Arapaho and Roosevelt National Forests
and
Pawnee National Grassland

Monitoring and Evaluation Report
for
Fiscal Year 2001

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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 Forests and Grassland for the next ten years. The Forests and Grassland are in the fourth season of implementing plan goals and objectives. Lessons learned from a fourth season of monitoring and evaluation point how to better do the job of interdisciplinary resource management, monitoring and evaluation of plan implementation by Forest and Grassland 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. Work has been initiated on amendments dealing with management indicator 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.

JAMES S. BEDWELL
Forest Supervisor

Executive Summary

Arapaho and Roosevelt National Forests (include 1.3 million acres of public land in the Rocky Mountains and foothills of north central Colorado. Boundaries extend north to the Wyoming border and south of Mt. Evans. The Arapaho National Forest includes lands on both sides of the Continental Divide. Topography on the forests varies from rolling hills to snow covered mountain peaks over 14,000' in elevation.

President Theodore Roosevelt established the Arapaho National Forest on July 1, 1908. It is named after the Native American tribe that occupied the region for summer hunting. Roosevelt National Forest originally began as a part of Medicine Bow Forest Reserve, created in 1897. In 1910 this forest was renamed Colorado National Forest. Finally, in 1932 it was renamed by President Herbert Hoover to honor President Theodore Roosevelt, the person who was the most responsible for its creation.

Pawnee National Grassland includes 193,000 acres of primarily short grass prairie in two units located approximately 30 miles east of Fort Collins, Colorado. Elevations range from 4,900' on the prairie to 5,500' at the summit of the Pawnee Buttes.

The Pawnee National Grassland was transferred to the USDA Forest Service from the USDI Soil Conservation Service (SCS) in 1954. The SCS acquired this prairie during the dust bowl days of the 1930's and was charged with its rehabilitation. It was designated a National Grassland in 1960.

The Arapaho and Roosevelt National Forests and Pawnee National Grassland (ARP) are within a one-hour drive of the heavily populated Denver metropolitan area and, therefore, is considered to be one of the fourteen Urban National Forests nation-wide. The landownership pattern of the Forest and Grassland creates special challenges, with approximately 750,000 acres of small private parcels intermixed with federal lands.

The following are additional facts about the ARP for 2001:

Total ARP Budget in Fiscal Year 2001 (October 1, 2000 to September 31, 2001):

$15.7 million (includes $7.4 million for National Forest/Grassland,
$ 3.8 million National Fire Plan, and $4.5 million construction dollars
for fire and nonfire facilities)

Total Receipts (dollars) to the U.S. Treasury in FY 2001:

Arapaho National Forest	$1,382,835
Roosevelt National Forest	323,221
Pawnee National Grassland	521,711

Personnel:

171 permanent employees
79 temporary employees
5 SESEP

Recreation:

14 million total visitors to the ARP
(6.2 million site visitors, 7.8 million highway visitors)
104 camping and picnicking areas
92 outfitters and guides
3 alpine ski areas
163 recreation residences

Range:

205 active grazing allotments
55 grazing permittees
13,286 permitted cattle grazed

Minerals/Oil and Gas:

14 bonded and nonbonded mining operation in stages of planning, exploration and evaluation. None are in production phase.
14 Oil and Gas operators with a total of 88 wells (all on the Pawnee National Grassland)

Timber:

2,705 thousand board feet of sawlogs harvested
383 thousand board feet of posts, poles, etc harvested
218 thousand board feet of fuelwood harvested
7,124 Christmas trees sold
3,900 thousand board feet offered

Wildlife:

20,000 estimated elk summer population
48,000 estimated deer summer population
500 estimated bighorn sheep population

Lands:

497 non-recreation special use permits

Roads/Trails:

2607 miles of forest developed roads
800 miles of trail

Volunteer Program:

Over 43,400 hours (or 24.11 years) at a value of $542,477 was provided by volunteer work in all resource and administrative areas.

Monitoring Activities:

In Chapter 2 of this monitoring report each resource program reviews and evaluates the monitoring activities accomplished in FY 2001. The following is a summary of these.

Wildlife:

- Intensive and extensive monitoring of Management Indicator Species (MIS), which started, with the onset of the 1997 Revised Forest Plan is continuing, but monitoring efforts have long timeframes. Specific efforts include population trend analysis of MIS in relationship to habitat changes. 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 of the 1997 Revised Forest Plan in 2003
- Fuels reduction projects and timber management are enabling progress towards a full range of successional or structural stages of community types across the forest and grassland landscapes. On the Pawnee the tall grass structure was reduced via prescribed fire to benefit the mountain plover.
- Old Growth and future old growth are being maintained. Low elevation old growth is being inventoried to provide input into the prescribed fire planning efforts. This allows using fire as a tool to help future old growth development or by directing prescribed burning away from areas that would not benefit from fire.
- Habitat improvement projects for Threatened, Endangered, or Sensitive (TES) species have been effective. Maintenance of key habitat conditions (e.g. burning the tall grasses to improve mountain plover habitat) or restrictions (e.g. seasonal closures or mitigation on project implementation) to eliminate disturbance during key vulnerable seasons of TES have been successful.
- No progress has been made toward improving wildlife habitat and watershed condition through modification of system roads, trails and ways because road closures to public access are not effective. Closures are illegally destroyed to obtain access to the area and lack of law enforcement and public education is the two main problems. This directly relates to budget.

Fish:

- Gathering baseline data for Pawnee National Grassland native fish and native cutthroat trout is ongoing and this data will be used for population status and trend monitoring of MIS. Results will be summarized for the 5-year review of the 1997 Revised Forest Plan.
- Cold water temperatures can delay spawning and prolong egg incubation, thereby reducing fry growth and possible limiting their over winter survival. Water temperature is being monitored to evaluate fish survival. Results will be summarized for the 5-year review of the 1997 Revised Forest Plan.

Water:

- Monitoring continued on the Bobcat Fire, which burned over 10,600 acres in 2000. Monitoring projects include effectiveness of emergency rehabilitation treatments, runoff and sediment yields at the watershed scale. The runoff and sediment yields at the plot

and hillslope scale project was completed. The post-fire hydrophobic soils monitoring project was completed. This monitoring indicated that hydrophobicity is weakening and soils are returning to a pre-fire state.

- To provide direction for range management planning 9.5 miles of streams and riparian were surveyed in three range allotments. Eight miles were found to be properly functioning and 1.5 miles were functioning-at-risk. This information will be used to provide direction for the allotment management plan, so that all areas will improve toward properly functioning condition over time.
- The ARP continues to do watershed improvement work. However, though specific segments of streams in the watershed have been improved, no sixth-level watershed has been improved sufficiently to improve its condition class from *at-risk* or *non-functional* to *functional*.

Soil:

- Monitoring continued on the Bobcat Fire area. Monitoring projects include effectiveness of emergency rehabilitation treatments, runoff and sediment yields at the watershed scale. The runoff and sediment yields at the plot and hillslope scale project was completed. The post-fire hydrophobic soils monitoring project was completed. Results indicate that hydrophobicity is weakening and soils are returning to their pre-fire state. However, in a recent poster presentation (MacDonald *et al.*, 2001) data from all of the monitoring by CSU on the Bobcat fire was incorporated. It showed that even though the soil hydrophobicity was weakening, the runoff and erosion from plot, hillslope, and watershed scales was still highly elevated above background, pre-fire levels. The lack of effective ground cover appeared to be the main causal factor for the increases in soil erosion and runoff.
- Several timber sales were monitored after harvest was complete. Monitoring results indicated that some areas did not meet soil quality standards. Soil compaction related to site preparation activities or harvest was identified as the key detrimental soil impact.
- Monitoring to determine the effects of prescribed fire continued in 2001. Areas treated with broadcast burning met soil quality standards. Areas treated with pile burning or other residue treatment were mixed in terms of meeting soil quality standards, but most units evaluated met standards (see timber sale monitoring above).

Air:

- Progress has been made in evaluating baseline conditions for some air quality related values (AQRV) (water quality, flora, and visibility) of forest resources as well as developing ways to evaluate trends in condition for AQRV.
- Sampling the chemistry of Wilderness lakes can indicate the quality of the air. This data will be used to help assess baseline levels as well as trends in lake chemistry and how this reflects changes in air quality.
- Smoke emitted during prescribed burning has been monitored and air quality meets all applicable state and federal requirements.

Hazardous Fuels Reduction:

- During 2001, hazardous fuels reduction treatments were accomplished on 2,903 acres. Of the total, 1,198 acres were treated mechanically and the balance of acres was accomplished using prescribed fire.
- The Forest is making progress toward treatment of hazardous fuels but at an annual rate less than desired but greater than the minimum identified in the Forest Plan.

Wildfire:

- There were 79 fires on 997 acres of National Forest lands on the Arapaho and Roosevelt National Forests and Pawnee National Grassland during the 2001 fire season. Of these acres, 30 acres were on the Forest and 967 acres were on the Grassland. The Forest acres burned in FY 2001 was well below average. Many more hundreds of acres were burned on State or private lands. The wildfires reduced hazardous fuels and caused adjustments of forest vegetation successional stages.

Insects and Disease:

- To monitor the spread of insect and disease infestation on forested ecosystems, aerial and ground surveys were conducted. These surveys indicated that mountain pine beetle infestation has leveled off across much of the forested land but infestations in the Williams Fork and Green Ridge (Arapaho National Recreation Area) areas of the Sulphur Ranger District are expanding.

Recreation:

- In 2000 the ARP participated in the National Visitor Use Monitoring (NVUM) project. The results of this project were reported in 2001. These results showed that the ARP had the highest recreation use (6.2 million site visits) of all National Forests sampled in the first year including the high recreation-use Angeles National Forest.
- Though the ARP has high recreation use, it does not receive commensurate funding compared to other high-use recreation forests.
- Lack of major projects with National Environmental Policy Act (NEPA) decisions may delay continued progress towards improving facilities.
- The Fee Demo program is helping the two designated Fee Demo areas, Mt. Evans and the Arapaho National Recreation Area, to improve the quality of facilities and services.

