

Arapaho and Roosevelt National Forests
and
Pawnee National Grassland

**Monitoring and Evaluation Report
for
Fiscal Year 2000**

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Forest Certification

The Revised Forest Management Plan approved in November 1997 has provided goals and objectives to direct the future of resource management of the Forest and Grassland for the next ten years. The Forests and Grassland are in the third season of implementing plan goals and objectives. Lessons learned from a third season of monitoring and evaluation point to how to better do the job of interdisciplinary resource management, monitoring and evaluation of plan implementation by Forest personnel. Monitoring and evaluation carried out by the Monitoring and Evaluation Team with findings reviewed and concurred with by the Forest Leadership Team has resulted in no significant problems or reasons for change to the Revised Forest Management Plan at this time. Some work has been initiated on amendments dealing with Threatened, Endangered and Sensitive (TES) species and incorporating the Williams Fork area into the Arapaho and Roosevelt National Forest and Pawnee National Grassland Revised Forest Plan from the Routt National Forest Revised Forest Plan. These efforts will be back on track as soon as budgets and priorities permit.

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Introduction

Monitoring and evaluation are conducted at several scales and for many purposes, each of which has different objectives and requirements. Monitoring is not designed to be similar to research in either purpose or degree of statistical rigor. The Forest Plan for the Arapaho and Roosevelt National Forests and Pawnee National Grassland was revised in November 1997. This Plan guides management actions on the Forests and Grassland. Monitoring of the 1997 Revised Forest Plan is intended to provide the Forest Supervisor with the information necessary to determine whether the Revised Plan is sufficient to guide management of the Arapaho and Roosevelt National Forests and Pawnee National Grassland for the subsequent year or whether modification of the plan is needed.

This monitoring report consists of three chapters. The first chapter sets the context for this report by describing what is included in the Revised Forest Plan. This description is related to the Montreal Process, which was adopted in 1995 by nations (including the United States) interested in achieving international-level agreement on principles of sustainable forest management. Seven criteria were developed to measure the sustainability principles.

The second chapter focuses on the specific monitoring activities, findings, recommendations, and emerging issues for each resource program. Chapter 4 of the Revised Forest Plan guides each program's annual monitoring and evaluation process. Chapter 4 was developed under the guidance of the National Forest Management Act (NFMA). The regulations enforcing NFMA define monitoring requirements. Some are legally required monitoring direction. These are found in Table 4.1, *Minimum Legally Required Monitoring Activities*, (p.393) of the Forest Plan. These regulations also describe general forest plan monitoring guidance. Some of this guidance is expressed in Table 4.2, *Forest Plan Monitoring Questions for Priority Management Emphasis and Stateholder/Public Involvement* (pp. 394-396).

Chapter 2 of this monitoring report reviews each resource program's monitoring activities. In this chapter you will find segments of Table 4.1 in most resource program sections. A legally required monitoring item can apply to more than one program. Therefore, you may find the same monitoring item listed over and over again for different resource programs such as Wildlife, Fish, Range and so on. Some items may apply to only one resource area such as the Forest Health legal requirement to monitor the control of destructive insects and diseases.

In Chapter 2 you will also read about other monitoring activities (other than legally required). These activities usually support the answers to Table 4.2. These questions have been split out by resource area and are addressed in each resource program description.

Chapter 3 provides an evaluation of the fiscal year (FY) 2000 monitoring of the Revised Forest Plan. It also ties back to recommendations made in the 1999 Monitoring and Evaluation Report by summarizing the status of the actions recommended in that report. An action plan for FY 2001 is recommended along with possible research needs.

Chapter 1. Setting the Context

As mentioned earlier, the Arapaho and Roosevelt National Forests and Pawnee National Grassland (ARP) Revised Forest Plan was approved in November 1997. To set the context for our Forest Plan monitoring it is helpful to understand what is in the Revised Plan. Therefore, the following information is taken from the Final Environmental Impact Statement that accompanied the Revision.

This information is organized according to the seven Montreal Criteria.¹ These seven criteria were accepted at a meeting of nations interested in achieving international-level agreement on principles of sustainable forest management as well as criteria and indicators for measuring such principles. The seven Montreal Criteria are: 1) conservation of biological diversity, 2) maintenance of productive capacity of forest ecosystems, 3) maintenance of forest ecosystem health and vitality, 4) conservation and maintenance of soil and water resources, 5) maintenance of forest contribution to global carbon cycles, 6) maintenance and enhancement of long-term socioeconomic benefits to meet the needs of society, 7) legal, institutional, and economic framework for forest conservation and sustainable management.

Conservation of Biological Diversity

The Arapaho and Roosevelt National Forests and Pawnee National Grassland contain almost 1.5 million acres of short-grass prairie, montane forest, subalpine forest, and alpine tundra. The Forest lies in northern Colorado with the Continental Divide and the Front Range of the Rocky Mountains forming the rugged backbone for most of the Forest's land base. The ARP is dotted with numerous peaks above 13,000 feet and three above 14,000 feet. The ARP provides habitat for over 400 species of wildlife, including several nationally designated threatened, endangered or sensitive species, and including most of the mammals traditionally associated with the American West: deer, elk, bighorn sheep, black bear, mountain lion, pronghorn antelope, coyotes, beaver, and others. Moose, reintroduced in 1987, is successfully extending its range on parts of the ARNF. A number of fish species, among them rainbow, brook, brown, cutthroat and lake trout, inhabit the Forests' waters.

Managing for biological diversity means managing the ARP to maintain a diversity of 1) communities of plants and animals, 2) individual species of plants and animals, 3) different genes within the species, and 4) the thousands of different ways individual organisms interact with one another and their environment.

In the forests, biological diversity is most affected by any alteration in the composition, pattern, and structure of the vegetation. Three factors influence the vegetation in the ARP most strongly: fire, insects and disease, and logging. Naturally occurring fires were a regular phenomenon into the early part of the 1900s. These fires thinned the trees, removed dead wood and thick ground cover, allowed a new crop of trees to sprout, and generally rejuvenated the ecosystems. Human

¹ The Santiago Declaration and its accompanying criteria and indicators were accepted at a meeting of Montreal Process countries in Santiago, Chile, on February 3, 1995.

interference with these fire cycles has led to increased insect infestation and a buildup of dead wood, a condition that could contribute to fires of an unusually destructive nature in the future.

There are currently two ways of relieving this situation: logging and prescribed fire. Both the experienced and full budget levels fall seriously short of the amount of prescribed fire that would be needed to bring and maintain fuel levels in the Forests to their natural condition. Still unnaturally loaded with fuels, ecosystems will therefore continue to experience larger and more severe fires that will threaten ecological values. The 1984 Forest Plan projected a timber harvest of 30 million board feet per year. Dependent on the budget for any given year, the 1997 Revised Forest Plan projects from 2 million to 6.5 million board feet of harvest. The decrease is chiefly because many of the chosen timber production areas have been harvested to the point that they have approached the tolerance limits set for other resources such as water quality, soil erosion, big game cover and scenery. There are numerous forest-wide standards and guidelines governing timber harvest operations. Tables in Revised Plan, Chapter 3, Management Area Direction, specify whether, or to what extent, timber harvest is allowed in each kind of management area.

Maintenance of Productive Capacity of Forest Ecosystems

The Revised Forest Plan in Chapter 1 establishes goals to assure productive, healthy, ecosystems blending social, physical, economic and biological needs and values to enhance forest health, manage old growth forests, improve conditions for threatened, endangered or sensitive plant and animal species, to protect air, soil and water resources, insure a full range of all stages of forest community types, and so forth. Specific objectives also in Chapter 1 prescribe measures for bringing about the realization of these goals.

High quality, healthy soils are a basic resource on which ecosystems and their various components including vegetation, wildlife and humans, depend for continuous growth and function. In order to maintain, enhance, and where necessary, restore the long-term quality and health of the soil, detrimental soil impacts must be maintained within tolerable limits. Compaction, displacement, erosion, puddling and severe burning are five types of impacts that have levels defined as detrimental. With any activity, a minimum of 85 percent of an activity area must be maintained at a level such that the physical, chemical and biological processes and functions are not detrimentally impacted. Mitigation measures, standards and guidelines along with the state's "Water Quality Best Management Practices" are applied at the project level to protect, enhance and where appropriate, improve the soil resource.

Maintenance of Forest Ecosystem Health and Vitality

The Range of Natural Variation (RNV) is defined as the spectrum of conditions possible in ecosystem composition, structure and function considering both temporal and spatial factors. The existing land cover of the Forests is expected to change little over time. No conversions of one vegetation type to another will occur; however, shifts in seral and climax species within habitats will occur. For example, where management and other disturbances are absent the

lodgepole pine cover will become dominated by subalpine fir and Engelmann spruce. Such shifts would, however, be within the RNV where change is slow and probably detectable only over centuries.

Inventories of the ARP show that lodgepole pine is the most common forest type followed by Engelmann spruce/subalpine fire, ponderosa pine, Douglas-fir, and aspen. Most of these stands are mature to over-mature; more than 58% of the stands are in this condition. With the majority of the forested lands in a mature to over-mature condition, fire, insects and disease will continue to play significant roles in forest succession and disturbance processes in the future despite the presence of humans.

Past fire suppression and vegetation management practices have altered the mosaic of wildland fuels. These changes have led to greater flammability than occurred in the range of natural variation. Ponderosa pine systems have become overstocked with younger vegetation, providing a ladder for fire to spread into the upper canopy of the forest. High intensity stand-replacement events over larger areas are now occurring where fires typically burned in only spotty severities earlier. Higher elevation forests are becoming susceptible to fire on a landscape scale. Fire protection is not always possible and any protection comes at a cost. Fire management on the ARP consists of applying appropriate management actions to wildland fire events, reducing unacceptable fuel profiles and fuel buildups through prescribed fires, and reinforcing fire as an ecological process.

Of the numerous insects and diseases that affect forests, only a few have had a significant impact on the attainment of forest management objectives. Major infestations of spruce beetle, mountain pine beetle, and the western spruce budworm have caused mortality over large areas of the Forest in the past and continue to play a role in forest succession. The dwarf mistletoes, root disease fungi, and comandra blister rust are the most important diseases.

The current and projected future conditions on the Forests ensure that insects and diseases will continue to play significant roles in the development, successional processes and both the small and large-scale level disturbance processes at work on the Forests. Growth loss and mortality will continue to occur, particularly where access, topography or other resource restraints preclude silvicultural treatment of stands.

Conservation and Maintenance of Soil and Water Resources

The primary goal of soil management is to maintain and where appropriate improve soil quality and health in order to sustain or improve the physical, chemical and biological functions of the soil in the ecosystem. Nine general map units describe soil types on the Arapaho and Roosevelt National Forests. Of the six detrimental soil impacts that can occur, and for which we have standards, compaction, displacement and erosion are of greatest concern.

Seventy-five percent of the ARP's soils are on steep or dry areas. These areas are subject to erosion and displacement, and are the units where most Forest activities occur. Fifteen percent of the Forest's soils occur at elevations between 10,000 and 14,000 feet, where little or no

activity is implemented. The vegetation is sparse and the soils are subject to erosion and mass failure. Five percent of the soils are associated with morainal features and are also subject to erosion. Three percent of the soils are associated with wetland-riparian areas and are subject to compaction and displacement; they are some of the most biologically diverse soils and have some of the greatest diversity of functions. All three general map units on the Pawnee National Grassland are subject to wind and water erosion. Implementation of regional or forestwide standards and guidelines, mitigation measures, and existing laws and regulations will address the cumulative effects of past impacts and hold potential future detrimental impacts within acceptable levels.

