Arapaho and Roosevelt National Forests
And
Pawnee National Grassland

Monitoring and Evaluation Report of the

1997 Revision of the Land and Resource Management Plan

for

Fiscal Year 2005

Table of Contents

Forest Certification

The 1997 Revision of the Land and Resource Management Plan (Forest Plan) has provided goals and objectives to direct the future of resource management of the Forests and Grassland for the next ten to fifteen years. The Forests and Grassland have completed the eighth season of implementing plan goals and objectives. Lessons learned from these eight years of monitoring and evaluation point how to better conduct 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 completed on Forest Plan amendments for management indicator species and stream flows, and work has been initiated to incorporate the Williams Fork area into the Arapaho and Roosevelt National Forest and Pawnee National Grassland (ARP) Revised Forest Plan from the Routt National Forest Revised Forest Plan.

/s/ Jacqueline L. Parks

Jacqueline L. Parks
Acting Forest Supervisor

Introduction

Location and History:
The Arapaho and Roosevelt National Forests (ARNF) include 1.3 million acres of public land (not including the Williams Fork Area) in the Rocky Mountains and foothills of north central Colorado. Boundaries extend north to the Wyoming border and south of Mt. Evans and Interstate-70. These two National Forests include 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.

The Pawnee National Grassland (PNG) 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 USDA 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 the other heavily populated areas along the northern Front Range (Boulder, Ft. Collins, Longmont, Loveland and Greeley) and, therefore, are considered to be one of the fourteen Urban National Forests nation-wide. The landownership pattern of the ARP creates special challenges, with approximately 750,000 acres of small private parcels intermixed with federal lands.

Eight Years of Forest Plan Implementation:
The ARP is making progress in accomplishing Forest Plan objectives. Actual levels of accomplishment vary by programs due mainly to funding levels. When program budgets were low during these past eight years, staffing was reduced and projects were not implemented. The Forest Plan was optimistic in its funding predictions and, therefore, predictions for program objectives (Chapter 1, Forest Plan) was also overly optimistic. Some programs, though under-funded, have benefited from other well-funded projects. For example, the Wildlife Program is typically under-funded and wildlife habitat improvement acreage would have only increased in small increments. Yet, due to the increased funding to treat hazardous fuels, more acreage of wildlife habitat improvement has occurred than funding would have allowed.

There are many highlights since the 1997 Revised Forest Plan. Developed recreation has been invigorated through the Capital Investment Program. Many of the ARP's campgrounds have been reconstructed to bring them up to the standard our camping visitors expect. The campground concessionaire contract is working well and management of our campgrounds is running smoothly. The Recreation Fee Demonstration program is providing more funding for our more heavily impacted recreation areas such as Mt. Evans and the Arapaho National Recreation Area. Through the fees our visitors pay to use these areas, we are able to maintain these facilities to a higher standard and expand

interpretation and education programs. The Dos Chappell Nature Center has been built off the Mt. Evans Road that will provide the public more information about the surrounding fragile environment. In addition, recreation fees for managed parking at the Brainard Lake area on Boulder Ranger District help offset costs of managing the parking areas, cleaning and pumping the toilets, cleaning up and trash service for the picnic areas and some limited trail maintenance from the Mitchell Lake and Long Lake Trailheads.

Through increased public and congressional awareness, the ARP is receiving increasing funding to treat the buildup of dead trees and dense, overgrown forests. Through this hazardous fuels reduction we will better protect against the devastation of wildfires. Through "Good Neighbor" programs, our ranger district personnel are actively working with local communities, county and state governments to plan potential hazardous fuels treatment areas. In Fiscal Year 2005 (Oct 1, 2004 - September 30, 2005) the ARP treated over 13,000 acres of hazardous fuels. By the end of Fiscal Year 2006 (FY 2005) we are expecting to complete planning to treat an additional 50,000 acres.

The timber program was able to offer and sell over 1,700 acres of timber. In FY 2005, over 3,500 acres of timber were harvested from the Forests from previously sold sales.

The ARP is pockmarked with abandoned mines. In 2005 important progress was made in rehabilitating abandoned mines. The Fair Day Uranium mine was reclaimed which included the consolidation of 3,500 cubic yards of waste-rock. A total of 1.5 acres of upland was amended and revegetated. Approximately .25 acres of wetlands were enhanced and/or created. Revegetation was completed on the Dibbens/Sydney Mine and approximately 0.75 acres of upland were revegetated including 0.2 miles of reclaimed access road. Preliminary Assessment/Site Investigations were completed for the West Gold, Bob Tail, and Doctor Mines. A contract was completed for a Removal Action at the Doctor Mine to be implemented in FY 06. Funds were transferred to EPA and initial planning completed for a Removal Action at the Bueno Mine/Streamside Tailings to be implemented in FY 06. Funds were transferred to the Colorado Division of Minerals and Geology for the closure of 25 mine openings.