Wilderness:

- Field presence has lower funding priority than some of the other Forests and Grassland programs. This is a problem for Wilderness management because it removes the ability of managers to make visitor contacts and enforce Wilderness regulations. Volunteers are filling this gap by making visitor contacts and teaching Wilderness ethics. However, volunteers can only advise Wilderness visitors about regulations but cannot enforce Wilderness regulations.

Scenery:

- Monitoring of projects is indicating that visual quality is being maintained for most projects. However, more emphasis on maintaining scenic quality during the planning process (NEPA) is needed.

Timber:

- Timber volume offered in 2001 was 48% of the target set. The shortfall was due to an appeal and remand of the Bearscat Timber Sale Decision Notice.
- A team of specialists reviewed two small timber sales, Table Mountain and Road Kill. On Table Mountain it was identified that two units partially did not meet soil quality standards due to soil compaction and on Road Kill wildlife standards were not being met. These problems are being corrected through mitigation and improved NEPA compliance.

Range:

- All active grazing allotments were monitored during allotment inspections. Some of the items monitored included: livestock ownership; livestock numbers to insure stocking does not exceed permitted numbers; management system compliance; estimate forage utilization and forage residue; and estimate vigor of plant species, and record locations of noxious weeds. Adjustments were made in allotment management.
- Many allotments were monitored to evaluate rangeland health, to determine long-term trends, and to determine ecological condition of riparian areas.

Heritage Resources:

- Evaluation of sites/acres found limited adverse effects to heritage resources. But where there were effects, these were mitigated.
- Lack of reliable and easily accessible baseline heritage data continues to be a problem that hampers the efficient execution of compliance work. In order to help establish accurate baseline heritage data, all of the Forests and Grassland heritage sites and survey data is being input into the corporate Geographic Information System (GIS). During FY2001, GIS coverages were successfully created for the Arapaho and Roosevelt National Forests. This will assist tracking sites and will improve future monitoring

Lands:

- Funding was low for the lands program except in boundary management. There is still a high amount of backlog cases in special use authorizations. To address this the lands team developed a reviewing process, which allows a review of renewal and reissuance by specialists and a “check off” that there were no issues or concerns.

Transportation:

- Transportation planning efforts continued on Clear Creek and Boulder Ranger Districts. However, National Fire Plan mandate caused a shift in priorities and planning was put on hold for the year.
- Twenty-seven miles of road were reconstructed to standard. Seventeen miles of classified and unclassified (“ways”) roads were decommissioned. Additionally, eight miles of trail were constructed. (Revised Forest Plan, Objective 7, p. 8; Goal 2, p. 7; Objective 7, p. 8, respectively).
- Monitoring of the road system indicated that road closures and road decommissioning are, in many cases, not effective. Gates are damaged, driven around or completely destroyed. Lack of Forest Service field presence is partially responsible, though lack of education and a small, destructive, percentage of the public is the root of the problem.

Law Enforcement:

- Funding allows one law enforcement officer for every 700,00 acres. On average each officer covers 850 incidents per year. Many more incidents are occurring that are going unrecorded and are not prosecuted due to lack of adequate coverage.
- In the past when out in the field, Forest Service personnel would greatly supplement the law enforcement staff by monitoring regulations, talking to the public, and reporting incidents. Due to a reduction in workforce, office requirements, and a lack of Forest Protection Officer training, this important monitoring is occurring at much reduced levels.

Ongoing or Emerging Issues:

The ARP is faced with challenges through increasing populations on the Front Range or in the intermixed lands where subdivisions are built within or adjacent to Forest/Grassland boundaries. These increasing populations bring more demands for a variety of recreational experiences. Some types of recreation uses conflict with each other or can cause significant resource damage if not managed and controlled properly. Funding to the ARP has been significantly decreased from the 1997 Revised Forest Plan projections. Tight budgets lead to downsizing of workforce, a decreasing in programs offered and a decreasing ability to meet the Forest Plan goals and objectives. The following is a list of some of these challenging issues. For a more thorough list of issues, review Chapter 2.

Water:

- 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.

Air:

- Nitrogen deposition due to human-caused emissions may be of concern to higher elevation ecosystems.
- Cumulative impacts of air quality on the Front Range are affecting the ability to conduct prescribed burning which puts smoke in the air.

Soil:

- Evaluate impacts of site preparation techniques on soils; work with silviculturists & fuels specialists to best meet goals of all disciplines while still protecting soil quality. This is mostly related to compaction issues that are being observed in some units from site preparation activities. Further monitoring will help identify why it is occurring.

Forest Health

- Though mountain pine beetle infestation has leveled off across much of the forested land, infestations on the Sulphur Ranger District are expanding.
- Subalpine fir has a disease that is causing tree decline.

Timber:

- The continuing decline in the value for timber as reflected in the soft timber market could cause a lack of bidding on timber sales for fiscal year 2002.
- 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.

Range:

- An increasing urban population and its accompanying desire for recreation will conflict with livestock grazing on the range allotments.

Heritage Resources:

- An important emerging issue related to heritage compliance continues to be the new implementing regulations for the National Historic Preservation Act. 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.

Boundary Management

- Survey support to the National Fire Plan is needed to locate boundaries of public lands and resolve discovered conflicts.
- With the increased population, the demands for recreation and quality of life, the Forests and Grassland are experiencing dramatic increases in use causing increasing problems of trespass, encroachment and loss of access by the Public.

Transportation:

- 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.
- Though transportation issues are given a high priority in the forest plan other priorities such as national fire planning have decreased the staff time for transportation planning, implementation, maintenance and monitoring. The Forests and Grassland are not meeting all Forest Plan objectives or standards and guidelines.
- 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 resource damage occurring off system roads.

- Many new travel routes are being established through "social" use and illegal activities caused by off road/trail use. In some instances, users are constructing trails and then coming to the forest and asking that the forest add the new trails to our "system" and demanding that we maintain the trails. Many times, these requests are the first we know of the "new" facilities. Some liability issues could be associated with these new, illegal facilities.

Law Enforcement:

- Lack of Forest Service employee field presence and effective law enforcement of Forest/Grassland regulations is an ongoing issue in the era of tight budgets and personnel down-sizing. An example of this is increased dependence on volunteers to meet program needs. Volunteers fulfill much of these program needs but volunteers lack the authority to enforce regulations. Another example is contract campground management which puts concessionaire-paid employees in campground rather that Forest Service employees interacting with campers.

Forest Association:

- A non-profit Forest Association is in the development stages. It is anticipated that this Association will be able to assist the ARP in moving towards the goals stated in the 1997 Revised Forest Plan.

General recommendations:

From evaluation of our monitoring programs/projects and from ongoing or emerging issues a number of recommendations were developed. The most critical ones are reported here. For a more extensive list, review Chapter 2.

Wildlife:

- 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 all Forest programs (vegetation management, prescribed fire, lands, special uses, recreation special uses, dispersed recreation and travel management) is needed.
- Many more roads and trails exist that 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.

Old Growth:

- 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.

- It is necessary for the fuels reduction program (National Fire Plan) to incorporate low elevation inventories of old growth/future old growth into the environmental analysis and mitigation measures.

Fish:

- The Forest Plan standard for instream flow can be interpreted in many different ways (especially during the repermitting process of water special uses). This standard should be rewritten to eliminate multiple interpretations.

Soil:

- Need to include soil remediation in KV plans in order to improve areas where detrimental soil compaction and/or erosion has occurred.

Forest Health

- The mountain pine beetle infestation on the Sulphur Ranger District, which is expanding, should be monitored closely.
- Subalpine fir has a disease that is causing tree decline. Research should continue on the disease causing Subalpine fir decline.

Project Planning, NEPA, Monitoring of Projects:

- Better NEPA analysis is needed across all project planning.
    1. All available tools should be used in the analysis such as Recreation Opportunity Spectrum, Scenery Management System (as it is developed), Old Growth analysis, etc.
    2. Mitigation must be developed interdisciplinary to ensure conflicts between mitigation are discussed before the project goes into the implementation phase.
    3. Monitoring plans must become part of the NEPA process with appropriate funding indicated to ensure proper monitoring occurs.
- Emphasize integrated planning across disciplines to assure that multiple resource recovery efforts are directed to watersheds of the greatest concern.
- 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.
- Project monitoring of mitigation written into the NEPA decision should have more emphasis by the Forests and Grassland.
    1. Additional funding should be directed to projects to allow resource specialists to ensure that projects such as timber harvest operation are meeting the needs of their resources as stated in the mitigation measures.
    2. Develop and institute a monitoring program for the expanded wildfire protection strategies, which were instituted beginning in fiscal year 2001 through the National Fire Plan.
- The heritage resources 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.

Heritage Resources:

- During the 5-year Forest Plan review in fiscal year 2002 consider whether the heritage resource could be better served with protection requirements beyond what Federal law requires by adding standards currently not in the Revised Forest Plan.

Scenery:

- Do a Forest Plan amendment adopting the Scenery Management System.

Range:

- Involve the range permittees more with on-the-ground monitoring. Some monitoring forms can be filled out by the permittee.

Transportation:

- The ARP leadership team needs to make a commitment to transportation planning and facilitate its completion. On a forestwide basis, the leadership team should prioritize the areas where the ARP will address travel management in association with landscape analysis or on broad project areas. Planning and implementation should be based on these priorities.
- Improve the effectiveness of Forest Plan standards by increasing law enforcement capability to enforce regulations. Increase field presence of Forest Service employees.
- Minimize illegal use through expanded law enforcement and field presence. 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.
- Reevaluate the Forest Supervisors Order on allowing camping or picnic parking within 300 feet from authorized travel routes.

Law Enforcement/Field Presence:

- When out in the field Forest Service personnel need to reestablish their law enforcement responsibilities attitude such as talking to the public and recording incidents. Currently the fire organization has the person-power and can be an excellent resource for field presence by enforcing forest regulations as well as fire regulations. Taking Forest Protection Officer training and carrying an incident book in their gear can accomplish this.
- 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.

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 and ongoing 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 2001 monitoring of the Revised Forest Plan as well as resource program accomplishments made during 2001. It also ties back to recommendations made in the 2000 Monitoring and Evaluation Report by summarizing the status of the actions recommended in that report. An action plan for FY 2002 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 interference with these fire cycles has lead 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.