There are 1,937 miles of perennial streams and 476 lakes on the Forests and Grassland. These vary from nearly pristine water bodies in wilderness areas to streams that have been heavily impacted by human activities including timber harvest, grazing, road construction, and mining. The Final Environmental Impact Statement contains a Watershed Condition Assessment that records the health of 147 watersheds on the ARP. Of these watersheds, 41 were rated as functional, 87 were rated at risk, and 19 were rated nonfunctional. In addition, 12 stream segments are listed by the State of Colorado as having impairment of designated uses.

At the moment, all streams that originate in the ARNF-PNG are over-appropriated. That is, most water users hold the rights on paper to more water than is actually flowing in the streams. The demands for water on the Colorado Front Range have grown to a point that there is not enough water left in some water courses to support riparian and aquatic life. Water concerns are reflected in many of the standards and guidelines since one of the mandates of the National Forests is to insure a continuous supply of clean water and to maintain aquatic and riparian ecosystems. The key issue for this revision was to maintain sufficient flow in perennial streams while meeting the need for water storage and development. The Forest is working with the State of Colorado to comply with 1996 amendments to the Safe Drinking Water Act to identify source areas for public water supplies. The Forest remains responsive to requests to evaluate site-specific proposals for water facilities and at the same time remains attentive to the need to maintain sufficient streamflow for threatened and endangered species both locally and in the Platte River in Nebraska.

Maintenance of Forest Contribution to Global Carbon Cycles

This criterion is beyond the scope of the 1997 Revised Forest Plan.

Maintenance and Enhancement of Long-term Socioeconomic Benefits to meet the Needs of Society

Historically, the Forest and Grassland were hunting grounds for Native American tribes. Europeans first settled the area to mine silver and gold beginning in the 1850's. Miners used the forests to supply lumber for housing and mine props. Ranchers and homesteaders settled on the grasslands and in many small mountain valleys. Ranchers used the entire Grasslands and all Forest meadows and alpine areas for grazing their cattle and sheep. Over half of the forests in the area were harvested for use in mines, homes, and railroad ties. Water as a commodity from

forested lands was diverted and stored both on and below the Arapaho and Roosevelt National Forests.

The Forests and Grasslands play a role in local and state economies. They contribute substantially to economic development opportunities. Communities such as Winter Park, Granby, Grand Lake, Kremmling, and Walden, are tied to the Forests and Grassland for their economic well-being. Wood products, livestock, minerals, water, and recreation have all contributed to rural incomes. Recreation and tourism associated within the Forests have become a large portion of small local community economies.

The key features that make the Forests and Grasslands unique and important for recreation are: its proximity to nearly 2 million people; surrounding Rocky Mountain National Park; accessibility from major freeways and highways; downhill and cross-county skiing opportunities; water in an arid landscape; nationally designated Wilderness areas; a Wild and Scenic River; Scenic Byways; a National Recreation Area; seasonal change; and a variety of wildlife.

A significant portion of the Arapaho and Roosevelt National Forests is included in the densely populated areas along the front range of the Rocky Mountains. Land ownership patterns and management activities have resulted in conflict between resident landowners and forest users. There has been an increasing interest in the type and impact of activities on National Forest lands in this intermix area. Forest visitors are primarily attracted to the Forest because of the setting that accommodates or enhances the particular activity they participate in. Several forces can detract from the desired setting. One is change caused by the recreation activity, participation rate, or competition between various recreation activities, and the other is a competing management activity that causes a perceived negative change.

The sustainability of these economies, communities, and lifestyles depend on multiple use management and sustainable ecosystems.

Legal, Institutional, and Economic Framework for Forest Conservation and Sustainable Management

Appendix B of the Revised Forest Plan is a partial listing of national and regional Forest Service policy. A complete listing can be found in the Forest Service Manual and Forest Service Handbook. Appendix C of the Revised Forest Plan is a listing of the relevant Federal and State Statutes and other Regulations.

The Forests lie within Larimer, Boulder, Gilpin, Clear Creek, Park, Jefferson, and Grand counties; the Grassland lies within Weld County. Six counties have the greatest potential to be affected economically by Forest Service management. They are Clear Creek, Gilpin, Boulder, Larimer, Grand, and Weld Counties. Collectively they are referred to as the influence area. Colorado's population has steadily increased since 1980. The population base for the areas in and around the Forests and Grasslands is expected to continue to increase during the next 20 years. Colorado's population increases are attributed to several factors: the state economy has been strong in comparison to the national economy and people move here because of the state's

attractive lifestyle. As population increases, land development in and around the Forests and Grassland increases; thus, the demand for open space can be expected to increase. Residents may turn their attention to the National Forest for recreation and solitude in greater numbers and with increasing demands on forest resources.

The Forests and Grasslands contribute to the economy both as an employer and as an agency with economic impacts on recreation and timber and, to a lesser extent, on the oil and gas and livestock industries. The biggest category of Forest-related activities is recreation where the majority of the jobs are generated. Timber is less than .01 percent of the total area employment.

Over 8 million people visit the ARP annually which is in the top ten of all National Forests. The ARP is one of eleven National Forests in the United States where recreation and other resource uses are strongly influenced by large urban areas. Colorado's Front Range population is expected to reach 2.8 million by 2005.

Developed recreation use has increased 31.4 percent and dispersed recreation use by 42.4 percent. The greatest increase in developed recreation use is public participation in interpretive programs. The greatest increase in dispersed recreation use includes mountain biking, dispersed camping, canoeing and rafting, winter-oriented activities, and cold-water fishing. Based on the expected increase in use and on field information, meeting projected use by 2005 would require reconstruction of 550 to 700 campground units and 75 to 150 units in picnic areas as well as new construction of 150 to 250 units in campgrounds and 75 to 150 units in picnic areas. Generally, a large surplus of land is available with the potential to support additional dispersed recreation activity opportunities well into the future. However, the key limitation to participating in dispersed recreation activities is access to dispersed areas, parking availability, limited dispersed campsites, and the availability of information on dispersed opportunities.

The Monitoring and Evaluation Strategy described in the Forest Plan will gather information to address limits of acceptable change as an effective measure of resource and facility condition to enhance management of the recreation facilities and resources. The Forest Plan maintains a mixture of recreation settings emphasizing semi-primitive non-motorized and roaded natural opportunities. It emphasizes reconstructing most existing facilities first and then constructing new facilities to meet future demand.

Chapter 2. Monitoring and Evaluation Results by Program

This chapter highlights the individual resource program's monitoring accomplished in Fiscal Year (FY) 2000 which started on October 1, 1999 and ended on September 30, 2000. Accomplishments varied due to program priorities, program start-up time, available budgets and the intense wildfire season which diverted personnel from field work to fire fighting.

The monitoring results are reported by program in the following manner:

1. A brief description of the program
2. Monitoring: key accomplishments and monitoring for the year. This section also includes a response to the Revised Forest Plan monitoring questions that address priority management emphasis, goals and objectives in Chapter 1 of the Forest Plan (Table 4.2, Revised Forest Plan, pp394-396.
3. Recommendations: to provide guidance for future management and monitoring efforts.
4. Emerging Issues: heads-up for management/monitoring
5. Legally required monitoring activities from Table 4.1 of the Revised Forest Plan, p. 393. One item from this table may apply to many or all resource programs and, therefore, may be repeated.

To comply with the Government Performance and Results Act of 1993 (GPRA) the individual programs are grouped into 3 of the 4 GPRA goals:

- *Ensure ecosystem health,*
- *Provide multiple benefits to people,*
- *Provide effective public service*

The fourth goal, *scientific and technical assistance*, is addressed in this report in Chapter 3, Evaluation of the Forest Plan and Action Plan.

Wildlife and Plants

To maintain diverse wildlife species and viable populations of individual species the wildlife program emphasizes maintenance of diverse ecosystems by maintaining the abundance and distribution of habitats. These habitats in a forested environment include early successional grass-forb, shrub-seedling, sapling-pole, late successional-mature, and late successional old growth. In the grassland environment the habitats found are grass-forb, shrubs, woody draws, and trees. Another key component of the program is protection and recovery of threatened or endangered species as well as the maintenance of management indicator species identified in the Revised Forest Plan

Monitoring:

Intensive and extensive monitoring of management indicator species (MIS) was begun with the onset of the Revised Forest Plan in 1997. Monitoring of populations in relation to habitat conditions and changes is challenging because species populations are affected not only by human disturbances (Forests and Grassland management, ranching, road driving, hunting etc.) but also by many other factors such as natality, fatality, weather events, predation, and disease. The Colorado Department of Wildlife (CDOW) monitors mammals and their habitats, particularly large mammals and game species. The CDOW also has new data and ongoing data collected from studies of game birds, raptors, neo-tropical migrant birds, amphibians, small mammals and fish. Through cooperative working agreements the Forests and Grassland receives population information on a regular basis. Colorado State University, U.S. Fish and Wildlife Service and the Colorado Natural Heritage Program all share their current ongoing monitoring work with the Forests and Grassland.

Specific accomplishments towards monitoring occurred in 2000 though less was accomplished due to the busy fire season, which required biologists to work either in suppression or rehabilitation activities. A conservation strategy for rare fens (lands wholly or partially covered with water; boggy or marshy land) was developed. Lynx habitat mapping and a management process were also developed. Conservation and monitoring of prairie wildlife species was continued.

There are four monitoring questions that address priority management emphasis which pertain to this program.

Biological Diversity Question: *Have the Forests and Grassland made progress toward assuring adequate representation of the full range of successional or structural stages of community types across the forest and grassland landscapes? How as the representation of successional stages been accomplished?*

Progress has been made through planning and initiating implementation of fuels reduction projects in the forest and grassland ecosystems. On the Pawnee National Grassland the tall grass structure is reduced which benefits the mountain plover.

Ecological Processes and Human Influences Question: *Has progress been made toward improving Forest and Grassland wildlife habitat and watershed condition through modification of system roads, trails and ways? How has this been accomplished?*

Progress has not been made because many road closures to public access are not effective. These closures are illegally destroyed to obtain access to the area. Lack of law enforcement and public education are the two main problems. And these are directly related to the budget available.

Old Growth Question: *Have old growth quantity and quality been maintained and have management activities assured adequate sufficient old growth for the future? How has this been accomplished?*

Yes the ARP is maintaining its old growth and future old growth. We have been inventorying our low elevation old growth to provide input into the prescribe fire planning documents. In this manner we can use fire as a tool to help future old growth development or we can direct prescribed burning away from areas which would not benefit from fire.

Threatened, Endangered and Sensitive (TES) Species Question: *Have habitat improvement projects resulted in protection, restoration and enhancement of habitat for threatened, endangered and sensitive species? What management practices have been most effective?*

Yes, habitat improvement projects for TES species have been effective. Maintenance of key habitat conditions such as burning the tall grasses to improve mountain plover habitat or restrictions (seasonal closures or mitigation on project implementation) to eliminate disturbance during key vulnerable seasons of TES have been successful.

