natural recreation opportunities with-in ½ mile off Forest arterial, collector and local roads with better than primitive surfaces which are open to public motorized travel.*

*Provide semi-primitive motorized recreation opportunities with a low to moderate incidence of contact with other groups and individuals within ½ mile of designated local roads with primitive surfaces and trails open to motorized recreation use.*

*Where local roads are closed to public motorized recreation travel, provide for dispersed non-motorized recreation opportunities. Manage recreation use to provide for the incidence of contact with other groups and individuals appropriate for the established ROS class*

*Provide semi-primitive non-motorized recreation opportunities in all areas more than ½ mile away from roads and trails open to motorized recreation use (Forest Plan III-159, III-164).*

*Manage winter use for very low or low densities.*

*Close management area to cross-country ski trail development and to snowmobile use.*

*Do not provide parking or trail head facilities during winter (Forest Plan III-159, III-166).*

*Close existing roads, prohibit off-road vehicle use and manage non-motorized use to prevent stress on big game animals (Forest Plan III-162, III-171).*

*Close trails to motorized vehicle use except through trails. Through trails will have seasonal closures as necessary to protect the big game winter range values (Forest Plan III-162, III-172).*

*Wood fiber emphasis areas*

*...Provide roaded natural recreation opportunities with-in ½ mile off Forest arterial, collector and local roads with better than primitive surfaces which are open to public motorized travel.*

*Provide semi-primitive motorized recreation opportunities with a low to moderate incidence of contact with other groups and individuals within ½ mile of designated local roads with primitive surfaces and trails open to motorized recreation use.*

*Where local roads are closed to public motorized recreation travel, provide for dispersed non-motorized recreation opportunities. Manage recreation use to provide for the incidence of contact with other groups and individuals appropriate for the established ROS class*

*Provide semi-primitive non-motorized recreation opportunities in all areas more than ½ mile away from roads and trails open to motorized recreation use (Forest Plan III-174).*

*Wood fiber emphasis areas*

*Prohibit motorized vehicle use (including snowmobiles) off Forest System roads and trails in alpine shrub and Krummholz ecosystems (Forest Plan III-148).*

*Pristine wilderness*

*Provide opportunities for primitive and unconfined recreation featuring solitude and to travel cross-country in an environment where success or failure is directly dependent on ability, knowledge and initiative (Forest Plan III-182).*

*Emphasize recreation opportunities on the most primitive end of the recreation opportunity spectrum. Manage use to provide very infrequent contact with other groups or individuals (Forest Plan III-182).*

*Do not construct or reconstruct trails (Forest Plan III-184).*

*Primitive wilderness*

*Manage sites to provide opportunity for moderate to high degree of solitude (Forest Plan III-187).*

*Trail density will be less than one mile per square mile (Forest Plan III-189).*

*Semi-primitive wilderness*

*Trail density will not exceed two miles per square mile...(Forest Plan III-196).*

*Semi-primitive wilderness and Whiskey Mountain portion of Fitzpatrick Wilderness*

*Provide semi-primitive recreation opportunities requiring predominantly unmodified natural settings, with a moderate to high degree of challenge and risk while traveling cross-country or on trails (Forest Plan III-194, III-200).*

*Manage summer use to allow moderate to high contact with other groups and individuals (Forest Plan III-194, III-200).*

*Manage location of campsites to provide a moderate degree of solitude (Forest Plan III-194, III-201).*

*Riparian areas*

*Do not develop additional recreation facilities within 100 feet of water bodies except for facilities necessary to allow water related recreation use (Forest Plan III-208).*

*...Provide roaded natural recreation opportunities with-in ½ mile off Forest arterial, collector and local roads with better than primitive surfaces which are open to public motorized travel.*

*Provide semi-primitive motorized recreation opportunities with a low to moderate incidence of contact with other groups and individuals within ½ mile of designated local roads with primitive surfaces and trails open o motorized recreation use.*

*Where local roads are closed to public motorized recreation travel, provide for dispersed non-motorized recreation opportunities. Manage recreation use to provide for the incidence of contact with other groups and individuals appropriate for the established ROS class*

*Provide semi-primitive non-motorized recreation opportunities in all areas more than ½ mile away from roads and trails open to motorized recreation use (Forest Plan III-208).*

*Prohibit motorized vehicle use (including snowmobiles) off Forest System roads and trails in alpine shrub and Krummholz ecosystems (Forest Plan III-210).*

*Research Natural Areas*

*Prohibit construction of developed recreation sites (Forest Plan III-232).*

*Limit trails to those needed for access to conduct research and for education purposes (Forest Plan III-233).*

*Wild and Scenic River*

*No new developed recreation facilities will be permitted other than those associated with planned trails and VIS overlook sites or those needed to prevent resource degradation by recreation use (Forest Plan III-235).*

*Provide for primitive and semi-primitive nonmotorized recreation in an unmodified setting (Forest Plan III-235).*

*Prohibit motorized vehicle use (including snowmobiles) off Forest System roads and trails. Close existing trails to motorized vehicle use (Forest Plan III-239).*

*Locate trails outside riparian areas where the route parallels the river (Forest Plan III-239).*

*High Lakes Wilderness Study Area and the Dunoir Special Management area*

*Emphasis semi-primitive non-motorized recreation opportunities...The area is never open for motorized recreation activities except for snowmobiles operating on snow (Forest Plan III-241).*

*Manage use to allow low to moderate contact with other groups and individuals (Forest Plan III-241).*

## **Activity and condition trends**

### **Performance measures**

- Recreation use by type of use
- Developed recreation infrastructure provided
- Miles of trails by type of use

A number of factors need to be considered in assessing 1986 to 2004 recreation use trends on the Forest. During this time, the human population increased in adjacent communities. The increase in the average age of the population has changed the types of activities in which people engage. Other factors include changes in technology related to recreational activities, an increase in the number of grizzly bears, and an expansion of lands occupied by grizzly bears.

The 1986 Forest Plan stated that

Off-road vehicle use does not represent a major percentage of total recreation use on the Forest. Because of the rugged terrain, amount of wilderness, and availability of challenging primitive roads, most users of motor bikes and 4x4s limit use to designated routes. Snowmobilers are the major off-road vehicle users on the Forest (II-31).

Today, OHV (off-highway vehicle) use is one of the fastest growing forms of outdoor recreation. During the last fifty years, the number of visitors to the national forests has increased. The percentage of these visitors using OHVs is now a much larger percentage of the total recreation use. Nationally, OHV users now account for 5 percent of the total number of visitors to national forests; on the Shoshone, OHV use is following this national increase. Increases in unmanaged OHV recreation are leading to increased wildlife disturbance, soil erosion, and sedimentation in streams.

Other recreation activities that have increased include mountain biking, rafting, kayaking, rock climbing, ice climbing, snowmobiling, day hiking, fly fishing, and scenic driving.

The National Visitor Use Monitoring Survey conducted on the Shoshone in 2003 showed the top five activities recreationists participated in were viewing natural features, viewing wildlife, general relaxing, scenic driving, and hiking and walking.

The number of developed campsites has remained steady. Some campgrounds have been reconstructed to accommodate a trend of decreasing tent camping and increasing trailer and RV camping.

The number and duration of extended wilderness horse pack trips decreased, while the number of day rides and short, two- to three-day trips into wilderness have increased.

The growing grizzly bear population has affected recreation use trends. On one hand, grizzly bears attract people in viewing areas such as the North Fork Shoshone River. Conversely, increases in developed recreation opportunities are discouraged or precluded by current management direction for areas occupied by grizzly bears. In portions of the Forest, increasing and expanding bear populations have had the effect of displacing some recreational users to other locations on the Forest or to areas off-Forest. The overall effect of an increasing grizzly bear population has been a slower, less dramatic increase in recreation use compared to the increase occurring regionally and nationally.

Data for 1970 through 1981 were used in development of the 1986 Forest Plan, and show a trend of increased recreation use (visitor days) on the Forest. This trend appears to have continued from 1981 through 2002. Data for 2003 were collected as number of site visits for the National Visitor Use Monitoring survey. There is enough difference between the protocols used for both data sets that it is unclear whether the numbers are comparable. NVUM data for 2003 showed 651,000 visits on the Shoshone. Recreation use seems to be following the upward trend; evidence of this will not be known until future monitoring data are collected. The next set of monitoring will be performed in 2006 and will be based on the National Visitor Use Monitoring protocol.



**Figure 21. Breakdown of total Forest recreation visitor days.<sup>8</sup>**

	1986	2003
Non-wilderness dispersed recreation	52%	55%
Wilderness dispersed recreation	14%	5%
Developed recreation	34%	40%

**Figure 22. Recreation sites provided on the Forest in 1986 and 2004.<sup>9</sup>**

Type of Site	1986	2004
Trailheads	20	28
Campgrounds	33	32
Picnic grounds	7	11

### Trails

A wide range of recreation opportunities is available relative to the trail system, ranging from challenging foot travel to motorized uses. The priority on the Forest pertaining to trails management is keeping mainline trails open and safe to support commercial and non-commercial access to wilderness. User and outfitter clearing of trails has been emphasized to allow the Forest to focus on heavy maintenance and reconstruction. This trend is expected to continue as the Forest's backlog of maintenance increases due to reduced budgets and the increase of dead trees from fire and insect and disease infestation.

It has been difficult to meet expectations for acceptable levels of trail maintenance due to reduced funding and the extensive miles of trail in the system. An inventory of deferred maintenance needs was started in 1999. Approximately 85 percent of the Forest's 1,389 miles of system trail has been inventoried. The inventory is helping managers prioritize trail safety problems and plan repairs as funds become available.

The increase in popularity of OHVs has lead to resource damage on some primitive trail segments not designed for motorized use.

There are 281 miles of non-system snow trails on the Forest and winter use monitoring indicates an increase in the use of these trails.

## Projections if existing Forest Plan direction continues

Recreation use and demand for recreation facilities will increase as the population of the country increases. There will be a steady increase in day hiking trips, scenic driving, and fishing. A continued high use of OHVs will increase the need for more funding and personnel to enforce OHV regulations and manage resource damage.

Wyoming is expected to have a high percentage of retired residents in the USA. This older, wealthier, recreating public will likely desire an increase in RV camping facilities as opposed to tent camping facilities. Technological advances will lead to new or modified recreational pursuits that have not been identified or managed in the past.

## Need for change in Forest Plan direction

The revised plan direction needs to reflect changes that have occurred in recreation use, management, and impacts, such as:

- Increasing OHV use
- Changing demographics of recreation users
- Increasing demand for different types of recreation uses

<sup>8</sup> Data for 1986 are from the Forest Plan FEIS. Data for 2003 are from the National Visitor Use Monitoring survey.

<sup>9</sup> Data for 1986 are from the Forest Plan FEIS. Data for 2004 are from the Shoshone National Forest Recreation Guide.

- Visitor and grizzly bear conflicts
- Mixing of uses on travel routes

The revised plan should identify those areas that are generally suitable for motorized use.

## Socioeconomics

### Existing Forest Plan direction

*Provide the opportunity for economic growth of industries and communities dependent upon Forest outputs (Forest Plan III-10).*

### Activity and condition trends

#### Performance measures

- Populations demographics for counties
- Employment and earnings figures for counties
- Forest expenditures
- Forest receipts
- Payments to counties

#### County impacts

The Shoshone National Forest encompasses parts of five counties of which two have less than 10,000 acres within the Forest boundary (Figure 23).

Information on population, employment, income, age, and racial background was derived from detailed county social-economic profiles. The profiles were produced by the Sonoran Institute<sup>10</sup> and based on federal data sources.

**Figure 23. County acreages within Shoshone National Forest boundary.**

County	Acres
Fremont	853,959
Hot Springs	54,155
Park	1,547,684
Sublette	9,470
Teton	2,740

The following discussion focuses on Fremont, Park, and Hot Springs counties, since they have the largest portion of national forest acres within their boundaries. County lands are dominated by federal ownership.

Figure 24 shows populations trends along with population trend projections for Fremont and Park Counties made in the 1986 Forest Plan. Population projections made in the 1986 plan over estimated population growth. Park County has grown at a slower rate than projected (18 percent versus 44 percent). For Fremont County, the population has actually declined rather than increased (-8 percent versus 36 percent), though it has been increasing since 1990 (7 percent). Projections for Hot Springs County were not made in the 1986 Plan.

<sup>10</sup> [www.sonoran.org](http://www.sonoran.org)

**Figure 24. Population trends for Fremont, Hot Springs, and Park counties.**

<b>County</b>	<b>1980</b>	<b>1990</b>	<b>2000</b>
Fremont County (current data)	39,071	33,565	35,840
Hot Springs County (current data)	5,732	4,786	4,861
Park County (current data)	21,783	23,190	25,809
Fremont County (growth projection from 1986 Forest Plan)	--	41,881	53,082
Park County (growth projection from 1986 Forest Plan)	--	25,881	31,360

The major employment sectors for Fremont and Park Counties in 1980 and 2000 are shown in Figure 25. Many facets of the local economy are dependent upon National Forest System lands.

- Virtually all the water for Park, Fremont, and Hot Springs Counties originates within the Forest boundary.
- Visitors recreate on or pass through the Forest on their way to other destinations. Winter recreation, primarily snowmobile use, is growing.
- A large portion of the local livestock industry depends upon the Forest in the summer to round out their operations.
- The local timber industry procures a large portion of its timber from National Forest System lands.

**Figure 25. Comparison of employment percentages for Fremont and Park Counties, 1980 and 2000.**

<b>Employment Sector</b>	<b>Fremont County</b>		<b>Park County</b>	
	<b>1980</b>	<b>2000</b>	<b>1980</b>	<b>2000</b>
Construction	7.3%	9.0%	7.6%	8.4%
Government	16.9%	18.8%	16.7%	18.9%
Farm and agricultural services	6.3%	7.2%	8.7%	7.0%
Mining	20.0%	3.0%	9.3%	3.2%
Manufacturing (including forest products)	3.5%	3.9%	6.5%	4.4%
Services and professional	46%	58.1%	51.2%	58.1%

From 1980 to 2000, 1,186 and 4,371 new jobs were created in Fremont and Park Counties. The most percentage changes for both counties were increases in employment in the services and professional sectors and a decrease in employment in the mining sector. For Fremont County, the decrease in mining employment was large when a mine closed in 1982. A significant local effect in the town of Dubois in Fremont County was the closure of the Louisiana-Pacific sawmill in 1987. On the southern portion of the Forest, timber industry related employment is now represented by smaller family run mills.

As shown in Figure 26, all three counties have seen the greatest increase in non-labor sources of income<sup>11</sup>. For Park and Fremont Counties, 95 percent and 83 percent of new income was in non-labor sources. Almost all of the new income in Hot Springs County was in non-labor sources.

<sup>11</sup> The term non-labor income is also referred by some economists as non-earnings income. It consists of dividends, interest, rent (collectively often referred to as money earned from investments), and transfer payments (payments from governments to individuals, age-related, including Medicare, disability insurance payments, and retirements).

**Figure 26. Personal income measures for Fremont, Hot Springs, and Park Counties; Wyoming; and the United States, 1980 and 2000.**

Year	Fremont County	Park County	Hot Springs County	State of Wyoming	United States
Average earnings per job (dollars per year)					
1980	32,158	28,883	26,488	33,907	31,648
2000	21,605	22,984	19,086	27,037	36,316
Non-labor income (percent of total income)					
1980	24%	30%	35%	24%	29%
2000	45%	45%	49%	38%	31%
Total income (change in percent from 1980 to 2000)					
1980	+ 0.4%	+ 29.5%	- 0.3	+ 16.1%	+ 71.9%

In Figure 27, race is broken out two ways. The Hispanic breakout is separate because Hispanics can be of any race.

**Figure 27. Racial diversity for Fremont, Hot Springs, and Park Counties; Wyoming; and the United States.**

	Fremont County	% of total	Park County	% of total	Hot Springs County	% of total	State of Wyoming	% of total	U.S. % of total
White	27,388	76.5%	24,872	96.5%	4,685	96%	454,670	92.1%	75.1%
Black or African American	44	0.1%	23	0.1%	17	0.3%	3,722	0.8%	12.3%
American Indian & Alaska Native	7,047	19.7%	122	0.5%	74	1.5%	11,133	2.3%	0.9%
Asian	106	0.3%	114	0.4%	12	0.2%	2,771	0.6%	3.6%
Native Hawaiian & other Pacific Islander	9	0.0%	13	0.1%	0	0.0%	302	0.1%	0.1%
Some other race	417	1.2%	364	1.4%	31	0.6%	12,301	2.5%	5.5%
Two or more races	793	2.2%	278	1.1%	63	1.3%	8,883	1.8%	2.4%
Hispanic or Latino (of any race)	1,566	4.4%	959	3.7%	116	2.4%	31,669	6.4%	12.5%
Not Hispanic or Latino	34,238	95.6%	24,827	96.3%	4,766	97.6%	462,113	93.6%	87.5%

As shown in Figure 28, in 2000 the median age for the nation and Wyoming was 35.3 and 36.2. That compares to a median age of 37.7, 39.8, and 44.2 for Fremont, Park, and Hot Springs Counties.

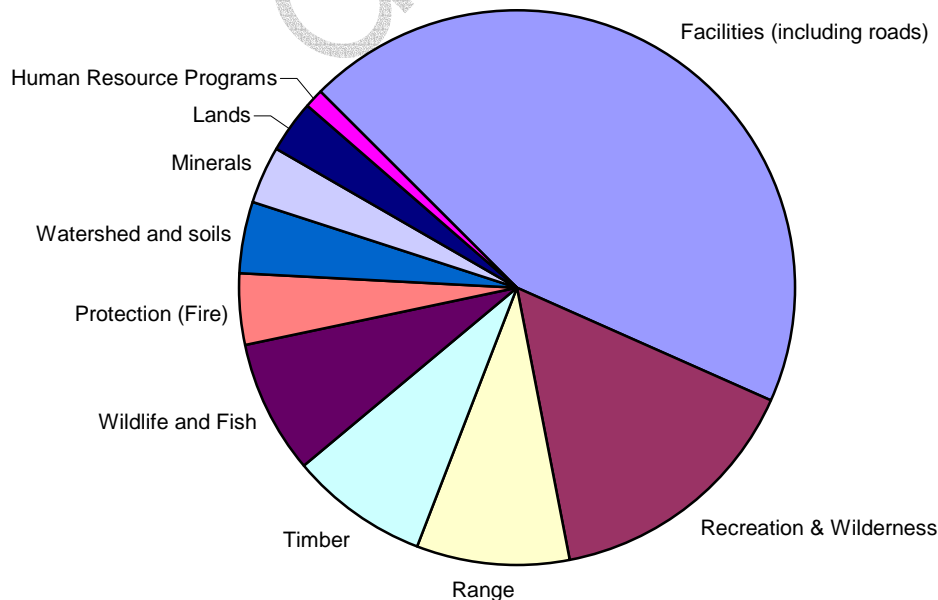
**Figure 28. Gender and age for Fremont, Hot Springs, and Park Counties and Wyoming, 1990 and 2000.**

Population by category, 1990								
	Fremont County	% of total	Park County	% of total	Hot Springs County	% of total	State of Wyoming	% of total
Population	33,662		23,178		4,809		453,588	
Male	16,729	50%	11,382	49%	2,367	49%	227,007	50%
Female	16,933	50%	11,796	51%	2,442	51%	226,581	50%
Under 20 years	11,398	34%	7,297	31%	1,361	28%	149,121	33%
65 years and over	3,873	12%	3,076	13%	900	19%	47,195	10%
Population by category, 2000								
	Fremont County	% of total	Park County	% of total	Hot Springs County	% of total	State of Wyoming	% of total
Population	35,804		25,786		4,882		493,782	
Male	17,740	50%	12,562	49%	2,348	48%	248,374	50%
Female	18,064	50%	13,224	51%	2,534	52%	245,408	50%
Under 20 years	10,954	31%	7,245	28%	1,195	24%	145,346	29%
65 years and over	4,750	13%	3,740	15%	978	20%	57,693	12%
Median Age	37.7		39.8		44.2		36.2	

#### **Forest expenditures and returns**

The fiscal year 1982 budget for the Forest was \$4.748 million (adjusted for inflation) including capital investments and general administration (Forest Plan III-8). For fiscal year 2004, the budget was \$7.778 million including all appropriated funds. An additional half million dollars was available to the Forest in the form of agreements, trust funds, collections, and cooperative accounts. Figure 29 and Figure 30 show a breakdown by budget line item for those two years. The budget categories have changed over the years, so there is not a one-to-one correspondence between the two periods.

**Figure 29. 1982 Shoshone National Forest budget by resource area.**



**Figure 30. 2004 Shoshone National Forest budget by resource area.**

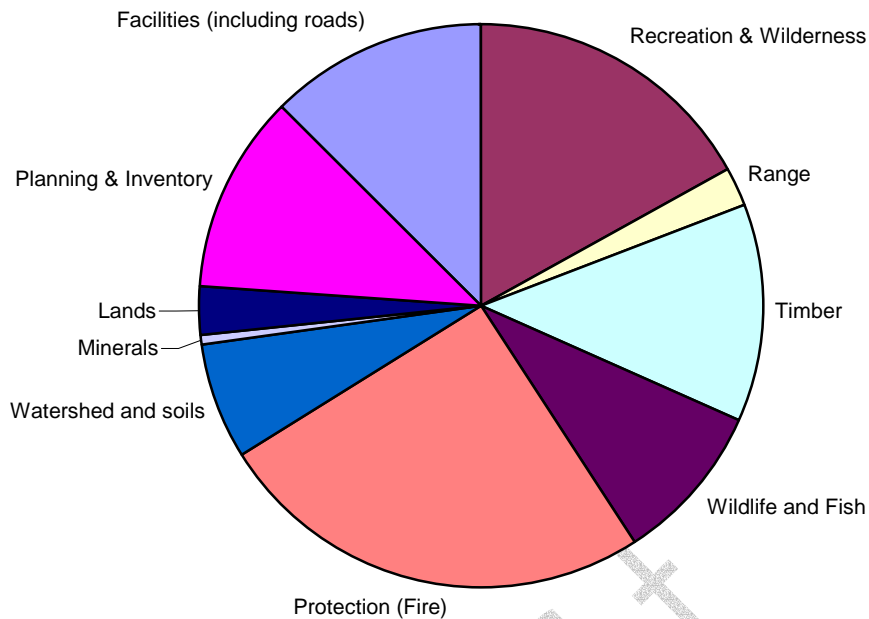


Figure 31 compares receipts to the Forest from 1982 (Forest Plan III-8) and 2004.

**Figure 31. Forest receipts 1982 and 2004. Dollar amounts are adjusted for inflation.**

	1982	2004
Administrative user fees	143,038	235,690
Grazing	136,235	35,221
Recreation	132,418	126,273
Minerals	132,252	832
Timber	55,755	163,702
Land uses	17,092	44,254
Power	663	0

A portion of the revenues collected by the Forest Service is returned to the State of Wyoming to be used for schools and roads in the counties where National Forest System lands are located. Figure 32 shows the fiscal year 1983 (Forest Plan III-9) and 2004 payments to Wyoming for distribution to counties.

**Figure 32. Payments to counties for 1983 and 2004. Payments in this table are based on receipts. Dollar amounts are adjusted for inflation.**

County	1983 Payments	2004 Payments
Fremont	86,027	104,063
Park	105,653	184,937
Hot Springs	5,397	6,281

## Projections if existing Forest Plan direction continues

### County impacts

Trends reflected in the past 20 years are expected to continue, particularly with increases in population growth.

### Forest expenditures and returns

Forest expenditures are expected to grow little over the next 10 years, with returns to counties experiencing slow growth.

## Need for change in Forest Plan direction

Current management direction is adequate; there is no need for change in management direction.

### Performance measures

- There may be a need to identify new performance measures to better track those aspects that local governments are concerned about.