[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.

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 the Revised Forest 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 Grassland play a role in local and state economies. They contribute substantially to economic development opportunities. Communities such as Briggsdale, Winter Park, Granby, Grand Lake, Grover, Kremmling, Raymer 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 and Grassland have become a large portion of small local community economies.

The key features that make the Forests and Grassland unique and important for recreation are: its proximity to nearly 2 million people; surrounding Rocky Mountain National Park; accessibility from major Interstate and State 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 Forests and Grassland 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. 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 Grassland 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 Forests or National Grassland for recreation and solitude in greater numbers and with increasing demands on 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 six 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 2001 which started on October 1, 2000 and ended on September 30, 2001. Accomplishments varied due to program priorities, project start-up time, and sufficient or insufficient budgets.

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, pp 394-396.
3. Recommendations: to provide guidance for future management and monitoring efforts.
4. Emerging and Ongoing 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.

GPRA GOAL: **Ensure Ecosystem Health**

Wildlife and Plants

To maintain diverse wildlife species and viable populations of individual species the wildlife program emphasizes maintenance of diverse ecosystems with abundant and well-distributed 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 scattered trees. Another key part of the program is protection and/or recovery of threatened, endangered and sensitive species, as well as the maintenance of management indicator species identified in the Revised Forest Plan.

Monitoring:

Management Indicator Species (MIS)

Intensive and extensive monitoring of MIS started 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, particularly game species, and also has new and ongoing data being collected in studies of game birds, raptors, neo-tropical migrant birds, amphibians, small mammals and fish. Through cooperative working agreements the Forests and Grassland receive population information. Colorado State University, U.S. Fish and Wildlife Service and the Colorado Natural Heritage Program all share their current ongoing monitoring efforts with the Forests and Grassland.

Forest and prairie species monitoring efforts continued in 2001, despite the busy wildfire season. Species monitoring involves continued Forest Service data collection for several species and expanded efforts with Rocky Mountain Bird Observatory, Colorado Natural Heritage Program and Colorado Division of Wildlife.

Mandatory monitoring of Forest/Grassland-wide MIS populations and related activities that affect MIS populations are presented in the following table.

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

Legally Required Monitoring Activity Accomplishments (related to MIS) for FY 2001

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 continued according to the Revised Forest Plan of 1997. Trend analysis will be reported in the 5-year Revised Forest Plan review.
Prescriptions and effects. 36 CFR 219.12(k)2	Years 5 & 10	Years 5 & 10	Continued progress.

Effects of off-road vehicles	Annual review, Analysis Years 5 & 10	Years 5 & 10	Continued progress.
Effects of management practices. 36 CFR 219.11(d)	Years 5 & 10	Years 5 & 10	Continued progress.

In addition, there are four monitoring questions that address priority management emphasis pertaining 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 continued in 2001 through planning and initiating implementation of fuels reduction projects and timber management in forest ecosystems. On the Pawnee National Grassland the tall grass structure was reduced to benefit 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 prescribed fire planning documents. In this manner we have used fire as a tool to help future old growth development or directing 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 (e.g., burning the tall grasses to improve mountain plover habitat) or restrictions (e.g., 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 for the remainder of 2002 (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 all 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. It is necessary for the fuels reduction program (National Fire Plan) 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 that 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.

Ongoing Issues

1. 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.

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:

Ongoing collection of baseline data for Pawnee National Grassland native fish and native cutthroat trout was undertaken. 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

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 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 Second 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.

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?*

Because the program manager position was vacant during most of the fiscal year, this question was not addressed this year.

Recommendations:

1. Complete study 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.

Ongoing 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 2001

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 satalite technology 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. Habitat surveys of pool quantity and quality, riparian vegetation, and channel characteristics were conducted on 35 miles of native cutthroat streams.
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:

In 2000 the Roosevelt National Forest had its largest wildfire. The Bobcat Fire burned over 10,600 acres and 22 structures. 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 in the summer of 2000 and continued in 2001. These projects are determining 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. Most work is still in progress, however, the hydrophobicity monitoring has been completed. It was found that hydrophobicity declined toward prefire levels.

A related study, although not part of the above cooperative agreement, is also being conducted by CSU pertaining to runoff and sediment yield at the plot and hillslope scale (Kunze, Matt D. and John D. Stednick. 2002. Effects of the Bobcat Fire on Runoff and Suspended Sediment Yields for Small Watersheds. 46 pp.). This study has found that two watersheds in the Bobcat area showed elevated runoff and suspended sediment yields during the second summer after the Bobcat Fire. This suggests that there was minimal hydrologic recovery within the severely burned portions of the watersheds. This elevated runoff and suspended sediment yields occurred even though there was good regeneration of grasses and other forbs after the rehabilitation treatments.

“Proper Functioning Condition” (PFC) monitoring condition was performed on streams within the Gabrielson, Forrester, and Johnson Creek range allotments in preparation for the issuance of new allotment management plans. PFC rates the functional condition of riparian areas, and puts the areas into properly functioning, functioning-at-risk, and non-functional categories. Of the 9.5 miles of streams surveyed, 8 miles were properly functioning, and 1.5 miles were functioning-at-risk. This information will be used to provide direction for the allotment management plan, so that all areas will improve toward properly functioning condition over time.

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 that 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. However, though specific segments of streams in the watershed have been improved, no watershed has been improved sufficiently to improve its condition class

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?*

1.25 miles of a road along Cabin Creek, on the Sulphur Ranger District was closed and obliterated in the fall of 2001. The purpose was to cure a source of chronic source of sedimentation into Cabin Creek. Pre-project monitoring was performed prior to project accomplishment. Post-project monitoring to determine the success of the project will be conducted in the summer of 2002.

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 2001 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.

Ongoing 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 2001

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 discusstion.) "Proper Functioning Condition" (PFC) monitoring condition was performed on streams within the Gabrielson, Forrester, and Johnson Creek range allotments (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 primary goal of the soil management program 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.

The primary tools for achieving long-term soil health are contained in the water conservation practices and regional and national soil quality standards and guidelines. The standards relate to physical conditions or thresholds of change acceptable in soils as a result of management activities or wildfire. Water conservation practices also provide guidelines for meeting these standards and maintaining soils in an acceptable condition. When these thresholds are exceeded or soils are considered to be in detrimental condition, appropriate corrective measures are applied.

Many activities and land treatments affect soils. Detrimental impacts to soils that are of the greatest concern include compaction, erosion and displacement of topsoil or removal of organic matter.

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.

Monitoring:

Soil monitoring in 2001 was conducted for various management activities including timber harvest, prescribed burning, and grazing. Monitoring included collection of data in the preparation of environmental analyses and also monitoring of impacts of management activities on soils during project implementation. The goal of the monitoring was to assess implementation of water conservation practices, adherence to standards and guidelines, and assess existing condition of proposed project areas. Units chosen for monitoring were based on current project work and not random selection.

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The following Table summarizes the 2001 soil quality monitoring efforts.

Soil Quality Monitoring Summary for Fiscal Year 2001

Activity	Monitoring Accomplished	General Findings
Vegetation Management	1. Pre activity monitoring of Sheep Creek #1, Peedee Creek Stewardship Project, Lazy Z Unit (Winegar Ridge Project), Columbine & Sante Fe Fuel Reduction, Winter Park tree clearing for ski run mgmt. 2. Post-activity monitoring of Bear Gulch Timber Sale, Roadkill Salvage Project, Table Mountain Beetle Salvage, Lazy Z Unit (Winegar Ridge)	1. Pre-monitoring was used in developing recommendations for project implementation and environmental analyses. Areas of previous entries/clear cuts or historic activities, such as tie-hacking had localized areas of detrimentally impacted soils. Some of these units exceeded soil quality standards and recommendations were made for remediation as part of the current projects or at least minimizing expected impacts. However, for the most part the project areas met soil quality standards. Compaction and excessive erosion were the key detrimental soil impacts identified. 2. Of the three timber sales evaluated post-activity, all had units meeting the soil quality standards and not meeting soil quality standards. Generally compaction related to site preparation activities or harvest was identified as the key detrimental soil impact. Corrective action was taken where possible and appropriate. Mitigations to avoid detrimental soil impacts in similar situations will be incorporated into project plans.
Prescribed Fire	1. Pre-activity monitoring of proposed broadcast burn units of Columbine, Sante Fe, Coffey, Sheep Creek #1 projects. 2. Post activity monitoring of the Dadd-Bennett Burn area. 3. Bobcat and other prescribed fire and wildfire monitoring	1. Generally, areas proposed for broadcast burning met soil quality standards, usually these areas lacked prior management activities. Areas proposed for pile burning or other residue treatment were mixed in terms of meeting soil quality standards, but most units evaluated met standards (see veg mgmt results). 2. Several transects were completed within the burn and in adjacent areas (for comparison). Generally, the burned area was well within soil quality standards and the appropriate water conservation practices were implemented. 3. See paragraph and notes below in the Effects of Fire on Soil section.
Grazing	Assessment of soil conditions of grazing areas within the Roach Project Area, Grace Creek, Gabrielson, & Forrester Allotments.	There are several small localized areas within the allotments showing detrimental soil compaction or erosion, but generally these are within the percentage allowed in the regional soil quality standards. Impacted areas are being addressed in the current environmental analysis of the allotments as part of the permit renewal process.

Effects of Fire on Soil

Monitoring projects to determine the effects of fire and the success of rehabilitation were continued in 2001. 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) strength and persistence of fire-induced 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 on runoff and erosion following burning at the plot and watershed scale. The results of this monitoring have been presented in two peer-reviewed manuscripts, a thesis, several nationally attended presentations and poster presentations. The thesis (Huffman, 2001) and one of the peer-reviewed manuscripts (Huffman *et al.*, 2001) presented the findings of the strength and persistence of fire-induced soil hydrophobicity from 5 Colorado Front Range Fires, four on the Arapaho-Roosevelt NF (Bobcat Fire, Crosier prescribed burn, Dadd Bennett prescribed burn, and Lower Flowers prescribed burn). The other peer-reviewed manuscript (Benavides-Solorio and MacDonald, 2001) discussed the plot and hillslope scale runoff and erosion following burning on the Bobcat fire, the Hourglass fire, and the Lower Flowers prescribed burn. Data from 2001 monitoring of runoff and erosion at this scale was presented at the American Geophysical Union fall 2001 meeting, but has yet to be written-up and presented to the forest. Data on the effectiveness of post-fire rehabilitation treatments on the Bobcat fire was also presented at this national conference and a local conference (Wagenbrenner, 2001) but to date is not written-up. Some of the preliminary results on the effect of fire on runoff and sediment yields monitoring was also presented at a local conference (Kunze, 2001). All of the published information is located in the Soils office in Fort Collins.