Recommendations

1. Monitoring efforts have long timeframes. No conclusions or recommendations can be drawn at this time. However, any results from ongoing monitoring efforts will be summarized for the 5-year review in 2003 of the Revised Forest Plan.
2. The Forest Monitoring and Evaluation Team should emphasize information gathering for the legally required monitoring activities (Chapter 4 of the Revised Forest Plan and the table at the end of each resource section). This information is needed for the 2003 5-year review of the Revised Forest Plan.
3. More attention needs to be given to benefiting wildlife and terrestrial Threatened, Endangered and Sensitive (TES) habitat and species. Better integration of wildlife management and TES species management with other Forest programs (vegetation management, prescribed fire, lands, special uses, recreation special uses, dispersed recreation and travel management) is needed.

4. Many more roads and trails exist than are not recorded in the Forests and Grassland inventory. Habitat effectiveness for wildlife significantly changes due to the extent of the road/trail system. The Forest Plan inventory of roads and trails must be updated to more closely represent the effects of these roads/trails on wildlife as well as other resources.
5. Prescribed burning at low elevation should continue, but protecting old growth development areas must be incorporated into the burning plans. The prescribed fire program (National Fire Plan) is a key area for the Monitoring and Evaluation Team to monitor over the next several years because the prescribed burning program is expanding and will affect thousands of acres of forested land.
6. A key for the fuels reduction program (National Fire Plan) is to incorporate low elevation inventories of old growth/future old growth into the environmental analysis and mitigation measures.
7. More emphasis should be placed on monitoring completed NEPA projects. Often, either personnel or funding or both are not sufficient to accomplish this important aspect of project implementation.
8. For Management Indicator Species, existing baseline data should be included in a database for future comparisons, analyses and evaluations.
9. Methods and data collection for MIS without adequate baseline and trend data need attention.

Emerging Issues

1. Species viability continues to be an important issue both locally and nationally. The Forests and Grassland will be involved with all aspects, especially for species of common concern that are influenced at scales larger than the Forest (e.g., Forest Plan amendments for lynx and other species). This may represent a substantial workload with a corresponding shift in program priority work.
2. The National Fire Plan involves significant ground disturbance whether by mechanical treatment (tree thinning) or by prescribed fire. NEPA decisions will be required for these projects. Significant biologist time will be spent in the analysis and writing of Biological Assessment/Evaluations and MIS reports. This may constrain biologist time to planning rather than monitoring.
3. The transportation system (both roads and trails) continues to be an ongoing issue for impacts to wildlife. (See item 4, above.) Road closures have not proven effective without Forest Service presence to enforce the closures or better public education to gain acceptance of travel management decisions.

Legally Required Monitoring Activities (from Table 4.1 of the Revised Forest Plan, p. 393)

Legally Required Monitoring Activity Accomplishments for FY 2000

Legally required Activity (action, effect or resource)	Freq. of Measurement After Plan	Minimum Monitoring and Evaluation Report Freq.	Comments/ Related Accomplishments
Population trends of management indicator species in relationship to habitat changes. 36 CFR 219.19(a)(6)	Years 5 & 10	Years 5 & 10	Intensive and extensive monitoring of management indicator species was begun with the onset of the Revised Forest Plan in 1997. Trend analysis will be reported for the 5-year Revised Forest Plan review
Prescriptions and effects. 36 CFR 219.12(k)2	Years 5 & 10	Years 5 & 10	Prescribed burning at low elevation should continue, but protecting old growth development areas must be incorporated into the burning plans. More emphasis should be placed on monitoring completed NEPA projects to determine the effectiveness of required mitigation. Often, either personnel or funding or both are not sufficient to accomplish this important aspect of project implementation.
Effects of management practices. 36 CFR 219.11(d)	Years 5 & 10	Years 5 & 10	Wildlife habitat capability changes with the density of the road system. The ARP transportation system inventory needs to be updated to determine current effects on wildlife.

GPRA GOAL: Ensure Ecosystem Health

Fish

There are 1,937 miles of perennial streams and 476 lakes on the Forest. These vary from nearly pristine water bodies in Wilderness to streams that have been heavily impacted by human activities such as timber harvest, grazing, road construction and use, and mining. Native fish populations have been affected by habitat modification and by the introduction of nonnative fish. Seven species of fish have been identified as management indicators for the Forests and Grassland. It is the goal of the fisheries program to maintain or restore the aquatic habitat conditions to sustain the diversity and production of fish including Management Indicator Species (MIS) and Threatened, Endangered and Sensitive (TES) Species.

Monitoring:

Baseline data for Pawnee National Grassland native fish and native cutthroat trout was established. This will be used for ongoing population status and trend monitoring of management indicator species. Some populations are stronger and others are weaker than suspected. A habitat quality model was used to predict persistence and to help prioritize future native trout management efforts. For an extensive discussion of this monitoring project refer to pages 31-34 of the “Hydrology, Soils, Air and Fisheries Data Summary and Monitoring Report 2000”.

Cold water temperatures can delay spawning and prolong egg incubation that, in turn, can reduce fry growth and likely limit their over winter survival. In Little Vasquez Creek on the Sulphur Ranger District, it does not appear that summer water temperatures limit development and emergence of cutthroat trout fry. See the “Hydrology, Soils, Air and Fisheries Data Summary and Monitoring Report 2000”, pages 18-30 for a detailed discussion of the results. In addition, temperature monitoring devices were installed in 30 cutthroat streams forest wide to evaluate probability of fish persistence.

An accomplishment under the realm of education rather than monitoring was the First Annual Clear Creek Fishing Fest for Hearing and Hearing-impaired Children. One hundred and seventy-five people attended with over 50 kids from 2 to 14 years of age. About 40 of them were deaf and one had Down syndrome.

There is one priority management emphasis question for the fisheries program.

Threatened, Endangered and Sensitive (TES) Species Question: *Have habitat improvement projects resulted in protection, restoration and enhancement of habitat for threatened, endangered and sensitive species? What management practices have been most effective?*

Fish ladders were installed in Little Vasquez Creek in 1999, which allowed more Colorado River cutthroat trout to access spawning areas. Monitoring in 2000 documented the first

young cutthroat to be observed in this Creek over the past five years. This habitat enhancement and the warm water year of 2000 benefited the spawning cutthroat.

Recommendations:

1. Finish last year of 4-year study (planned for summer 2001) of native cutthroat trout.
2. Work with water special uses proponents in Roaring Creek, Little Vasquez Creek and Upper Williams Fork to emphasize native cutthroat trout protection and restoration.
3. Consider installing fish ladders in other cutthroat streams for spawning access similar to what was done in Little Vasquez Creek.
4. Do on-the-ground interdisciplinary monitoring of a sample of NEPA projects which have been completed since the 1997 Revised Forest Plan.
5. Integrate planning and monitoring of outcomes of watershed restoration projects to assure benefits to fisheries and aquatic resources.
6. Maintain good working relationships with Winter Park Recreation Association and the City of Greeley during Little Vasquez projects and proposals to operate the Bob Creek Ditch on Roaring Creek.

Emerging Issues:

1. The Bob Creek Ditch on the Canyon Lakes District pulls water from Nunn Creek, a nonnative trout stream, into Roaring Creek, which has established greenback cutthroat trout (management indicator species and TES). This may endanger the cutthroat trout due to contamination and competition by the nonnative trout.

Legally Required Monitoring Activities (from Table 4.1 of the Revised Forest Plan, p. 393)

Legally Required Monitoring Activity Accomplishments for FY 2000

Legally required Activity (action, effect or resource)	Freq. of Measurement After Plan	Minimum Monitoring and Evaluation Report Freq.	Comments/ Related Accomplishments
Population trends of management indicator species in relationship to habitat changes. 36 CFR 219.19(a)(6)	Years 5 & 10	Years 5 & 10	Using satellite technology 16 miles of prairie aquatic habitats on the Grassland were geographically located using GPS to establish location for future monitoring of plains fishes and amphibians. This is an ongoing project. Native cutthroat trout population surveys (via electrofishing) were conducted on 20 miles of known cutthroat streams. (year 3 of 4-year study) Habitat surveys of pool quantity and quality, riparian vegetation, and channel characteristics were conducted on 35 miles of native cutthroat streams. (year 3 of 4-year study)

Prescriptions and effects. 36 CFR 219.12(k)2	Years 5 & 10	Years 5 & 10	Instream flow guidance is very fluid, which creates tension during repermitting water special uses. The water standards can be interpreted in many different ways. Need to rework standards to limit amount of interpretation during repermitting process.
Effects of management practices. 36 CFR 219.11(d)	Years 5 & 10	Years 5 & 10	More emphasis should be placed on monitoring completed NEPA projects. Often, either personnel or funding or both are not sufficient to accomplish this important aspect of project implementation.

GPRA GOAL: Ensure Ecosystem Health

Water

Waters originating on the Forests provide for many, and often conflicting uses. Many people depend on the Forest to supply water for municipal use and irrigation. Streams and riparian areas provide recreation sites for anglers, campers, rafters and other recreationists. The same streams and riparian areas also provide habitat for a variety of aquatic and terrestrial plants and animals.

The goal of the watershed program (water and soil resources) is to maintain or improve water quality, stream processes, channel stability, aquatic habitat, and riparian resources. Sediment transported to streams from land disturbing activities is minimized. Such land-disturbing activities can either be nature-caused such as wildfire or human-caused such as recreational use of roads.

Monitoring:

Most water-related monitoring efforts in 2000 were limited due to personnel being involved in higher priority projects such as Burn Area Emergency Rehabilitation for the Bobcat Fire. Post-fire emergency rehabilitation treatments were implemented for the Bobcat Fire in order to minimize potential negative post-fire effects of mass erosion, soil loss, degrading water quality, and flooding.

Several monitoring projects were established to determine the effects of the Bobcat Fire and the success of rehabilitation. A cooperative agreement was established with the Department of Earth Resources at Colorado State University (CSU) to have CSU monitor effects of the Bobcat Fire, including rehabilitation treatments. Monitoring is being conducted in three areas: 1) post fire hydrophobic soils, 2) effectiveness of emergency rehabilitation treatments, and 3) runoff and sediment yields at the watershed scale. A related study, although not part of this cooperative agreement, is also being conducted by CSU pertaining to runoff and sediment yield at the plot and hillslope scale (Benavides-Solorio and MacDonald et al., 2000). All work is still in progress. For a more thorough discussion about these efforts, see the Hydrology, Soils, Air and Fisheries Data Summary and Monitoring Report 2000, pages 3-5, which accompany this report.

On Crow Creek in the Pawnee National Grassland a grade control structure had over the past 50+ years caused a wetland to form, which supported numerous wildlife and plant species. Monitoring of this structure indicated its failure. Repairs were implemented which prevented the wetland from draining and drying up.

There are three priority management emphasis questions for this program.

Functional Watersheds Question: *Has the Forest made progress toward moving sixth-level watersheds from at-risk or non-functional to functional? Which watersheds were improved and how was this accomplished?*

A watershed condition assessment conducted for the Final Environmental Impact Statement of the 1997 Revised Forest Plan indicated that of the 177 watersheds on the Forests and Grassland, 41 were rated as functional, 87 were rated at risk, and 19 were rated nonfunctional. Thirty watersheds with less than 10 percent National Forest System lands were not rated. In addition, 12 stream segments are listed by the State of Colorado as having impairment of designated uses.