# Special area designations

## Existing Forest Plan direction

*Manage the High Lakes Wilderness Study Area and the Dunoir Special Management Area to protect their wilderness characteristics until Congress acts on the disposition of the areas (Forest Plan III-7).*

## Activity and condition trends

### Performance measures

- Acres of special designations

### Roadless and related special areas

The High Lakes Wilderness Study Area and the Dunoir Special Management Area have been managed according to the Forest Plan, protecting their wilderness characteristics.

In 1977, roadless areas were inventoried during the RARE II (Roadless Area Review and Evaluation) process to identify roadless and undeveloped land areas in the National Forest System and to determine their general uses for both wilderness and other resource management and development. Roadless areas are defined as unroaded areas that are generally equal to or greater than five thousand acres. There are 748,852 roadless (RARE II) acres on the Shoshone. Of these, 635,991 acres are within management areas that are open to timber harvest and road construction. The remaining 112,861 acres are within management areas that are not available for timber harvest or road construction.

### Research Natural Areas

Line Creek, a designated Research Natural Area, has been managed to protect its unique natural characteristics. There are several potential Research Natural Areas (Lake Creek, Beartooth Butte, Pat O'Hara, Grizzly Creek, Sheep Mesa, Arrow Mountain, Roaring Fork, Bald Ridge, and Picketts Knob) on the Forest. The Forest will continue to protect these potential Research Natural Areas for their individual unique features until a decision is made on whether to officially designate these areas.

The potential Research Natural Areas comprise approximately 71,000 acres (80 percent in wilderness areas) of National Forest System lands. Research Natural Areas represent unique geologic, ecologic, or vegetative communities that are protected for continued studies and for reference areas to observe anthropogenic impacts. Generally, these areas are protected from timber harvesting, grazing, oil and gas exploration, and other activities that may alter their unique characteristics until a final determination has been made on their designation.

### Special Interest Areas

The objective of a Special Interest Area (SIA) is to protect and, where appropriate, foster public use and enjoyment of areas with scenic, historical, geological, botanical, zoological, paleontological, or other special characteristics. SIAs less than 10,000 acres can be designated by the Regional Forester.

The Sawtooth Peat Beds Geologic SIA, Little Popo Agie Piedmont Moraine SIA, and the Deep Lake Slide SIA are proposed for designation.

The Swamp Lake botanical area is a designated Special Interest Area.

### Projections if existing Forest Plan direction continues

Roadless areas, the High Lakes Wilderness Study Area, and the Dunoir Special Management Area will continue to be protected and managed as they have under the current Forest Plan.

Currently, the Research Natural Areas and Special Interest Areas are proposed and have no official designation.

### Need for change in Forest Plan direction

The revised Forest Plan needs to identify whether

- Inventoried roadless areas should be recommended for wilderness designation, managed as they are, or managed as other forest lands
- Potential Research Natural Areas and Special Interest Areas should be recommended for special designation or managed as other forest lands

## Special uses

### Existing Forest Plan direction

*Do not approve any special use applications that can be reasonably met on private or other federal lands unless it is clearly in the public interest (Forest Plan III-82).*

*Identify areas where designation as transportation and utility corridors in the future are compatible with management area goals...(Forest plan III-116).*

*Primitive recreation areas, the High Lakes Wilderness Study Area, and the Dunoir Special Management area*

*Prohibit competitive contest events, group demonstrations, ceremonies, and other similar events (Forest Plan III-142).*

### Activity and condition trends

#### Performance measures

- Numbers of special uses by category

Special Uses are defined as all uses of National Forest System lands, improvements, and resources (except timber, minerals, and livestock grazing). Special Uses fall into two broad categories: recreation Special Uses include uses such as outfitter-guide authorizations, recreational cabins, and resorts; and non-recreation Special Uses include uses such as roads, ditches, and utility lines.

In the past 15 to 20 years, the number of Special Use authorizations on the Forest has not varied significantly, in spite of increased demand. Funding constraints have not allowed the completion of the required processes for new permits. In addition to inquiries for traditional horse-based outfitted uses, inquiries are very high for outfitted activities not currently authorized on the Forest, such as bicycle tours, guided nature tours, and ice climbing. The Forest's top priority in funding recreation Special Use authorizations is the administration of existing uses, with an emphasis on those uses involving potential risks to human health and safety.

The number of many other recreation-based authorizations has also remained constant for several reasons. New authorizations for recreation residence authorizations have remained at pre-1986 levels because Forest Service policy precludes issuance of new authorizations for these uses. Due to limited capacity for potential



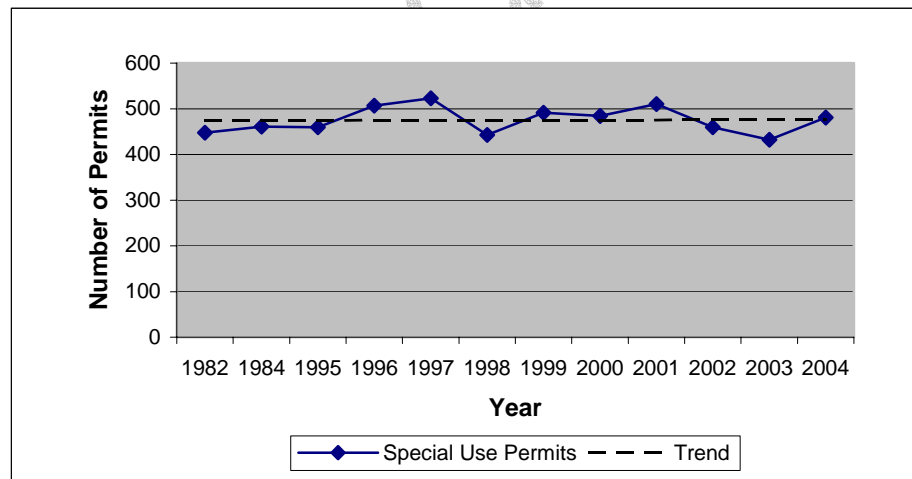
expansion and the lack of demonstrated public need for expansion of these privately provided recreation services, the number of authorizations for organization camps (e.g., Boy Scouts camps), skiing, and resorts has largely remained constant.

Numbers of non-recreation uses have increased over the last 15 years. Most of the increases have been in water uses such as pipelines and ditches, and in the number of road use authorizations that provide access to private lands located within the Forest boundary. New requests for these types of uses are authorized if they are found to be consistent with current Forest Service policy, the Forest Plan, and if potential environmental impacts can be mitigated successfully.

**Figure 33. Special Use permit categories by year, 1982 through 2004.**

Special Use type	1982	1984	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Organization camp	3	3	3	3	3	3	3	3	3	3	3	3
Resort	17	18	17	19	19	18	18	18	19	18	18	18
Skiing	3	3	4	4	4	4	4	4	4	4	4	4
Recreation residence	100	100	100	100	100	95	100	100	100	100	100	100
Outfitter/guide	110	118	118	132	135	100	147	134	127	121	91	126
Minerals	--	4	11	19	28	40	24	17	16	18	18	--
Road use authorizations	--	12	34	34	33	38	37	37	35	35	40	40
Research	--	1	--	--	15	17	16	13	19	5	6	8
Utilities/communications	--	67	38	38	37	46	46	48	46	42	47	47
Water use	--	78	79	82	79	74	75	74	93	84	89	90
Miscellaneous	--	65	--	76	70	8	21	35	48	30	16	45
Forest total	448	461	460	507	523	443	491	483	510	460	432	481

**Figure 34. Special Use permits by year, 1982 through 2004.**



## Projections if existing Forest Plan direction continues

There will continue to be an increase in demand for a variety of recreation, communication, and water-related special use authorizations. A decrease in demand for more traditional outfitted services will occur as demand for new, non-traditional types of authorizations increase. The increase and change in the type of authorizations will increase the complexity of administering commercial special uses. Increases in the number of recreationists and special use authorizations may lead to increased conflict between commercial uses and non-commercial uses of Forest lands.

The new funding source for special use authorizations under the Federal Lands Recreation Enhancement Act may help to increase the total number of authorizations.

## **Need for change in Forest Plan direction**

Current management direction for special use application priorities is adequate.

The revised plan needs to

- Reflect the recreational residence tracts that exist on National Forest System lands and how those places impact management options
- Address the demand for designated communication sites on the Forest and to what degree that use should be accommodated
- Address the increasing demands for special uses and how those new demands should be addressed, given the level of existing special uses

# Timber

## **Existing Forest Plan direction**

*Manage the timber resources on lands suitable for timber management to provide sawtimber, roundwood, and firewood to meet resource management objectives (Forest Plan III-8).*

*Provide timber sales of sufficient quantity and quality to attract investment by the timber industry to accomplish desired vegetation management (Forest Plan III-8).*

*Assure that all even-aged stands scheduled to be harvested during the planning period will generally have reached the culmination of mean annual increment of growth (Forest Plan III-63).*

*The maximum size of openings created by the application of even-aged silviculture will be 40 acres regardless of the forest cover type. Exceptions are:*

- *Proposals for larger openings are subject to a 60-day public review and are approved by the Regional Forester*
- *Larger openings are the result of natural catastrophic conditions of fire, insect or disease attack, windstorm*
- *The area does not meet the definition of created openings (Forest Plan III-63)*

*Establish a satisfactory stand on cutover areas, emphasizing natural regeneration within five years after final harvest except:*

- *For permanent openings that serve specific management objectives*
- *When other resource objectives dictate a different period such as spruce-fir clearcuts where planting must occur within three years after harvest*
- *When provided for otherwise in specific management prescriptions (Forest Plan III-66)*

*Primitive recreation areas, the High Lakes Wilderness Study Area, and the Dunoir Special Management area*

*Do not implement silvicultural practices (other than prescribed fire) to manage forested vegetation (Forest Plan III-143).*

*Research Natural Areas*

*Prohibit any logging activity (Forest Plan III-232).*

## **Forest Plan amendment 94-001 direction**

Direction from the 94-001 amendment will be added.

## Activity and condition trends

### *Performance measures*

- Harvest volume
- Acres harvested
- Acres clearcut
- Acres of regeneration certified
- Acres of timber stand improvement (precommercial thinning)

The 1986 Forest Plan set an average annual Allowable Sale Quantity (ASQ) volume of 11.2 million board feet. The Forest Plan set this amount as the maximum allowable harvest of timber from the suitable timber land base of approximately 86,000 acres. The 1986 decision indicated that all of this volume would be sawtimber. The 1986 decision predicted that an additional 1.2 million board feet of products other than logs<sup>12</sup> would be sold annually. This additional volume would not count toward the ASQ.

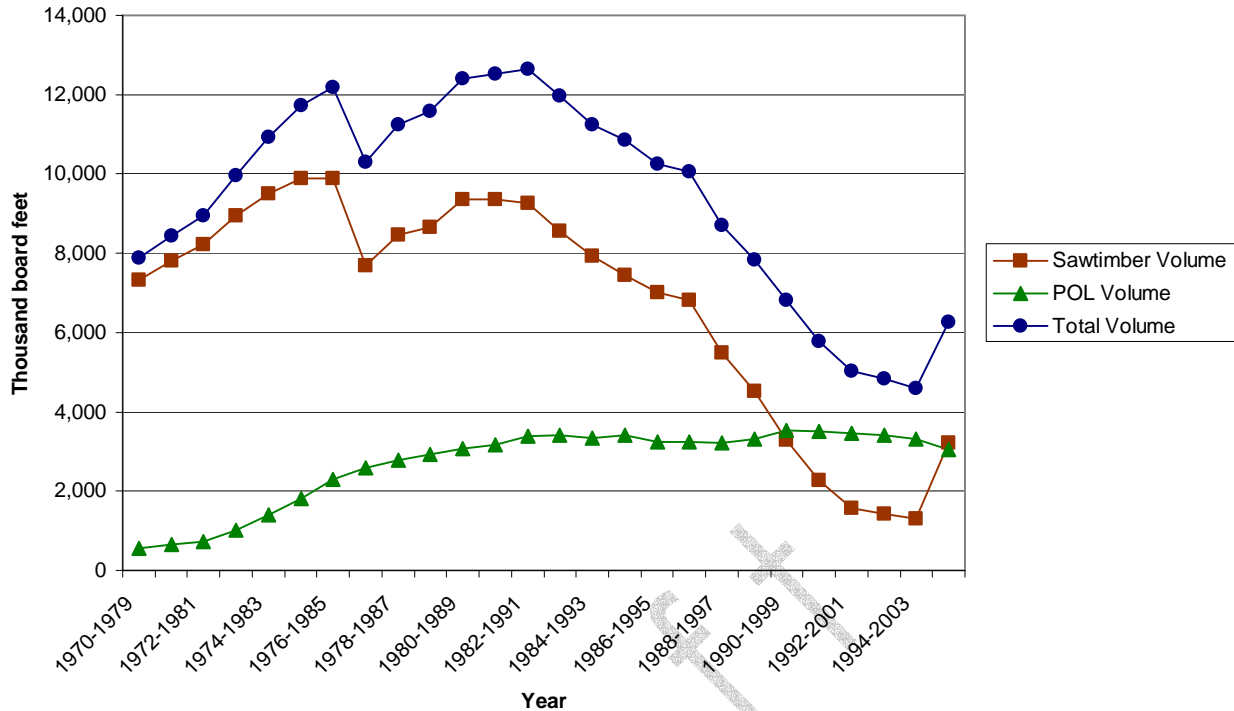
In the early 1990s, monitoring indicated that timber data and assumptions used in the Forest Plan analysis had overestimated the amount of timber that the Forest could produce. This, combined with the 1988 fires that burned over 9,000 acres of suitable timber land, resulted in the need to amend the Forest Plan. The Forest Plan was amended in August 1994 (USDA Forest Service 1994) with a recalculated ASQ. The amendment changed the annual average volume to 4.5 million board feet. The amended amount included 4.3 million board feet of sawtimber and 0.2 million board feet of products other than logs. The amendment also predicted that an additional 3.0 million board feet of products other than logs would be sold annually. The amendment directed that all salvage volumes offered for sale would count toward ASQ. This decision was made to address events such as the 1988 wildfires.

Based on data shown in Figure 38, it is possible to look at some general trends on the Forest by certain periods.

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<sup>12</sup> Products other than logs includes posts, poles, firewood, etc.

**Figure 35. Average annual harvest for rolling ten-year periods.**



Data from Figure 38 are displayed in Figure 35 using a rolling 10-year average to smooth out the year-to-year fluctuations that make it difficult to discern trends. Total average annual volume harvested has fallen steadily since 1990, until the increase in 2004. The graph also shows that products other than logs volume has remained relatively stable during that period. The majority of the decline has occurred in the form of reduced sawtimber harvest.

In comparing these data to the Forest Plan decisions, the volume of products other than logs sold since 1986 has averaged slightly over 3.0 million board feet per year. This amount is very close to the volume predicted in the 1994 Allowable Sale Quantity amendment of 3.0 million board feet, though it is above the 1.2 million board feet predicted in the 1986 Forest Plan decision.

Sawtimber volume sold has fluctuated greatly since 1986, as shown in Figure 36. The period from 1995 to 2004 was influenced by the large volume sold in 2004. Without the 2004 volume, the average for 1995 through 2003 would have been 1.2 million board feet.

The large fluctuations in total sawtimber volume are related to the offering of salvage sales in response to large catastrophic events such as the 1988 wildfires and the recent insect epidemic.

Other than in the late 1980s, total sawtimber sold has been below the Forest Plan ASQ. As a point of clarification, volume that contributes to ASQ is harvested from suitable timber lands. Not all of the volume sold was from suitable lands. As a result, this discussion does not provide an exact accounting of ASQ harvested, but it does provide adequate information to assess the trends of ASQ harvest over the life of the Forest Plan.

**Figure 36. Sawtimber volume sold, in million board feet.**

Timber period	Average annual total sawtimber volume sold	Forest Plan average annual allowable sale quantity
1986 – 1990	11.2	11.0
1991 – 1994	3.4	11.0
1995 – 2004	3.2	4.5

*Figure 37. Acres harvested in fiscal years 1984 through 2003.*<sup>13</sup>

<b>Fiscal Year</b>	<b>Acres Harvested</b>
1984	0
1985	248
1986	472
1987	272
1988	1,470
1989	548
1990	494
1991	499
1992	2,007
1993	709
1994	553
1995	33
1996	206
1997	51
1998	24
1999	85
2000	47
2001	69
2002	19
2003	323

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<sup>13</sup> Data from Eilers 2004.

**Figure 38. Volume sold and harvested, by product, in thousand board feet.<sup>14</sup>**

Fiscal year	Sawtimber sold	POL sold	TOTAL		Sawtimber harvested	Products other than logs harvested	TOTAL
1970	5,777	427	6,203		11,519	501	12,020
1971	3,735	348	4,083		11,569	388	11,957
1972 <sup>15</sup>	--	--	1,177		--	--	3,678
1973	--	--	3,777		--	--	7,798
1974	--	--	3,335		--	--	6,121
1975	--	--	5,200		--	--	2,852
1976 <sup>16</sup>	26,731	796	27,527		3,996	341	4,337
1977	7,723	1,370	9,093		5,557	998	6,555
1978	9,999	969	10,968		5,108	1,107	6,216
1979	6,784	635	7,419		17,187	351	17,538
1980	10,479	1,404	11,883		7,682	842	8,525
1981	7,911	1,213	9,123		10,653	1,574	12,227
1982	8,466	2,884	11,350		3,625	2,415	6,040
1983	9,107	4,174	13,281		5,366	1,749	7,115
1984	6,978	4,421	11,398		6,490	4,052	10,542
1985	4,720	5,103	9,823		11,575	4,345	15,920
1986	4,743	3,806	8,549		8,799	4,360	13,159
1987	15,410	3,262	18,672		14,639	4,824	19,463
1988	12,054	2,270	14,324		12,351	3,509	15,860
1989	13,620	2,106	15,726		5,982	2,109	8,091
1990	10,516	2,437	12,953		14,709	2,360	17,069
1991	7,104	3,292	10,395		10,055	2,489	12,544
1992	1,327	3,170	4,497		6,926	3,300	10,226
1993	2,730	3,441	6,172		4,222	2,975	7,197
1994	2,254	5,176	7,430		3,965	3,790	7,755
1995	284	3,420	3,705		1,141	3,796	4,936
1996	2,850	3,784	6,634		2,234	3,627	5,861
1997	2,241	2,970	5,211		1,732	3,975	5,707
1998	2,315	3,359	5,674		385	5,230	5,615
1999	1,158	4,250	5,408		1,289	4,092	5,380
2000	400	2,202	2,602		2,020	1,611	3,631
2001	112	2,923	3,035		1,068	2,895	3,962
2002	4	2,466	2,471		630	2,619	3,250
2003	1,410	2,458	3,868		1,044	2,591	3,635
2004	21,373	2,538	23,911		5,762	2,465	8,226

#### **Restocking of clearcuts and other reforestation**

The National Forest Management Act requires that where trees are harvested for timber production "the cuttings shall be made in such a way as to assure that the technology and knowledge exists to adequately restock the lands within five years after final harvest." For clearcuts, that means five years after the clearcut occurs (36 CFR 219.27 sec. (c)(3)). The Restocking of Clearcuts monitoring item was intended to ensure that clearcuts are restocked by the fifth year, by requiring regeneration surveys one, three, and five years after the clearcut.

<sup>14</sup> Data from Eilers 2004a. Numbers in this table were rounded up to the next whole number.

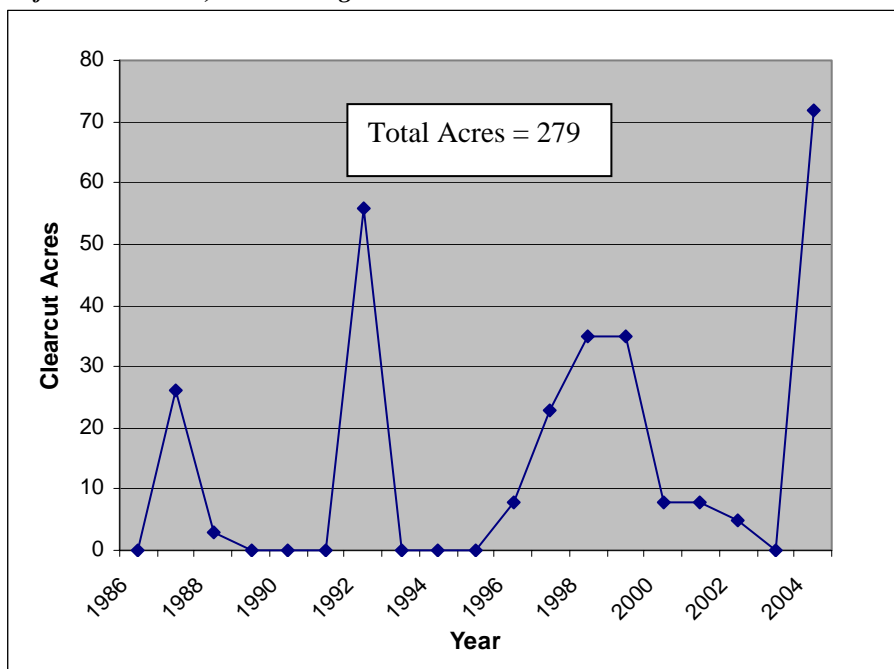
<sup>15</sup> Cut and sold data by product are not available for fiscal years 1972 through 1975 (totals only).

<sup>16</sup> Fiscal year 1976 data include the transition quarter.

Regeneration, or reforestation, of sites other than those clearcut is also monitored using regeneration surveys. For example, sites that have received other forms of regeneration harvest or natural disturbance such as fire are also surveyed the first, third, and fifth years after the event. Both naturally regenerated stands and planted stands are surveyed. Minimum stocking levels to be achieved are found on Forest Plan pages III 66-68. When stands meet or exceed minimum stocking standards, the stand is certified as fully stocked. If the stand is not regenerating naturally or plantation survival is poor, additional reforestation recommendations will be made by the fifth year survey.

The clearcut method of timber harvesting has not been used extensively on the Shoshone National Forest since 1986. Figure 39 displays the number of acres clearcut since the Forest Plan was published in 1986 (total 207 acres). Between 1992 and 1999, the majority of acres clearcut were along utility corridors for rights-of-way, along highways for construction projects and visual enhancements, and on the southern districts of the Forest for dwarf mistletoe removal.

**Figure 39. Number of acres clearcut, 1986 through 2004.**



The trend for regeneration and certification of clearcut acres on the Shoshone was fairly sporadic in the first eight years of the Plan. Many of the acres being surveyed for regeneration certification during this time were backlog survey acres for areas cut before 1976 and occurred on the south zone of the Forest. In general, acres that could not be certified failed due to poor seedling distribution rather than abundance of seedlings. A trend analysis documented in the 1996 Monitoring and Evaluation Report indicated that poor distribution of seedlings was likely the result of past management practices such as piling of slash or broadcast burning of the sites (USDA Forest Service 1996b). The majority of these sites were cut prior to passage of the National Forest Management Act; hence, a regeneration certification was not required. Most of the pre-1976 clearcut acres have since filled in with seedlings from seed blown in from adjacent stands and from seeds produced by saplings from the first batch of regeneration.

Acres harvested using the clearcut harvest method since 1986 are shown in Figure 40 by timber sale name.