Recent, yet unpublished data from the 2001 measurement of soil hydrophobicity on the Bobcat fire indicates that the soil hydrophobicity has weakened to pre-burn levels on the Bobcat burned area. However, in a recent poster presentation (MacDonald *et al.*, 2001) data from all of the monitoring by CSU on the Bobcat fire was incorporated. It showed that even though the soil hydrophobicity was weakening the runoff and erosion from plot, hillslope, and watershed scales was still highly elevated above background, pre-fire levels. The lack of effective ground cover appeared to be the main causal factor for the increases in soil erosion and runoff.

Copies of most of these reports are on file in the Boulder Fire Planning Team office, soil program files. Citations for reports are as follows:

Benavides-Solorio, J, L. H. MacDonald. 2001. Post-fire runoff and erosion from simulated rainfall on small plots, Colorado Front Range. *Hydrological Processes.* 15: 2931-2952.

Huffman, E. L., L. H. MacDonald, and J. D. Stednick. 2001. Strength and persistence of fire-induced soil hydrophobicity under ponderosa and lodgepole pine, Colorado Front Range. *Hydrological Processes.* 15: 2877-2892

Huffman E. L. 2001. *Fire-induced soil hydrophobicity under ponderosa and lodgepole pine, Colorado Front Range*. Master's thesis. Colorado State University. 186 pp.

MacDonald, L. H., J. de Dios Benavides-Solorio, E. L. Huffman, M. D. Kunze, J. D. Stednick, and J. W. Wagenbrenner. 2001. Effects of wildfire on runoff and erosion at the point, plot and catchment scales. In: Chapman Conference on the state-of-the-art hillslope hydrology.

Kunze, M. D. 2001. Post-fire streamflow and suspended sediment responses in small watersheds after convective storm events, Colorado Front Range. In: Proceedings of the Fifth Annual Colorado State University Student Water Symposium. 12 p.

Wagenbrenner, J. W. 2001. Effectiveness of post-wildfire burn area emergency rehabilitation treatments. In: Proceedings of the Fifth Annual Colorado State University Student Water Symposium. 12

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 forest staff is working at improving implementation of water and soil conservation practices during project implementation. Also watershed improvement projects such as the road obliteration at Cabin Creek on the Sulpher Ranger District contribute towards improving condition of detrimentally impacted soils moving them towards a higher functioning level.

Recommendations:

1. Replace the monitoring question and goal above with something more related to soil health across the forest or in highly impacted watersheds. This goal has no methodology for assessing a baseline condition of ecological units, let alone whether we are moving towards this goal. Need to substitute something that we can measure.
2. Establish a monitoring program for the projects which will be accomplished through National Fire Plan funding (e.g., prescribed fire and mechanical treatment).
3. Use/develop standard protocols for soil quality monitoring beginning in 2002. Work with regional office personnel if necessary to ensure protocols used are acceptable.
4. Need to include soil remediation in KV plans in order to improve areas where detrimental soil compaction and/or erosion has occurred.

Emerging Issues:

1. Evaluate impacts of site preparation techniques on soils, work with silviculturists & fuels specialists to best meet goals of all disciplines while still protecting soil quality. This is mostly related to compaction issues that are being observed in some units from site preparation activities. Further monitoring will help identify why it is occurring and adaptive management will be used to correct the situations where it occurs.

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

Legally Required Monitoring Activity Accomplishments for FY 2001

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	Monitored a sample of forest vegetation management and prescribed fire projects for implementation of water & soil conservation practices
Effects of management practices. 36 CFR 219.11(d)	Years 5 & 10	Years 5 & 10	Monitored a sample of forest vegetation management and prescribed fire projects to assess achievement of soil quality standards and impacts of management activities to soils.

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?*

Progress has been made in evaluating baseline conditions for some air quality related values (AQRV's) of forest resources as well as developing ways to evaluate trends in condition for AQRV's.

In the last several years the focus for monitoring air quality related values has been on lake chemistry in Wilderness and nearby areas. The AQRV being measured is water quality. Year 2001 lake sampling and analysis has been completed and data is still being compiled. Results of this year and previous years sampling are currently being analyzed and summarized by the Rocky Mountain Experiment Station (Dr. Robert Musselman). This data will be used to help assess baseline levels as well as trends in lake chemistry on the forest and how they reflect changes in air quality.

In 2001, as part of a larger floristic inventory and species list for the Canyon Lakes Ranger District, floristic data was collected in the Rawah Wilderness Area. When completed, the report should help provide some baseline information about the flora within this Class I Wilderness Airshed. Also air staff on the forest worked with regional and national lichen and air quality specialists to evaluate the potential use of lichen monitoring as an indicator of affects of air quality on flora within the forest and the potential for adding to a regional database with similar information.

To maintain existing air quality the ARP 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 2001.

Scientific articles published in 2000 indicate that there has been a downward trend in Class I Areas on the Colorado Front Range as a result of increased air pollution in the last 50-100 years. The Forest continued to work with Regional staff and adjacent land managers (eg Rocky Mountain National Park) to evaluate impacts from new pollution sources and recommend mitigations to minimize those impacts.

The forest has also continued to work with Colorado Department of Transportation and Federal Highways Commission to evaluate, and modify if necessary, potential impacts of road and highway projects such as I-70 and Guanella Pass Road where such projects could impact air quality of national forest system lands.

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

As part of the burn permitting process smoke emission models are used to predict emissions from all burn projects, these are currently tracked and recorded in project files and yearly spreadsheets. This year the Forest started to calculate not only the maximum emissions for all projects for the year, but also, based on actual acres burned, the likely emissions created.

The ARP and Rocky Mountain National Park jointly purchased a particulate concentration monitor, which can be used to measure the impact of a prescribed fire at a sensitive receptor. While concentration cannot be tied directly to predicted or calculated emissions, the monitoring provides a means of quantifying emissions and compare them to either pre-burn levels and/or regulatory limits. In the next year or two, the Forest will continue to develop experience using the monitor and utilizing the data it provides.

Forest staff has also been communicating the need for tools to track and store emissions data with developers of the NRIS Air Module, which is a forest service database for tracking air quality information. This database is expected to be in service by late 2002.

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. Continue to work with NRIS Air Module Developers to incorporate data needs for smoke and emissions tracking in addition to migrating existing water quality data sets.

Ongoing Issues:

1. Nitrogen deposition due to human-caused emissions may be of concern to higher elevation ecosystems.
2. Cumulative air quality impasts on the Front Range are affecting the ability to conduct prescribed burning which puts smoke in the air.

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

Legally Required Monitoring Activity Accomplishments for FY 2001

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 eighth year and this data is being used to assess air quality impacts in Wilderness Areas. One PSD permit was evaluated for potential impacts by the Regional Office staff and the RMNP staff and was approved (increase in VOx for the Coors plant in Golden).
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.

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 can contribute to intense, large acre-consuming wildfires. Dense forests can also 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

During 2001 hazardous fuels reduction treatments were accomplished on 2,903 acres. Of the total, 1,198 acres were treated mechanically in three project areas including Winiger, Sevenmile and Stringtown. The balance of acres was accomplished using prescribed fire in two project areas, Dadd-Bennett and Pawnee. An additional 4,197 acres were planned for prescribed burning but could not be accomplished due to inadequate periods of time when burning could be accomplished within prescription and the commitment of resources to wildfire suppression. The ARP is making progress toward treatment of hazardous fuels but at an annual rate less than desired but greater than the minimum identified in the Forest plan.

Wildfire

There were 79 fires on 997 acres of on the Arapaho and Roosevelt National Forests and Pawnee National Grassland during the 2001 fire season. Of these acres, 30 were on the Forest and 967 were on the Grassland. The Forest acres burned in FY01 was well below average. Many more hundreds of acres were burned on State or private lands. The wildfires reduced hazardous fuels and caused adjustments of forest vegetation successional stages.

Insect and Disease

To monitor the spread of insect and disease infestation on forested ecosystems, aerial and ground surveys were conducted. These surveys indicated that mountain pine beetle infestation has leveled off across much of the forested land but infestations in the Williams Fork and Green Ridge (Arapaho National Recreation Area) areas of the Sulphur Ranger District is expanding.

There is mountain pine beetle activity occurring in the Winiger and Sevenmile projects. The treatments being implemented in these area also have an objective of suppressing current activity and preventing future infestations.

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.

Undesirable Vegetation

The goal as stated in the Revised Forest Plan is to manage 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 2002.

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 were instituted beginning in fiscal year 2001 through the National Fire Plan. Continue the established monitoring and evaluation of the Winiger and Sevenmile projects.

Emerging Issues:

1. Though mountain pine beetle infestation has leveled off across much of the forested land, infestations on the Sulphur Ranger District are 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 2001

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	The Winiger and Sevenmile projects discussed above in the hazardous fuels reduction section also have an objective of suppressing and preventing mountain pine beetle outbreaks. Infested trees will be cut and removed and the reduction of stand density will help prevent future infestations.
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. And, as reported below, the results from the 2000 National Visitor Use Monitoring project showed that the ARP had the highest recreation use of the first quarter National Forests sampled across the nation. However, our recreation budgets do not reflect this high recreation use. For many years the recreation program has been operating with insufficient money to maintain facilities to standard, to continue work on projects or to have any significant field presence. The budget for 2001 was better than 2000, but this came about by not filling the vacant recreation program manager. Not having a program manager has hurt the ARP's recreation program because of the lack of leadership to spearhead the program.