The ARP continues to do watershed improvement work but the projects are on local sites rather than over the entire watershed. Therefore, though specific segments of streams in the watershed may be improved the overall condition of the watershed is not enough improved to change its condition class.

The Fraser River near Winter Park, Colorado is detrimentally impacted by accelerated erosion and sedimentation from a variety of human uses in the watershed. Headgate operation of a diversion structure was used to sluice sediment downstream in an attempt to maintain a clean diversion structure yet this added fine sediment loads in the Fraser River. A project to remove sediment from behind the diversion structure was implemented. Monitoring efforts for this project involved studies above and below the diversion. Reference conditions in St. Louis Creek were determined to compare with the conditions in the Fraser River. Two conclusions were made. 1) The Fraser River has a significantly higher proportion of fine sediment in the surface substrate than reference conditions in St. Louis Creek. 2) Fish over-winter habitat quality as measured by pool conditions did not change as a result of the project and did not show substantial differences from the reference conditions in St. Louis Creek. Other monitoring studies to determine effects on fish and macroinvertebrate populations were either inconclusive or not yet completed. Again, for a more thorough discussion about these efforts, see the "Hydrology, Soils, Air and Fisheries Data Summary and Monitoring Report 2000", pages 6-9, which accompanies this report.

Nonpoint Source Pollution Question: *Has the Forest made progress toward reducing nonpoint source pollution in Class II and III watersheds and in streams, which are not fully supporting State-designated uses? How has this been accomplished?*

Best Management Practices (BMPs) are the primary mechanism used to protect soil, aquatic and riparian systems from nonpoint source pollutants. The environmental analysis documents for projects list the BMPs required. Monitoring of two projects (Grazing Effects on Little Muddy Creek in Muddy Grazing Allotment on the Sulphur Ranger District and Como Creek Culvert Replacement on the Boulder Ranger District) in 2000 determined whether the BMPs were implemented as specified and how effective the BMPs were for control of nonpoint source pollutants. The results from this monitoring suggest that

implementation and effectiveness of Best Management Practices was generally very good. A detailed discussion is presented on pages 10 –17 in “Hydrology, Soils, Air and Fisheries Data Summary and Monitoring Report 2000”.

Stream Flows Question: *Has the Forest made progress toward obtaining (through negotiation, trade or purchase) stream flows to sustain aquatic life and maintain stream processes on up to 5 reaches of stream channels? What were the most effective and cost efficient methods?*

Since the inception of the Revised Forest Plan there have been no opportunities to repermit water developments with instream flow issues. Therefore, no progress was made in FY 2000 to obtain additional stream flows.

Recommendations:

1. Emphasize integrated planning across disciplines to assure that multiple resource recovery efforts are directed to watersheds of the greatest concern.
2. Prioritize watersheds to allow concentrating projects on the priority watersheds to improve their condition class.

Emerging Issues:

1. Increasing mountain development causes increased risk of water quality problems associated with wastewater treatment and increasing sediment loading from new development roads. Water quantity can also be impacted by the increasing water demands from these developments to support residential needs.

Legally Required Monitoring Activities (from Table 4.1 of the Revised Forest Plan, p. 393)

Legally Required Monitoring Activity Accomplishments for FY 2000

Legally required Activity (action, effect or resource)	Freq. of Measurement After Plan	Minimum Monitoring and Evaluation Report Freq.	Comments/ Related Accomplishments
Prescriptions and effects. 36 CFR 219.12(k)2	Years 5 & 10	Years 5 & 10	The landscape analysis process provides a monitoring framework. At this time no implementation of this monitoring has been done until the analysis process is completed.
Effects of management practices. 36 CFR 219.11(d)	Years 5 & 10	Years 5 & 10	Bobcat Fire rehabilitation treatments are in on-going monitoring process. (See previous discussion.) Implementation and effectiveness monitoring of Best Management Practices indicate positive results (see previous discussion.) More emphasis should be placed on monitoring completed NEPA projects. Often, either personnel or funding or both are not sufficient to accomplish this important aspect of project implementation.

GPRA GOAL: Ensure Ecosystem Health

Soil

The Arapaho and Roosevelt National Forest can be divided into nine general ecological map units or landtypes, which describe soils and associated climate, geology, geomorphology and general vegetation. Many activities and land treatments affect soils. Detrimental impacts to soils that are of the greatest concern and for which there are Forest Plan standards include compaction, erosion and displacement.

There are three general map units that are used to describe soils of the Pawnee National Grassland (PNG). All three are subject to wind and water erosion. Forty-two percent of the PNG is described by one general map unit that has soils with a high clay content, which makes these areas particularly susceptible to compaction.

Management actions with the greatest potential for affecting soils are those which involve ground disturbance and vegetation removal, including vegetation management, use or development of travelways and recreation facilities, grazing, fire, and the extraction of minerals, and oil and gas exploration/extraction.

The primary goal of soil management on the Forests and Grassland is to maintain and, where appropriate, improve soil quality and health in order to sustain or improve the physical, chemical and biological functions of the soil in the ecosystem.

Monitoring:

Soil monitoring was conducted for the Bobcat Fire. Post-fire emergency rehabilitation treatments were implemented for the Bobcat Fire in order to minimize potential negative post-fire effects of mass erosion, soil loss, degrading water quality, and flooding.

Several monitoring projects were established to determine the effects of the fire and the success of rehabilitation. A cooperative agreement was established with the Department of Earth Resources at Colorado State University (CSU) to have CSU monitor effects of the Bobcat Fire, including rehabilitation treatments. Monitoring is being conducted in three areas: 1) post fire hydrophobic soils, 2) effectiveness of emergency rehabilitation treatments, 3) runoff and sediment yields at the watershed scale. A related study, although not part of this cooperative agreement, is also being conducted by CSU related to runoff and sediment yield at the plot and hillslope scale (Benavides-Solorio and MacDonald et al., 2000). The work is still in progress. For a more thorough discussion about these efforts, see the Hydrology, Soils, Air and Fisheries Data Summary and Monitoring Report 2000, pages 3-5, which accompanies this report.

There is one priority management emphasis question for the soil program.

Ecological Landtype Units Question: *Has the Forest made progress toward moving Ecological Landtype Units from at-risk to a maintenance or higher functioning level? How was this accomplished?*

The Soil position was vacant in 2000 and program soil monitoring was not done, however, some minimum level project monitoring was done (Best Management Practices). Soil monitoring related to the Bobcat Fire was also conducted. The Soil position has now been filled, and a soil monitoring programs is being developed.

Recommendations:

1. Establish a monitoring program for the projects which will be accomplished through National Fire Plan funding (e.g., prescribed fire and mechanical treatment).
2. Use standard protocols for soil quality monitoring beginning in 2001.

Emerging Issues:

Because very little monitoring was done this year, no emerging issues were identified.

GPRA GOAL: Ensure Ecosystem Health

Air

Three airsheds cover the Arapaho and Roosevelt National Forests and Pawnee National Grassland: Front Range, Medicine Bow and Granby. Within each of the airsheds five Air Quality Related Values (AQRVs) have been identified as having the potential to be impacted by human-caused air pollution. The five AQRVs are soil, water quality, flora, fauna and visibility. The goal of the air program is to protect the air resource and as stated in the Revised Forest Plan (page 5) by improving four AQRVs (water, soil, visibility and flora) that are at risk to a maintenance or higher level of protection by the next planning period.

Monitoring:

There are two priority management emphasis questions for the air program.

Air Quality Related Values Question: *Is progress being made to move air quality related values from at risk to a maintenance or higher level of protection? How were related values protected and improved?*

In the last several years the focus for air quality related values has been on lake chemistry in Wilderness and nearby areas. The AQRV being measured is water quality. Year 2000 lake sampling and analysis was completed, however, the results are still being compiled for comparison with previous sampling.

Related to this, however, was the publication of at least two scientific articles last year assessing impacts on air quality in the Front Range and associated high elevation areas in the Rocky Mountains, some of this research utilized past data collection from this forest. Two critical papers are:

1. Ecosystem Responses to Nitrogen Deposition in the Colorado Front Range: Jill Baron, Heather Rueth, Alexander Wolfe, Koren Nydick, Eric Allstott, J. Minear, and Brenda Moraska, *Ecosystems* (2000) 3:352-368.
2. Critical Loads for Inorganic Nitrogen Deposition in the Colorado Front Range, USA: Mark Williams and Kathy Tonnessen, *Ecological Applications*, 10(6) 2000, pp 1648-1665.

The first paper examined changes in nitrogen deposition in the Front Range and comparisons in ecosystem properties including lake chemistry, forest foliage, soils, and lake sediments in parts of the Arapaho-Roosevelt National Forest and Rocky Mountain National Park on east and west sides of the Rocky Mountain Crest. The article uses strong evidence to support the conclusion that increases in emissions and nitrogen deposition related to human activities in the last 50 years has resulted in changes in ecosystem properties at higher elevations.

The second paper takes the link between increased emissions and changes in lake chemistry a step farther by suggesting a method to calculate critical or target loads for N deposition and makes recommendations for establishing guidelines for EPA to use in regulating wet deposition of nitrogen in order to protect Class I airsheds (most stringent protection) such as the Rawah Wilderness.

Forest Emission Budget Question: *Has progress been made on developing a Forest and Grassland emission budget? How was the Forest emission budget developed?*

The Forests and Grassland continued to work closely with the Colorado Air Pollution Control Division and continued to meet all applicable state and federal air quality requirements related to smoke emitted during prescribed burning projects in 2000. The air quality impacts from last year’s wildfires were not quantified. The Forest is currently developing methodology to track emissions from prescribed fires. This information will be used to help develop an emissions budget in the future.

Recommendations:

1. Continue with synoptic lake sampling program.
2. Continue to work with the Forest Service Regional and Washington offices air specialists and other agencies to change management if necessary in order to protect Class I airsheds.
3. Begin monitoring for other air quality related values such as soils and continue any established visibility monitoring sites.
4. Add to Chapter 4 of the Revised Forest Plan to the Legally Required Monitoring Activities: “Smoke Monitoring for Prescribed Fire for Prevention of Significant Deterioration (PSD) to protect both Class I and II Wilderness”.

Emerging Issues:

1. Nitrogen deposition due to human-caused emissions may be of concern to higher elevation ecosystems.

Legally Required Monitoring Activities (from Table 4.1 of the Revised Forest Plan, p. 393)

Legally Required Monitoring Activity Accomplishments for FY 2000

Legally required Activity (action, effect or resource)	Freq. of Measurement After Plan	Minimum Monitoring and Evaluation Report Freq.	Comments/ Related Accomplishments
Prescriptions and effects. 36 CFR 219.12(k)2	Years 5 & 10	Years 5 & 10	The longterm synoptic lake sampling program is in its seventh year and this data is being used to assess air quality impacts in Wilderness Areas. No new prevention of significant deterioration (PSD) permits were approved that could lead to air quality impacts in 2000.

Effects of management practices. 36 CFR 219.11(d)	Years 5 & 10	Years 5 & 10	All necessary permits related to prescribed fire and emissions were submitted and approved by EPA and generally all conditions of the permits were met.
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GPRA GOAL: Ensure Ecosystem Health

Forest and Grassland Health

(Hazardous Fuels Reduction, Wildfire, Insect and Disease, Undesirable Vegetation)

The emphasis of this program is to enhance the health of the forest and grassland vegetation. Monitoring is key to assessing the need for human interference to manage the vegetation. One example of management of the vegetation is fire in the forest or grassland ecosystems. Lack of cleansing fires has led to areas that have high concentrations of dead woody material (hazardous fuels), high concentrations of trees per acre (dense forests) or acreage of undesirable grasses or forbs. High concentrations of fuel contributed to intense, acre-consuming wildfires of the summer of 2000. Dense forests can contribute to insect and disease outbreaks.