**Figure 40. Acres treated by clearcut and status.**

<b>Timber sale</b>	<b>Acres</b>	<b>Harvest year</b>	<b>Planted</b>	<b>Certified</b>
Spring Creek Unit 2	26	1987	N	Y
Neff Park	3	1988	N	Y
Wildcat Blowdown	22	1992	N	11 acres
Union Pass Blowdown	22	1992	N	Y
Trapper Creek	12	1992	Y	Y
Neff Park	3	1996	N	Y
Loop Road	5	1996	N	Y
Loop Road	23	1997	N	Y
Neff Park	3	1998	N	Y
Aspen 3	4	1998	N	N
Charlie Horse	24	1998	N	Y
Loop Road	4	1998	N	2 acres
Sheridan Creek Oil Well	5	1999	Y	Y
Pelham Lake Unit 1	13	1999	N	Y
Burroughs Creek	17	1999	N	Y
Neff Park	8	2000	N	Y
Worthen	8	2001	N	Y
Loop Road	5	2002	N	N
Switchback Unit 3	38	2004	NA	NA
Atlantic Creek Unit 1	6	2004	NA	NA
Rattlesnake II	12	2004	NA	NA
Horse Creek Unit 1	16	2004	NA	NA

For the most part, acres treated by clearcut on the Forest since the Plan was published have regenerated naturally. In some instances, cut units have been replanted, as in the case of Trapper Creek and Sheridan Creek Oil Well Pad, which were planted in 2000. Occasionally, cut units that do not appear to be restocked by the fifth year survey are scheduled for planting but regenerate before the scheduled planting occurs. One reason for the delayed or failed regeneration is the extended drought that Wyoming and other parts of the intermountain west have experienced for the last five years.

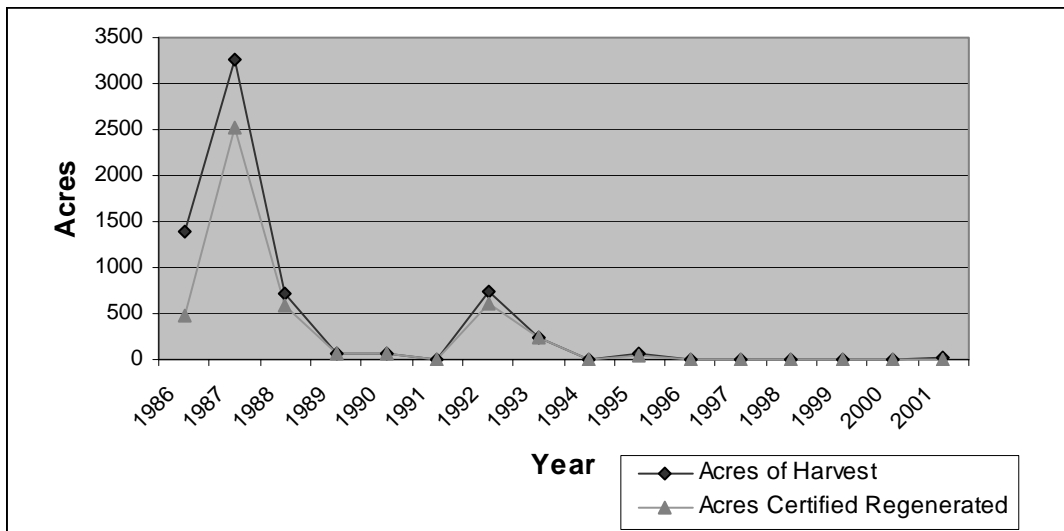
#### **Other reforestation**

Figure 41 displays the number of acres on which regeneration harvest has been applied since the Forest Plan was published and, of those same acres, which have been certified as regenerated. The trend on the majority of harvested acres has been natural regeneration although not necessarily by the fifth year. Drought, soil types, and grass/forb competition are factors that affect regeneration of treated or disturbed sites. In some cases, only portions of the treated site were certified as regenerated when regeneration surveys indicated trouble spots where trees were not growing in. The surveys help identify any additional reforestation measures needed for uncertified sites such as reseeding or planting.

Much of the effort put into regeneration surveys in the first decade of the Plan was directed at large clearcut areas from the 1960s and 1970s. Although these treatments pre-date the National Forest Management Act requirement for restocking, Forest personnel have spent considerable time surveying, monitoring, and evaluating these sites. Ensuring the old clearcuts were restocked diverted resources from more recent harvests, resulting in delayed certification. The backlog has been largely eliminated.



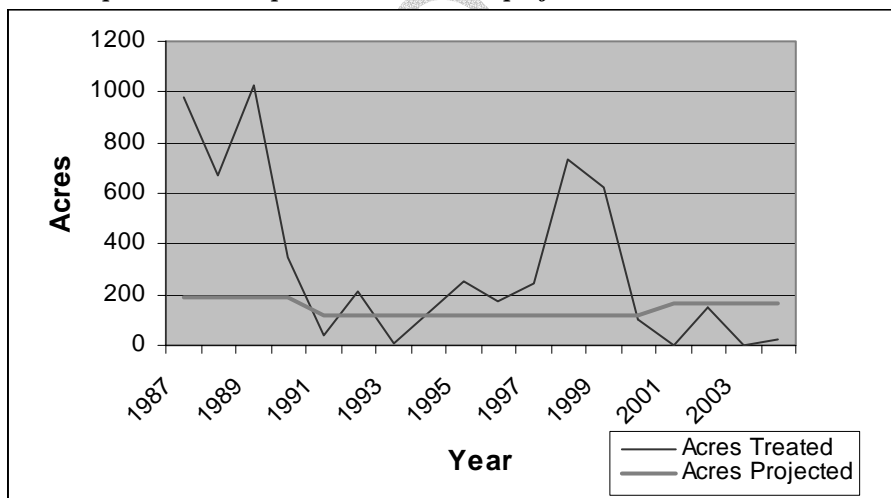
**Figure 41. Regeneration harvest and certified acres since 1986.**



#### **Timber stand improvement**

Timber stand improvement is any vegetation management activity that improves the composition, condition, or growth of a stand of trees. During the past 13 years, emphasis for timber stand improvement activities has been placed on cutover areas to enhance new stand growth by reducing competition on desirable species and to promote individual tree growth. Figure 42 illustrates the acres of timber stand improvement accomplished and the Forest Plan projection.

**Figure 42. Timber stand improvement compared to Forest Plan projection.**



The trend for acres receiving timber stand improvement has fluctuated greatly since the Forest Plan was published. Between 1995 and 1999, the Forest accomplished an average of 334 percent of what the Forest Plan projected for acres of timber stand improvement as shown in Figure 43. Some of the timber stand improvement contracts span multiple years, therefore acreage accomplishments will vary from year to year, with accomplishments exceeding planned acreage targets in some years. One major reason the Forest Plan timber stand improvement estimates were exceeded during this period relates to the fact that clearcuts from the 1960s have grown in and are now overstocked. For example, on the southern part of the Forest, there are at least 4,000 acres of old cutover areas on suited base timberlands from the 1960s. Some of these stands are in need of thinning to lessen competition, promote growth, add to age class diversity, and protect the stands from insect and disease infestations.

The decrease in timber stand improvement after 2000 reflects the listing of the Canada lynx as a threatened species. Lynx habitat was identified as per the Lynx Conservation Assessment and Strategy on the Shoshone NF in fiscal year 2001. Precommercial thinning in lynx habitat is permitted only when stands no longer provide snowshoe hare habitat.<sup>17</sup>

Beginning in 2001, areas outside of lynx analysis units were evaluated for timber stand improvement needs and in fiscal year 2002, 152 acres of lodgepole pine stands were precommercially thinned outside of lynx habitat (in the South Pass area on the Washakie Ranger District) where previous stand improvement work (removal of mistletoe-infected overstory trees) had occurred.

**Figure 43. Timber stand improvement actual and projected acres.**

Year	Acres treated	Acres projected	Percent of Forest Plan
1987	979	190	515
1988	669	190	352
1989	1,029	190	542
1990	347	190	183
1991	40	121	33
1992	214	121	177
1993	11	121	9
1994	129	121	107
1995	250	121	207
1996	170	121	140
1997	243	121	201
1998	734	121	607
1999	623	121	515
2000	105	121	87
2001	0	169	0
2002	152	169	90
2003	0	169	0
2004	23	169	14

### Projections if existing Forest Plan direction continues

Due to the current insect epidemic, it is anticipated that the harvest levels will be temporarily higher than average until this epidemic subsides, fuel levels are reduced, and the volume of damaged timber is salvaged. The increased harvest levels should continue until areas of urban interface can be protected. It is also anticipated that the demand for products other than logs will continue at or above the current levels of 2.5 million board feet. Once the salvage effort is completed, it is anticipated that the Forest will return to a harvest level near 4.5 million board feet of sawtimber and 2.5 million board feet of products other than logs.

Under current management direction, the trend for restocking of clearcuts and other areas where regeneration harvest has been applied will continue and improve. It is expected that regeneration surveys and certification will occur in a timely matter since the backlog of certification on pre-1976 clearcuts has been accomplished.

Timber stand improvement work on the Forest is anticipated to remain at current low levels, at least temporarily, due to federal listing of the lynx and implementation of the Canada Lynx Conservation Assessment and Strategy (Ruediger et al. 2000).

<sup>17</sup>Self-pruning processes have eliminated snowshoe hare cover and forage availability during winter conditions with average snow pack.

## Need for change in Forest Plan direction

The revised plan needs to

- Address the difference that exists between the mix of sawtimber and products other than logs that was envisioned in the current Forest Plan and the actual mix of these products that was realized during Plan implementation
- Incorporate what has been learned about management prescriptions that are most appropriate for treating timber
- Better address the purposes of timber management activities on suited versus unsuited lands
- Assess demand for firewood
- Comply with the Lynx Conservation Assessment and Strategy relative to timber management

# Transportation

## Existing Forest Plan direction

*Develop a transportation system that meets land and resource management needs at lowest cost and least disturbance to the environment (Forest Plan III-10).*

*Implement travel management practices, including both seasonal and permanent closures, to protect road and trail investment (Forest Plan III-10).*

*Manage motorized travel on roads, trails, and snow to protect land and resource values at lowest cost and with a minimum of regulations (Forest Plan III-10).*

*Close all newly constructed roads to public motorized use unless documented analysis shows:*

- *Use does not adversely impact other resources*
- *Use is compatible with ROS class established for the area*
- *They are located in areas open to motorized use*
- *They provide user safety*
- *They serve an identified public need*
- *The area accessed can be adequately managed*
- *Financing is available for maintenance or coop-maintenance can be arranged (Forest Plan III-88)*

*Manage road use by seasonal closure if:*

- *Use causes unacceptable damage to soil and water resources due to weather or seasonal conditions*
- *Use conflicts with the ROS class established for the area*
- *Use causes unacceptable wildlife conflict or habitat degradation*
- *Use results in unsafe conditions due to weather conditions*
- *They serve a seasonal public or administration need*
- *Area accessed has seasonal need for protection or non-use (Forest Plan III-89)*

*Keep existing roads open to public motorized use unless*

- *Financing is not available to maintain the facility or manage the associated use of adjacent lands*
- *Use causes unacceptable damage to soil and water resources*
- *Use conflicts with the ROS class established for the area*
- *They are located in areas closed to motorized use and are not “designated routes” in the Forest travel management direction*
- *Use results in unsafe conditions unrelated to weather conditions*

- *There is little or no public need for them*
- *Use conflicts with wildlife management objectives (Forest Plan III-89)*

*Closed or restricted roads may be used for and to accomplish administrative purposes when*

- *Prescribed in management area direction statements*
- *Authorized by the Forest Supervisor*
- *In case of emergency (Forest Plan III-89)*

*Construct and reconstruct arterial and collector roads to meet multiple resource needs (Forest Plan III-90).*

*Construct and reconstruct local roads to provide access for specific resource activities such as campgrounds, trailheads, timber sales, range allotments, mineral leases, etc., with the minimum amount of earthwork (Forest Plan III-90).*

*Maintain all roads to the following minimum requirements:*

- *All arterial and open collectors—Level 3*
- *All open local roads—Level 2*
- *All closed roads—Level 1 (Forest Plan III-91)*

*Maintain structures, bridges, cattle guards, etc. to be structurally sound and safe for use (Forest Plan III-91).*

*Semi-primitive motorized recreation areas*

*Do not exceed an average open local road density of 2 miles/square mile on fourth-order watersheds (Forest Plan III-123)*

*Non-forested and forested big game winter range emphasis areas*

*Allow new roads in the management area only if needed to meet priority goals outside the management area or to meet big game goals on the management area... (Forest Plan III-161, III-170).*

*Research Natural Areas*

*Generally, physical improvements, such as roads are not permitted (Forest Plan III-233).*

*Wild and Scenic River*

*Prohibit new road construction within the river corridor (Forest Plan III-239).*

### **Forest Plan amendment 94-001 direction**

*Manage new Forest Development Road construction and existing System and Non-system road obliteration so that, for each five-year period, beginning October 1, 1994, the number of miles of new Forest Development Road construction does not exceed the number of miles of road obliteration, forestwide. Obliterated road mileage in any five-year period which exceeded the number of miles of new road construction may be carried forward into the next five-year period for purposes of monitoring “no net increase” in new road mileages (USDA Forest Service 1994).*

## **Activity and condition trends**

### **Performance measures**

- Miles of roads reconstructed/constructed
- Total miles of road
- Miles of roads decommissioned

The following set of definitions is intended to help the reader better understand this section.

#### **Transportation Definitions**

**Classified roads.** A road constructed or maintained for long-term highway vehicle use. Classified roads may be public, private, or National Forest System Roads.

**System roads or National Forest System Roads.** A road wholly or partially within or adjacent to a national forest boundary and necessary for protecting, administering, and using National Forest System lands, which the Forest Service has authorized and over which the agency maintains jurisdiction.

**Non-system road.** An unclassified road; one that is not constructed, maintained, or intended for long-term highway vehicle use, such as roads built for temporary access and other remnants of short-term-use roads associated with fire suppression; timber harvest; and oil, gas, or mineral activities; as well as travel-ways resulting from off-road vehicle use.

**Functional class.** A road may be classified as one of three categories.

- Arterial roads provide service to large land areas and connect with other arterials or public highways.
- Collector roads serve smaller land areas than arterials and connect arterials to local roads or terminal facilities.
- Local roads are single purpose roads that connect terminal facilities with collectors or arterials.

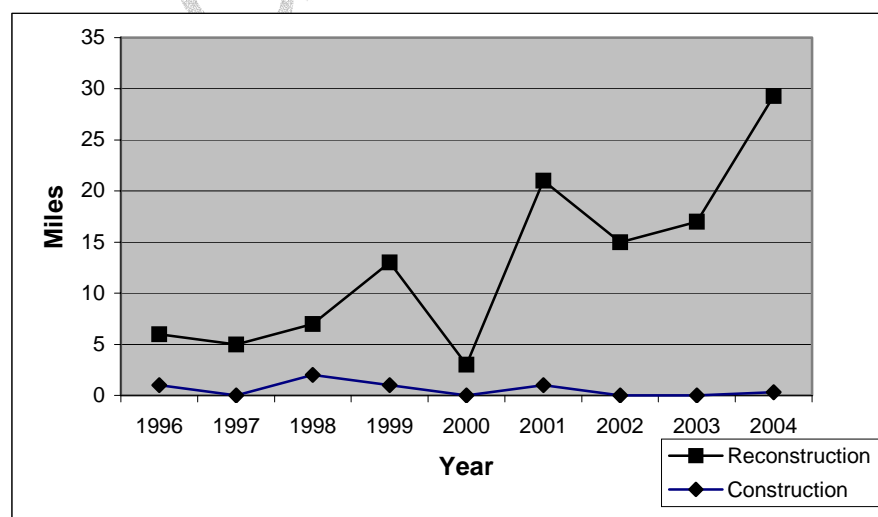
**Maintenance level** is the level of service provided by, and maintenance required for, a specific road.

- Level 1 is assigned to intermittent service roads during the time they are closed to vehicular traffic. The closure period must exceed one year. Basic custodial maintenance is performed.
- Level 2 is assigned to roads open for use by high-clearance vehicles. Traffic is normally minor.
- Level 3 is assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience not considered priorities. Level 3 roads are generally low speed, single lane, with spot surfacing.
- Level 4 is assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most are double lane and aggregate surfaced.
- Level 5 is assigned to roads that provide a high degree of user comfort and convenience. Normally level 5 roads are double lane, paved facilities.

Since 1986, new road construction has remained at a fairly consistent level, under four miles per year. Vegetative treatment activities generate the primary need for new road construction. Existing roads were decommissioned to balance the miles of new roads, or the newly constructed roads were closed to highway vehicles upon completion of the activity for which they were constructed. Most of the new roads constructed on the Forest are local roads.

In the same time period, levels of reconstruction have fluctuated. Reconstruction is directly related to activities such as timber sales and the capital investment and deferred maintenance programs. Vegetation management programs have experienced an increase in funding recently, which accounts for the majority of miles of road reconstruction. The majority of reconstruction work has been on local and collector type roads.

**Figure 44. Annual miles of road constructed/reconstructed, 1996 through 2004.**

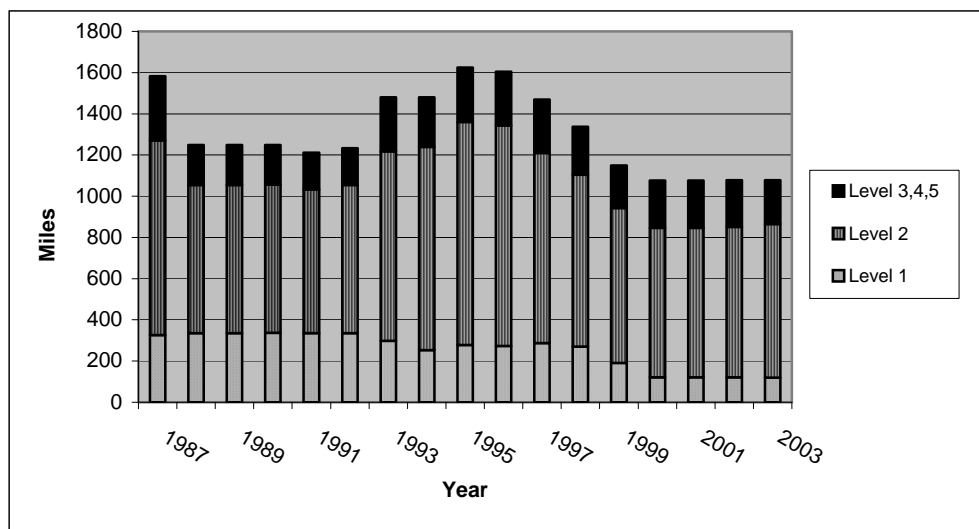


The overall miles of system roads have declined since 1987, although the ratio of miles in each maintenance level has remained fairly consistent. A peak in the mid-1990s of total road miles was likely due to active

inventorying of two-track roads existing at the time and a lack of guidance on how to categorize this new set of routes (e.g. classified versus unclassified).

Annual road maintenance activities continue to be performed, with roads in Maintenance Levels 3, 4 and 5 receiving the majority of funding due to their use as primary routes and access ways to Forest facilities and uses. The majority of roads on the Forest are within the Maintenance Level 2 classification.

**Figure 45. Total miles of road, by maintenance level, 1987 through 2003.**

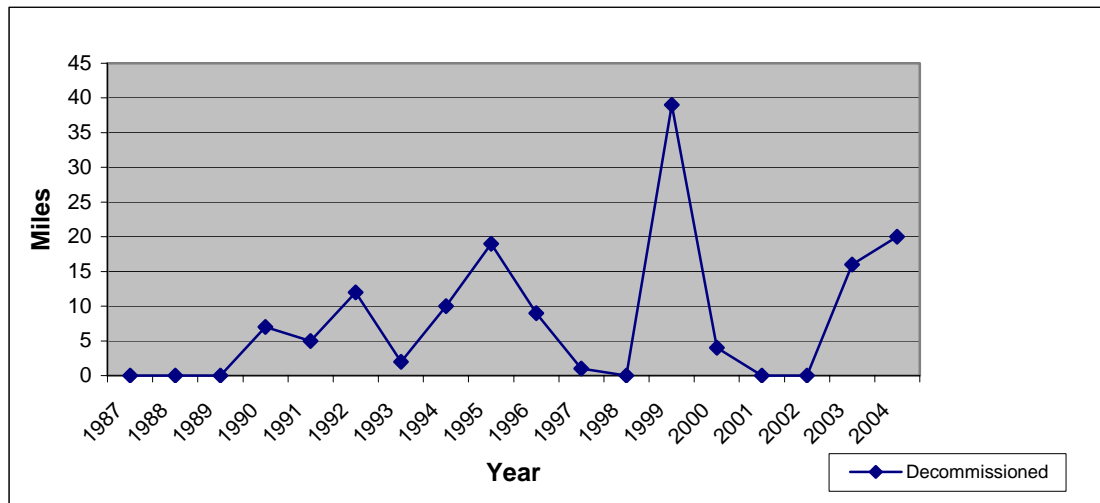


An emphasis on decommissioning roads not needed for resource management, administrative use, or public access and roads causing resource damage in the 1990s resulted in fairly consistent achievement of goals during that decade. Decommissioning strategies range from complete removal of the template and corridor from the landscape, which is essentially obliteration, to constructing closure devices to eliminating use by highway vehicles and restoring the template to natural drainage patterns and vegetation. Decommissioning occurred on both system and non-system roads and will continue as needed to eliminate resource damage and remove routes that are not needed for access for the short or long term.

The purpose of the Forest's strategy of not increasing net miles of roads is to mitigate cumulative impacts, which were a significant issue in the oil and gas leasing analysis (1992) and the ASQ analysis (1994). Implementation of the strategy requires that the number of miles of new construction not exceed the number of miles of road decommissioned Forest-wide. For each running five-year period beginning October 1, 1994, the cumulative number of new miles of Forest Service Road constructed should not exceed the cumulative number of miles of road decommissioned. Therefore, as new construction is planned, decommissioning of other roads is planned and implemented. Additionally, any temporary roads constructed or utilized for vegetative treatment activities must be closed upon completion of the activity.

Since the "no net gain of roads" policy was adopted in 1994 (USDA Forest Service 1994), a total of seven miles of new roads were built, and 105 miles of road were decommissioned, totaling 98 more miles of road decommissioned than constructed. The five-year average of roads constructed for the period ending in fiscal year 2004 is 0.2 miles. The five-year average of roads decommissioned for the same period is 5.4 miles. The trend since the 1994 Forest Plan amendment is illustrated in Figure 46. Though the total number of roads increased in the middle to late 1990s, a decrease followed. The inventory has been stable for the last several years.

**Figure 46. Annual miles of road decommissioned, 1986 through 2004.**



### Projections if existing Forest Plan direction continues

The trend for reconstruction should remain fairly similar to the current situation, as there are great needs but little funding. The cost of performing deferred maintenance will continue to increase unless more funding is directed to the reconstruction and maintenance of roads. Emphasis will continue to be placed on maintenance and improvement of Maintenance Level 3, 4 and 5 roads that provide general access.

Initiatives, such as the proposed Public Forest Service Road program, and current funding sources, including the Capital Investment Program and the Deferred Maintenance program, are potential funding sources for work needed to improve the condition of roads on the Forest. However, funding levels of these programs are determined by Congress and are prone to fluctuations, depending on other needs of the national budget.

The trend for new construction is expected to remain at or slightly above current levels, as long as there is emphasis on higher levels of vegetative treatment, which may result in greater access needs, especially in areas where no current access exists.

Efforts will continue to properly classify all routes on the Forest. It is not expected that system road miles will increase substantially in the future. However, efforts to reduce non-system road mileage will be emphasized.

Annual road maintenance activities will continue to be performed, with roads in Maintenance Level 3, 4 and 5 receiving the majority of funding due to their use as primary routes and access ways to Forest facilities and uses.

Decommissioning of system and non-system roads, with emphasis on non-system roads, will continue as needed to eliminate resource damage and remove routes that are not needed for access for the short or long term. User created roads that are discovered on a routine basis will be emphasized for decommissioning as soon as possible.

The no net increase in roads strategy will continue to guide road system management. Temporary roads constructed or utilized for vegetative treatment activities will be closed upon completion of the activity.