Monitoring:

With the above stated, there were still accomplishments made in fiscal year 2001. The Forests and Grassland have now completed 80 percent of all the deferred maintenance surveys. These surveys indicated that the ARP needs $40 million just to bring 80 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 data collected from developed sites, dispersed sites, and trails and the maintenance needs survey data is being input into the INFRA database. By having all this information readily accessible it should help to prioritize recreation projects by directing money and personnel to the areas most in need of work.

In 2000 the ARP participated in the National Visitor Use Monitoring (NVUM) project by sampling our Forests and Grassland visitors on 189 days during the calendar year. These sampling days included surveying visitors at the conclusion of their visit at developed sites (campgrounds, picnic grounds, ski areas), Wilderness trailheads, or general forest areas (roads which exited the National Forest or National Grassland lands. This National project will be completed in 2004 by doing a quarter of the National Forests each year. The ARP was one of the 32 National Forests (one-quarter of all National Forests) to participate in this project in 2000.

The results of the National Visitor Use Monitoring project were collated in August 2001. These results showed that recreation use on the ARP for the calendar year 2000 was **6.2 million** national forest visits. A national forest/grassland visit is defined as "the entry of one person upon a national forest/grassland to participate in recreation activities for an unspecified period of time. A national forest/grassland visit can be composed of multiple site visits." (USDA Forest Service. 2001. National Visitor Use Monitoring Results). In additions to these 6.2 million visits there were 7.8 million site visits. Included in the site visit estimate are 399,143 Wilderness visits.

The ARP had the highest recreation use of all National Forests (32) sampled in the first year of this project. Included in those 32 forests was the Angeles National Forest just east of Los Angeles, California. The Angeles Forest has long been considered to have very high recreation visitor use, however, it had only 3.5 million visits compared to the ARP's 6.2 million visits.

A total of 2390 visitors were contacted on the ARP during 2000. Approximately, seventy-one percent of those interviewed said their primary purpose on the Forests/Grassland was recreation. The remaining 29 percent who agreed to be interviewed were not recreating, including 2.8 percent who just stopped to use the bathroom, 6.1 percent who were working, 12.5 percent who were just passing through, and 8.2 percent who had some other reason to be there.

The following are some of the other results reported for the ARP. For more reporting information go to the internet at *http://www.fs.fed.us/recreation/recuse/recuse.shtml*

Description of Visitors

Basic descriptors of the forest visitors were developed based upon those visitors interviewed then expanded to the national forest visitor population. Almost sixty-six percent of the Arapaho-Roosevelt National Forests visitors were male and 34 percent were female. About seventeen percent of the visitors were under age 16 and not interviewed. About 3 percent of the visitors were over 70 years old and the 31-40 year old age group comprised 23 percent of the visitors. See the table below for a complete age group breakout.

Gender distribution of Arapaho-Roosevelt National Forests visitors.

Gender	65.8 percent males	34.2 percent females

Age distribution of Arapaho-Roosevelt National Forests visitors.

Age Group	Percent in group
Under 16	16.8
16-20	4.4
21-30	13.1
31-40	22.8
41-50	21.5
51-60	12.8
61-70	5.4
Over 70	3.2

Visitors categorized themselves into one of seven race/ethnicity categories. Almost 94 percent of the visitors were ethnically white. The following table gives a detailed breakout by category.

Race/ethnicity of Arapaho-Roosevelt National Forests visitors.

Category	Total percent National Forest visits
Black/African American	0.1
Asian	0.2
White	93.7
American Indian/Alaska Native	0.1
Native Hawaiian or Other Pacific Islander	0.7
Spanish, Hispanic, or Latino	1.7
Other	3.6

There are three priority management emphasis questions for the recreation 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?*

The West Lake Campground by Red Feather Lakes and Ansel Watrous Campground along the Cache la Poudre River and Willow Creek Campground by Granby, Colorado were reconstructed in 2001. The reconstruction improved the quality of the camping experience by providing new camping amenities such as outhouses, picnic tables, level camping pads, paved road, etc.

A problem for the future is that projects, which require reconstruction or major rehabilitation, require that the effects of that reconstruction/rehabilitation be analyzed under the National Environmental Policy Act (NEPA). This NEPA analysis is lacking for many future projects which will delay their implementation. This means that most reconstruction and expansion will have to wait for NEPA compliance before beginning. In part, the lack of NEPA analysis is due to a skeleton recreation staff on the ARP both at the Supervisor's Office and on the Ranger Districts.

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?*

More was accomplished in fiscal year 2001 than 2000. The Boulder Ranger District constructed several designated dispersed campsites and the Sulphur District received grant money for developing dispersed campsites in the Stillwater area.

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

Again, more was accomplished in fiscal year 2001 than 2000. Though the budget was well below past levels, some trail crew seasonal employees were hired. These employees were able to maintain some of the trails to standard and obliterate user-created routes. Volunteers filled in the gap with their 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.

Boulder Off Road Alliance
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
Hillbillies 4x4 Club
Indian Peaks Wilderness Volunteers
Indian Peaks Wilderness Alliance
Trail Ridge Runners 4x4 Club
Volunteer Grants Group

Nearly 1000 individuals provided their free time to accomplish numerous projects throughout the year. These volunteers provided to the recreation program 39,300 hours of work at an appraised value to the Arapaho and Roosevelt National Forests and Pawnee National Grassland of $485,665. To all of these wonderful people, the Arapaho and Roosevelt National Forests and Pawnee National Grassland give a much-appreciated “Thanks”.

Concessionaires managed most of the campgrounds on the Arapaho and Roosevelt National Forests. 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 had another successful year. 105,000 visits were recorded. 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 an interpretive visitor center near the midway point on the Mt. Evans Road is nearing the construction phase. 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 Arapaho National Recreation Area (ANRA) near Granby, Colorado includes Lake Granby, Shadow Mountain Reservoir, Willow Creek Reservoir, Monarch Lake and Meadow Creek Reservoir and their associated trails, campgrounds and picnic grounds. The ANRA was included in the Fee Demo program for 2001. Ninety percent of the fee receipts were reinvested in the ANRA to operate, maintain and improve the area. Projects such as sewer system upgrades; repairing and maintenance to refurbish signs, picnic tables, and bulletin boards; new visitor brochures; improvements at boat launches; and additional law enforcement occurred due to the additional money from these fee receipts.

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.

As stated above 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.

Recommendations:

1. Include Recreation Opportunity Spectrum evaluation in any NEPA project analysis.
2. 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.
3. Continue to do deferred maintenance surveys for both developed sites and trails. Use a global positioning system to accurately locate all developed sites and trails

Ongoing Issues:

1. An expanding population along the Front Range of Colorado from Colorado Springs north to the Wyoming border have expanding recreation needs and 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 2001

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	This item was not monitored due to minimal personnel.
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:

Fiscal year 2001 was a better year in Wilderness funding than 2000. The districts were able to hire a minimal contingent of seasonal employees to maintain trails, patrol, make public contacts, and enforce regulations in these Wilderness Areas. Volunteers again did a remarkable job in helping to monitor and manage wilderness.. Many of the volunteer groups listed in the previous Recreation section of this report spent much of their volunteer hours in designated Wilderness Areas.

The Grand County Wilderness Group monitored trail registration boxes for eight trails in 4 Wildernesses (Byers Peak, Indian Peaks, Never Summer, Vasquez). This group produced a report documenting their monitoring. This report is available from the Sulphur Ranger District (970-887-4100). The Poudre Wilderness Volunteers (PWV) on the Canyon Lakes District patrolled and monitored visitor use and trail condition on four Wildernesses (Rawah, Comanche Peak, Neota, Cache la Poudre). PWV contacted over 7,800 backcountry recreationists while volunteering 769 days of patrol. Additionally, the PWV organized a ten-person trail crew and in conjunction with Forest Service training, the crew cleared over 200 trees from 150 miles of trails. This was vital work since the Canyon Lakes District has had no paid trail crew for the past four years. On the Boulder District the Indian Peaks Wilderness Alliance and Indian Peaks Wilderness Volunteers provided the same services.

ARP personnel on each district monitor outfitter/guide activities. When necessary the operating plans of the outfitter/guides are adjusted to protect Wilderness values and visitor experiences.

In 2000 the ARP participated in the National Visitor Use Monitoring (NVUM) project by sampling our Forests and Grassland visitors on 189 days during the calendar year. These sampling days included surveying visitors at the conclusion of their visit at developed sites (campgrounds, picnic grounds, ski areas), Wilderness trailheads, or general forest areas (roads which exited the National Forest or National Grassland lands. The National project will be completed in 2004 with the ARP part of the first quarter of all National Forest to participate in this project.

The results of the National Visitor Use Monitoring project were collated in August 2001. These results showed that recreation use on the ARP for the calendar year 2000 was **6.2 million** national forest visits. A national forest/grassland visit is defined as “the entry of one person upon a national forest/grassland to participated in recreation activities for an unspecified period of time. A national forest/grassland visit can be composed of multiple site visits.” (USDA Forest Service. 2001. National Visitor Use Monitoring Results). In additions to these 6.2 million visits there were 7.8 million site visits. Included in the site visit estimate are 399,143 Wilderness visits.

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Angeles Forest has long been considered to have very high recreation visitor use, however, it had only 3.5 million visits compared to the ARP's 6.2 million visits.

A total of 2390 visitors were contacted on the ARP during 2000. Approximately, seventy-one percent of those interviewed said their primary purpose on the Forests/Grassland was recreation. The remaining 29 percent who agreed to be interviewed were not recreating, including 2.8 percent who just stopped to use the bathroom, 6.1 percent who were working, 12.5 percent who were just passing through, and 8.2 percent who had some other reason to be there.

The following are some of the other results reported for the ARP. For more reporting information go to the internet at *http://www.fs.fed.us/recreation/recuse/recuse.shtml*

Description of Visitors Wilderness Visitors

Several questions on the NVUM survey form dealt directly with use of designated Wilderness. Wilderness was sampled 28 days on the Arapaho and Roosevelt National Forests. (The Pawnee National Grassland has no designated Wilderness.) There were 63 percent male and 37 percent female visitors to Wilderness on the Forests. See the table below for the age distribution.

Age Distribution of Wilderness Visitors on Arapaho-Roosevelt National Forests.