Through human interference the benefits of fire on the landscape can be reestablished. Vegetation management tools such as timber harvesting or prescribed fire (purposely setting fire to designated acres of forestland or grassland) can restore forest ecosystem health, reduce invasive species (noxious weeds) and reduce the risks of catastrophic fires.

Monitoring:

Hazardous Fuels Reduction

To monitor the fuels buildup in areas on the forest, aerial and walking surveys were conducted. Photos at designated photo points were taken. Transects were also done for fuels loading determination. This monitoring of fuels buildup allows the prioritization of future fuels reduction projects.

Prescribed Fire

Total acres of prescribed burning were down almost 40% from the years target levels. 2360 acres were burned though the target was 4,000 acres. However, the Forest Plan requires only 2,000 acres at the lowest budget level. The decrease was due to a thirty-day moratorium on prescribed burning across the western United States, mandated by the Secretary of the Department of Agriculture. This moratorium was instituted during our primary prescribed burning season.

Wildfire

There were 68 fires on 7733 acres of National Forest lands on the Arapaho and Roosevelt National Forests during the 2000 fire season. Many more thousands of acres were burned but these were on State or private lands. The average size of the wildfire was approximately 1100 acres. These wildfires reduced hazardous fuels and caused adjustments of forest vegetation successional stages.

The Bobcat Fire was the largest and most destructive fire. The fire started in June 2000 and consumed 22 structures and 10,600 acres of federal and nonfederal lands. A Burned Area Emergency Rehabilitation (BAER) team was established immediately after the fire to assess the rehabilitation needed to minimize potential negative post-fire effects such as mass erosion, soil loss, degrading water quality, and flooding. A cooperative agreement was established with the Department of Earth Resources at Colorado State University (CSU) to have CSU monitor effects of the Bobcat Fire, including rehabilitation treatments. Monitoring is being conducted in three areas: 1) post fire hydrophobic soils, 2) effectiveness of emergency rehabilitation treatments, 3) runoff and sediment yields at the watershed scale. A related study, although not part of this cooperative agreement, is also being conducted by CSU related to runoff and sediment yield at the plot and hillslope scale (Benavides-Solorio and MacDonald et al., 2000). This work is still in progress. For a more thorough discussion about these efforts, see the Hydrology, Soils, Air and Fisheries Data Summary and Monitoring Report 2000, pages 3-5, which accompany this report.

Insect and Disease

Monitoring plots were used to verify regeneration success to determine if lands were adequately restocked. 1487 acres were naturally restocked and met the “adequately restocked “ standard of the Revised Forest Plan. Any lands not adequately restocked within the 5-year period have been scheduled for tree planting.

To monitor the spread of insect and disease infestation on the forest, aerial and ground surveys were conducted. These surveys indicated that mountain pine beetle infestation has leveled off across much of the forested land but infestation in the Williams Fork area in the southwest portion of the Sulphur Ranger District is expanding.

The Rocky Mountain Research Station is conducting long-term research using aerial surveying to monitor insect outbreaks in the Bobcat Fire of 2001 that consumed 10,600 acres west of Loveland, Colorado and into the Cedar Park subdivision north of U. S. Highway 34.

Monitoring for insect outbreaks is beginning on the Bobcat Wildfire (10,600 ac on federal and nonfederal lands.)

Undesirable Vegetation

The goal as stated in the Revised Forest Plan is to management undesirable vegetation, including noxious weeds, using an integrated pest management approach. The ARP is finalizing the Environmental Assessment for managing noxious weeds with the decision due out in the fall of 2001.

There is one priority management emphasis question for this program.

High Fire Hazard Question: *Has the Forest made progress toward reducing the number of high fire hazard, high value, and high and moderate risk acres? How was this accomplished? What was the most effective method?*

See the above discussion under “Hazardous Fuels Reduction”

Recommendations:

1. Develop and institute a monitoring program for the expanded wildfire protection strategies, which will be instituted beginning in fiscal year 2001 through the National Fire Plan.

Emerging Issues:

1. Though mountain pine beetle infestation has leveled off across much of the forested land, infestation in the Williams Fork area in the southwest portion of the Sulphur Ranger District is expanding. This should be monitored closely.
2. Subalpine fir has a disease that is causing tree decline. Research should continue on the cause and any action possible.

Legally Required Monitoring Activities (from Table 4.1 of the Revised Forest Plan, p. 393)

Legally Required Monitoring Activity Accomplishments for FY 2000

Legally required Activity (action, effect or resource)	Freq. of Measurement After Plan	Minimum Monitoring and Evaluation Report Freq.	Comments/ Related Accomplishments
Control of destructive insects and diseases 36 CFR 219.12(k)5(iv)	Annually	Annually	Table Mountain Timber Sale on the Sulphur Ranger District was sold and harvested. These trees were infested with mountain pine beetle. Road Kill Timber Salvage Sale on Canyon Lakes Ranger District was sold and harvested to remove mountain pine beetle killed or infected trees. Horseshoe Timber Salvage Sale, again for mountain pine beetle control, on the Sulphur Ranger District did not sell.
Prescriptions and effects. 36 CFR 219.12(k)2	Years 5 & 10	Years 5 & 10	In compliance with prescriptions. All effects were anticipated.
Effects of management practices. 36 CFR 219.11(d)	Years 5 & 10	Years 5 & 10	Monitoring for insect outbreaks is beginning on the Bobcat Fire (10,600 ac on federal and non-federal land)

GPRA GOAL: Provide Multiple Benefits to People

Recreation

The Recreation Program provides a range of recreation opportunities consisting of: (1) developed recreation (managing campgrounds, picnic grounds, trailheads); (2) dispersed recreation (managing designated dispersed campsites, trails and all other areas on the Forest and Grassland where people recreate that isn't categorized as a developed site); and (3) Wilderness-based recreation.

The Revised Forest Plan lists human uses (developed and dispersed recreation opportunities, wilderness use and travel) as one of the three major emphasis areas for Forests and Grassland management. However, this year the Recreation Program operated with a very reduced budget making maintenance to a standard level unachievable. All visitor centers were forced to reduce their operating hours due to budget constraints. With the extreme fire season many of the minimal recreation workforce were recruited into fire-fighting activities, which further limited accomplishments and monitoring in the Recreation Program.

Monitoring:

Accomplishments were made in fiscal year 2000. The Forests and Grassland have now completed 60 percent of all the Deferred Maintenance surveys. These surveys indicated that the ARP needs \$30 million just to bring 60 percent of its facilities up to standard. There is no calculation on the cost to maintain these facilities to standard.

Recreation data gathering has had a higher priority than field presence for the last several years. Lack of field presence is a very serious problem, one that cannot be sustained and still meet the intent of the Forest Plan. However, we expect the data gathering effort to have many long-term benefits. The recreation information management system (INFRA) with survey data from developed sites, dispersed sites, and trails (Meaningful Measures Inventory) and the maintenance needs survey (Deferred Maintenance Inventory) will help to prioritize recreation projects by directing money and personnel to the areas most in need of work. The National Recreation User Survey of visitors to the Forests and Grassland will provide needed socio-economic data to improve visitor satisfaction.

There are three priority management emphasis questions for this program.

Developed Recreation Question: *Has the Forest made progress toward providing a mix of facility reconstruction, expansion, and, when possible, new development consistent with future use projections? Has this been done to assure quality developed recreational opportunities?*

Two campgrounds were put under contract for reconstruction in 2000, West Lake Campground by Red Feather Lakes and Ansel Watrous Campground along the Cache la Poudre River. The reconstruction will improve the quality of the camping experience by providing new camping amenities such as outhouses, picnic tables, level camping pads, paved road, etc.

Dispersed Recreation Question: *Has the Forest made progress toward reconstructing or rehabilitating impacted dispersed areas and sites, providing new designated dispersed campsites consistent with future use projections? How has this been accomplished?*

Very little was accomplished due to data gathering efforts and wildfire suppression requiring recreation personnel. However, our Wilderness volunteer work force (Poudre Wilderness Volunteers) and volunteer organizations rehabilitated many dispersed campsites through the Forests.

Visitor Satisfaction Question: *Have the Forest and Grassland made progress toward providing satisfactory recreational experiences to visitors?*

Due to the reduced recreation budget, trail crew seasonal employees were not hired. However, our volunteers filled in the gap by doing nearly superhuman efforts to clear and maintain trails both in and outside of Wildernesses.

Not only did volunteers work on trails but also they provided information and education about National Forest recreation opportunities, backcountry safety and regulations, and leave-no-trace techniques both in Visitor Information Centers, administrative sites, and in the field. Through Adopt-a-Trail and Adopt-A-Road programs volunteers built and maintained roads and trails. They conducted inspections of administrative and recreation sites, served as Campground Hosts/Hostesses, coordinated interpretive display kiosks, did revegetation projects, and obliterated an unauthorized off-highway vehicle. Organized volunteer patrols assisted with search and rescues, Nordic skiing, and contacting visitors in Wildernesses.

To give these volunteers the recognition they deserve, listed below are the groups and patrols, which have provided many hours of in-kind services to the Forest Service.

Diamond Peak Mountain Bike Patrol
Diamond Peak Ski Patrol
Northern Colorado Mounted Patrol
Cameron Pass Nordic Rangers
Poudre Wilderness Volunteers
Poudre River Volunteers
Continental Divide Trail Alliance
Colorado Fourteeners Initiative
Colorado Mountain Club
Denver Boy Scouts
Scenic Byways Program Volunteers

Grand County Wilderness Group
Indian Peaks Working Group

Volunteers provided to the recreation program 39,287 hours of work at an appraised value to the Arapaho and Roosevelt National Forests and Pawnee National Grassland of \$485,665.

Including volunteer work in all resource and administrative areas over 43,400 hours at a value of \$542,477 was provided.

Concessionaires managed most of the campgrounds on the Arapaho and Roosevelt National Forests. Due to their management 22 campgrounds out of a total of 51 campgrounds on the ARP, were managed to standard. This is a total of 43% of all developed sites (many picnic areas and trailheads were not managed by concessionaires).

The Fee Demo program for Mt. Evans is a success. With the additional money that the Forest is allowed to keep and spend on the Mt. Evans area and with the money that our partner, the Denver Botanical Gardens, has contributed we will be constructing an interpretive visitor center near the midway point on the Mt. Evans Road. A full contingent of interpretive rangers was funded with the Fee Demo money and these rangers provided an educational and safety component to our visitors' recreation experience.

The other Fee Demo program on the Arapaho and Roosevelt National Forests is the Christmas Tree Program. Due to the additional monies, which went back into the program, the Districts were able to have more people out in the sale area helping families in their Christmas Tree hunt and capture.

The ARP was one of the first National Forests to participate in the 4-year National Forest Recreation Use Survey. Starting in January 1, 2000 and ending on December 31, 2000 our recreation personnel randomly sampled developed and dispersed recreation visitors to monitor their satisfaction level and to develop basic data about the visitor. The analysis of this data is expected to be completed for our Forests and Grassland by September 2001.