### Need for change in Forest Plan direction

The revised plan should provide guidance on general travel management on the Forest, including consideration of

- Increasing OHV use
- Road decommissioning
- Road reconstruction and construction

- No net gain in roads
- Maintaining and improving public and administrative access

The revised plan should

- Incorporate the Roads Analysis process (Miscellaneous Report FS-643)
- Adjust the minimum requirements for road maintenance for different road levels, to better address desired conditions

# Vegetation

## Existing Forest Plan direction

*Manage vegetation types outside of wilderness to provide multiple benefits commensurate with land capability and resource demand (Forest Plan III-6).*

*Improve the health and vigor of vegetation types outside wilderness and selected types in wilderness where necessary (Forest Plan III-6).*

*Improve habitats where vegetation conditions are significantly below biological potential (Forest Plan III-8).*

*Improve or maintain the quality of habitat in winter range on the Forest (Forest Plan III-8).*

*Implement an integrated pest management program to prevent and control insect infestations and disease (Forest Plan III-8).*

*Improve tree age class and species diversity to benefit forest health, recreation experiences, visual quality, and wildlife habitat (Forest Plan III-8).*

*Reduce damages by insect, disease, and other forest pests to acceptable levels through integrated management of vegetation (Forest Plan III-10).*

*Maintain structural diversity of vegetation on units of land 5,000 to 20,000 acres in size, or fourth-order watersheds that are dominated by forested ecosystems (Forest Plan III-19).*

*Maintain or establish a minimum of 20 percent of the forested area within a unit to provide vertical diversity.*

*Maintain or establish a minimum of 30 percent of the forested area within a unit to provide horizontal diversity.*

*In forested areas of a unit, maintain at least 5 percent in grass/forb stages and at least 10 percent of the conifer potential natural vegetation type in old growth ... in 30 acres or larger patches.*

*In forested units, create or modify created openings so they have natural appearing shapes. (Forest Plan III-19).*

*In forest diversity units, maintain at a minimum on each treated area, an average of 20-30 snags (in all stages of development) per 10 acres, well distributed over the diversity unit (Forest Plan III-21).*

*Manage aspen for retention wherever it occurs, unless justified by one of the following:*

- *Conversion of determinant aspen to conifers, or shrub or grass/forb seral stages for wildlife, aesthetic, recreation, transportation, or watershed purposes*
- *Conversion of determinant aspen to conifers on sites with high site index for conifers, in conjunction with a high demand for softwood*
- *Areas of aspen, which are larger than are needed for wildlife or aesthetic purposes (Forest Plan III-21)*

*Control overnight grazing of recreational stock in alpine and Krummholz ecosystems according to use standards in Management D02, Forest Direction (Forest Plan III-39).*



*Control natural insect or disease outbreaks in wilderness only when justified by predicted loss of resource values outside of wilderness (Forest Plan-41).*

*In forested areas, maintain deer or elk hiding cover on 60 percent or more of the perimeter of all natural openings, all created openings and along at least 75 percent of the edge of arterial and collector roads and 40 percent along streams and rivers.... Along streams and rivers in addition to hiding cover, 20 percent or more of the edge must be in thermal cover (Forest Plan III-50).*

*In diversity units dominated by forested ecosystems, maintain a minimum of 40 percent of the diversity unit in deer or elk hiding cover. This hiding cover should be well distributed over the unit. Maintain 20 percent of the diversity unit in thermal cover... (Forest Plan III-51).*

*Treat noxious farm weeds in the following priority:*

- *Leafy spurge and Russian and spotted knapweed*
- *Invasion of new plant species classified as noxious farm weeds*
- *Infestation in new areas*
- *Expansion of existing infestations of Canada and musk thistle, and other noxious farm weeds*
- *Reduce acreage of current infestation (Forest Plan III-58)*

*Prevent or suppress epidemic insect and disease populations that threatened forest tree stands with an integrated pest management (IPM) approach consistent with resource management objectives (Forest Plan III-97).*

*Semi-primitive non-motorized recreation areas*

*Maintain habitat for old growth dependent species.*

*Management areas will be managed to attain at least 20 percent in old growth and occur in 30 acre or larger patches (Forest Plan III-135).*

*Maintain or establish tall forest cover along the edges of all parks, meadows, riparian areas, collector roads, and natural openings to provide big game hiding cover (Forest Plan III-136).*

*Wildlife emphasis (management indicator species) areas*

*Maintain hiding cover for elk and deer, where present.*

*Maintain, along 75 percent of all arterial and collector road edges cover that hides...deer or elk...*

*In diversity units dominated by forested ecosystems, maintain a minimum of 50 percent of the diversity unit in deer or elk hiding cover. This hiding cover should be well distributed over the unit. Maintain 30 percent of the diversity unit in thermal cover (Forest Plan III-148).*

*Maintain habitat for old growth dependent species.*

*Management areas will be managed to attain at least 20 percent in old growth and occur in 30 acres or larger patches (Forest Plan III-149).*

*Manage forest cover types to provide variety in stand sizes, shape, crown closure, edge contrast, age structure and interspersed (Forest Plan III-149).*

*Aspen emphasis areas*

*Maintain aspen clones (Forest Plan III-154).*

*Maintain big game hiding cover next to aspen viewing areas, and along the edge of arterial and collector roads (Forest Plan III-154).*

*Maintain standing dead trees (Forest Plan III-154).*

*Non-forested big game winter range emphasis areas*

*Provide big-game forage and cover, and habitat.*

*Maintain at least 30 percent of shrub plants in mature age, and at least 10 percent in young stage (Forested III-160).*

*Maintain at least two shrub species on shrub lands capable of growing two or more shrub species (Forest Plan III-160).*

*Maintain existing natural shrub and grassland openings unless treatment is designed to benefit wildlife (Forest Plan III-160).*

*Forested big game winter range emphasis areas*

*Provide big-game forage and cover, and habitat.*

*Maintain at least 30 percent of the area in created or natural openings.*

*Provide thermal cover for elk or deer on at least 20 percent of the area.*

*Maintain, along 75 percent of all arterial and collector road edges cover that hides ... deer or elk.*

*In diversity units dominated by forested ecosystems, maintain a minimum of 50 percent of the diversity unit in deer or elk hiding cover. This hiding cover should be well distributed over the unit. Maintain 20 percent of the diversity unit in thermal cover (Forest Plan III-166).*

*Maintain existing natural shrub and grassland openings unless treatment is designed to benefit wildlife (Forest Plan III-166).*

*Wood fiber emphasis area*

*Maintain existing natural shrub and grassland openings unless treatment is designed to benefit wildlife (Forest Plan III-176).*

*Whiskey Mountain portion of Fitzpatrick Wilderness*

*Maintain existing natural shrub and grassland openings unless treatment is designed to benefit wildlife (Forest Plan III-204).*

*Riparian areas*

*Provide habitat diversity through vegetation treatments,..., designed to maintain or improve wildlife or fisheries habitat (Forest Plan III-210).*

*Management areas will be managed to attain at least 20 percent in old growth and occur in 30 acres or larger patches (Forest Plan III-211).*

*Manage forest cover types to perpetuate tree cover and provide healthy stands, high water quality and wildlife and fish habitat (Forest Plan III-212).*

*Research Natural Areas*

*Take no action against endemic insects, diseases, or wild animals (Forest Plan III-233).*

### **Wild and Scenic River**

*Manage for natural succession...(Forest Plan III-235).*

## **Activity and condition trends**

### **Performance measures**

- Acres by cover type and stand structure
- Acres of insect and disease impacts
- Acres of invasive plant species

### **Vegetation structure**

Vegetation composition or the types of trees, shrubs, and grasses and structure (the age, height, and density of trees) are the measures used for stand diversity. The Forest is currently working on completing a new vegetation inventory.

The vegetation composition and structure has been influenced by management activities, wildfire, and the insect epidemic since the 1986 plan was adopted. Management activities, including timber harvest and prescribed burning, have been conducted as prescribed by the Forest Plan. Prescribed burning has been conducted on approximately 30,000 acres. Timber harvest has been conducted on 13,390 acres, including 279 acres of clearcutting, 5,506 acres of shelterwood harvest, 4,208 acres of salvage, and 3,397 acres of thinning. Two other natural disturbance events have also affected the vegetation. Wildfires have burned over 260,000

acres since 1986 and insect epidemics have impacted tens of thousands of acres since 1990. This combination of management actions and natural events has influenced how the vegetation has changed since 1986.

According to the Historic Variability for the Upland Vegetation of the Shoshone National Forest, Wyoming (Meyer et al. 2004) deviations from the historic vegetative patterns across the Forest are occurring where timber management, fire suppression, and livestock grazing have been important management activities and where invasive species have become established. Natural disturbances (fire, insects) are a regular occurrence on the Shoshone National Forest and are within their historic variability. Overall, compared to other national forests in Wyoming, the Shoshone National Forest has been changed relatively little by European-Americans.

Currently 60 percent of the Forest's acres are dominated by tree cover, 25 percent are dominated by grass/forb cover, 10 percent are barren, and 4 percent are dominated by shrubs. The tree species on the Forest are spruce/fir, Douglas-fir, lodgepole pine, white bark pine, limber pine, and aspen (Figure 47).

**Figure 47. Acres of tree species on the Shoshone National Forest.**

Tree Species	Acres
Spruce/fir	414,703
Douglas-fir	408,587
Lodgepole pine	294,987
Whitebark pine	222,517
Limber pine	53,070
Aspen	18,266
Other	4,368

To address forest structure, we examine a combination of size class and stand density. For size class, we consider seedlings/saplings, immature timber (four to nine inches diameter breast height), and mature timber (over nine inches diameter at breast height). Over 75 percent of the forested stands are in a mature condition.

**Figure 48. Need a caption.**

Size	Acres
Seedling	15,925
Immature (four to nine inches in diameter)	305,153
Mature (greater than nine inches in diameter)	1,095,420

Canopy closure is used as a surrogate for stand density. A stand with a canopy closure of 40 percent indicates that if you were standing within the stand and looking at the sky, 40 percent of the sky would be obscured by tree canopies. Figure 49 displays the structure of the forested vegetation. Stands with less than 40 percent canopy cover make up approximately 30 percent of forested stands. Stands with canopy cover between 40 and 70 percent make up 40 percent of forested stands. The remainder of the forested stands has canopy covers over 70 percent. Disturbance events affect the stand structure and result in a reduction of canopy cover. In the cases of clearcuts and extreme wildfire, the canopy cover can be eliminated. Insect epidemics, fire, and some types of harvesting lower average stand diameter since they affect the older mature trees in a stand. Vegetation treatments have various effects, depending upon whether the harvest takes the older trees for timber, or whether the trees are thinned to concentrate stand growth on the remaining trees. Prescribed fire and wildfire sometimes kill only the smaller trees, leaving a stand dominated by larger trees. In the cases of more severe wildfires, larger trees are also killed.

**Figure 49. Forested vegetation structure on the Shoshone National Forest.**

Size	Canopy Cover	Acres
Seedlings and saplings	NA	15,925
Immature (four to nine inches in diameter)	Less than 40%	67,415
	40 to 70%	140,603
	Greater than 70%	97,135
Mature (greater than nine inches in diameter)	Less than 40%	371,779
	40 to 70%	441,643
	Greater than 70%	281,998

Figure 50 displays stand structure by tree species. This table can be used to compare how vegetation structure varies by species. Species such as whitebark pine and limber pine tend to have lower canopy closures, while spruce/fir stands tend to have higher canopy closures.

**Figure 50. Forested vegetation structure percentages by tree species on the Shoshone National Forest**

Species	Vegetation structure condition (size and canopy closure)					
	Immature			Mature		
	<40%	40-60%	>60%	<40%	40-60%	>60%
Spruce/fir	3	4	5	18	38	31
Whitebark pine	7	15	4	45	19	10
Douglas-fir	4	4	5	35	35	17
Aspen	18	51	16	3	9	3
Lodgepole pine	4	3	18	9	29	20
Limber pine	21	17	0	45	16	1

#### **Insects and disease**

The 1986 Forest Plan management direction did not envision large scale insect or disease epidemics on the Forest. The direction considered controlling large events but did not reflect the possibility that they would occur. Most insect and disease outbreaks are a natural occurrence of a natural system.

A Forestwide aerial survey, in 1996, identified a number of insect and disease events on the Forest (USDA Forest Service Report RCSC-97-04). The largest impact on the Forest was from mistletoe and commandra blister rust. It was estimated that over 100,000 acres were impacted by these diseases, with the majority of the damage located on the Washakie Ranger District and the southern end of the Wind River Ranger District. The second most prominent damage agent was from subalpine fir decline, which was impacting 5,994 acres. Douglas-fir beetle impacted 1,203 acres, with the greatest concentrations along the Clarks Fork gorge and in Sunlight Basin. The report noted that the Douglas-fir outbreak had subsided significantly from past years and concluded that the outbreak may be subsiding. Mountain pine beetle was a minor factor with very few trees impacted across the Forest.

The forest wide aerial surveys in 1999 and 2000 revealed a substantially different situation (USDA Forest Service Reports LSC-00-07 and LSC-01-09). Spruce beetle impacts, which are not even mentioned in the 1996 survey, increased greatly. In 1999, 6,000 acres were impacted primarily in the Washakie Wilderness. By 2000, over 17,000 acres were being impacted with a six-fold increase in the number of trees killed. Douglas-fir beetle impacts were 5,000 acres in 1999 with the most damage in the Absaroka Mountains north of Wapiti Ridge. Within this area, the highest mortality was within the North Fork drainage of the Shoshone River. In 2000, acres had increased to 7,500. Impacts were now being seen in the South Fork of the Shoshone River drainage, where there had been little impact the year before. In all, numbers of trees killed were up 36-fold from 1998 levels. Much of the dramatic increase in insects is the result of drought, mild winters, and the susceptibility of mature forests.

Surveys in recent years have been focused on the insect epidemics in the northern part of the Forest. Though not mentioned in the recent reports, impacts from commandra blister rust and mistletoe are still widespread on the southern portion of the Forest. In addition, subalpine fir decline is still wide spread on the north half of the Forest.

In 2003, a survey was conducted on the Wind River Ranger District to assess the status of spruce beetle mortality (USDA Forest Service Report RCSC-5-04). The survey found that there is not yet evidence of epidemic spruce beetle populations on the Wind River Ranger District. The report goes on to say that given the large populations of beetles to the north and west and the susceptible conditions of the spruce stands on the district, it is likely that activity will increase on the district in the next few years. The survey also revealed that mountain pine beetle activity in lodgepole and white bark pine is increasing with outbreak or epidemic levels of mortality, especially at higher elevations.

These epidemics have continued to spread since the 2000 survey. Figure 51 and Figure 52 show the aerial survey results from 1996 and 1999. Within the last two years, the Forest has engaged in major salvage efforts to address the mortality in the North and South Forks of the Shoshone River. In all parts of the Forest, there is additional effort on vegetation treatment to address the impacts of the increasing insect epidemics. These efforts are focused on protecting infrastructure from the potential wildfires that could feed off the increased fuel loadings in the dying stands.

***Figure 51. 1996 aerial survey map to be added.***

***Figure 52. 1999 aerial survey map to be added.***

#### ***Invasive plant species***

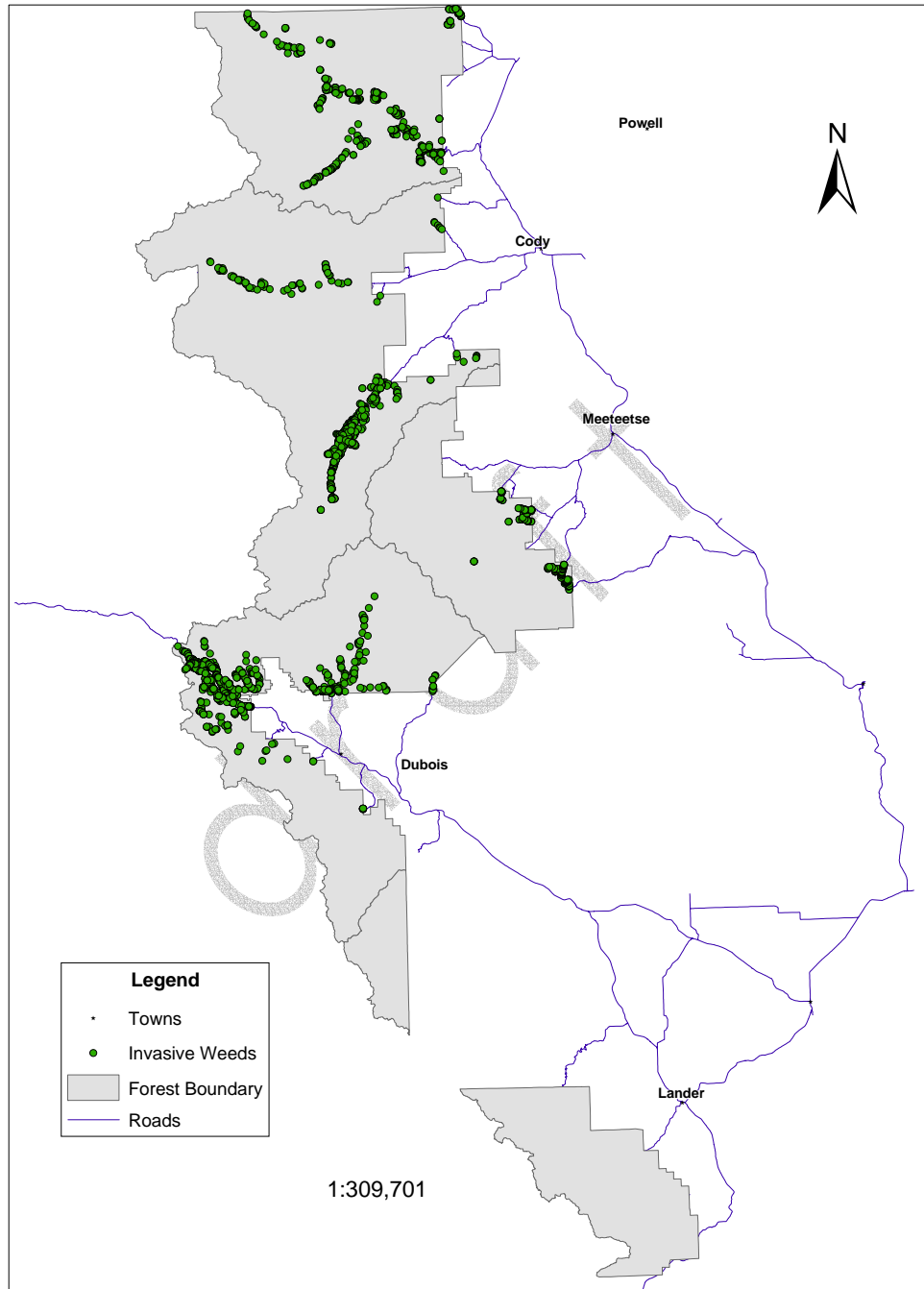
Nationwide, 1.7 million acres annually are lost to invasive plants. Invasive plants constitute an increasing threat to the health of the Shoshone National Forest.

Prior to the 1986 Forest Plan, Canada thistle was the most common invasive plant found on the Shoshone National Forest. This plant is considered naturalized across the Greater Yellowstone Ecosystem and control efforts have been shifted to the more invasive and greater environmental damaging plants such as leafy spurge, knapweeds, dalmatian toadflax, musk thistle, and oxeye daisy.

Since 1999, an intensive invasive plant mapping effort has documented populations of knapweed (spotted, diffuse, and Russian), thistles (Canada thistle, bull thistle, and musk), leafy spurge, whitetop, and toadflax (Dalmatian and yellow) across the Forest.

In 2004, 148 new invasive plant locations were identified and treated on the north half of the Shoshone. Most of these locations were isolated plants on less than a 0.10 acre. The newly documented invasive plant locations on the north half of the Forest were generally along major travel corridors (roads and trails).

**Figure 53. Locations of invasive plant infestations on the Shoshone National Forest.**



Several infestations occur on hundreds of acres of Forest Service land. These include Dalmatian toadflax in the South Fork of the Shoshone drainage, leafy spurge in the Sinks Canyon area, oxeye daisy along Highway 212 and along the Wiggins Fork, and cheatgrass and musk thistle increases in the Sinks Canyon area due to prescribed fire projects and exacerbated by the continued drought..

Knapweed (spotted, diffuse, and Russian), yellow toadflax, common tansy, and whitetop occur as scattered populations mostly along trails, trailheads, and road corridors.

Current control efforts focus on eliminating the small infestations and controlling the spread of larger populations of invasive plants. These small populations of invasive plant species have the potential to spread over thousands of acres and alter native plant community composition and land productivity. The lands that are the most threatened include most of the Forest's big game winter ranges.

## **Projections if existing Forest Plan direction continues**

### ***Vegetation structure***

Current vegetation patterns and changes will persist as they have. Low levels of harvest will alter some stands. Periodic wildfires will also occur and impact some stands. The result of insect epidemics may be greater than it was during the last 15 plus years. The current epidemic is proceeding unchecked, and will likely result in the reduction of canopy closure over a large portion of the Forest.

### ***Insects and disease***

Given the susceptibility of forest stand conditions to insect epidemics, it is likely that the current epidemics will continue to spread across the Forest. The increased treatments being planned will limit this spread in some areas, but the limited amount of the Forest that is open for management and the finite number of dollars available means that the general pattern of impacts across the Forest will be the same regardless of any activities.

### ***Invasive plant species***

Non-native invasive plant species that have been introduced to the Greater Yellowstone Ecosystem and impose future threats to the Forest include yellow starthistle, perennial pepperweed, orange hawkweed, dyer's woad, St. Johnswort, sulfur cinquefoil, purple loosestrife, cheatgrass, and rush skeletonweed. New outbreaks are expected to increase along major travel routes. Large areas that are already infested by invasive plants will probably trend toward expanding in size, depending upon suitable available habitat.

## **Need for change in Forest Plan direction**

### ***Vegetation structure***

There does not appear to be a need for change in management direction for the purposes of vegetation structural diversity across the Forest. The revised plan will likely propose some needed changes to diversity, but this would be in response to wildlife habitat needs and not in response to any specific need for change in management direction in vegetative diversity itself.

### ***Insects and disease***

Plan direction needs to address how insect epidemics will be handled, given the limited management options available. Desired conditions and objectives need to address whether actions are for recovering wood fiber, reducing fuels loads, and/or preventing/limiting stand susceptibility to future epidemics—existing Plan direction focuses on controlling and preventing insect and disease impacts without addressing the realities that constrain potential actions.

### ***Invasive plant species***

The revised plan needs to address how the increasing spread of noxious weeds should be managed.

### ***Whitebark Pine***

Whitebark pine is an important food item for grizzly bears in the Greater Yellowstone Area. There is concern over changes that have occurred in its distribution and condition. The revised plan should address options for

future management of this species and incorporate direction provided by the Forest Plan Amendments for Grizzly Bear Conservation for the Greater Yellowstone Areas National Forests, scheduled to be completed in 2005.

#### **Performance measures**

- Acres of invasive plants treated

## Visuals

### **Existing Forest Plan direction**

*Adopt visual quality objectives<sup>18</sup> that will maintain or enhance the characteristic landscapes of the Forest (Forest Plan III-7).*

*Manage activities along travel routes to maintain and enhance recreation and scenic values (Forest Plan III-7).*

*Apply the Visual Management System to all National Forest System lands. Travel routes, use areas, and water bodies determined to be of primary importance are sensitivity level 1<sup>19</sup> and appropriate visual quality objectives are established according to the Visual Management System (Forest Plan III-24).*

*Rehabilitate all existing projects and areas which do not meet the adopted visual quality objective(s) (VQO) specified for each management area. Set priorities for rehabilitation, considering the following:*

- *Relative importance of the area and the amount of deviation from the adopted VQO. Foreground areas have the highest priority.*
- *Length of time it will take natural processes to reduce the visual impacts so that they meet the adopted VQO*
- *Length of time it will take rehabilitation measures to meet the adopted VQO*
- *Benefits to other resource management objectives to accomplish rehabilitation (Forest Plan III-24)*

*Meet the visual quality objectives of retention and partial retention on full growing season after completion of project. Meet modification and maximum modification objectives three full growing seasons after completion of a project (Forest Plan III-25).*

*Choose facility and structure design, color of materials, location, and orientation to meet the adopted visual quality objective(s) for the management area (Forest Plan III-26).*

*Manage utilities and utility corridors to obtain conformance with adopted visual quality levels (Forest Plan III-26).*

*Achieve a natural-appearing edge on timber harvest units located in the foreground and middleground distance zones (Forest Plan III-27).*

*Shape timber harvest units so they appear as naturally appearing occurrences (Forest Plan III-27).*

*Size of timber harvest units should be in scale with characteristics of the surrounding landscape (Forest Plan III-28).*

*Reduce the visual impacts of timber harvest activities with special foreground applications (Forest Plan III-28).*

<sup>18</sup> Visual quality objectives: primitive - very high probability of experiencing solitude, unmodified natural or natural appearing environment, non-motorized, no vegetative alterations; semi-primitive non-motorized - high probability of experiencing solitude, natural appearing environment, non-motorized, widely dispersed vegetative alternations in very small units; semi-primitive motorized - moderate probability of experiencing solitude, predominantly natural appearing environment, vegetative alterations dispersed and visually subordinate.