Age Group	Percent in Age Group
Under 16	6.2
16-20	7.4
21-30	9.1
31-40	24.9
41-50	37.1
51-60	11.9
61-70	3.3
Over 70	0

The majority of the Wilderness visitors were ethnically white (95 percent). See the following table for race/ethnicity distribution.

Race/ethnicity of Arapaho-Roosevelt National Forests Wilderness visitors.

Category	Total Percent of National Forest Visits
Black/African American	0.2
Asian	0.2
White	94.6
American Indian/Alaska Native	0
Native Hawaiian or Other Pacific Islander	0
Spanish, Hispanic, or Latino	0.2
Other	4.8

The average length of stay in Wilderness on the Forests was 3.3 hours. In addition, all visitors were asked on how many different days they entered into designated Wilderness during their national forest visit even if we interviewed them at a developed recreation site or general forest area. Of those visitors who did enter designated Wilderness, they entered 1.5 different days.

Forty-four percent of those interviewed in Wilderness said they used the services of a commercial guide.

Wilderness visitors on the average rated their visit 5.2 (on a scale from 1 to 10) concerning crowding, meaning they felt there were few people there. Twenty-nine percent said the area they visited was overcrowded (a 10 on the scale) and 7 percent said there was hardly anyone there (a 1 on the scale).

There is one priority management emphasis question for the Wilderness 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, there was some rehabilitation of existing designated campsites, which were showing resource damage.

Recommendations:

1. Increase field presence to improve regulation compliance and improve: visitor understanding of Wilderness " Leave No Trace" ethics; opportunities available and a better understanding of the Wilderness resource.
2. Continue to do deferred maintenance trail surveys and use a global positioning system to accurately locate all Wilderness trails.

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

Legally Required Monitoring Activity Accomplishments for FY 2001

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.

GPRA GOAL: **Provide Multiple Benefits to People**

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:

Monitoring of projects to ensure visual quality is maintained is done for most projects, but this has been complicated because the ARP is changing from the Visual Management System which is currently part of the 1997 Revised Forest Plan to the relatively new Scenery Management System which will be adopted into our Forest Plan via an amendment.

The Visual Management System (VMS) was developed and implemented in the 1970's and early 1980's. In the 1990's a new system was introduced—the Scenery Management System (SMS). The SMS embraces many of the concepts of the earlier VMS, but it enhances the consideration of humans in the landscape and the ecological forces that influence the land.

Forest Service direction requires changing from the VMS to the SMS. Due to time and budget constraints the ARP has not implemented the SMS on a Forest/Grassland-wide basis, but the ARP is implementing the SMS on a specific project-by-project basis. New and on-going projects, for example, the proposed future of Interstate 70 through the Arapaho National Forest and the vegetation manipulation projects on the Front Range of the Forest, have included SMS or the concepts of SMS.

The first step of implementing the SMS on the Forest/Grassland has been taken by developing a Forest-wide GIS layer containing social information—the Sense of Place map.

The National Forest Built Environment Image Guide is a system of keeping Forest Service signing and building/campground architecture consistent and in keeping with the "natural" landscape character. The architectural image guide standards were implemented into the design of the new fire facilities (bunkhouses, garages, supply buildings)

Recommendations:

1. Include scenery evaluation in any NEPA projects
2. Continue to monitor the condition of the visual resource on the Forests and Grassland.

3. Gather inventory data as time and budgets allow to facilitate the implementation of SMS.
4. Continue to use SMS on new projects.
5. Continue to monitor any sign, building or architectural change on the ARP for compliance to the Built Environment Image Guide.
6. Design a protocol that sets standards for trail signs, site signs and site architecture and forest entrance signs specific to the Arapaho and Roosevelt National Forests and Pawnee National Grassland.
7. Do a Forest Plan amendment adopting SMS.

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

Legally Required Monitoring Activity Accomplishments for FY 2001

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	Informal review indicates a good level of awareness for the visual resource by personnel of the ARP. Visual resource specialists need to continue developing tools to maintain and enhance this level.
Effects of management practices. 36 CFR 219.11(d)	Years 5 & 10	Years 5 & 10	Informal review indicates a good level of awareness for the visual resource by personnel of the ARP. Visual resource specialists need to continue developing tools to maintain and enhance this level.

GPRA GOAL: **Provide Multiple Benefits to People**

Timber

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 3.9 million board feet, which was 48% of the actual target set by the Regional Office. The shortfall in the timber target was due to an appeal and subsequent remand of the Bearscat Timber Sale Decision Notice. This sale was planned for offer during fiscal year 2001. It will be offered in fiscal year 2002 upon resolution of the remand.

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. A team of specialists reviewed two small sales, Table Mountain and Road Kill. On Table Mountain it was identified that two units partially did not meet soil quality standards due to soil compaction some of which was contributed to this sale and some due to previous activity in the area. Mitigation measures were prescribed. On Road Kill Sale wildlife standards were not met.

Reforestation

Monitoring plots were used to verify regeneration success to determine if lands were adequately restocked. 277 acres were naturally restocked and met the “adequately restocked “ standard of the 1997 Revised Forest Plan. Any lands not adequately restocked within the 5-year period have been scheduled for tree planting.

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.

Ongoing Issues:

1. The continuing soft timber market could affect the bidding on timber sales for fiscal year 2002.
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 2001

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 1st, 3rd and 5th years per FSM 2472.4	Annual	Targets were met. 277 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. Openings were 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. Some soil compaction issues were identified in the review of the Table mountain Timber Sale. This will need to be better addressed in future environmental analyses and prescribed mitigation measures.

GPRA GOAL: **Provide Multiple Benefits to People**

Rangeland Vegetation

Rangelands are a major component of ecosystems on the Arapaho/Roosevelt/Pawnee. They are lands that include a large representation of herbaceous and graminoid (grass) species. Rangelands include but are not limited to: grasslands, forblands, shrublands, open-canopied forests, and associated riparian and aquatic areas. Well-managed rangelands provide for the production of vegetation and 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. Rangeland vegetation is managed by planning and implementing livestock grazing systems to control livestock numbers and distribution, and by treatment of vegetation by mechanical practices, prescribed fire, and herbicides.

Monitoring:

Rangeland monitoring and evaluation are essential to good rangeland management. Monitoring and evaluation is described as the gathering of sufficient information so the manager knows what is happening and why it is happening. Goals and objectives in the Forest Plan and in Allotment Management Plans portray a vision of desired conditions of allotment resources. The intent of monitoring and evaluation is to test the success of the prescribed management strategy in accomplishing these goals and objectives.

The following is a summary of the rangeland monitoring that occurred on the ARP in 2001:

- On the ground allotment inspections occurred on 205 range allotments. Several items were monitored during the allotment inspections: livestock ownership; livestock numbers to insure stocking does not exceed permitted numbers; management system compliance, including if livestock are in the correct pastures for the correct seasons; verify permittee maintenance of range improvements; determine livestock distribution; inspect salting locations; estimate forage utilization and forage residue; estimate vigor of plant species; record locations of noxious weeds.
- Rangeland inventory and monitoring data collection was started on the Dowdy, Elkhorn, Seven Mile, Wintersteen, and Lonepine Allotments on the Canyon Lakes Ranger District. This data will be used to evaluate rangeland health and for the affects analysis in the Environmental Assessments that are planned for these allotments in 2004.
- Long-term trend monitoring was conducted on the Muddy and Skylark allotments on the Sulphur Ranger District. Several monitoring actions were accomplished to determine if Allotment objectives are being met:
    - Proper use in riparian areas.
    - Ecological condition of riparian areas.

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 out by the permittee.

Ongoing 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 2001

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 FY2001. 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 includes public outreach, research, interpretation, and stewardship of heritage resources.

Monitoring:

Compliance

During fiscal year 2001 a total of 55 projects was submitted to the heritage program staff for compliance review. Of these, 37 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 2001 as well as trend data from previous years.

Heritage Resource Inventory Trend Data, FY 1997-2001.

Year	Acres Surveyed	Sites Evaluated
2001	2082	116
2000	1895	131
1999	5711	95
1998	6013	92
1997	3134	113

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 Forests and Grassland heritage site and survey data into GIS. During FY2001, 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 the national standard. This is an ongoing effort.

The addition of the National Fuel Reduction Plan to the Forests workload created a challenge to the heritage team as it set forth NEPA and 106 timeframes, which were greatly accelerated. In an effort to streamline the 106 process of the National Historic Preservation Act, the Regional Office negotiated a Programmatic Agreement (PA) with the Advisory Council on Historic Preservation and the Colorado State Historic Preservation Office to identify survey strategies for fuel reduction projects. In addition this Forest negotiated a similar PA, which defined activities for Mechanical Fuel Reduction projects, which defined activities, which were determined to have no potential to adversely affect resources. These Programmatic Agreements allowed the heritage team to streamline the amount of field inventory required for fuel reduction projects.

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 2001, we hosted one PIT project resulting in 2,500 hours of contributed labor, at a value of over $ 35,000.

Heritage Program Activity Trend Data, FY 1997 – 2001.

Year	Sites Interpreted	Sites Preserved and Protected
2001	3	30
2000	20	30
1999	14	29
1998	9	32
1997	0	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 2001 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 2001

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

GPRA GOAL: **Provide Effective Public Service**

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 2001 than usual years because of the lack of sufficient funding for the program. Numerous lands specialists found themselves seeking funding in other program areas because of the lack of lands funding. The shortage of funding also did not allow for scheduling specialists for the NEPA process for permit actions. In addition, available specialist time was assigned to cover needs in higher priority areas, primarily fuels planning. These actions almost eliminated any time allocated to the land programs's recurring (backlog) cases that makes up the majority of work.

Land adjustments are multi-year projects in most cases. One significant exchange in the Winter Park area was completed in 2001. Four cases that have been worked on in fiscal year 2001 will be completed in fiscal year 2002.

Special use authorizations are permits, leases, or easements, which allow occupancy, use, rights, or privileges of NFS land. Although our target was to process 40 special use cases, the lands team processed 38 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 fiscal year 2002 included 29.0 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 15.0 miles of new line and 1.0 miles of maintenance per year with very minimal trespass encroachment or trespass cases discovered or resolved. This level of funding does not provide support to other functions nor does it 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 2001 will be completed in fiscal year 2002.