Recommendations:

1. Increase field presence to improve regulation compliance and improve visitor understanding of recreational opportunities available as well as a better understanding of the natural environment.
2. Continue to do Deferred Maintenance surveys.
3. Expand Fee Demo program to include the Arapaho National Recreation Area

Emerging Issues:

1. An expanding population along the Front Range of Colorado from Colorado Springs north to the Wyoming border continues to challenge the recreation program.

Legally Required Monitoring Activities (from Table 4.1 of the Revised Forest Plan, p. 393)

Legally Required Monitoring Activity Accomplishments for FY 2000

Legally required Activity (action, effect or resource)	Freq. of Measurement After Plan	Minimum Monitoring and Evaluation Report Freq.	Comments/ Related Accomplishments
Prescriptions and effects. 36 CFR 219.12(k)2	Years 5 & 10	Years 5 & 10	Due to lack of field personnel, this item was not monitored.
Effects of management practices. 36 CFR 219.11(d)	Years 5 & 10	Years 5 & 10	Lack of field presence and law enforcement is having a detrimental effect on managing recreation.

GPRA GOAL: Provide Multiple Benefits to People

Wilderness

Eight Wildernesses have been designated on the Forest, totaling 295,572 acres (23 percent of the Forest). Of that total, 78 percent is in the alpine, spruce-fir, and spruce-fir-lodgepole pine plant series. Management emphasis is to allow natural processes to be maintained or improved within Wilderness, while identifying and managing unacceptable impacts created by human use.

Monitoring:

In fiscal year 2000 there were no seasonal employees hired to either maintain trails, patrol, make public contacts, or enforce regulations in these Wilderness Areas. Volunteers eagerly stepped in to fill the gap and they did a remarkable job. Many of the volunteer groups listed in the previous Recreation section of this report spent much of their volunteer hours in designated Wilderness Areas.

There is one priority management emphasis question for this program.

Recreational Use of Wilderness Question: *Is the Forest making progress toward providing designated Wilderness campsites where resource impacts from users are evident?*

Due to lack of funds and personnel, no additional designated campsites were installed. However, volunteers did do rehabilitation of existing designated campsites which were showing resource damage.

Legally Required Monitoring Activities (from Table 4.1 of the Revised Forest Plan, p. 393)

Legally Required Monitoring Activity Accomplishments for FY 2000

Legally required Activity (action, effect or resource)	Freq. of Measurement After Plan	Minimum Monitoring and Evaluation Report Freq.	Comments/ Related Accomplishments
Prescriptions and effects. 36 CFR 219.12(k)2	Years 5 & 10	Years 5 & 10	Due to lack of field personnel, this item was not monitored.
Effects of management practices. 36 CFR 219.11(d)	Years 5 & 10	Years 5 & 10	Due to lack of field personnel, this item was not monitored.

Scenic Resources

The scenic resource constitutes all scenery visible to people. Scenery is described as the general appearance of a place or landscape, or the features of a landscape. The visual condition varies by location and is dependent on natural features such as geology, vegetation, landforms, and human developments. The objective of the Scenery Management Program is to protect the scenic quality of our Forests and Grassland. This is accomplished by ensuring that management decisions follow the criteria developed within the Visual Management System which is displayed on a map accompanying the Revised Forest Plan.

Monitoring:

Visual inspections were used to evaluate the signing along the major roads of the Arapaho and Roosevelt National Forests and Pawnee National Grassland. These inspections indicated that there were much unneeded signing and that many of these signs did not follow the Forest Service sign standards.

Another monitoring effort included reviewing completed timber sales for compliance with scenery visual quality objectives. It was found that many sale layout designs were not reviewed by a landscape architect and, therefore, some designs did meet visual quality objectives of the Revised Forest Plan.

Recommendations:

1. The Arapaho and Roosevelt National Forests and Pawnee National Grassland will be brought into compliance with the Forest Service Sign Handbook and will reduce unnecessary signing.
2. A landscape architect will review and approve timber sale design layouts.

Legally Required Monitoring Activities (from Table 4.1 of the Revised Forest Plan, p. 393)

Legally Required Monitoring Activity Accomplishments for FY 2000

Legally required Activity (action, effect or resource)	Freq. of Measurement After Plan	Minimum Monitoring and Evaluation Report Freq.	Comments/ Related Accomplishments
Prescriptions and effects. 36 CFR 219.12(k)2	Years 5 & 10	Years 5 & 10	Lack of project review has led to inadequate scenery protection.
Effects of management practices. 36 CFR 219.11(d)	Years 5 & 10	Years 5 & 10	Lack of project review has led to effects which do not meet visual quality objectives.

Timber

Background:

Timber management utilizes harvesting to manage our forests for: (1) biological diversity (developing various structural or growth stages of the forest vegetation); (2) insect and disease populations; (3) wood fiber production; (4) wildlife habitat; (6) recreation and (7) scenic settings; and wildfire hazard reduction. Harvesting timber provides forest products that help support local wood-processing industries and associated communities. It helps meet the demands of the local public for products such as lumber, fuelwood, tree transplants, Christmas trees, and posts and poles.

The goal of the timber program is to manage the timber resource for production of saw timber and other wood products from suitable timber lands made available for timber harvest, on an even-flow, long-term sustained yield basis and in an economically efficient manner.

Monitoring:

The Forest Plan projects yearly timber volume to be offered for sale depending on how much of the budget is allocated to Timber Management. At low budget levels the volume offered is expected to be 2 million board feet. At the highest budget level the volume offered would be 6.5 million board feet. The actual amount offered this year was 2.2 million board feet, which was one-quarter of the actual target set by the Washington office. The shortfall in the timber target was due to a number of factors. The intense fire season pulled timber crews away from their jobs to do the vital work of fire suppression. Additionally, two sales, which were offered, did not receive a bid from any timber contractors. Some of the reasons for this could be the soft timber market in 2000, the volume of timber to be removed per acre was too low (contractor comment) and the appraisal price was too high (contractor comment).

The Timber Sale Administrator is our best monitor of how the timber operator is complying with the stipulations in the contract. However, an important component of timber sale monitoring is the review by the various resource specialists (wildlife, hydrology, fisheries, recreation, etc.) to ensure that the sale is following the mitigation measures, which they included in the NEPA document, which supported the timber sale decision. Due to a lack of funding, there was a lack of personnel to support this mitigation monitoring.

Recommendations:

1. Program monitoring should be expanded as funding and/or personnel allows
2. Project monitoring of mitigation written into the NEPA decision should have more emphasis by the Forests and Grassland. Additional funding should be directed to projects to allow resource specialists to ensure that the timber harvest operation is meeting the needs of their resources as stated in the mitigation measures.

Emerging Issues:

1. The continuing soft timber market could affect the bidding on timber sales for fiscal year 2001.
2. Though the timber program is meeting the Forest Plan direction and expects to continue to do so, emerging issues such as the National Fire Plan or species viability may require greater funding and personnel. If money and people are directed away from the timber program, it is expected that future timber targets may not be met unless targets are adjusted accordingly.

Legally Required Monitoring Activities (from Table 4.1 of the Revised Forest Plan, p. 393)

Legally Required Monitoring Activity Accomplishments for FY 2000

Legally required Activity (action, effect or resource)	Freq. of Measurement After Plan	Minimum Monitoring and Evaluation Report Freq.	Comments/ Related Accomplishments
Lands are adequately restocked. 36 CFR 219.12(k)5(i)	Mix of 1 st , 3 rd and 5 th years per FSM 2472.4	Annual	Targets were met. 1487 acres of lands were adequately restocked. Any areas which did not meet stocking standards have been scheduled for planting. Monitoring is continuing with regeneration plots.
Lands not suited for timber production 36 CFR 219.12(k)5(ii)	Year 10	Year 10	No projects have indicated a need to change the Revised Forest Plan.
Harvest unit size 36 CFR 219.12(k)5(iii)	Years 5 & 10	Years 5 & 10	The ARP is in compliance with NFMA and the Revised Forest Plan which limits the size to 40 ac. openings. One exception was made for the Roach area for a larger opening. This exception was only granted after approval by the Regional Forester. This larger opening was desired to mimic historic fire patterns in the area.
Prescriptions and effects. 36 CFR 219.12(k)2	Years 5 & 10	Years 5 & 10	In compliance with prescriptions. All effects were anticipated.
Effects of management practices. 36 CFR 219.11(d)	Years 5 & 10	Years 5 & 10	Aerial surveys for insect and disease showed areas of infestation. Possible management decisions by lack of activity may cause the spread of these insects and diseases.

Range

Rangeland management includes the production of vegetation for the protection of the watershed to produce high-quality water, provide stability to the soil, produce a wide variety of plants for the enjoyment and use of visitors and provide habitat and food for numerous kinds of wild animals, birds, insects, and fish, as well as forage (food) for livestock. The livestock-grazing program is managed primarily through activities such as controlling livestock numbers and distribution; vegetation treatment by mechanical practices, prescribed fire and chemicals; grazing allotment planning and permit administration; and implementation of livestock grazing systems.

Monitoring:

In 2000 all monitoring was done on range allotments. These were done to ensure compliance with the allotment management plans and their accompanying environmental analysis. Each district monitored riparian vegetation and set up transects and photo points. The Boulder District did utilization studies of its Mammoth Allotment. Meetings with permittees enabled the Forest personnel to check grazing management as well as riparian management and wildlife.

Recommendations:

1. Each allotment management plan should have fairly stringent mitigation measures.
2. Need more people and time to monitor.
3. Involve the permittees more with on-the-ground monitoring. Some monitoring forms can be filled by the permittee.

Emerging Issues:

1. An increasing urban population and its accompanying desire for recreation will conflict with livestock grazing on the range allotments
2. Conflicts between grazing and dispersed recreation continue to occur on the Mammoth Allotment.
3. National or high priority programs take precedence over range monitoring, therefore, range monitoring is not always done to the extent desirable.

Legally Required Monitoring Activities (from Table 4.1 of the Revised Forest Plan, p. 393)

Legally Required Monitoring Activity Accomplishments for FY 2000

Legally required Activity (action, effect or resource)	Freq. of Measurement After Plan	Minimum Monitoring and Evaluation Report Freq.	Comments/ Related Accomplishments
Prescriptions and effects. 36 CFR 219.12(k)2	Years 5 & 10	Years 5 & 10	No comments
Effects of management practices. 36 CFR 219.11(d)	Years 5 & 10	Years 5 & 10	Prescribed fire can help improve range for livestock and wildlife

GPRA GOAL : Provide Multiple Benefits to People

Heritage Resources

Heritage resources are the physical remains of past human activities on the Forests and Grassland. Prehistoric artifacts such as projectile points, sites such as stone circles, and physical remains from historic-period activities such as homesteading, mining, railroads, recreation, and other legendary and real events are examples.

If any activity planned under a federal permit or with federal funding might impact the characteristics of a site eligible for the National Register of Historic Places (NRHP), it must be evaluated for heritage purposes prior to implementation. Available evidence suggests that the Forests and Grassland may contain as many as 10,648 individual heritage sites, with 14 percent, or 1,479 properties, eventually qualifying for the NRHP.