<sup>19</sup> Sensitivity level: a particular degree or measure of viewer interest in the scenic qualities of the landscape.



*Manage range structural improvements to obtain conformance with adopted visual quality levels (Forest Plan III-29).*

*Manage range non-structural improvements to obtain conformance with adopted visual quality levels (Forest Plan III-30).*

*Construct and design roads and trails to obtain conformance with adopted visual quality levels (Forest Plan III-30).*

*Manage mineral exploration and development activities to obtain conformance with adopted visual quality levels to the highest practicable degree (Forest Plan III-32).*

*Semi-primitive motorized recreation areas, roaded natural recreation areas, and semi-primitive non-motorized recreation areas*

*Design and implement management activities to provide a visually appealing landscape. Enhance or provide more viewing opportunities and increase vegetation diversity in selected areas (Forest Plan III-119, III-125).*

*Primitive recreation areas, primitive wilderness, the High Lakes Wilderness Study Area, and the Dunoir Special Management area*

*Design and implement management activities so that the impact of man is not apparent and the area appears in a condition affected only by natural biotic succession (Forest Plan III-141, III-246).*

*Wildlife emphasis (management indicator species) areas and non-forested and forested big game winter range emphasis areas*

*Design and implement management activities to blend with the natural landscape (Forest Plan III-146, III-159, III-164).*

*Aspen emphasis areas*

*Vary location of treated clones to maintain natural-appearing diversity in age classes (Forest Plan III-154).*

*Emphasize aspen viewing areas (Forest Plan III-154).*

*Pristine wilderness*

*Design and implement management activities to maintain a pristine ecosystem (Forest Plan III-182).*

*Semi-primitive wilderness and Whiskey Mountain portion of Fitzpatrick Wilderness*

*Manage for maximum retention of the natural landscape (Forest Plan III-193, III-200).*

*Riparian areas*

*Design and implement management activities which sustain inherent visual values of riparian areas and blend with the surrounding natural landscapes (Forest Plan III-208).*

## Activity and condition trends

### *Visuals definitions*

**Preservation** is a visual quality objective that provides for ecological change only.

**Retention** is a visual quality objective, which in general, means human activities are not evident to the casual forest visitor.

**Partial retention** is a visual quality objective in which human activities may be evident but must remain subordinate to the characteristic landscape.

**Modification** is a visual quality objective where human activity may dominate the characteristic landscape but must, at the same time, utilize naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed in foreground or middleground.

**Maximum modification** is a visual quality objective where human activity may dominate the characteristic landscape but should appear as a natural occurrence when viewed as background.

**Primitive** is a fairly large area characterized by unmodified natural environment. Interaction between users is very low and evidence of other uses is minimal. The area is managed to be free from evidence of human-induced restrictions and controls. Motorized use is not permitted.

**Semi-primitive non-motorized** is a moderate to large size area characterized by a predominantly natural or natural appearing environment. Interaction between users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. Motorized use is not permitted.

Currently, the Forest's land base is primarily in a very high visual quality condition.

The majority of the Forest scenery rates at preservation and retention. A minority portion is mixed with partial retention and modification.

With the Shoshone's total land area at 2.4 million acres and 1.4 million acres designated as wilderness, approximately 2/3 of the Forest is managed primarily for ecological change and preservation VQOs (visual quality objectives).

The Forest's Recreation Opportunity Spectrum (ROS) designates approximately 2 million acres to be managed in a combination of primitive and semi-primitive non-motorized. This results in a very high visual quality.

Under the Healthy Forests Restoration Act, approximately 81,000 acres of prescribed burning and approximately 15,000 acres of mechanical treatment are planned over the next 10 years. These activities will reduce existing visual condition in the long term (25 to 50 years), depending on setting. Partial retention, modification, and in some minor portions of the Forest, maximum modification, will be the result. Over the next 30 to 50 years, long-term visual enhancement is expected.

### **Projections if existing Forest Plan direction continues**

The vegetation management occurring under the Healthy Forests Initiative and Accelerated Watershed and Vegetation Restoration Plan should continue to enhance the long-term scenic integrity of the landscape and lower the short-term scenic integrity. The effects will occur in the seen areas along Forest scenic byways and other Forest roads, highways, and trails. Amendments to the current Forest Plan will continue to be done to address inconsistencies between management direction, management area maps, and mapped VQOs as vegetation projects are implemented.

The visual landscape across a large portion of the Forest will change due to an increase in tree mortality from older age classes, drought, and insect and disease infestations. If vegetation management continues through mechanical treatment and use of fire, the scenic integrity of the landscape will be enhanced within 30 to 50 years. There will be varied public opinion about changes in the visual landscape due to vegetation management, especially along the Forest scenic highways and trails.

### **Need for change in Forest Plan direction**

The revised plan needs to

- Incorporate the nationally adopted Scenery Management System
- Address how to manage viewsheds along major travel routes in the context of the other lands
- Address how to manage scenery in situations where natural conditions have reduced scenery integrity or will reduce scenery integrity below forest plan objective levels
- Address how to manage scenery in areas of the Forest treated with prescribed fire

#### **Performance measures**

- The revised plan may need to develop one or more performance measures for visuals.

# Water use

## Existing Forest Plan direction

*Transfer, exchange, use for augmentation purposes, or dispose of adjudicated water rights not necessary for the management of reserved or acquired National Forest System land (Forest Plan III-9).*

*Obtain water rights necessary for the management of reserved and acquired National Forest System lands. Achieve an efficient use of water rights (Forest Plan III-9).*

*Maintain instream flows and protect public property and resources (Forest Plan III-70).*

*Riparian areas*

*Recommend maintenance of instream flows in cooperation with state wildlife agencies to support a sustained yield of natural fisheries resources (Forest Plan III-211).*

## Activity and condition trends

Forest Plan goals have been met and management direction has been implemented.

Several new water right applications were reviewed to ensure the requested uses would not conflict with existing uses and rights, including instream flows quantified by the Big Horn adjudication. Potential conflicts were resolved as the application was processed through the State Engineer's Office or through special use permit clauses, once a right was granted.

Work relative to the filing of water right claims with the State Engineer's Office, per agreement under the Big Horn adjudication interlocutory decree, continued. Final location and volume information on instream flow quantification points were provided. Additionally, the Forest awarded a water rights investigation contract for detailed survey of non-stock-related discreet water uses listed in the decree. Much of this information has been submitted to the State for review and approval. Any outstanding information will be provided to the State by early 2005. Closure on the decree should be reached shortly thereafter. Before issuance of the contract, the Forest and State agreed that due to court ordered time constraints, stock-related discreet water uses would be accepted as listed in the decree rather than field investigated via the contract, but they would be validated over time as staffing and funding permit.

During the water rights investigation, it became apparent that holders of special use permits that include water rights are lax in following State water law. There is a need to educate permittees on water law requirements and ensure permits are adequately administered and enforced.

## Projections if existing Forest Plan direction continues

Implementation of existing management direction will continue. However, water use issues and concerns are expected to increase over time as additional demands are placed on a limited resource, so there may be a future need to adjust management direction.

## Need for change in Forest Plan direction

The desired conditions and objectives in the revised plan need to address how existing and future water uses are protected and managed.

### Performance measures

- The revised plan may need to develop one or more performance measures for water uses.

# Watersheds

## Existing Forest Plan direction

*Evaluate the effects of Forest management on water and soil resources to ensure that neither will be significantly or permanently impaired by management (Forest Plan III-9).*

*Protect wetlands, riparian areas, and floodplains (Forest Plan III-9).*

*Maintain or restore the inherent biological, physical, and aesthetic values of riparian ecosystems (Forest Plan III-8).*

*Maintain or improve soil productivity and water quality (Forest Plan III-8).*

*Rehabilitate lands in declining and unsatisfactory watershed condition (Forest Plan III-9).*

*Meet state water quality standards (Forest Plan III-9).*

*Protect municipal water supplies (Forest Plan III-9).*

*Increase water yield while maintaining water quality (Forest Plan III-9).*

*Revegetate disturbed soils. In large projects, this may have to be done in stages (Forest Plan III-25).*

*Complete revegetation and restoration within 5 years following project completion (Forest Plan III-25).*

*Facilities proposed for construction or reconstruction which lie within identified 100-year floodplains will be evaluated as to the specific flood hazards and values involved with the site. Viable alternatives will be thoroughly evaluated (Forest Plan III-34).*

*Close or rehabilitate dispersed sites where unacceptable environmental damage is occurring (Forest Plan III-35).*

*Prohibit camping within a minimum of 100 feet from lakes and streams unless exceptions are justified by terrain or specific design which protects the riparian and aquatic ecosystems (Forest Plan III-37).*

*Design and implement activities in management areas to protect and manage the riparian ecosystem (Forest Plan III-69).*

*Manage riparian areas to reach the latest seral stage possible within the stated objectives (Forest Plan III-69).*

*Improve or maintain water quality to meet state water quality standards (Forest Plan III-70).*

*Develop a schedule of water yield treatments within fourth-order watersheds which attains desired water yield increases while maintaining stream channel stability (Forest Plan III-71).*

*Maintain soil productivity, minimize man-caused [sic] soil erosion, and maintain the integrity of associated ecosystems.*

- Use site preparation methods which are designed to keep fertile, friable topsoil essentially intact.*
- Give roads and trails special design considerations to prevent resource damage on capability areas containing soils with high shrink/swell capacity.*
- Provide adequate road and trail cross drainage to reduce sediment transport energy.*
- Revegetate all areas, capable of supporting vegetation, disturbed during road construction and/or reconstruction to stabilize the area and reduce soil erosion. Use less palatable plant species on cuts, fills, and other areas subject to trampling damage by domestic livestock and big game to discourage grazing by herbivores.*
- Prevent livestock and wildlife grazing which reduces the percent of plant cover to less than the amount needed for watershed protection and plant health.*

- *Place tractor-built firelines on the contour, where possible, and avoid use of tractors on highly erodable sites.*
- *Provide permanent drainage and establish protective vegetative cover on all new temporary roads or equipment ways, and all existing roads which are being removed from the transportation system.*
- *Minimize soil compaction by reducing vehicle passes, skidding on snow, frozen or dry soil conditions, or by off-ground logging systems.*
- *Restore soil disturbance caused by human use to soil loss tolerance levels commensurate with the natural ecological processes for the treatment areas (Forest Plan III-86).*

*Eliminate watershed improvement needs inventory backlog by the year 2000 according to RPA (Forest Plan III-88).*

*Semi-primitive non-motorized recreation areas*

*Permanent openings may be employed to enhance water production (Forest Plan III-138).*

## Activity and condition trends

### Performance measures

- Results from Best Management Practices reviews

The science of wildland watershed management has evolved considerably since the Forest Plan was developed. The evolution of the science and the results of Plan monitoring are reflected in annual monitoring reports and certain amendments to the Plan, specifically the oil and gas leasing (USDA Forest Service 1996) and allowable sale quantity (USDA Forest Service 1994) amendments.

The oil and gas leasing and allowable sale quantity efforts incorporated a first generation watershed cumulative effects analysis screening process using best available information at that time. Model assumptions and weaknesses were identified as part of the process. Modeling results were presented in tabular form because spatial presentation opportunities were limited.

The modeling identified validated, unvalidated, and potential watersheds of concern. On the Clarks Fork Ranger District, there were ten validated, two unvalidated, and two potential watersheds of concern. On the Wapiti Ranger District, there were three validated, one unvalidated, and two potential watersheds of concern. On these two districts, the large Yellowstone fires of 1988 were a major impact leading to identification of these watersheds as areas of concern. On the Wind River Ranger District, two potential watersheds of concern were identified, mainly due to past logging. This identification led to monitoring and inventory of watershed condition across the Forest and to implementation of watershed improvement projects in targeted areas. Examples since the last annual monitoring report include inventory of approximately 40 stream reaches, obliteration of approximately 50 miles of road in the Horse Creek watershed, and interdisciplinary Best Management Practice reviews on several timber sales and commercial livestock grazing allotments. The Best Management Practice reviews are providing valuable information on whether implementation is occurring and if so, its effectiveness. If implementation is not occurring, or is found to be ineffective, the review identifies the reasons. Overall, implementation is occurring and is effective in protecting soil and water resources. Concerns with proper riparian area management and proper road drainage have been identified, resulting in changes in allotment management and road design.

Through these inventory, monitoring, and improvement project efforts, there is a better understanding of overall watershed health across the Forest; the information that should be very useful during Plan revision.

**Figure 54. Best Management Practice reviews.**

Year	Activity
1999	Bear Creek allotment
1999	Burroughs Creek Salvage Sale
2001	Lodgepole II Timber Sale
2001	Dick Creek allotment
2002	Rock Creek allotment
2002	Wood River/Kirwin allotments
2002	East Fork allotment
2002	Enos Creek allotment
2003	West Goose Timber Sale
2003	Union Pass allotment
2003	Wolf Creek I & II Sales/Unit 40 Fire
2004	Atlantic Creek Salvage
2004	Rattlesnake II Timber Sale
2004	Maxon Basin allotment
2004	Belknap allotment

In recent years, the Forest has completed four watershed assessments that used Ecosystem Analysis at the Watershed Scale (USDA Forest Service 1995) as a guide. These assessments resulted in comparisons of current watershed health against reference health. Where significant deviation was documented, management recommendations to improve health were identified.

### Projections if existing Forest Plan direction continues

Implementation of existing management direction will continue. However, watershed issues and concerns are expected to increase over time as additional demands are placed on a limited resource, so there may be a future need to adjust management direction.

### Need for change in Forest Plan direction

The revised plan needs to

- Incorporate Forest Service Handbook 2509.25, Watershed Conservation Practices, as appropriate, and supplement that direction if other needs are addressed that are not covered in the handbook
- Identify watersheds of concern using a watershed cumulative effects analysis screening process
- Incorporate the latest models for soil erosion

## Wild and scenic rivers

### Existing Forest Plan direction

*Protect the eligibility characteristics of the Clark's Fork River segments eligible for inclusion in the Wild and Scenic River System (Forest Plan III-7).*

*Protect the eligibility characteristics of the Clark's Fork of the Yellowstone River as defined by the Clark's Fork of the Yellowstone River Wild and Scenic River Study Final Environmental Impact Statement and administrative recommendation (Forest Plan III-10).*

*Protect river segments that have been determined eligible for potential addition to the National Wild and Scenic Rivers system from activities which could diminish or change the free-flowing character, water quality, or the scenic, recreational, fish and wildlife, and other values which make the river eligible for designation.*

- *Request that federal lands which constitute the bed or bank, or which are within one-quarter mile of either bank, be temporarily withdrawn from appropriation and entry under the mining laws. Withdrawal should continue until the river segment is: a) found to be ineligible, b) not recommended for inclusion in the national system, or c) added to the system by Act of Congress.*
- *Safeguard the values of the river area by appropriate conditions and stipulations in leases, permits, and licenses, including prospecting, issued under terms of the mineral leasing laws.*
- *Extraction of salable, common-variety minerals from the river or the study area shall not be authorized until the study is complete and recommended actions are enacted.*
- *Prohibit construction of roads within the river study area if it would have direct and adverse effects on the values which make the river eligible for potential inclusion in to the system.*
- *Maintain current motorized access character and avoid any changes to the potential wild and scenic river classification.*
- *Maintain free-flowing characteristics and water quality during the study and Congressional review period.*
- *Manage tree stands within the study area to maintain or enhance potential wild and scenic river values. Protect scenic values by sizing and shaping timber harvest units to achieve a natural appearance and to harmonize with the surrounding landscape.*
- *Prohibit special uses or permitted land uses which degrade or have directly adverse effects on values which make the river segment eligible.*
- *None of this direction shall abrogate any existing privileges or contracts affecting National Forest System lands held by any private party without consent of said party. Activities affecting the applicability of U.S. mining and mineral leasing laws are subject to valid existing rights (Forest Plan III-22 and 23).*

#### *Wild and Scenic River*

*Prohibit silvicultural practices within the river corridor (Forest Plan III-237).*

*Recognize and protect the free flowing stream character of the ... river...(Forest Plan III-237).*

### **Activity and condition trends**

The Wild and Scenic Rivers Act was enacted in 1968 to preserve free-flowing conditions, water quality, and outstanding remarkable values of selected rivers. Wild rivers are managed to be free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and water unpolluted. The Clarks Fork of the Yellowstone River is the only designated Wild and Scenic River on the Shoshone National Forest. The designation includes 21.5 miles of the river from approximately the Clarks Fork bridge downstream to the mouth of the Clarks Fork canyon at the Forest boundary. Management of the river corridor has followed Forest Plan direction to avoid any changes to the potential Wild and Scenic River classification.

### **Projections if existing Forest Plan direction continues**

Under current management direction, the Clarks Fork Wild and Scenic River would continue to be protected to maintain its free-flowing characteristics, water quality, scenic, recreational, and fish and wildlife values. The designated protection area of ¼ mile from each bank would be maintained.

### **Need for change in Forest Plan direction**

Forest plan direction needs to address the management of the Clarks Fork River as a designated Wild and Scenic River instead of a potential addition to the Wild and Scenic River system.

A comprehensive management plan for the Clarks Fork Wild and Scenic River corridor needs to be completed through forest planning or a separate planning effort.

# Wilderness

## Existing Forest Plan direction

*Design, construct, and operate developed sites which are adjacent to or provide an access point into a wilderness to complement wilderness management objectives (Forest Plan III-34).*

*Ensure the permitted private and public sector sties on Forest service lands which are adjacent to, or provide an access point into, a wilderness complement wilderness management objectives (Forest Plan III-38).*

*Do not provide interpretive facilities at cultural resources sites, nor restore or enhance cultural resources for recreation purposes (Forest Plan III-38).*

*Provide opportunities for human isolation, solitude, self-reliance, and challenge while traveling cross-country and on system trails (Forest Plan III-38).*

*Prohibit competitive contest events, group demonstrations, ceremonies, and other similar events (Forest Plan III-39).*

*Protect air quality related values from adverse effects from air pollution (Forest Plan III-41).*

*Maintain fire dependent ecosystems using fires ignited naturally. Reclaim areas disturbed as part of fire control activities to meet the visual quality objective of retention (Forest Plan III-41).*

*Whiskey Mountain portion of Fitzpatrick Wilderness*

*Motorized equipment use is limited to the minimum necessary to bait, salt, treat habitat, trap and transport bighorn sheep (Forest Plan III-206).*

## Activity and condition trends

### Performance measures

- 10 primary output elements

The Wilderness Act of 1964 (Act) set aside approximately 1,378,440 acres of the Shoshone National Forest to be administered as designated wilderness areas unimpaired for future use and enjoyment. The Act defines wilderness as an area of undeveloped federal land retaining its primeval character and influence without permanent improvements or human habitation, which is protected and managed to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of human work substantially unnoticeable, (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation, (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition, and (4) may also contain ecological, geological, or other features of scientific educational, scenic, or historical value.

Visitor use data for 2003 showed approximately 27,000 wilderness visits on the Shoshone. Wilderness visitor contacts have emphasized Leave No Trace principles and recreating in grizzly bear habitat.

Management of each wilderness is measured against accomplishment levels for the following 10 primary output elements (standards):

- Direction exists in either the Forest Plan or subsequent planning document, that updated or amended the Forest Plan, and addresses the natural role of fire in wilderness and considers the full range of management responses.
- This wilderness was successfully treated for non-native, invasive plants.
- Monitoring of wilderness air quality values is conducted and a baseline is established for this wilderness.
- Priority actions identified in a wilderness education plan are implemented.



- This wilderness has adequate direction, monitoring, and management programs to protect opportunities for solitude or primitive and unconfined recreation.
- This wilderness has a completed recreation site inventory.
- Existing outfitter and guide operating plans for this wilderness direct outfitters to model appropriate wilderness practices and incorporate appreciation for wilderness values in their interaction with clients and others. Needs assessments are completed for new operations or for major changes to existing outfitter programs.
- This wilderness has adequate direction in the Forest Plan to prevent degradation of the wilderness resource.
- The priority information needs for this wilderness have been addressed through field data collection, storage, and analysis.
- The wilderness has a baseline workforce in place.

Accomplishment of approximately 60 percent of all elements must be achieved in order for a wilderness to be considered as meeting the minimum stewardship level.

Wilderness areas on the Shoshone have been managed to standard. With current wilderness management emphasis on completion of wildland fire use plans, monitoring, site inventory, wilderness education, and monitoring of air quality, it is expected that a minimum stewardship level will be met for wilderness areas in 2005.

### **Projections if existing Forest Plan direction continues**

The number of wilderness acres would remain the same. Opportunities for human isolation, solitude, self-reliance, and challenge would be provided. A minimum stewardship level would continue to be met.

### **Need for change in Forest Plan direction**

Current management direction is adequate; there is no need for change in management direction.

## **Wildlife**

### **Existing Forest Plan direction**

*Manage fish and wildlife habitats, including plant diversity, to maintain viable populations of known native vertebrate species and meet population objectives of management indicator species (Forest Plan III-7).*

*Maintain or improve habitat for threatened and endangered species including participation in recovery efforts for listed species (Forest Plan III-8).*

*Coordinate Forest wildlife and fish management with the Wyoming Game and Fish Department and the U.S. Fish and Wildlife Service (Forest Plan III-8).*

*Where present, the following species are Management Indicator Species: deer, elk, and all federally listed endangered or threatened plant and animal species (Forest Plan III-49).*

*In addition to the above, use indicator species that represent the following categories:*

- *Riparian area dependent species*
- *Wetland dependent species*
- *Species dependent on either climax plant communities or one seral stage of a plant community or communities (forested land and rangeland)*
- *Tree cavity-dependent species*

- *Game fish*
- *Unique fish habitats for which there are dependent species (cliff, talus, cave)*
- *Small game species*
- *Species dependent on multi-storied tree stands by commercial forest cover type*
- *Species which have particular scientific, local, or national interest, and species needing special management to prevent federal listing as threatened or endangered (Forest Plan III-49)*

*Maintain habitat for viable populations of all existing vertebrate wildlife species (Forest Plan III-49).*

*Establish elk, moose, bighorn sheep, and threatened and endangered species on sites that can supply the habitat needs of the species and the population levels and distribution agreed to with the states (FSM 2610) (Forest Plan III-50).*

*Manage waters capable of supporting self-sustaining trout populations to provide for those populations (Forest Plan III-50).*

*Manage minerals activities to protect Crucial Preferred Winter Range and unique wildlife areas during critical seasonal periods (Forest Plan III-50).*

*Manage and provide habitat for recovery of endangered and threatened species as specified in the Regional Forester's 1920 (2670) letter dated June 25, 1982 (Forest Plan III-50).*

*Conduct habitat improvement projects jointly or cooperatively funded with the states (Forest Plan III-52).*

*Manage animal damage in cooperation with the state wildlife agencies, Fish and Wildlife Service, other appropriate agencies, and cooperators to prevent or reduce damage to other resources and direct control toward preventing damage or removing only the offending animal (Forest Plan III-53).*

*Provide mitigating measures for grizzly bears during timber harvest activities resulting from consultation with the U.S. Fish and Wildlife Service (Forest Plan III-65).*

*Semi-primitive non-motorized recreation areas*

*Maintain effective wildlife habitat.*

*Locate roads and trails to avoid key areas such as primary feed areas, big game rearing areas and migration routes (Forest Plan III-135).*

*Whiskey Mountain portion of Fitzpatrick Wilderness*

*Improve habitat capability through direct treatments of vegetation, soil, and waters.*

*Maintain habitat capability for Bighorn sheep...(Forest Plan III-203).*

## **Activity and condition trends**

### **Performance measures**

- Populations and habitat trends for management indicator species

### **Wildlife population data for 1986 management indicator species**

#### **Grizzly bear**

The grizzly bear was listed as a threatened species under the Endangered Species Act in 1975. The Grizzly Bear Recovery Plan (Recovery Plan) (USDI Fish and Wildlife Service 1982 and 1993), first approved in 1982 and revised in 1993, defined a recovered grizzly bear population as one that could sustain a defined level of mortality and is well distributed throughout the recovery zone. The Recovery Plan outlined a monitoring scheme that employed three demographic sub-goals to measure and monitor recovery of the Yellowstone grizzly bear population. They include:

- Maintain a minimum of 15 unduplicated females with cubs-of-the-year over a six-year average both inside the recovery zone and within a 10-mile area immediately surrounding the recovery zone (14,497 square miles).