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 40 special use cases, the lands team processed 38 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.

The shortage of time and funding for specialists let to the development of a streamlined NEPA checklist process for addressing our backlog of special uses. The process allowed a quick review of renewal and reissuance by specialists and "check off" that there were no issues or concerns. We found that this process is very efficient and saves time for the reissuance of simple authorizations.

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.

4. Boundary Management - 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 winter 2002). 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 causing 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 2001

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.

GPRA GOAL: **Provide Effective Public Service**

Transportation

The goal of the transportation program is to manage roads and trails to support resource management and allow access by the public to and through National Forest and National Grassland lands. Travel management consists of three components: transportation planning in support of increased users and uses, implementation of projects resulting from transportation planning; on-going maintenance and monitoring of the decisions made on the transportation system.

Monitoring:

Planning: Clear Creek and Boulder Ranger Districts began the year scoping their publics for issues and concerns, but due to shifts in workload later in the year, the planning was put on hold with the commitment to begin again in fiscal year 2002. Conclusion of this effort in fiscal year 2002 will lead to travel management plans, which will review specific travel issues and validate or recommend updates to the transportation system and its uses.

Implementation: Implementation of projects occurs when transportation decisions are made in the planning stage and are funded through capital investment, timber purchaser or other programs. Through the Capital Investment and Timber Purchase program, 27 miles of road was reconstructed to standard (Forest Plan, page 8, Objective 7). Seventeen miles of classified and unclassified ("ways") roads were decommissioned (Forest Plan, page 7, Goal 2). When a road is decommissioned, it is taken out of service and closed permanently to all uses. Additionally, eight miles of trail were constructed (Forest Plan, page 8, Objective 7).

O*n-going Maintenance and Monitoring:* Ongoing maintenance includes the recurring work such as system road and trail maintenance, 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 decommissioning previously decommissioned (closed or obliterated) roads. This work involved replacing damaged gates, fences, boulders and signs. Inventorying of existing roads continued on all districts with primary emphasis in areas of future planning projects. The Forest and Grassland personnel doing the on-going management activities are continually monitoring, evaluating and prioritizing the work for following years. Twenty-one percent (551 miles) of our road system of 2,600 miles of roads was maintained to standard. Sixty-eight percent (546 miles) of our trail system of 800 miles of both motorized and non-motorized trails were maintained to standard (Forest Plan, page 8, Objective 11). It should be noted that much of the trail maintenance was done through the donated hours of hardworking volunteer groups and individuals.

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 has been tied primarily to annual programs of work and specific projects. As explained in the first paragraph under the "Monitoring" section, above, this is a process, which is slowly occurring on several ranger districts.

Recommendations:

1. Ensure that travel management planning and implementation incorporates Forest wide 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. For roads that are decommissioned, an explanation of why this was necessary should be clearly displayed in the field to (hopefully) prohibit future trespass.
6. Minimize illegal use through expanded law enforcement and field presence. 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.
7. Work with the public and adjacent landowners to inform them of Arapaho and Roosevelt National Forests and Pawnee National Grassland travel regulations.
8. Establish a method to more adequately plan and track accomplishments and utilization of funds allocated for "ongoing" activities.
9. Incorporate travel management planning and the RAP process with other area or project level assessments and analyses for best efficiency.
10. On a forest wide basis, prioritize the areas where the forest will address travel management in association with landscape analysis or on broad project areas. Proceed with planning and implementation based on those priorities.

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. 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.

3. Many new travel routes are being established through "social" use and illegal travel activities. In some instances, users are constructing trails and then coming to the forest and asking that the forest add the new trails to our "system" and demanding that we maintain the trails. Many times, these requests are the first we know of the "new" facilities. Some liability issues could be associated with these new, illegal facilities.

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

Legally Required Monitoring Activity Accomplishments for FY 2001

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.

The following Supplemental Table is found on pages 399-405 of the 1997 Revised Forest Plan. The projected outcomes at the three budget levels, Base, Experienced and Full, were developed with historically higher budgets than the ARP has had since 1997. Note that under the FY 2001 Accomplishments column that the accomplishments are often below the outcomes set by the Forest Plan. But even in lean years some programs will be fully funded. Compare the FY 2001 accomplishments with the estimated outcomes. The ARP Monitoring and Evaluation team needs to revisit these Supplemental Tables and recommend changes in the 5-year review report.

Supplemental Table to the 1997 Revised Forest Plan

The following table shows the annual expected levels of activities and outcomes at three annual budget levels:

Budget Level	Anticipated Total Dollars
Base	9,500,000
Experienced	13,500,000
Full	19,500,000

These outcomes are based on the Forest Plan priorities (biodiversity, fire, fuels, recreation, lands and travel) outlined in Chapter One of the Forest Plan.

Supplemental Table 1. Comparison of FY01 Accomplishments with Annual Activities and Estimated Outcomes by Budget Levels Presented in the Revised Forest Plan.

Activities (with MAR Codes)	Meas. Unit	FY 2001 Accomp-lishments	Est. Outcomes by Budget Level			Comments on Accomplishments, Budget, and FY2001 Funding Level
			Base	Exper-ienced	Full	
Planning Inventories						
Forest Plan Amendments	# of Amend	0	2	2	4	National Fire Plan shifted priorities
Monitoring and Evaluation Report	Report	1	1	1	1	This report
Wldf/Fish/TES Habitat Trend	Report	1	0	1	1	Year 5 summary will be the first comprehenisve comparison of population trends.
Soil Monitoring	ELU	5	0	4	8	In 2001 target was changed to 5 sites monintored, per RO PBA direction
Rec/Wilderness Monitoring	Report	0	0	0	1	Volunteers monitored
Air Qual. Related Values Inventoried	AQRVs	8	13	30	60	7th year of a 10 year lake sampling program was completed, 8 lakes sampled
Landscape Scale Assessments	Report	2	3	6	10	Williams Fork and
Watershed Assessment	Report	0	0	5	10	
Integrat. Inventories Ldscape Lvl (IRI)	Acres	426,000	300,000	300,000	300,000	
TEUI Land Unit Scale (Soils)	Acres	see comments	0	12,000	36,000	Approx 85% complete, all field work done, all spatial data complete (except a few updates), tabular data approx 60% complete for AR and 5% complete for PNG
Stream Reach Inventory	Miles		0	10	22	
Forest Resoure inventory	Acres	0	0	0	65,000	
Rangeland Inventories	Acres	5	5,500	5,500	15,500	Allotments on Canyon Lakes
Wildlife Habitat Inventory	Acres	63000	2000	4000	6000	Same acres as TES inventory, mostly on Pawnee NG
TES Species Habitat Inventory	Acres	63000	6,550	13,250	19,950	Same acres as WL inventory, mostly on Pawnee NG
Heritage Inventory	Acres	10,000	15,000	17,000	20,000	Attribute GIS layers
Stand Exam	Acres		4,000	9,000	13,500	
Range Program						
Allots. Administered to Standard	Allots.	75	83	166	269	
Allotment Administration	Allots.	205	204	408	612	
Allot. Analyzed/Decisions Implemented	Allots.	0	3	8	15	Specialists time used for National Fire Plan Projects instead of range NEPA

Activities (with MAR Codes)	Meas. Unit	FY 2001 Accomp-lishments	Est. Outcomes by Budget Level			Comments on Accomplishments, Budget, and FY2001 Funding Level
			Base	Exper-ienced	Full	
Rngld Monitored and Evaluated	Acres	38,000	3,700	9,400	18,8,00	
Rng Structural Improvements	Structures	15	14	28	48	
Soils Program						
Abandoned Mines - Close	Sites	0	5	30	80	Due to vacant position, target was not met
Soil/Water Resource Improvmts	Acres	20	0	10	20	
(road closure for travel mgmt)	Miles	1.25	0	5	10	Cabin Creek
Improve Watershed Health	Watershed	0	5	5	5	While watershed improvement projects have improved specific sites, no watersheds have been improved sufficiently to improve to a higher condition class.
Wildlife Program						
Closing of Open Roads	Acres Miles	979	335 2.5	670 5	1,005 7.5	Boulder WL seasonal closures and Pawnee road obliterations
Prescr. Burn for PP Old Growth	Acres		200	400	600	Other priorities, No funding
Prescr. Burn for Elk/Sheep	Acres		80	80	160	Other priorities, No funding
Cut Doug-fir for Ponderosa Pine Old Growth	Acres		20	45	65	Other priorities, No funding
Aspen Regeneration	Acres		0	60	110	Other priorities, No funding
Reduce Conifer Encroachment	Acres		0	0	50	Other priorities, No funding
Riparian Restoration	Acres		0	2	3	Other priorities, No funding
Travel Management	Acres		0	0	640	Other priorities, No funding
Structural Improvement	Structures		0	12	28	Other priorities, No funding
Wildlife Program with Partnerships						
Prescr. Burn for Elk/Sheep	Acres	425	80	80	160	Dadd Bennett
Cut Doug-fir for Ponderosa Pine Old Growth	Acres		20	45	65	Other priorities, No funding
Aspen Regeneration	Acres		0	0	50	Other priorities, No funding
Wildlife Benefits from Other Programs						
Prescr. Burn for Ponderosa Pine Old Growth	Acres		200	400	600	Other priorities, No funding
Prescr. Burn for Elk/Sheep	Acres		80	80	160	Other priorities, No funding
Cut Doug-fir for PP Old Growth	MBF		20	45	65	Other priorities, No funding
Aspen Regeneration	MBF		0	50	150	Other priorities, No funding
Reduce Conifer Encroachment	MBF		0	0	50	Other priorities, No funding
Threatened and Endangered Species Program						
TES Fish Stream Barrier/Restoration	Strm Miles		2	4	4	Other priorities, No funding
Prescribed Burn on PNG	Acres	1280	640	640	1280	Continuing effort