Accomplishments were made in land ownership adjustments in 2005. The fourth phase of the Beaver Brook Watershed acquisition occurred adding to the final total of a 2,700-acre parcel that serves as an important wildlife refuge. This Beaver Brook area near Evergreen is one of the last remaining intact low-elevation, forested ecosystems along the Front Range of Colorado. Acquisition of a parcel of land on the Sulphur Ranger District added 40 acres of National Forest System land. This acquisition was purchased using the Land and Water Conservation Fund. The property is located on the south edge of the Town of Grand Lake, above the south shore of Grand Lake itself, within the Arapaho National Recreation Area (ANRA). The ANRA is managed to provide high quality recreation, conservation of scenic and historic values, and the stewardship of natural resources. The area receives national and international visitors as well as local use.

The Pawnee National Grassland has utilized prescribed fire to improve mountain plover habitat and reduce hazardous fuels. The Grassland has been diligently working with its range allotment permittees to improve range condition through better cattle distribution and improved grazing systems. Seventy percent of all PNG allotments were administered and monitored. Over 27,000 acres of rangeland received rangeland improvements to improve their ecological condition. The PNG is interspersed with numerous roads and "two-tracks". The district staff has been doing extensive travel management planning which has led to improving highly used roads and closing little used roads to improve wildlife and range habitat.

Noxious weeds are a problem in some areas on the ARP. To move proactively ahead in reducing this problem a Forests- and Grassland-wide noxious weed management plan was developed. Nine hundred and seventy-one (971) acres of weeds were treated across the ARP in 2005.

Many activities on the Forests and Grassland affect the soils. A forest-wide soil monitoring program is ongoing. Soil monitoring was conducted for various management activities including timber harvest, prescribed burning, range on the Grasslands, and road obliteration. Monitoring included collection of data in the preparation of environmental analyses, cumulative effects, and assessment of impacts of management activities on soils during and after project implementation. Methods and parameters were tested for different management activities and information was digitized. Soil condition transect information was collected in proposed project areas to determine pre-treatment soil condition and existing condition of project area soils. These transects will be visited after treatments and mitigation are implements to determine compliance with WCPH, Regional and Forest Plan soil condition standards and to assess effectiveness of implemented mitigations.

Not enough can be said about the hundreds of volunteers on the ARP. By hiking in the Wildernesses, raft-patrolling on the Poudre River, working on the Continental Divide trail, maintaining the 100s of miles of summer and winter trails, counting birds, working in our offices, and ad infinitum; these volunteers provide a tremendous service to the public and helped provide services that would otherwise have been eliminated due to reduced Forests and Grassland budgets. Our volunteers and partners provided over 92,000 hours of volunteer work on a yearly basis.

The Arapaho and Roosevelt National Forests and Pawnee National Grassland personnel are proud of the work they have done even through lean budget years. However, we all recognize that we need to do better in the areas of travel management and field presence/law enforcement.

The Forest Plan recognizes the importance of managing our road system and the Roads Analysis Process (national Forest Service direction) requires that we maintain a minimum road system that meets the public needs while considering ecologic, economic and social attributes of the road system. Increasing motorized and mechanized recreation on the ARP and minimal transportation planning and implementation dollars have increased the challenge of meeting our travel management needs We recognize that we have much work to do to meet Forest Plan expectations.

Limited recreation management and law enforcement funding have maintained minimal Forest Service employee presence in the Forests and on the Grassland. This puts an undo burden on our few law enforcement officers who are required to cover 700,000 acres per officer and respond to over 850 incidents per year. While the public is being underserved because the ARP personnel are not “in-the-woods” to answer visitors’ questions or to protect public land resources through enforcement of regulations, some progress was made in our General Forest Areas (GFA) by emphasizing efforts to provide uniformed Forest Service presence in the field during critical high-use periods, recording 660 GFA days managed to standard (DMS) in 2005.

Of particular note in FY 2003-2005 is Left Hand Canyon on the Boulder Ranger District. This canyon has had uncontrolled motorized use causing major erosion and loss of vegetation. The district applied for and received a $250,000 grant through the State of Colorado Off-Highway Vehicle Program to address these problems. The district has installed $40,000 of post and cable to control use off roads and trails. Additional law enforcement has been hired. New plate steel signage to notify users of opportunities and regulations has been installed. Volunteer coordination by the District for various work-day projects has accomplished over 1,000 hours of volunteer work from OHV and trail rider

groups. In 2005 the district will begin travel management planning for this area with a designated road and trail system as the anticipated product.