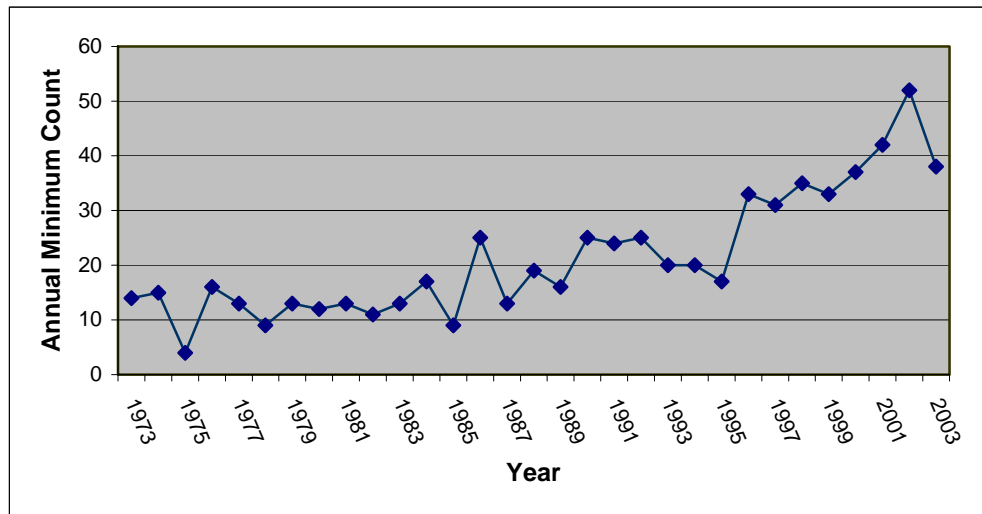
- Sixteen of 18 bear management units within the recovery zone must be occupied by females with young, including cubs-of-the-year, yearlings, or two-year olds, from a six-year sum of observations. No two adjacent bear management units may be unoccupied during the same six-year period. This is equivalent to verified evidence of at least one female grizzly bear with young at least once in each bear management unit over a six-year period.
- The running six-year average for total known, human-caused mortality is not to exceed 4 percent of the minimum population estimate. The running six-year average annual known, human-caused female grizzly bear mortality is not to exceed 30 percent of the 4 percent total mortality limit over the most recent three-year period. These mortality limits cannot be exceeded in any two consecutive years. Beginning in 2000, probable mortalities were included in the calculation of mortality thresholds; cubs-of-the-year orphaned because of human causes were designated as probable mortalities.

The Interagency Grizzly Bear Study Team monitors these recovery parameters in cooperation with the Forest Service. The general trend in the grizzly bear population within the Yellowstone Ecosystem has been upward since the species came under the protection of the Endangered Species Act. Current population estimates are two to three times greater than when the bear was listed in 1975. Bears have continued to expand into new areas both within and outside of the original recovery zone, with the greatest expansion south on the Bridger-Teton National Forest and east on the Shoshone National Forest. All recovery targets identified in the Recovery Plan have been met since 1998 and the six-year average of females with cubs-of-the-year at the end of 2003 was 2.5 times the target identified in the Recovery Plan. All 18 bear management units in the GYA have been occupied at least four times in the last six years by females with young. The four bear management units on the Shoshone have been occupied by females with young in each of the last six years.

Habitat management and management of grizzly bear/human and grizzly bear/livestock conflicts have been directed by the Interagency Grizzly Bear Guidelines (Guidelines) (USDA Forest Service 1991) that were incorporated into the Forest Plan. Adherence to the Guidelines has been instrumental in achieving the demographic recovery of the grizzly bear in the GYA and on the Shoshone National Forest. The Shoshone has made a concerted effort to educate users of proper behavior in bear country. A special order requiring that all attractants be kept unavailable to bears has been in place on most of the Forest since 1990. The order has been expanded several times to include all of the Forest north of the Wind River Indian Reservation. Grizzly bear/human conflicts and associated bear mortality still occur, vary by year, and are correlated with the availability of natural food sources. In years where these food sources are low, grizzly bear/human conflicts increase. Often these conflicts result in relocation or even death of the bear. High levels of grizzly bear mortality from 1994 through 1996 were associated with poor food years for bears. Recent increases in mortality are a result of several factors, including poor food years, bears expanding into marginal habitats, and just more bears.

The Conservation Strategy for the Grizzly Bear in the Greater Yellowstone Area (Conservation Strategy) (Interagency Conservation Strategy Team 2003) was completed in 2003 and is the document that will guide management and monitoring of the Yellowstone grizzly population upon delisting. This document describes a Primary Conservation Area where stipulations to protect grizzlies would be applied. The Primary Conservation Area is the same as the original recovery zone and much of this occurs on the Shoshone (1,230,000 acres). A forest plan amendment for the six GYA national forests is under way to incorporate the Conservation Strategy into existing forest plans. The completion of this amendment will improve the consistency of habitat management for the grizzly bear across the ecosystem. The U.S. Fish and Wildlife Service indicated that a proposal to delist the grizzly bear will be published in the Federal Register sometime in 2005.

Figure 55. Unduplicated females with cubs-of-the-year, 1973 through 2003.



**Figure 56. Female grizzly bears with cubs-of-the-year, known human-caused female mortalities, and all grizzly bear mortalities in the GYA, 1973 through 2003.**<sup>20</sup>

Year	Females with cubs-of-the-year		Female mortalities			All bear mortalities		
	Annual	Six-year average	Annual	Six-year average	30% of total mortality	Annual	Six-year average	4% of minimum population
1973	14	--	6	--	--	14	--	--
1974	15	--	6	--	--	15	--	--
1975	4	--	1	--	--	3	--	--
1976	17	--	1	--	--	6	--	--
1977	13	--	5	--	--	14	--	--
1978	9	12	1	3.3	1.4	7	10.2	4.5
1979	13	12	1	2.5	1.2	7	9.2	3.9
1980	12	11	3	2.0	1.4	6	7.7	4.5
1981	13	13	2	2.2	1.5	10	8.8	4.8
1982	11	12	5	2.8	1.2	14	10.2	4.1
1983	13	12	3	2.5	1.2	6	8.5	4.1
1984	17	13	3	2.8	1.5	9	8.8	4.8
1985	9	13	4	3.3	1.5	5	8.5	4.8
1986	25	15	4	3.5	2.0	5	9.0	6.6
1987	13	15	2	3.5	1.8	3	7.8	6.0
1988	19	16	2	3.0	2.3	5	6.3	7.7
1989	15	16	0	2.5	2.0	2	5.7	6.7
1990	25	18	6	3.0	2.5	9	5.7	8.2
1991	24	20	0	2.3	2.6	0	4.7	8.8
1992	25	20	1	1.8	3.1	4	3.8	10.2
1993	19	21	2	1.8	2.9	3	3.8	9.6
1994	20	21	3	2.0	2.6	10	4.7	8.6
1995	17	22	7	3.2	2.1	17	7.2	7.0
1996	33	23	4	2.8	2.7	10	7.3	8.9
1997	31	24	3	3.3	3.2	7	8.5	10.7
1998	35	26	1	3.3	4.1	1	8.0	13.6
1999	32	28	1	3.2	4.1	5	8.3	13.7
2000	35	31	6 <sup>21</sup>	3.7	4.2	16	9.3	14.2
2001	42	35	8	3.8	4.3	19	9.7	14.5
2002	50	38	7	4.3	5.0	15	10.5	16.6
2003	35	38	6	4.8	5.0	11	11.2	16.6

#### **Gray wolf**

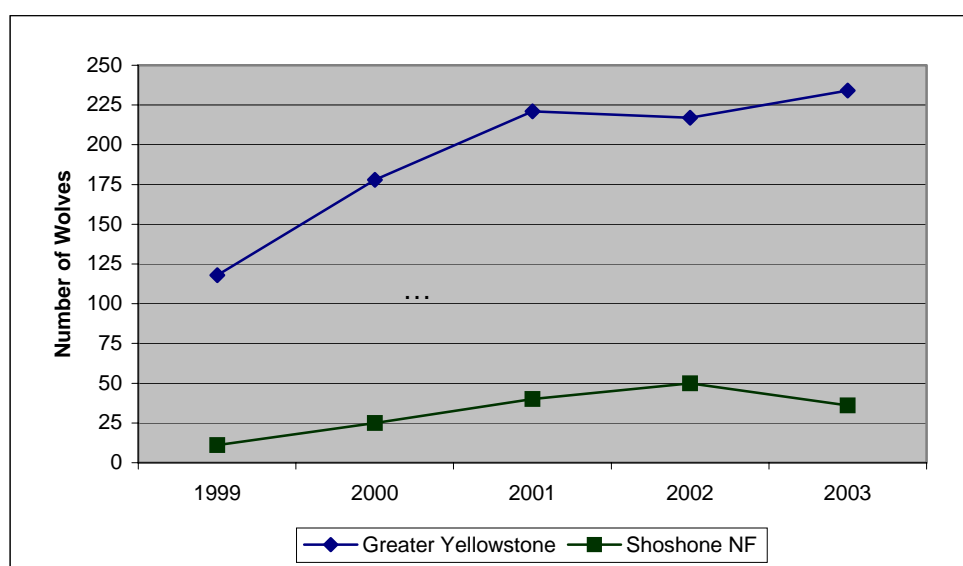
Fourteen gray wolves from Alberta, Canada were reintroduced into Yellowstone National Park in January 1995. The following year, 17 additional wolves from British Columbia were brought to the reintroduced population. These animals and any other native wolves that might have remained in the GYA have been classified as a “non-essential experimental” population, as per provisions of the Endangered Species Act. The U.S. Fish and Wildlife Service and National Park Service monitor wolves with assistance from other agencies, groups, and individuals.

<sup>20</sup> Data for 1973 through 1992 are from Knight et al. 1997. Data for 1993 through 2003 are from Schwartz and Haroldson 2003.

<sup>21</sup> Beginning in 2000, mortalities include both known and probable human-caused mortalities.

Wolves first made brief visits to the Shoshone National Forest in 1995. Numerous sightings occurred on the Forest in 1996 and one of the original packs, the Soda Butte Pack, included part of the northeast corner of the Clarks Fork Ranger District in its home range. In late 1996, the Washakie Pack formed, denned, and produced five pups in the Six Mile drainage on the Shoshone National Forest. This was the first pack to den outside of Yellowstone National Park in Wyoming. The Sunlight pair began using the Shoshone National Forest in the spring of 1998 in the Trail Creek and East Painter Creek area on the Clarks Fork District but did not produce pups until 1999. By 2000, there were four packs (Beartooth, Absaroka, Sunlight, and Washakie) using areas primarily on the Shoshone National Forest. Another pack (Greybull River) formed in 2001. All but the Greybull River pack were known to have pups in 2001. The Sunlight, Beartooth, Absaroka, Washakie, and Greybull packs all had pups in 2002 and 2003. An additional pack of four wolves, the Dubois Pack, appears to be using areas primarily on the Forest and did not produce pups in 2003. At the end of 2003 there were six known packs using areas mostly on the Shoshone for a total of 36 wolves. Several other packs include part of the Shoshone National Forest in their home ranges.

**Figure 57. Gray wolf population in the GYA, 1999 through 2003.**



**Figure 58. Wolf population in the GYA, 1999 through 2003.**<sup>22</sup>

	1999	2000	2001	2002	2003
Total Outside Shoshone NF	107	153	181	167	198
Total Shoshone NF	11	25	40	50	36
Total Yellowstone Recovery Area	118	178	221	217	234

#### **Bald eagle**

Breeding Bird Survey data for the central Rockies for 1980 through 2003 show an upward trend of 8 percent per year. The species has been proposed for delisting. The number of nesting bald eagles in Wyoming has increased from 20 pairs in 1978, to over 70 pairs in 1996, and to over 140 in 2004 (Oakleaf personal communication). There have been only a few recorded nests on the Shoshone as the Forest provides only marginal habitat for bald eagles. Areas of large open water with available large trees for roosting and nesting are more available on neighboring Bureau of Land Management land, while the Forest has predominantly smaller, headwater streams. Often pairs are found nesting in close proximity to the Shoshone.

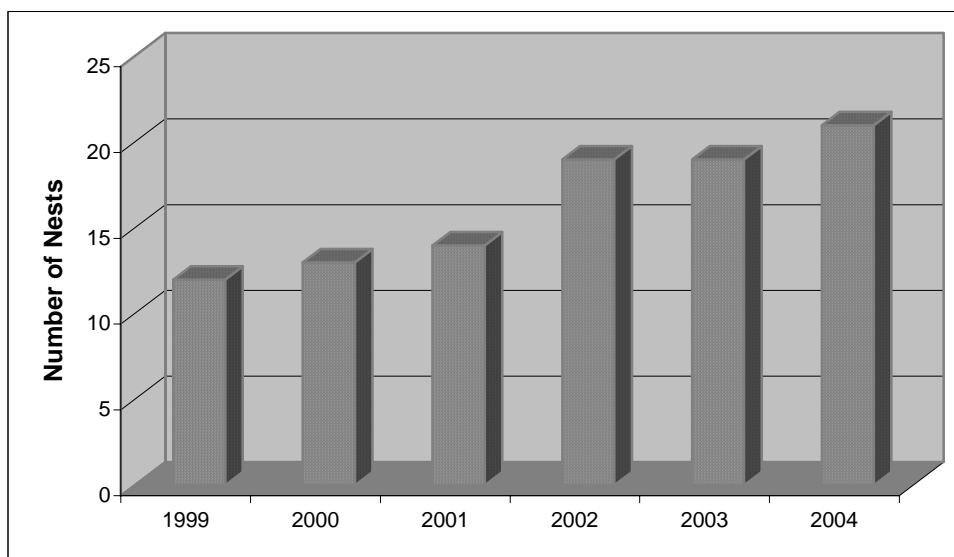
#### **Peregrine falcon**

In 1999, the peregrine falcon was removed from protection under the Endangered Species Act. The Shoshone National Forest participated heavily in the activities that led to delisting. Over 131 peregrines were

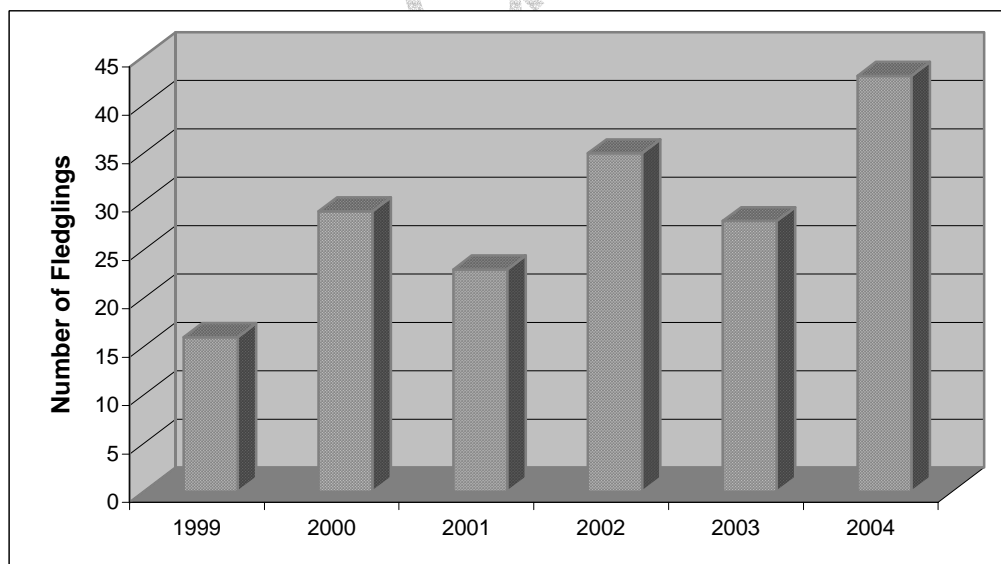
<sup>22</sup> Data were obtained at <http://westerngraywolf.fws.gov/annualreports.htm>

successfully released on the Forest or in adjacent areas between 1987 and 1995. The Wyoming Game and Fish Department monitors nest sites in cooperation with the Forest Service. Figure 59 and Figure 60 show the number of nests and fledglings produced over the last several years. Both of these measures show an upward trend for peregrines. Biologists monitoring peregrine falcons believe that these nests represent only a portion of the birds nesting in the area of the Forest because whenever new areas of suitable habitat are checked, they quite often find new nesting pairs.

**Figure 59. Number of occupied peregrine falcon nests, 1999 through 2004.**



**Figure 60. Number of peregrine falcon fledglings, 1999 through 2004.**



#### **Brewer's sparrow**

Data from 1980 through 2003 for the central Rockies indicate a positive trend of 1.4 percent per year. Brewer's sparrows appear to be common where habitat is good, on the Forest and throughout Wyoming. Data for 2002 and 2003 from the Monitoring Wyoming's Birds project indicate the species is at high densities in grassland, shrub, and juniper habitat types. On the Shoshone National Forest, the species was found at densities of 32 birds/km in the grassland habitats surveyed in 2002, and 14 birds/km in 2003. Grassland and shrub habitats are plentiful on the Forest, although the recent drought has reduced quality somewhat.

**Figure 61. Densities of Brewer's sparrows (birds/km) in various habitats.**

Year	Statewide			Shoshone NF grassland
	Grass	Shrub	Juniper	
2002	29	45	18	32
2003	21	95	27	14

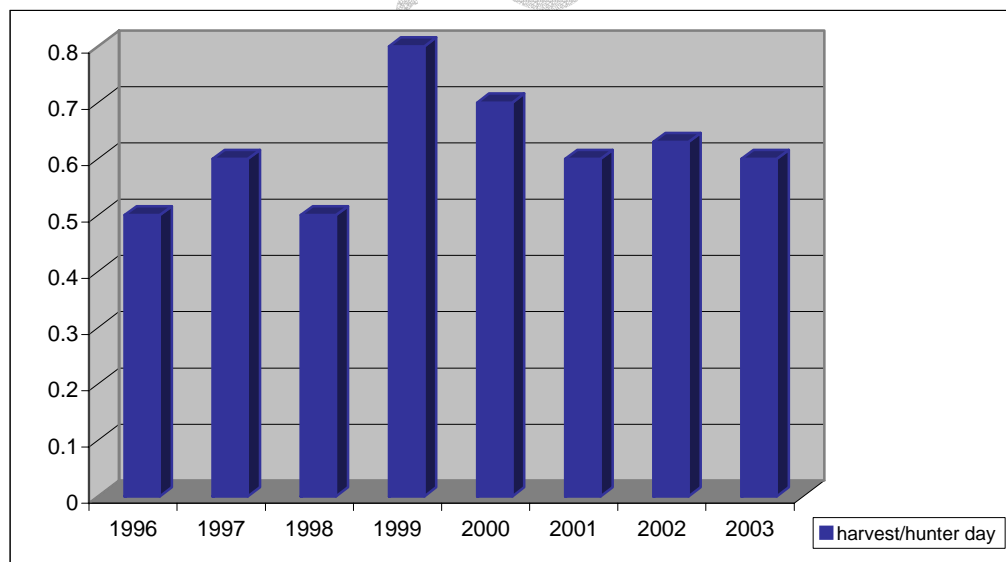
#### **Hairy woodpecker**

The hairy woodpecker was not recorded on any of the Monitoring Wyoming's Birds transects, which is not surprising as woodpeckers are not as vocal as songbirds. Breeding Bird Survey data for the central Rockies from 1980 to 2003 show a somewhat stable to slightly downward trend of -0.7 percent per year. Forest Service and other field researchers on the Forest observed several woodpeckers in different project areas in the summers of 2003 and 2004, indicating that hairy woodpeckers do occur, though they are uncommon on the Forest. In the last five years, habitat conditions on the Forest for hairy woodpeckers have improved as densities of snags have increased due to the insect and disease outbreak on the Forest.

#### **Blue and ruffed grouse**

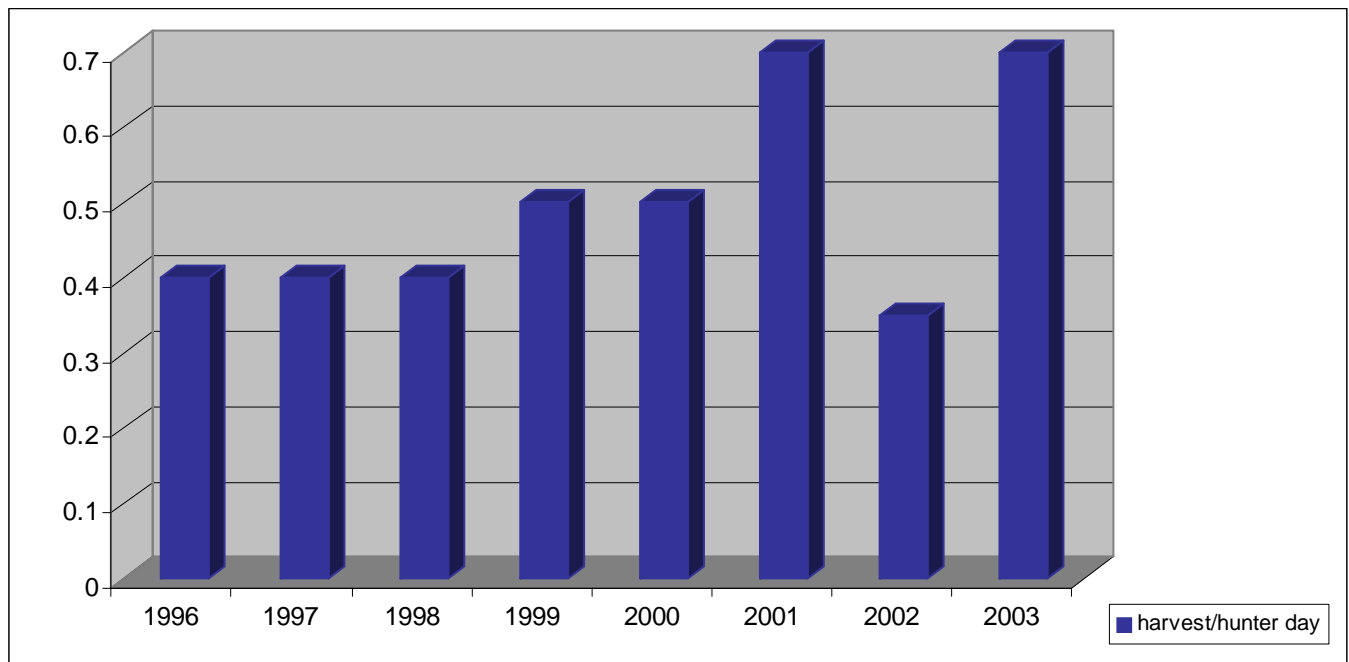
Data for blue and ruffed grouse are limited. Harvest data are variable from year to year and actual harvest numbers are a poor estimate of population size. Birds harvested per hunter effort is a somewhat better estimate of population numbers for these species, as it indicates how plentiful birds are and how available they are to hunters. Figure 62 and Figure 63 show birds/hunter day to measure hunter effort per bird. For blue grouse, the trend is variable but shows a stable trend. For ruffed grouse, it appears to be a stable to slightly upward trend. Blue grouse habitat is plentiful on the Forest and individuals are often seen by Forest Service personnel. Ruffed grouse habitat is declining with heavy encroachment in many aspen areas, especially on the north end of the Forest. Ruffed grouse data from the Breeding Bird Survey taken from 1980 through 2003 for the central Rockies indicate a stable trend of 0.5 percent per year. Data for the blue grouse for the same years and region indicate a stable to slightly downward trend of 0.8 percent per year.