Activities (with MAR Codes)	Meas. Unit	FY 2001 Accomp-lishments	Est. Outcomes by Budget Level			Comments on Accomplishments, Budget, and FY2001 Funding Level
			Base	Exper-ienced	Full	
Habitat	Acres	800	25	40	100	Buttes Raptor Closure
Structure Improvement	Structures		0	0	4	
Threatened and Endangered Species with Partnerships						
TES Fish Stream Barrier/Restoration	Strm Miles		2	4	4	
Habitat Protection	Acres		25	25	85	
Fisheries Program						
Biological Assessment	Tasks		1	3	5	
Move Watersheds to Functional-Streams	Miles		5	7	8	
Move Watersheds to Functional – Lakes	Acres		0	0	0	
Improve Channel Stability – Stream	Miles	1.25	0	2	20	Cabin Creek riparian restoration
Structure Maintenance	N/A		0	10	20	
Protect Aquatic Resource– Stream	Miles		12	32	42	
Protect Aquatic Resource–Lake	Acres		0	50	250	
Fisheries Program with Partnerships						
Improve Channel Stability – Stream	Miles		0	2	3	
Move Watersheds to Functional – Lakes	Acres		0	0	0	
Protect Aquatic Resource– Stream	Miles		12	14	24	
Protect Aquatic Resource–Lake	Acres		0	50	250	
Law Enforcement Program						
Coop Law Enforcement	Coop Agreemnts	6	7	7	7	Agreements with operating plans with Larimer, Grand, Weld, Boulder, Gilpin, and Clear Creek Counties. The Pike National Forest has an agreement with Jefferson County.
Forest Vegetation Program						
Natural Regeneration Certification	Acres	277	400	400	400	
Planting	Acres	0	50	50	50	No planting scheduled for FY01
TSI	Acres	298	0	200	686	
Timber - Road Program						
Road Construction	Miles	0	1.6	4.1	5.4	

Activities (with MAR Codes)	Meas. Unit	FY 2001 Accomp-lishments	Est. Outcomes by Budget Level			Comments on Accomplishments, Budget, and FY2001 Funding Level
			Base	Exper-ienced	Full	
Road Reconstruction	Miles	3.8	4	10	13	
Brush Disposal Program						
Fuels Treatment, Brush Disposal	Acres	58	200	300	375	
Timber Salvage Program						
Timber Volume Offered	MBF	87	900	900	900	
Land Line Location	Tasks	0	0.5	0.5	0.5	
Heritage Inventory	Acres	0	250	250	250	Completed in previous years for area treated.
Fuels Treatment	Acres	10	100	100	100	
Biological Assessments	Tasks	1	2	2	2	
Fuels Program						
Fuels Treatment	Acres	2903	2,000	4,000	7,000	
Fuels Program Benefitting Other Programs						
Wildlife Habitat Restored/Enhanced	Acres	1705	1,000	2,000	3,500	
Timber Volume Offered	MBF	0	100	200	350	
TES Habitat Mgmt Biological Assess.	Tasks	3	3	5	8	
Air Quality Related Values	AQRVs	2	3	6	10	
Fuels Vegetation Program from K-V						
Natural Regeneration Certification	Acres	0	300	700	950	None scheduled in FY01
Site Preparation	Acres	0	100	225	300	None scheduled in FY01
Planting	Acres	0	10	25	40	None scheduled in FY01
TSI	Acres	105	75	175	220	
Wildlife Habitat	Acres	0	100	200	260	None scheduled in FY01
Wildlife Structure	Structures	0	5	10	13	None scheduled in FY01
Road Obliteration	Miles	0	6	12	16	None scheduled in FY01
Soil and Watershed Improvement (13.0)	Acres	0	5	10	13	None scheduled in FY01
Inland Fisheries	Miles	0	0	1	1.6	None scheduled in FY01
Timber Management Program						
Timber Volume Offered	MBF	3764	2,000	5,000	6,500	
Timber Management Benefitting Other Programs						
Land Line Location	Miles	0	2	5	8	
Heritage Inventory	Acres	1211	1,000	2,500	3,250	
Fuels Treatment	Acres	0	100	250	325	
Wildlife Habitat	Acres	0	100	250	325	
Biological Assessments	Tasks	3	3	6	8	
Lands Program						

Activities (with MAR Codes)	Meas. Unit	FY 2001 Accomp-lishments	Est. Outcomes by Budget Level			Comments on Accomplishments, Budget, and FY2001 Funding Level
			Base	Exper-ienced	Full	
Land Ownership Adjustment	Acres	224	500	600	600	Continental Divide Nat'l Scenic Trail, Early and Olson
Encroachment, Land Ownership Administration	Cases	14	6	7	7	
Donations	Acres	0	5	5	5	
Landownership Administration – Small TractsActss	Cases	3	10	15	27	Very little specialist time available to work on cases
	Withdrwl Cases	0	4	6	12	
	Encroach Resolved		10	20	44	
Multi, Land Exchange						
Land Exchange - Fee Partial Interest	Acres Cases	1,773 1	500 5	1,500 6	4,300 11	Winter Park II
Right-of-way Acquisitions	Cases	10	5	8	23	
Encroachment Cases	Cases	1	20	24	44	
Multi, Special Uses						
SUP Applications Processed	Permit	38	146	146	146	
SUP to Standard	Permit	441	523	609	707	
SUP Aurthorization	Permit	497	854	854	854	Total # minus number of SUP that expired or not to standard
FLPMA	Cases	8	10	10	10	
Encroachments Solved	Cases	2	10	10	10	
Surveying Program						
Landline Location	Miles	29.0	2.5	8.5	40.5	29.0 miles accomplished due to increased funding level. It appears this level of funding will not occur in the future and should be more in line with the experienced level, although the program should be funded at the full level just to make a dent in the backlog.
Landline Maintenance	Miles	5.0	7	17	47	5.0 miles of maintenance done as part of normal operations. S-table is way out of proportion and should really reflect the following: 3, 5, 10. Also, special Boundaries need to be

Activities (with MAR Codes)	Meas. Unit	FY 2001 Accomp-lishments	Est. Outcomes by Budget Level			Comments on Accomplishments, Budget, and FY2001 Funding Level
			Base	Exper-ienced	Full	
						addressed a the next revision cycle during the 5-year review of the 1997 Revised Forest Plan.
Minerals Management Program						
Leas. Energy Opns. Processed	Cases	7	4	4	4	
Leas. Energy Opns. Admin to Standard	Operations	13	80	70	85	Less accomplishement due to ranger district staff position was vacant.
Leasable Active Energy Opns	Operations	101	70	70	92	
Leas. Energy Acres Processed	Acres	16,341	15,000	15,000	7,319	
Locatable Min., Nonbonded, nonenergy	Operations	9	8	8	8	
Locatable Min., Bonded, nonenergy	Operations	5	11	11	11	
Total Parcels, Locatable Minerals	Operations	?	11	11	11	
Bonded to Standard	Operations	3	8	8	8	
Recreation, Road and Trail Construction/Reconstruction						
Developed Rec - Rehab Existing	Sites		60	60	75	
Developed Rec - Construct New	Sites		0	0	25	
Dispersed Rec - Rehab Existing	Sites		0	30	60	
Dispersed Rec - Construct New	Sites		0	0	30	
Convert Ways to Roads/Trails	Miles		0	15	30	
Rights-of-Way	Cases		8	9	17	
Recreation Program						
Total Miles Nonwild. Trails Available	Miles		379	379	379	
Trails Obliterated	Miles		7	14	14	
Recreation Use Permits	Permits	363	368	389	389	Permit numbers in database
Special Use Ski Areas	Permits	4	4	4	4	
Travel Management Program						
Miles to Standard	Miles	551	380	380	380	Increase due to miles of road maintained through Schedule A program.
Miles Available	Miles	2600	2,547	2,547	2,547	Increase in mileage due to invetory updates.
Miles Obliterated	Miles	17	5	5	5	Increase in mileage due to decommisioning of resource damage non system (‘way”) roads.
Additional Miles Maintained	Miles	0	10	20	35	No funding for this

Activities (with MAR Codes)	Meas. Unit	FY 2001 Accomp-lishments	Est. Outcomes by Budget Level			Comments on Accomplishments, Budget, and FY2001 Funding Level
			Base	Exper-ienced	Full	
Road Construction	Miles	0	1	2	4	No projects required new construction
Road Reconstruction	Miles	27	1.5	3	7	Increase due to timber sale program, NFP and CIP.
Trail Construction/Reconstruc.	Miles	8	2.5	5	11	Increase due to Continenal Divide National Scenic Trail Initiative
Wilderness Management Program						
Total Wilderness Trails Available	Miles		343	343	343	

Status of FY 2000 Recommended Actions

The FY 2000 Monitoring and Evaluation report listed numerous monitoring activities for FY 2001. Many of these activities were started or continued from the previous year. Some, due to lack of funding, an active fire season, or priorities shifting to National Fire Plan did not get implemented in 2001.

The following projects stated in the FY 2000 Report were begun or accomplished in FY 2001.

- A major monitoring to oversee project planning and NEPA compliance indicated many areas for improvement in mitigation measure development, legal requirements, and monitoring during and after project implementation.

- 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 completed in FY 2000 had results reported in FY 2001. See the Recreation and Wilderness sections in Chapter 2.

The following projects stated in the FY 2000 Report were delayed due to inadequate funding or due to personnel redirected to other priorities.

- 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 are delayed until the 5-year Forest Plan review.

- The Scenery Management System (SMS) amendment analysis will not begin until 2002 due to funding and personnel contraints. 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 2002

All on-going monitoring programs should be continued. We will continue to monitor those legally required items shown in Table 4.1on 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 will select a program for office analysis of program funding, Supplemental Table predictions of outcomes and actual accomplishments.

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 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
Carl Chambers	Forest Hydrologist
Kevin Colby	Landscape Architect
Steve Currey	District Ranger
Chuck Dunfee	Law Enforcement Officer
Mike Foley	Fire/Vegetation Management Officer
Maryanne Kurtinaitis	Lands
Dennis Lowry	Forest Wildlife Biologist
Veronica Mitchell	Civil Engineer
Karen Roth	Interdisciplinary Planner
Kristin Sexton	Forest Fisheries Biologist
Sue Struthers	Heritage Resources
Carl Sumpter	Land Surveyor
Kenneth Tu	Forest Planner