Approximately 103,000 acres (or approximately 7 percent) of the 1.5 million acre Arapaho and Roosevelt National Forests and Pawnee Grassland have been inventoried, and approximately 2,200 prehistoric sites and 1,800 historic sites as of FY2000. Of these 4,000 sites, 350 appear to be eligible for the NRHP. Fourteen properties are currently listed.

The overriding goal of the Heritage Resources program is to identify, evaluate, preserve, protect and enhance heritage resources. The program is divided into two elements: *compliance*, or work related to Section 106 of the National Historic Preservation Act (NHPA), and *program*, or activities related to Section 110 of the same law. Compliance work such as monitoring is funded by the benefiting resource program. For example if archaeological surveys are done for a proposed timber sale, it is the timber program that funds the surveys. Other compliance work includes input into timber sale analyses, range allotment management plans, road construction activities, etc. Program work is funded from the RHWR budget line item, and includes public outreach, research, interpretation, and stewardship of heritage resources.

Monitoring:

Compliance

During Fiscal Year 2000 a total of 51 projects was submitted to the heritage program staff for compliance review. Of these, 30 projects required survey, field review, or other detailed involvement by the heritage resources staff. The table below summarizes the results of compliance inventories carried out in 2000 as well as trend data from previous years.

Heritage Resource Inventory Trend Data, FY 1996-2000.

Year	Acres Surveyed	Sites Evaluated
2000	1895	131

1999	5711	95
1998	6013	92
1997	3134	113
1996	9387	193

Lack of reliable and easily accessible baseline heritage data continues to be a nagging problem that hampers the efficient execution of compliance work. In order to help establish accurate baseline heritage data, and to more effectively and efficiently accomplish our compliance obligations, we have been working to move all of the Forest and Grassland heritage site and survey data into GIS. During FY2000, we successfully created GIS coverages for the Arapaho and Roosevelt National Forests. We must continue to focus on this effort if our compliance and management goals are to be successfully met in the future. Although coverages now exist for the Arapaho and Roosevelt National Forests and Pawnee National Grassland, they are not edited and attributed to national standard. This is an ongoing effort.

Program

The centerpiece of the Forest Service heritage program is Passport In Time (PIT). It is through PIT that we achieve most of our program goals of site stewardship, public participation, education, interpretation, and research. During FY 2000, we hosted four PIT projects resulting in 1,498 hours of contributed labor, at a value of over \$24,500.

Heritage Program Activity Trend Data, FY 1996 – 1999.

Year	Sites Interpreted	Sites Preserved and Protected
2000	20	30
1999	14	29
1998	9	32
1997	0	N/A
1996	5	N/A

Recommendations:

1. Compliance work is currently being accomplished on *most* projects in a timely and legal fashion. However, there have been instances when Decision Memos of Categorical Exclusions and Decision Notices of Environmental Assessments have been signed by the Line Officer without the completion of the Section 106 process. To help prevent this, the heritage staff should be fully integrated into the NEPA process on large projects, and on smaller projects should be involved much earlier in the planning stages.
2. Continue to seek out new and effective ways (e.g., Challenge Cost Share Agreements, university partnerships, volunteers, grants) to fund heritage resource program activities in an era of flat and declining budgets.

3. During the 5-year Forest Plan review in fiscal year 2002 consider whether the heritage resource could be better served with protection requirements such as standards currently not in the Revised Forest Plan.
4. Provide adequate project funding to do full implementation monitoring

Emerging Issues:

1. An important emerging issue related to heritage compliance continues to be the new implementing regulations for the NHPA, 36CFR Part 800. These new regulations greatly expand the Forest's requirements to seek out and involve Native American tribes and interested parties during project planning and analysis. While we are still working to interpret the new regulations, they will no doubt change the way that we do business. Generally, they are much more rigorous than the old regulations, and require extensive documentation showing potential appellants that we have followed the process to the best of our ability.
2. During FY 2000 we have struggled to meet the intent of these new regulations, but have found it difficult to make substantial headway due to flat budgets. The workload continues to increase, along with the legal requirements related to historic preservation; the amount of time, money, and personnel remains static.

Legally Required Monitoring Activities (from Table 4.1 of the Revised Forest Plan, p. 393)

Legally Required Monitoring Activity Accomplishments for FY 2000

Legally required Activity (action, effect or resource)	Freq. of Measurement After Plan	Minimum Monitoring and Evaluation Report Freq.	Comments/ Related Accomplishments
Prescriptions and effects. 36 CFR 219.12(k)2	Years 5 & 10	Years 5 & 10	There are no goals, objectives, standards or guidelines for the heritage resource. Much of what guides the work done in this area is guided by law. However, laws do not cover all aspects of the heritage resource program and it is left up to individual line officer to decide what work will be done.
Effects of management practices. 36 CFR 219.11(d)	Years 5 & 10	Years 5 & 10	There is no funding for project monitoring, thus, it has not been determined how well mitigation direction is being followed as stated in the project NEPA documents

Lands

The Lands Program involves protecting or enhancing Forests and Grassland resources and increasing management efficiencies through significantly improved boundary management, public access, and adjustments in landownership. It also includes improving public service in the areas of special-use permits, rights-of-way grants, and land ownership adjustments by reducing the number of backlogged cases. Finally, it also includes processing all land- and water-use authorizations (ski areas, reservoirs, etc) by the expiration date of the permit.

The Boundary and Title Management Program involves maintaining conflict free boundaries of the public lands. Conflict free boundaries are lines of land ownership, which are surveyed, monumented, marked and posted, free of trespass or encroachments, have clear title and access with regards to both public and private lands.

Monitoring:

The lands activity and accomplishments were lower in fiscal year 2000 than usual years because of the severe fire season as well as the efforts of the lands team to re-engineer many of the lands and special uses processes. This re-engineering will show future benefits due to streamlined processes (canned letters, development of packages for proponents, development of inspection and monitoring tools for special uses, and building consistency within the program) and minimizing costs to the taxpayer by instituting a 5-year billing rather than an annual cycle on all special uses with fees of less than \$100.

Land adjustments are multi-year projects in most cases. Four cases that have been worked on in fiscal year 2000 will be completed in fiscal year 2001.

Special use authorizations are permits, leases, or easements, which allow occupancy, use, rights, or privileges of NFS land. Although our target was to process 26 special use cases, the lands team far exceeded that by processing 84 special use cases. The majority of these cases were part of the forest and grassland special use backlog. The term “backlog” refers to expired special use authorizations and pending special use applications needing to be processed.

Boundary and Title Management: The accomplishment for FY-2000 included 35.0 miles of new line surveyed, marked and posted and 5.0 miles of existing line maintained. This was above expected accomplishments in the Forest Plan due to an increased level of funding. The expected level of funding in out years is expected to accomplish 30.0 miles of new line and 3.0 miles of maintenance per year with minimal trespass encroachment or trespass cases discovered or resolved. This level of funding provides minimal support to other functions and does not address the backlog of trespass, encroachments or title claims.

There are three priority management emphasis questions for the lands program.

Boundary Management, Access, Land Ownership Question: *Has the Forest made progress toward improving boundary management, access and land ownership adjustments to protect and enhance Forest and Grassland resources and to increase management efficiencies? Which approaches have been effective?*

Land adjustments are multi-year projects in most cases. Four cases that were worked on in fiscal year 2000 will be completed in fiscal year 2001.

The lands activity and accomplishments were lower in fiscal year 2000 than usual years because of the severe fire season as well as the efforts of the lands team to re-engineer many of the lands and special uses processes. This re-engineering will show future benefits due to streamlined processes (canned letters, development of packages for proponents, development of inspection and monitoring tools for special uses, and building consistency within the program) and minimizing costs to the taxpayer by instituting a 5-year billing rather than an annual billing cycle on all special uses with fees of less than \$100.

Case Backlog for Special Use Permits, Rights-of-way grants, and Land Ownership Adjustments Question: *Have the Forests and Grassland made progress toward improving customer services to reduce the number of backlogged cases for special-use permits, rights-of-way grants, and landownership adjustments? How has this been accomplished?*

Special use authorizations are permits, leases, or easements, which allow occupancy, use, rights, or privileges of NFS land. Although our target was to process 26 special use cases, the lands team far exceeded that by processing 84 special use cases. The majority of these cases were part of the Forests and Grassland special use backlog. The term “backlog” refers to expired special use authorizations and pending special use applications needing to be processed.

Cost Recovery for Permit Review Question: *Have the Forests and Grassland made progress toward working with potential permittees to insure that benefiting parties assume the costs of permit review and administration? How has this been accomplished?*

Cost recovery is not yet implemented. See Emerging Issues, below.

Recommendations:

1. Work aggressively to meet the 2007 desired outcomes for Land Uses and Ownership in chapter one of the Forest Plan.
2. Surveying and location of boundary lines is only a part of the solution, there needs to be adequate funding and personnel to accomplish the lands related part of conflict free boundaries with regards to trespass, encroachment, small tracts, rights-of-way and land exchange.

3. The S-Tables need to be updated to reflect the desired accomplishments necessary to manage the Forests and Grassland. The S-Table should show base as 30.0 miles of new, 3.0 miles maintenance; Experienced as 40.0 miles of new, 8.0 miles maintenance and Full as 50.0 miles of new and 10.0 miles of maintenance.

Emerging Issues:

1. On the horizon is the implementation of cost recovery regulations (scheduled to be final late summer of 2001). Cost recovery is the assessment and collection of administrative fees from applicants and holders to pay for administrative costs incurred by the Forest Service in processing an application and monitoring a special use for compliance with the terms and conditions of an authorization. The fees collected will be retained at the forest level.
2. Survey support to the National Fire Plan is needed to locate boundaries of public lands and resolve discovered conflicts.
3. With the increased population, the demands for recreation and quality of life, the Forests and Grassland are experiencing dramatic increases in use and the boundaries are under siege, increasing problems of trespass, encroachment and loss of access by the Public.

Legally Required Monitoring Activities (from Table 4.1 of the Revised Forest Plan, p. 393)

Legally Required Monitoring Activity Accomplishments for FY 2000

Legally required Activity (action, effect or resource)	Freq. of Measurement After Plan	Minimum Monitoring and Evaluation Report Freq.	Comments/ Related Accomplishments
Prescriptions and effects. 36 CFR 219.12(k)2	Years 5 & 10	Years 5 & 10	Lack of adequate funding for surveying to address conflict free boundaries.
Effects of management practices. 36 CFR 219.11(d)	Years 5 & 10	Years 5 & 10	Development of lands service team is a way to improve customer service and provide consistency on our business management practices related to lands and realty work on the forest and grassland. The team has made numerous internal processing improvements, but is hampered by continual lack of funding. The utilization of a Zone Boundary and Title Management team has been a way to accomplish increased targets and support to other functions relative to the level of funding.

Transportation

The goal of the transportation program is to develop and manage roads and trails to allow access by the public to and through National Forest lands as well as support resource management. Travel management consists of three components: planning; implementing (initiating on-the-ground work); and managing (routine maintenance) and monitoring of the transportation system.

Monitoring:

Planning: Both the Clear Creek and Boulder Ranger Districts continued inventorying existing roads and scoping their publics for issues and concerns. This will lead to travel management plans, which will recommend changes to the transportation system.