**Figure 62. Blue grouse harvested/hunter day, 1996 through 2003.**





**Figure 63. Ruffed grouse harvested/hunter day, 1996 through 2003.**



#### **Goshawk**

The Breeding Bird Survey data for goshawk suggest a decreasing trend in the central Rockies for the last seven to eight years (1996 through 2003). Data for the same region from 1980 through 2003 indicate a stable to slightly positive trend of 0.4 percent per year. Data collected on the Shoshone National Forest indicate that the species is present but uncommon. Goshawk nests have been difficult to locate. Two active nests were found in 1989 and two nests were discovered in 1994. Surveys of these old nesting areas and surrounding habitat were conducted in 2002 and 2003 and no nests were discovered. In 2004, in partnership with the Wyoming Natural Diversity Database, surveys were performed again in areas where earlier nests had been found, and two nests were discovered. Monitoring efforts later in the summer of 2004 failed to confirm whether these nests produced any young. These nests (and surrounding areas) will be resurveyed in 2005.

#### **Big game**

The Wyoming Department of Game and Fish sets herd unit objectives for big game species based upon habitat conditions, public opinion, and cooperating agency input. Post-season population estimates were generated from the most recent (and thus considered most reliable) Wyoming Department of Game and Fish population simulation model for each herd unit. Not all species/herd units have population models; thus, not all species/herd units have population estimates. Due to modeling revisions, use of standardized modeling parameters, and refined data collection/analysis, current estimates may or may not agree with previously published population estimates (e.g., Annual Job Completion Reports). Beyond the earliest year for which population estimates are made, or if no estimates were available, a narrative discussion addresses population trends, as perceived by Wyoming Department of Game and Fish managers, with particular comments directed at the segment(s) of each herd unit that spend part or all of the year on the Shoshone National Forest.

#### **Elk**

The most reliable population estimates for the Gooseberry elk herd date back to 1995. Prior to 1995, this population increased slightly until about 1999, when it peaked at about 4,200 elk. This upward trend was likely the result of improved forage quality and quantity due to increased moisture, as well as both prescribed and natural fires that have occurred on much of this herd's winter range. In recent years, the population has shown a declining trend toward objective due to increased hunter harvest and drought conditions.

Following a comprehensive telemetry project that revealed significant interchange between the Carter Mountain and North Fork Shoshone River elk herd units, the two herds were combined in 1993 to create the Cody elk herd unit. The objective for the Cody herd unit is the combined total of the two herds. The current simulation model produces reliable estimates through 1997. Although no figures are given for 1986 through 1996, the general trend was a population near or slightly above the objective in 1986 that grew prolifically following the 1988 fires to approach perhaps 10,000 elk by 1993. Since 1993, elk numbers have gradually declined to where they are once again near objective.

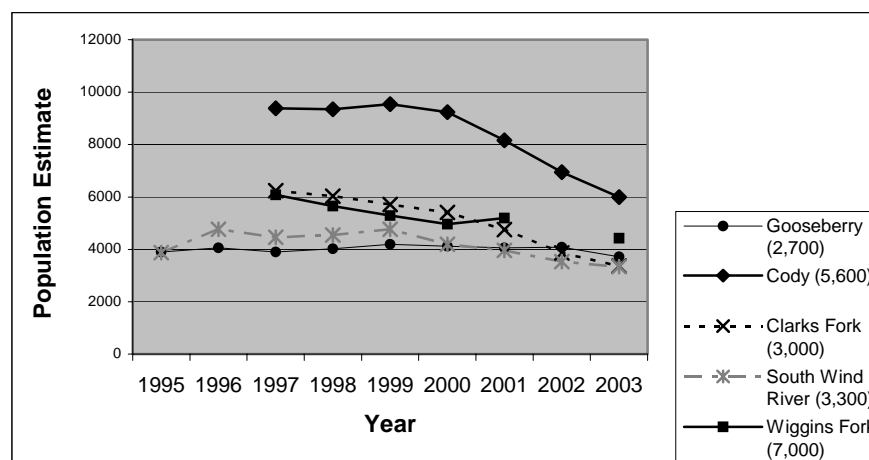
The current simulation model produces reliable estimates since 1997 for the Clarks Fork elk herd unit. Although no figures are given for 1986 through 1996, the general trend was a population above the objective in 1986 that grew following the 1988 fires to approach perhaps 6,300 elk by 1993. Since 1993, elk numbers have gradually declined to where they are once again near objective.

For several years, personnel have used winter trend counts to estimate the population of the Wiggins Fork elk herd unit. Trend counts are conducted on three sub-segments within the herd unit including East Fork, Dunoir/Spring Mountain, and South Dubois. These sub-segments represent groups of elk that follow three distinct movement/migration patterns detailed in the Wiggins Fork Elk Movement Study. As part of an objective change in 2002, the Wyoming Department of Game and Fish committed to maintain 6,000 to 7,000 wintering elk in the area. The total includes 2,400 to 2,800 elk in the East Fork segment, 2,300 to 2,700 elk in the Dunoir/Spring Mountain segment, and 1,300 to 1,500 elk in the South Dubois segment. The actual number of elk counted in each herd segment is divided by a sightability factor to calculate the low and high population estimates.

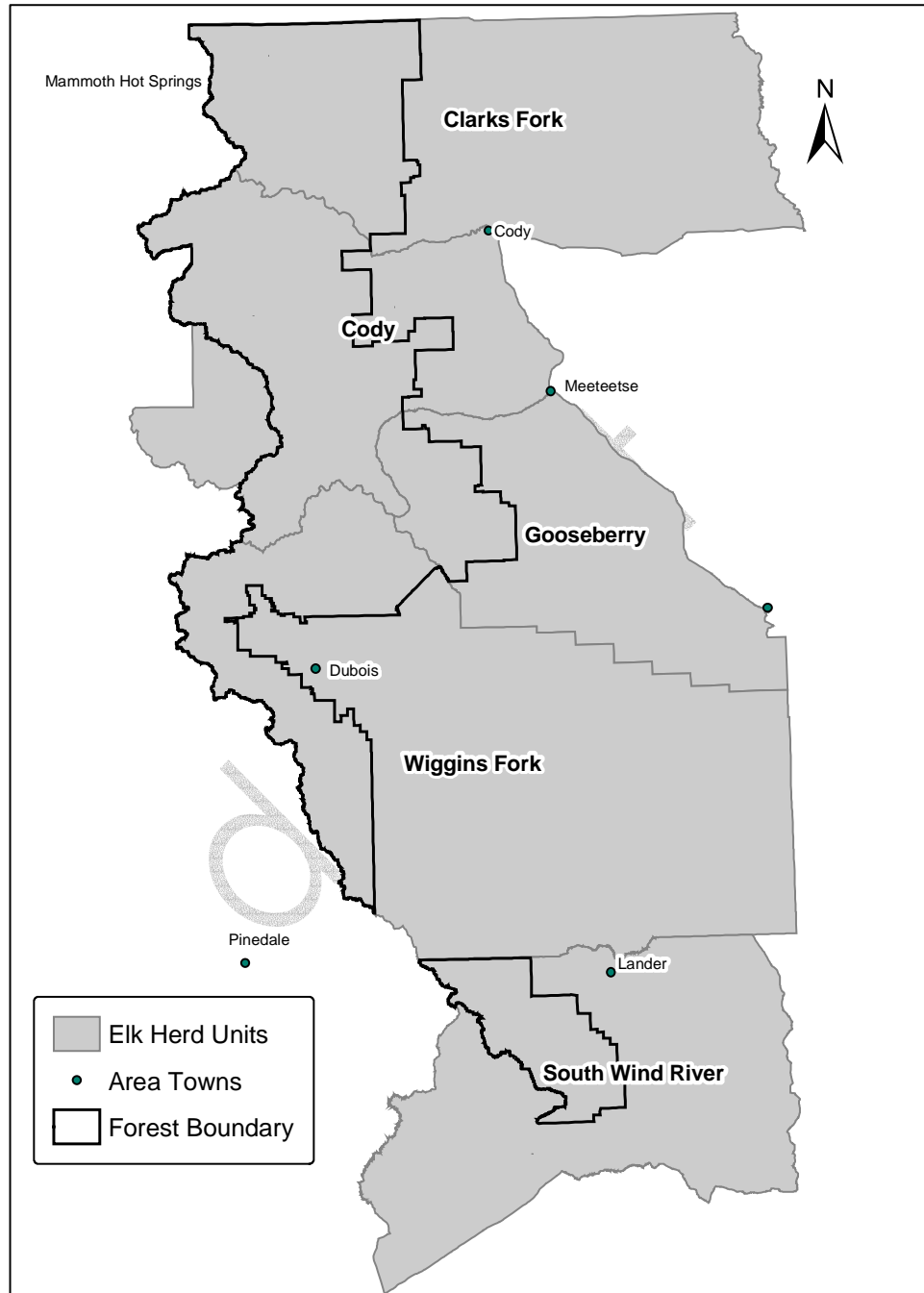
The population in the Wiggins Fork herd unit has declined since 1997. Counts performed in 2002 produced numbers so much lower than the previous years that they were considered unreasonable and the trend counts were deemed invalid. The winter of 2002/2003 was extremely mild with little snow cover. It is likely more elk wintered off traditional winter ranges where the counts are conducted. In 2003, personnel observed 4,418 elk and believe the trend count was more reliable. The elk population is currently at the lower end of the objective range set in 2002. Given recent recruitment trends in the herd, the population will likely continue to decline in the near future. The decline may be drought related.

Population numbers starting in 1996 for the South Wind River elk herd unit are from the POP-II model (a population simulation model) revised in 2003. Estimates for 1986 through 1995 are from prior Annual Job Completion Reports. Herd numbers rose significantly in the mid-1990s, most likely due to mild winters and now are down to very near objective. As the population rose above objective, more liberal hunting regulations were introduced and were effective at reducing this herd to near objective numbers.

**Figure 64. Elk population estimates. Herd unit objectives are shown in parentheses.**



*Figure 65. Elk herd units.*



### Mule deer

The most reliable population estimates for the Owl Creek/Meeteetse deer herd date back to 1995. Based on population estimates prior to 1995, it appears this deer herd increased slightly until about 1999, when the population began to stabilize. Severe drought conditions, which have persisted since about 2000, along with a slight decline in fawn production, have likely caused this deer herd to stabilize.

The current simulation model produces reliable estimates through 1990 for the Upper Shoshone mule deer herd unit. Although no figures are given for 1986 through 1990, the general trend was a population generally at the objective of 12,000 deer. Currently the trend is slightly downward due to reduced productivity in the herd. This loss of productivity may be due to the drought conditions of the past several years.

The current simulation model produces reliable estimates through 1990 for the Clarks Fork mule deer herd unit. Although no figures are given for 1986 through 1990, the general trend was a population below the objective of 9,000 deer. Although this herd has been managed very conservatively, the population trend is somewhat downward. This trend is potentially due to the effects of drought and increased wolf predation in the area.

The population of the Dubois mule deer herd unit is below objective and has been on a slightly downward trend. Based on current habitat conditions, the herd will probably stabilize at these numbers. Population estimates for this herd may not be reliable.

For the South Wind River mule deer herd unit, population numbers after 1992 are from the POP-II model revised in 2003. Numbers before 1993 are from the prior Annual Job Completion Report. The Lander and Hall Creek herd units were combined in 1993. This herd is fairly stable, although below objective. Habitat conditions are at a lower value because of several years of drought.

**Figure 66. Mule deer population estimates. Herd unit objectives are shown in parentheses.**

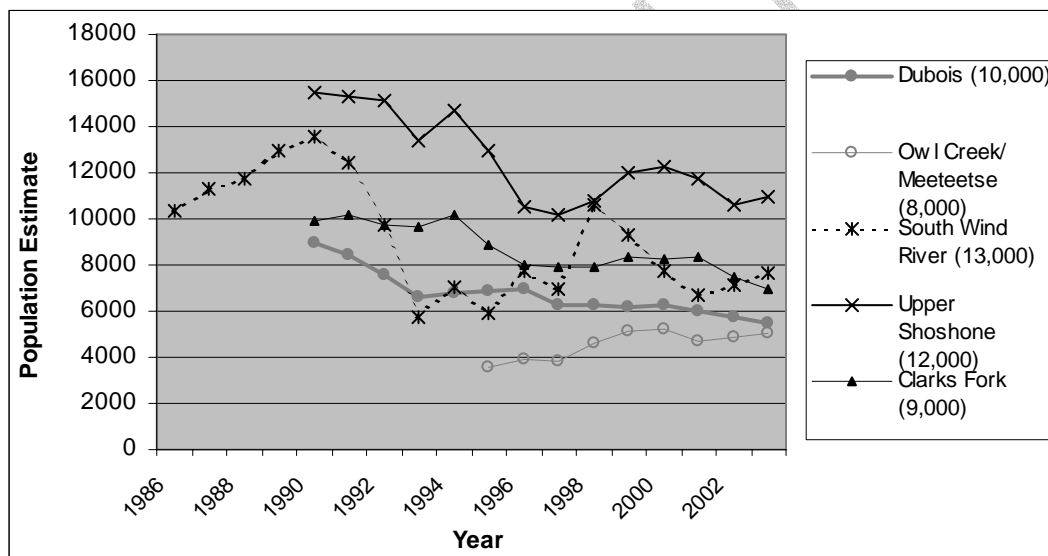
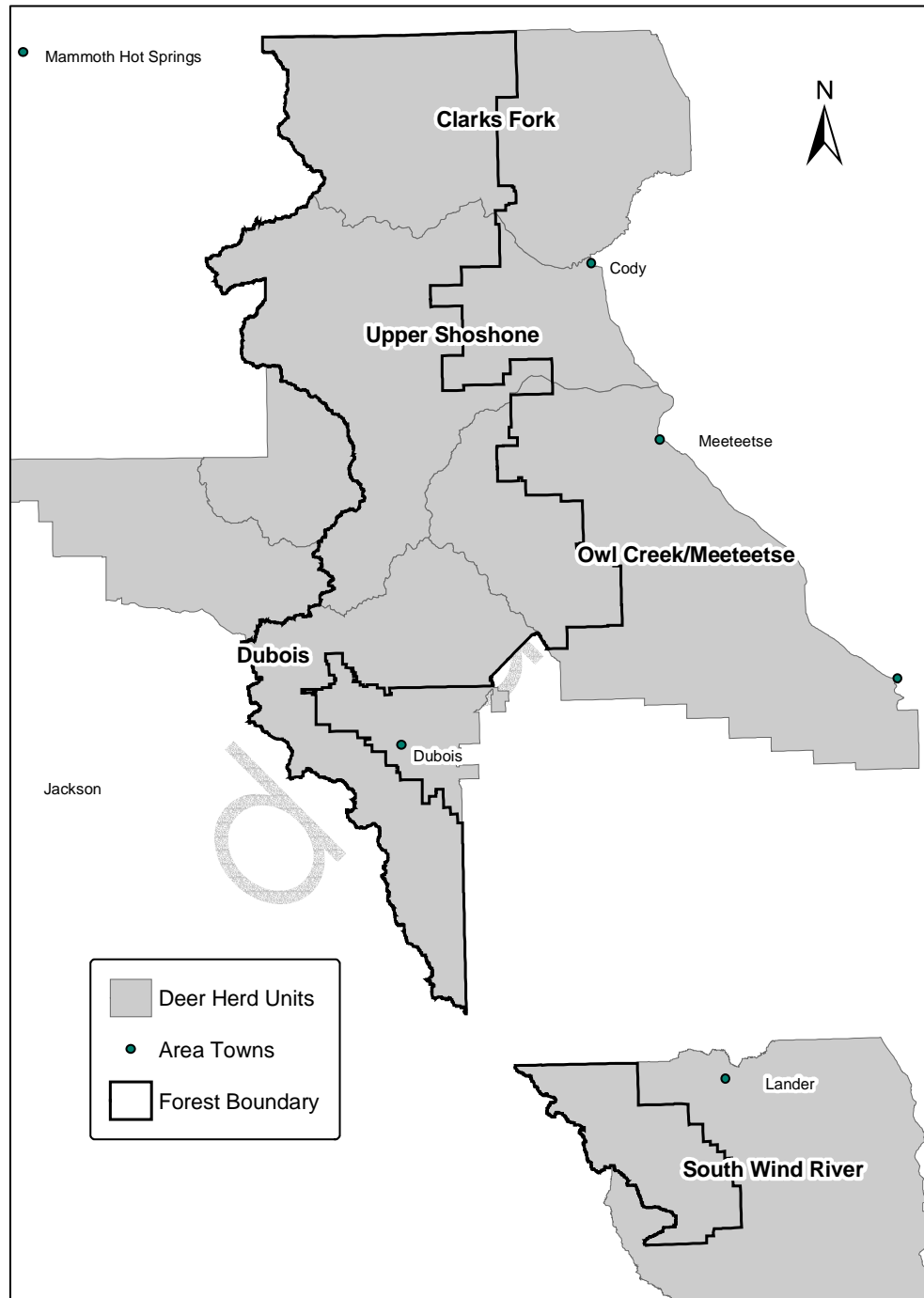


Figure 67. Mule deer herd units.



## Moose

Moose populations have traditionally been managed using relatively small, single hunt area herd units, consisting of the Crandall, Sunlight, North Fork Shoshone River (North Fork), South Fork Shoshone River (South Fork), Greybull/Gooseberry, and Thorofare moose herd units. Population objectives for these herd units were 100 for Crandall, 75 for Sunlight, 75 for the North Fork, 75 for the South Fork, 85 for the Greybull/Gooseberry, and 325 for the Thorofare. Moose data in these areas are extremely difficult to collect, and therefore attempts at estimating population size have always been tenuous. Harvest data (hunter success, hunter effort) are the only pieces of information with which to assess population status. Due to perceived declines in moose numbers and the need to reduce hunting pressure, the Crandall and Sunlight herd units were combined in 1992 to create the Clarks Fork moose herd unit. The objective of 175 was derived from the previously established objectives of the combined Crandall and Sunlight herd units.

For similar reasons, the North Fork and the South Fork herd units were combined in 1999 to create the Shoshone herd unit. The objective of 150 was a result of the combined objectives of the North Fork and South Fork Shoshone herd units. Again, for similar reasons as those stated above and to simplify Annual Job Completion Report record keeping, the Clarks Fork, Shoshone, Greybull/Gooseberry, and the Thorofare herd units were combined in 2004 to create the Absaroka moose herd unit. The new objective derived from the combination of all previous herd units is 830 moose. Examination of moose harvest information indicates that moose numbers in the Thorofare have been steadily declining since the mid-1970s. Moose numbers in the North Fork/South Fork and Sunlight and Crandall areas remained relatively stable until the mid- to late 1990s, at which time numbers declined. Moose numbers in the Greybull/Gooseberry herd unit continue to be stable. Recently collected movement information has shown connectivity between the Buffalo Valley area of the Jackson herd unit and the Thorofare. Therefore, it is likely that the Thorofare herd unit will be included in the Jackson herd unit in the near future. It is probably safe to say that from 1986 through 2003, moose numbers in all areas (except the Greybull/Gooseberry herd unit) have declined from near objective levels to a point substantially below objective. The most likely factors for the decline are prolonged drought, reduction of habitat from 1988 fires, and increased predation.

The population estimates for the Dubois moose herd unit are not considered reliable. The estimates are based on small classification samples most years. For some years, there are no empirical data on the population due to a lack of flight money for classifications. Anecdotal information suggests this moose population declined in the late 1990s and early 2000s. Several individuals of this herd were found dead in 2000 of unknown causes and it is possible that a disease came through the population, which may account for the decline. Other potential factors are drought conditions and increased levels of predation.

**Figure 68. Dubois moose herd unit population estimates, 1986 through 2003. The objective for this herd is 400 moose.**

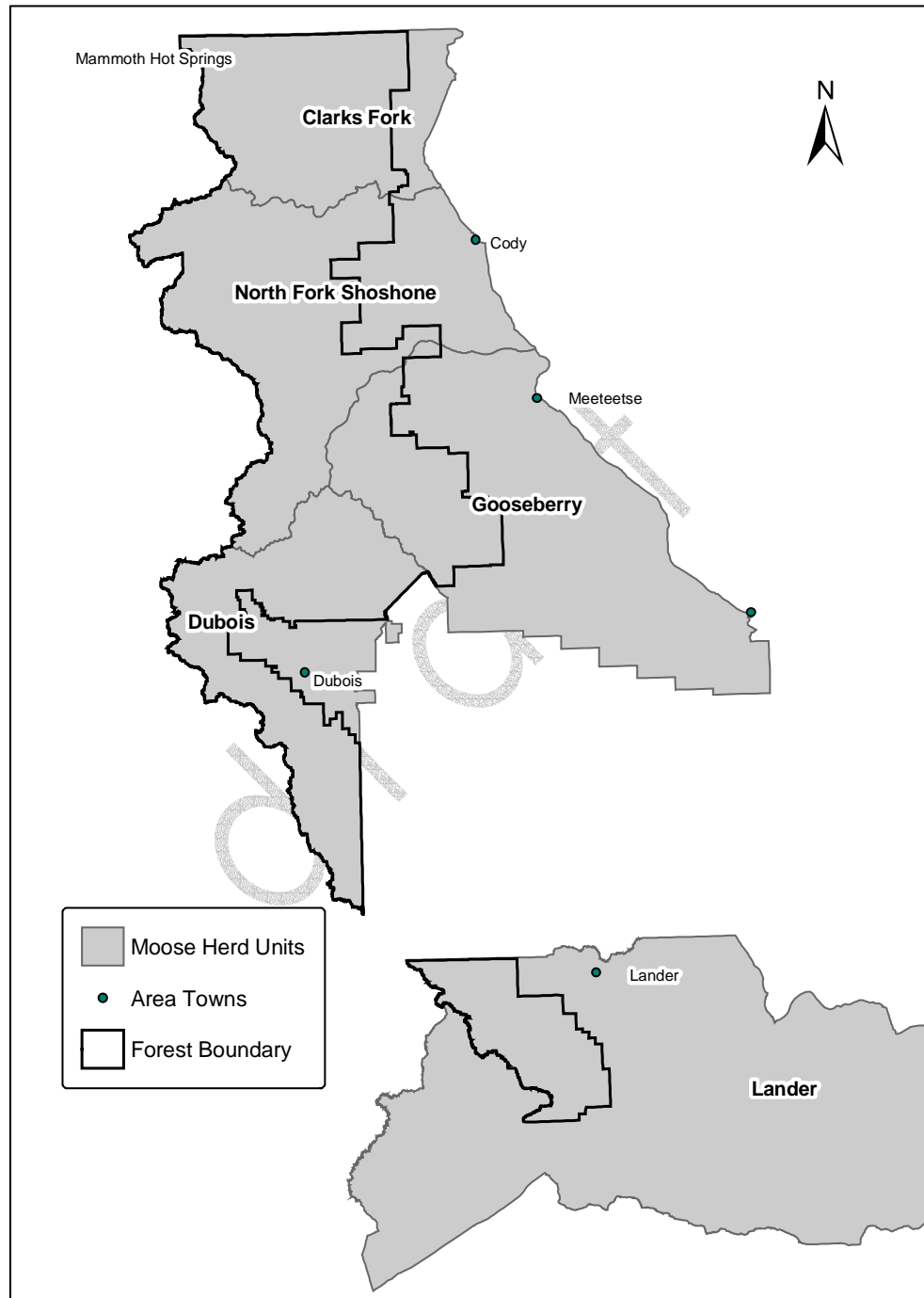
1986	1987	1988	1989	1990	1991	1992	1993	1994
625	654	699	715	686	672	697	663	674
1995	1996	1997	1998	1999	2000	2001	2002	2003
649	583	538	547	565	557	558	585	557

Lander moose herd unit population numbers from 1995 are from the POP-II model revised in 2003. This herd has trended somewhat downward perhaps due to the effects of drought conditions on willow and other deciduous vegetation food sources. Harvest of females will be reduced in hopes of reversing this downward trend.

**Figure 69. Lander moose herd unit population estimates, 1986 through 2003. The objective for this herd is 450 moose.**

1986	1987	1988	1989	1990	1991	1992	1993	1994
371	381	388	364	363	359	338	407	395
1995	1996	1997	1998	1999	2000	2001	2002	2003
520	499	475	475	477	451	421	410	393

*Figure 70. Moose herd units.*



### *Bighorn sheep*

A reliable population simulation model does not exist for the Clarks Fork herd unit. This herd is thought to have been near the objective of 500 sheep from 1986 through the mid-1990s. Particularly severe late winter snowstorms in 1995 and 1996 caused significant mortality in the northern portion of this herd unit. Since then, numbers have been steadily increasing, but are not thought to have reached the objective as of 2003.

A reliable population simulation model was recently developed for the Trout Peak bighorn sheep herd unit. Estimates place this herd substantially below the objective of 750 sheep. Only in the early 1990s was this herd thought to be near the population objective. Following the early 1990s, this herd is felt to have fluctuated below objective levels. Data collection in this herd unit has been sporadic; therefore, population dynamics in this herd are poorly understood.

A reliable population simulation model was recently developed for the Wapiti Ridge bighorn sheep herd unit. Estimates place this herd essentially at the objective of 1,000 sheep. Previous impressions of sheep numbers from 1986 through 1998 indicate this herd has been relatively stable near the objective.

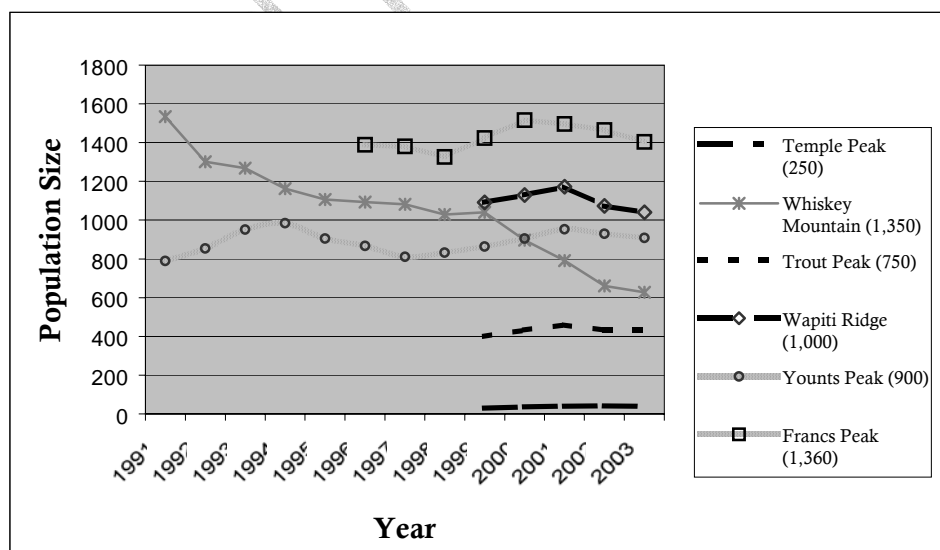
Good population data have been collected from the Younts Peak bighorn sheep herd since 1991, when the herd appeared somewhat stable. From 1986 through 1990, sheep numbers dropped from 1,000 to 900 sheep to a point near where they are estimated to have been in 1991.

The most reliable population estimates for the Francs Peak bighorn sheep herd unit date back to 1996. Based on hunter harvest statistics and annual herd classification counts dating back to the mid-1980s, it appears this population has remained relatively stable. Since 2001, lamb production has declined somewhat, which has caused a slight downward trend in the population in recent years.

The absolute value of these estimates is in all likelihood an underestimate of the Whiskey Mountain sheep population. The estimates provide an accurate trend of what has occurred in the population. Since a disease outbreak in the early 1990s, this population has declined substantially. The population is currently well below objective.

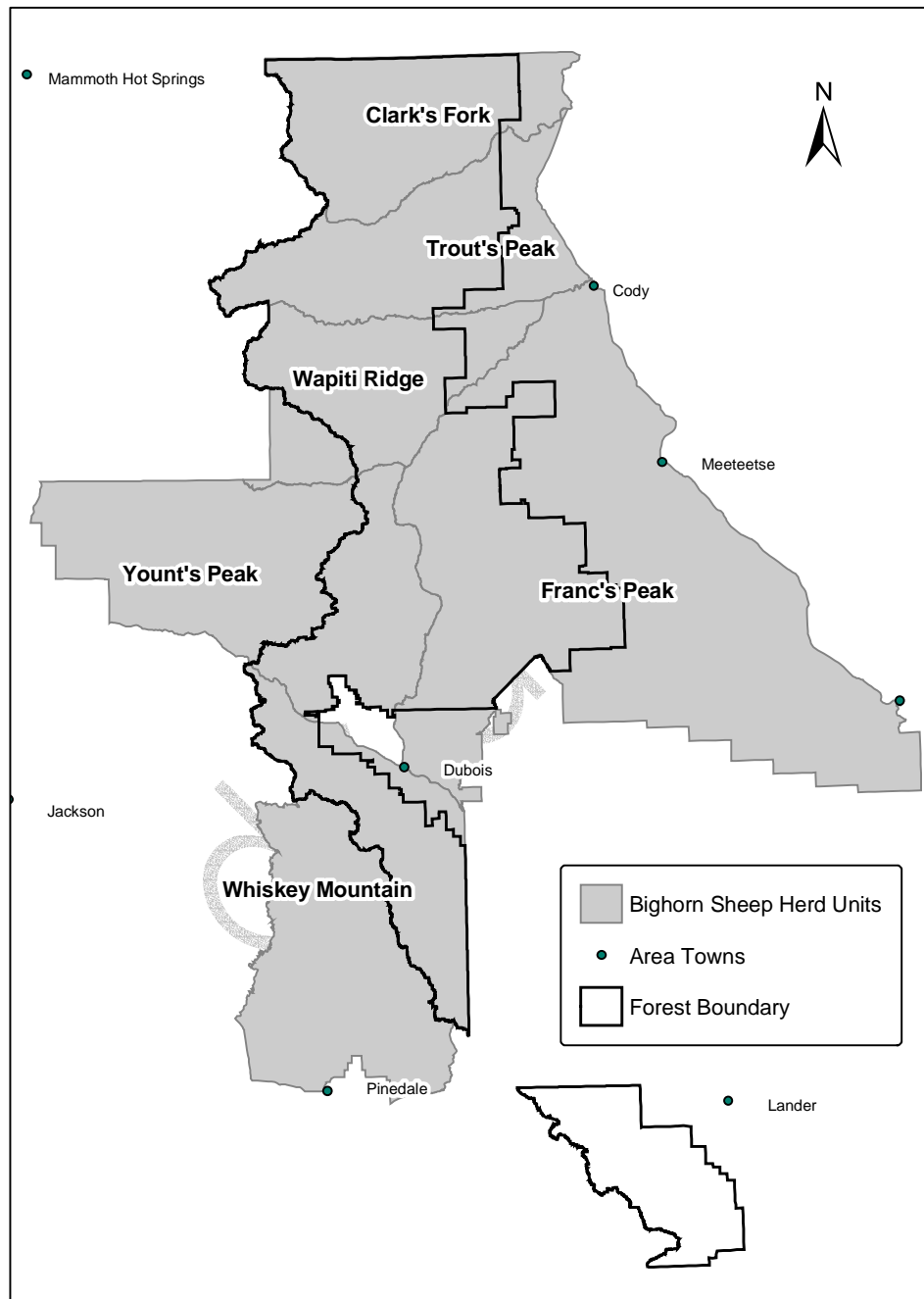
No population model has been available for the Temple Peak bighorn sheep herd since 1995. Numbers up to 1995 are from prior Annual Job Completion Reports. Numbers for 1999 through 2003 are from the 2003 Annual Job Completion Reports. The population trend appears to be stable over the last several years.

**Figure 71. Bighorn sheep population estimates. Herd unit objectives are shown in parentheses.**





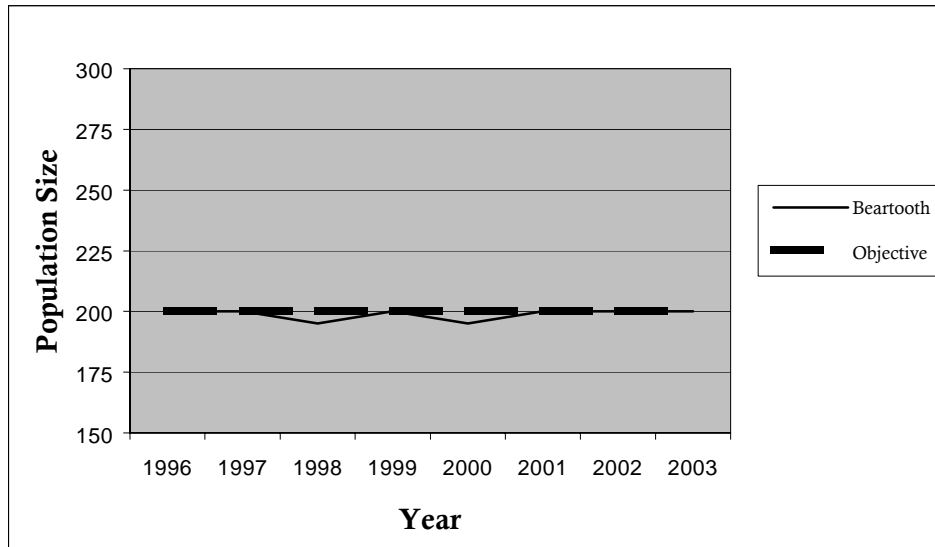
*Figure 72. Bighorn sheep herd units (Temple Peak herd unit map is pending).*



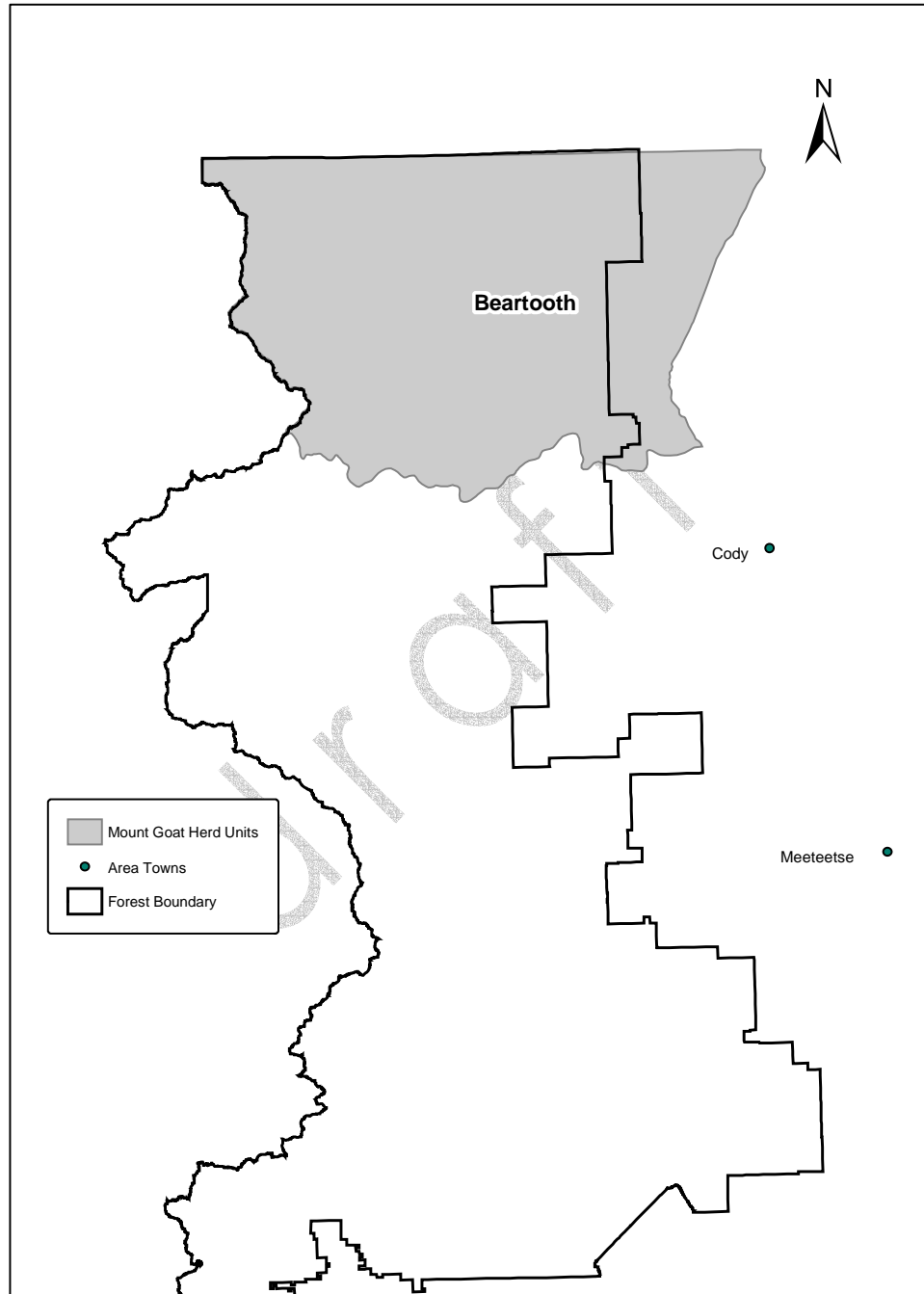
#### Mountain goats

The Beartooth herd is the only mountain goat herd on the Forest. Population estimates indicate the herd is at the objective level of 200 animals. It has been stable at this level for many years.

**Figure 73. Mountain goat population estimates.**



**Figure 74. Mountain goat herd unit location.**



### **Marten**

Forest Service personnel commonly see marten in suitable habitats. Some monitoring was completed in the winter of 1995/1996 by snow tracking along snowmobile routes on the northern and southern ends of the Forest. Marten tracks were encountered at a frequency of 0.7 tracks per mile. Many of these same routes were again surveyed in the winters of 2002/2003 and 2003/2004. Surveys in 2002/2003 had good snow conditions and recorded over 50 marten tracks. Snow conditions in 2003/2004 were much poorer and resulted in less snow tracking. Marten tracks were still seen frequently. Additionally, a crew surveying for lynx tracks in the Beartooth Mountain area of the Clarks Fork Ranger District in the winter of 2001/2002 gathered information on marten occurrences. This crew recorded marten tracks found while looking for lynx tracks, and they found over 40 marten tracks.

These data indicate that marten are common on the Forest and probably have a stable trend. Local trappers are still successful in trapping marten with similar effort over the past decades.

### **Beaver**

Observations made by McKinstry and Kruse in 1995 found beavers in the following drainages: Sweetwater, Little Popo Agie, Middle Fork Popo Agie, North Fork Popo Agie, Wind River, Clarks Fork, and Greybull River. Much of the Forest's stream habitat is too steep and has unstable volcanic substrates, with limited deciduous food supplies to provide good beaver habitat. Recent observations made by hydrology crews found active beavers in the following areas: Canyon Creek, Little Popo Agie, Hidden Creek, and Timber Creek.

Harvest data collected by the Wyoming Department of Game and Fish are limited for beavers, but harvest has declined in recent years. This is more an indication of the trend in the price of beaver pelts than that of beaver numbers. Based on this information, beaver trends are believed to be stable or declining on the Forest. This is not surprising as the quality and quantity of deciduous vegetation on the Forest has declined in recent years.

### **Game trout**

Game trout are the management indicator species for aquatic habitat. Forest-wide, game trout populations and their habitats have been maintained or enhanced since 1986. The reasons for the overall improved population and habitat conditions include improved livestock grazing administration and compliance, and reductions in animal unit months. This has led to improved riparian and fish habitat conditions by reducing bank trampling and erosion, and increasing stream bank stability. Improved road drainage has reduced fine sediment input to streams. Correcting fish passage problems at road crossings has increased access to available habitat. The Forest constructed various fish habitat improvement structures on the North Fork of the Shoshone River, increasing suitable fish habitat and game trout numbers. The Forest also created ponds with suitable fish habitat at Lower Dick Creek Lake and Sawmill Pond. Additionally, stream bank stabilization and restoration projects have been completed on the North Fork of the Shoshone River and Wind River that provide additional game trout habitat.

Yellowstone cutthroat trout are a game trout and a Region 2 sensitive fish species. Since 1986, Yellowstone cutthroat trout populations have decreased somewhat due to hybridization and competition with other non-native, invasive trout species although habitat conditions have improved overall (Yekel personal communication).

## **Projections if current Forest Plan direction continues**

If current management continues under the existing Forest Plan, the future trends of Management Indicator Species would be as follows:

### **Grizzly bear**

With current Forest Plan direction and the protective status afforded grizzly bears as a threatened species under the Endangered Species Act, grizzly bears will continue to increase in population in the short term. Mortalities associated with human conflicts are likely to increase as grizzly populations expand. These mortalities will not be significant enough to affect the species population growth.

**Gray wolf**

Gray wolf numbers are likely to increase at a slower rate than the past several years. Wolves are currently filling much of the prime habitat and as they spill out into less desirable habitat, mortalities from control actions will increase. It is anticipated that wolf populations will continue to increase (even with additional mortalities) and the species will be proposed for delisting from the endangered species act in the near future.

**Bald eagle**

The use of the National Forest System lands by bald eagles will probably remain stable in the future. This use is limited by lack of suitable habitat (large rivers or bodies of water) on the Forest, and this situation will not change over time under current Forest Plan direction. Therefore, the future trend in the short and long term should remain stable.

**Peregrine falcon**

The population trend of peregrine falcons will probably increase as the species is still spreading out into new, unoccupied habitat on the Forest. Peregrine falcon nesting habitat is unlikely to be impacted by any current Forest Plan guidelines.

**Brewer's sparrow**

Brewer's sparrows require sage and grassland habitats, which are currently suffering due to prolonged drought in the short term and conifer encroachment in the long term. Current management practices allow for habitat improvement; implementation of some of these projects may help reduce the downward population trend and habitat loss. This species population seems to be declining slowly over the short and long term.

**Hairy woodpecker**

Populations of hairy woodpecker will probably be stable to increasing in the near future. Increasing snag densities due to the insect and disease outbreak in the coniferous species may provide higher quality and quantity habitat for this species and result in an increasing population. Current standards and guidelines in the Forest Plan provide for ample amount of snags available for this species.

**Blue grouse**

Blue grouse will probably remain stable even with the insect and disease agents causing mortality in coniferous forest types. Blue grouse use opening and other mixed stands, so these habitat changes should not significantly affect their populations. Under current management, a sufficient amount of available habitat will be maintained.

**Ruffed grouse**

This species will remain stable or decline on the Forest due to the continued decline of early succession (young) aspen habitat. Aspen habitats have been lost due to lack of fire and the recent drought. Current and proposed vegetation treatments may increase aspen habitats, increasing ruffed grouse populations.

**Goshawk**

The future trend for goshawk habitat will probably continue slightly downward as the current insect and disease cycle is impacting available habitat (mature conifer forest) for this species in some areas of the Forest. The extent of decline of available habitat will depend upon how much of this species' habitat is affected by the insect and disease agents. There is a possibility that goshawks will switch to a more available prey species (such as woodpeckers). The current outlook for this species population is probably stable in the short term and unknown in the long term.

**Elk**

The future trends in elk populations will be chiefly determined by hunting regulations, set by the Wyoming Game and Fish Department and major fire events. The herds that are above objective levels (Gooseberry, Cody, and Clarks Fork) will probably trend downward due to high cow/calf hunting harvest/license quota until they near their objective levels. The Wiggins Fork herd is currently below objective, but based on habitat conditions, this herd will probably remain below the population objective. The South Wind River herd is currently near objective and will most likely remain stable. Current management objectives for herd populations allow for habitat improvement in crucial habitat areas.

### ***Mule deer***

The trend of mule deer herds is influenced by hunting regulations set by the Wyoming Game and Fish Department. Currently all herd units are below objective levels; some herds have been heavily affected by sustained drought and are trending downward. In the future, most populations will remain somewhat stable or perhaps increase as the Game and Fish Department sets appropriate hunting limits to encourage population increase. If the drought continues, it is possible that populations could still trend downward.

### ***Moose***

Moose populations are currently being affected by the drought conditions of the past several years, as well as increased predation. The limited available data for moose herds suggests that the northern herds are below objective levels, while the southern herds are closer to their objective levels. The Game and Fish Department will continue to limit hunting pressure on these herds to facilitate the recovery of the herd. If the drought continues, the populations will mostly likely be stable or continue to trend downward.

### ***Bighorn sheep***

The Clarks Fork, Trout Peak, Whiskey Basin, and Temple Peak sheep herds are below objective levels set by the Wyoming Game and Fish Department. Habitat conditions and severe illness are some of the factors responsible for these population declines. Current management allows for habitat improvement in crucial habitat areas. Several habitat improvement projects in the last few years have been aimed at improving habitat for this species, and other projects are planned. This management may result in a future upward trend of some of these herd units.

### ***Mountain goat***

The one population of mountain goats on the Forest will most likely continue to remain stable near the objective level. No change in management in the area this herd occupies is anticipated.

### ***Marten***

Marten habitat will probably decline as the quality is decreasing in many areas of the Forest due to insect and disease outbreaks. The extent of decline depends on how widespread the insect and disease agents become. Current levels of vegetation management are most likely not going to significantly affect marten, although without strong Forest Plan direction to monitor populations, it will be difficult to determine population trends.

### ***Beaver***

Beaver will most likely continue to decline on the Forest because the quality of the current riparian vegetation. Drought and perhaps past overgrazing of riparian areas have left insufficient habitat for beaver in some areas of the Forest. Current vegetation treatment projects are being done to improve riparian habitat but it will take many years, and the end of drought conditions, to have enough suitable habitat for beaver to increase in population.

### ***Game trout***

Under the current Forest Plan, game trout populations and associated habitat trends are improving overall. Riparian areas are slowly improving from turn-of-the-century overgrazing practices.

## **Need for change in Forest Plan direction**

The revised plan's desired conditions and objectives regarding wildlife and habitat should consider various measures of habitat both quantitatively and qualitatively. Measures that should be considered for inclusion are:

- Roading
- Human disturbance
- Habitat linkage
- Habitat interspersation

The revised plan's desired conditions and objectives should incorporate the new concepts of species of concern and species of interest. Monitoring direction in the plan should be integrated with these new concepts.

New science should be incorporated into the desired conditions and objectives in the plans that have changed the understanding of concepts from the original plan on subjects such as edge contrast and thermal cover.

The revised plan's desired conditions and objectives for vegetation diversity should consider the historical range of variability for vegetation in the planning area.

Desired conditions and objectives for stand components such as snags, dead and down, and density, etc. should address inherent differences in forest type.

Desired conditions and objectives for the maintenance or enhancement of riparian resources should consider the natural range of variability in both the short and long term.

The revised plan desired conditions and objectives should incorporate direction from the grizzly bear and lynx conservation strategies.

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