Implementation: Through the Capital Investment and Timber Purchase program 4.8 miles of road was reconstructed to standard (Forest Plan, page 8, Objective 7). Thirty-six miles of classified and unclassified roads (“ways”) were decommissioned (Forest Plan, page 7, Goal 2). Decommissioning a road is closing it permanently to all use. Twenty-one percent (533 miles) of our road system of 2,600 miles of roads was maintained to standard. Forty-seven percent (375 miles) of our trail system of 800 miles of both motorized and nonmotorized trails were maintained to standard (Forest Plan, page 8, Objective 11). Additionally, 16.2 miles of trail were reconstructed (Forest Plan, page 8, Objective 7). It should be noted that much of the trail work was done through the donated hours of hardworking volunteer groups and individuals.

On-going Management and Monitoring: Ongoing management includes the recurring work such as managing seasonal gate closures, installing information boards and signs, reinforcing existing closures and obliteration of parallel roads and resource damage. As in previous years much funding and time was spent on ‘reclosing’ previously closed or obliterated roads. This work involved replacing damaged gates, fences, boulders and signs. The people doing the on-going management activities accomplish most of the monitoring. They are continually inventorying the existing road and trail systems, making evaluations and prioritizing the work for following years. The deferred maintenance project of surveying roads and recording their condition continually updates our existing Forests and Grassland Travel Atlas.

In 1999, one hundred percent of the 418 miles of the passenger car roads (maintenance levels 3, 4, and 5) were surveyed and evaluated for road condition. In 2000 approximately 10 percent of the 2274 miles of the four-wheel drive roads (maintenance levels 1 and 2), were surveyed. From the field data collected in these two years it was determined that the cost to bring the road system of the Arapaho and Roosevelt National Forests and Pawnee National Grassland up to standard would be approximately \$12.8 million.

There is one priority management emphasis question for the transportation program.

Travel Management Question: *Have priorities been established and implemented for managing travel to best meet future travel and access needs of Forest users? How has this been accomplished?*

Some priorities have been established through project environmental analysis. However, travel management planning is the primary method to establish priorities. As explained in the first paragraph under the “Monitoring” section, above, this is a process which is in progress on several ranger districts.

Recommendations:

1. Ensure that travel management planning and implementation incorporates Forestwide standards and guidelines and is conducted through an interdisciplinary approach.
2. Follow the Roads Analysis Process for travel management recommendations.
3. Continue to improve relationships with volunteer groups and aggressively seek out challenge cost share projects.
4. Continue to sign roads and trails for the types of uses allowed.
5. Specify why roads are closed or decommissioned.
6. Minimize illegal use through expanded law enforcement and field presence.
7. Work with the public and adjacent landowners to inform them of Arapaho and Roosevelt National Forests and Pawnee National Grassland travel regulations.

Emerging Issues:

1. The cost and time to complete travel management planning is higher than expected. This is due to the high levels of public interest and opposing viewpoints on what type and how much of a travel system is needed to serve public and administrative needs. Concern is developing about meeting Forest Plan objectives due to higher planning costs and having to “re-close” previously closed roads and trails.
2. There is need for aggressive law enforcement and follow up on the districts where the transportation system is being actively signed and managed. The 'closed unless designated open' regulation should be actively enforced. This may help to educate the public on travel regulations.
3. Reevaluate the Forest Supervisors Order on allowing camping or picnic parking within 300 feet from authorized travel routes. Some forest visitors have been extending unauthorized roads beyond the 300-foot limit. This has created sanitation and erosion problems, resulting in users not knowing where the travel route legally ends. This has been identified as a possible reason for extensive uncontrollable resource damage occurring off system roads.

Legally Required Monitoring Activities (from Table 4.1 of the Revised Forest Plan, p. 393)

Legally Required Monitoring Activity Accomplishments for FY 2000

Legally required Activity (action, effect or resource)	Freq. of Measurement After Plan	Minimum Monitoring and Evaluation Report Freq.	Comments/ Related Accomplishments
Effects of off-road vehicles. 36 CFR 219.21	Annual Analysis years 5 & 10	Years 5 & 10	There is only one area available for OHVs, the Main, on the Pawnee Nat'l Grssld. All other OHV usage is restricted to designated roads and trails. Through travel management planning and public input we will be gaging the need for additional areas.
Prescriptions and effects. 36 CFR 219.12(k)2	Years 5 & 10	Years 5 & 10	Some of the Forestwide goals and objectives have been met and others are not being met on an annual basis. See page 8 of the Forest Plan. Items 7 and 11 have been accomplished. All other items will only be accomplished as travel management planning and recommendations indicate. Yearly budget allocation, competing priorities for the ARP as well as the long public process to bring polarized users into grudging agreement substantially lengthens the planning process. Two suggestions: Items 6 and 9 (page 8 of Forest Plan) may need to be combined into one item due to Federal Public Roads policy that conversion of "ways" is considered new construction. Items 8 and 10 (page 8 of Forest Plan) overlap. Either 8 or 10 should be dropped or a clear distinction should be made between the two.
Effects of management practices. 36 CFR 219.11(d)	Years 5 & 10	Years 5 & 10	Effectively closing roads is a problem. Many closures are illegally reopened or detoured around to obtain access. This points to a need for greater field and law enforcement presence.

Chapter 3. Evaluation of the Forest Plan, Status of the FY 1999 Recommended Action, FY 2001 Action Plan and Research Needs

At this time it is premature to make specific recommendations to change standard and guidelines. It takes time from implementation of management practices to evaluate the effectiveness of these standards and guidelines. The 5-year review of the 1997 Revised Forest Plan will be done in 2002 with the accompanying report due the following year. It is this review by the Forest Monitoring and Evaluation Team, which should indicate how well projects implementing the Forest Plan are meeting the goals and objectives stated in Chapter 1 of the Plan. This review will indicate any necessary changes needed. However, from this year of monitoring, there are two recommended changes to the Forest Plan's standards in this monitoring report. The first recommendation deals with instream flows. In the Fish section of this report, under Prescriptions and Effects in the Legally Required Monitoring Activity Accomplishments for FY2000, the comment in this table states that the water standards in the Revised Forest Plan can be interpreted in many different ways. The suggestion is to rework standards to limit the amount of interpretation during the repermitting process of water special uses. The second recommendation is in the Heritage Resources Recommendations section. It suggests that the 5-year review of the Forest Plan should include consideration of adding standards to protect heritage resources beyond what Federal law requires.

Status of FY 1999 Recommended Actions

The FY 1999 Monitoring and Evaluation report listed numerous monitoring activities for FY 2000 (pages 34-35). Many of these activities were started or continued from the previous year. Some, due to lack of funding or the very active fire season, did not get implemented in 2000.

The following projects stated in the FY 1999 Report were begun or accomplished in FY 2000.

- Very successful monitoring continued in the Fisheries Program. Two projects listed in the 1999 report, the Colorado River Cutthroat Trout monitoring and developing baseline data for trend analysis for management indicator specie (MIS), were accomplished.
- In the wildlife program numerous MIS monitoring programs were continued. These are long-term monitoring efforts, which will supply baseline and trend data. With the cooperation of the Colorado Division of Wildlife MIS data was gathered on the Pawnee Grassland and the Arapaho and Roosevelt National Forests.
- The air monitoring program continued high elevation lake water quality sampling. Results are still being compiled. Methodology is being developed to track emissions from prescribed fires.
- The Recreation User Survey continued throughout FY 2000 and will be completed by December 31. Results will be available in 2001.

The following projects stated in the FY 1999 Report were delayed due to inadequate funding or due to personnel redirected to fire-fighting duties or to establishment of monitoring protocol for the rehabilitation of the burned areas of the Bobcat fire and other large wildfires in FY 2000.

- The Williams Fork Amendment to incorporate the Williams Fork Area (formerly managed by the Routt National Forest) into the Revised Forest Plan for the Arapaho and Roosevelt National Forests and Pawnee National Grassland was put on hold due to other priorities and funding.
- Prioritization of critical watersheds for project work was delayed due to the immediate need to establish rehabilitation monitoring on the Bobcat Fire burned areas.
- Technical corrections to the Supplemental Tables in the Revised Forest Plan was delayed due to redirection of staff to wildfire fighting and monitoring
- The Scenery Management System (SMS) amendment analysis will not begin until 2001. The SMS is a tool for land management planning to integrate the benefits, values, desires and preferences of the public regarding aesthetics and scenery. Direction to use the SMS in project planning came after completion of the analysis of the Revised Forest Plan. It was decided that rather than delaying the Revised Plan that the Forests and Grassland would analyze and incorporate the Scenery Management System as an amendment.

Action Plan for Fiscal Year 2001

All on-going monitoring programs should be continued. We will continue to monitor those legally required items shown in Table 4.1 on page 393 of the Revised Forest Plan. Also, individual program managers will continue to monitor their resource to address the monitoring questions in Table 4.2 of the Revised Forest Plan (pp. 394-396).

The Forest Monitoring and Evaluation Team will select a project for field analysis, which has had a signed NEPA (National Environmental Policy Act) decision after the Revised Forest Plan was signed (11/97) and the project has been implemented. This review should address both project implementation monitoring and Forest Plan effectiveness monitoring.

The Forest Monitoring and Evaluation Team will select a project for office analysis of the mitigation measures effectiveness and the practicality of implementation of mitigation measures included in the Environmental Analysis of NEPA projects.

The Forest Monitoring and Evaluation Team should begin to discuss the methodology needed to complete the required 5-year review of the Revised Forest Plan.

Research Needs

The first three goals of the Government Performance and Results Act of 1993 were addressed in Chapter 2 of this report. The individual programs are grouped into these three goals:

- *Ensure ecosystem health,*
- *Provide multiple benefits to people,*
- *Provide effective public service*

The fourth goal, *scientific and technical assistance*, is discussed here.

Many research projects can be developed to address significant issues of the Forests and Grassland:

- Habitat fragmentation and wildlife dispersal due to illegal All Terrain Vehicle (ATV)/mountain bike trail construction and use
- Effects to/opinions of users of the Recreation Fee Demo program
- Public opinion of the Recreation Fee Demo program
- Hunters opinions of ATV use and of creating some ATV-free areas.
- Public opinion of effects of Winter Park Recreation Association (Winter Park Ski Area) events on Forest and private land
- Public opinion of fire hazard risk and Arapaho and Roosevelt National Forests methodology to reduce that risk in the urban/forest interface
- Develop and apply methodology to determine Wilderness private and commercial use capacities
- Maintain studies on the long-term so that both Management Indicator Species and Threatened, Endangered, Sensitive Species population changes can be related to habitat characteristics.

Appendices

A. List of Preparers

Lisa Bryant	Forest Soil/Air Scientist
Rick Caissie	Interdisciplinary Planner
Carl Chambers	Forest Hydrologist
Steve Currey	District Ranger
Rick Dustin	Forest Landscape Architect/Recreation/Wilderness
Mike Foley	Fire/Vegetation Management Officer
Paula Guenther-Gloss	Forest Fisheries Biologist
Ann Gray Koch	Acting Forest Fisheries Biologist
Maryanne Kurtinaitis	Lands
Dennis Lowry	Forest Wildlife Biologist
Veronica Mitchell	Civil Engineer
Jeff Overturf	Heritage Resources
Karen Roth	Interdisciplinary Planner
Kenneth Tu	Forest Planner

B. Individual Monitoring Reports

- Hydrology, Soils, Air and Fisheries Data Summary and Monitoring Report 2000
- Memo: Skylark [Grazing] Allotment Monitoring Report
- Muddy [Grazing] Allotment Monitoring Report