The remainder of this report describes Forest Plan monitoring and evaluation. In these sections there is more in-depth information about programs and resources on the Arapaho and Roosevelt National Forests and Pawnee National Grassland.

Monitoring and Evaluation

The 1997 Revised Forest Plan describes a monitoring program to evaluate forest plan implementation, which is programmatic and designed to evaluate the conditions on the Forests and Grassland. Monitoring and evaluation are separate, sequential activities required by the National Forest Management Act (NFMA) regulations to determine how well objectives have been met and how closely management standards and guidelines have been applied. Monitoring usually includes data collection and information gathering. Evaluation is the analysis of the data and information and the results are used to determine the need for changes to the Revised Forest Plan or how it is implemented.

To guide this monitoring and evaluation process, Chapter 4 of the Revised Forest Plan lists many monitoring questions presented in two tables. Table 4.1 lists the questions, which were developed to address the legally required monitoring per NFMA. The Revised Forest Plan management emphasis goals and objectives are addressed in the questions found in Table 4.2.

Table 4.1. Minimum Legally Required Monitoring Activities.

Action, Effect or Resource to be Measured	Frequency of Measurements	Precision and Reliability*	M & E Report**
Lands are adequately restocked. 36 CFR 219.12(k)5(i)	Mix of 1st, 3rd & 5th years per FSM 2472.4	A	Annual
Lands not suited for timber production. 36 CFR 219.12(k)5(ii)	Year 10	A	Year 10
Harvest unit size. 36 CFR 219.12(k)5(iii)	Years 5 & 10	B	Years 5 & 10
Control of destructive insects and diseases. 36 CFR 219.12(k)5(iv)	Annual	B	Annual
Population trends of management indicator species in relationship to habitat changes. 36 CFR 219.19(a)(6)	Years 5 & 10	B	Years 5 & 10
Effects of off-road vehicles. 36 CFR 219.21	Annual Review, Analysis years 5 & 10	B	Years 5 & 10
Effects to lands and communities adjacent to or near the National Forest and effects to the Forest from lands managed by government entities. 36 CFR 219.7(f)	Years 5 & 10	B	Years 5 & 10

Comparison of projected & actual outputs and services. 36 CFR 219.12(k)1	Annual	A	Annual
Prescriptions and effects. 36 CFR 219.12(k)2	Years 5 & 10	B	Years 5 & 10
Comparison of estimated and actual costs. 36 CFR 219.12(k)3	Annual	A	Years 5 & 10
Effects of management practices. 36 CFR 219.11(d)	Years 5 & 10	B	Years 5 & 10

*Monitoring methods used are divided into two categories, A and B based on their relative precision and reliability:

- A – Methods are generally well accepted for modeling or measuring the resource. Methods used produce repeatable results and are often statistically valid. Reliability, precision, and accuracy are very good. The cost of conducting these measurements is higher than other methods. Methods are often quantitative.
- B – Methods or measurement tools are based on a variety of techniques. Tools include: project records, communications, on site ocular estimates and less formal measurements such as pace transects, informal visitor surveys, aerial photo interpretation, and other similar types of assessments. Reliability, accuracy, and precision are good but usually less than that of A. Methods may be more qualitative in nature bu6t they still provide valuable information on resource conditions.

**The frequency of measurement and reporting are triggered by regulation as well as anticipated intervals at which gathered data will provide meaningful information.

Below are the responses to these monitoring activities. These responses were initially developed for the 5-year Forest Plan monitoring report. For this eighth year report, the narratives and the graphs have been updated. The long number with the letters "CFR" is the citation to the Code of Federal Regulations which translates Congressional Law (in this case, NFMA) into working regulations which the Forest Service can apply to management of its lands.

Lands Are Adequately Restocked - 36 CFR 219.12(k)(5)(i)

This CFR requires a determination of compliance with the standard that lands are adequately restocked as specified in the Forest Plan. Forest Plan Standard 58, Page 19, says "When trees are harvested on suitable and available lands, the cutting units must be in such a way that there is assurance that the technology and knowledge exists to adequately restock these areas within five years of final harvest. The minimum restocking levels are defined in tables 1.9 and 1.10". Forest Plan Standard 59, Page 20, describes the initiation of the five-year determination. Forest Plan Guideline 74, Page 25, indicates, "In most circumstances, rely on or make primary use of those silviculture systems which ensure regeneration of forest stands through natural seeding and suckering". In addition, Forest Plan Guideline 75, Page 25, says to "Use artificial regeneration methods when it is unreliable to count on the natural sequence of events and/or environmental conditions to regenerate the forests within five years".

Monitoring for compliance is accomplished through surveys the first, third, and fifth years following reforestation treatment. Where natural regeneration is prescribed the first year survey can be a walk-through survey to determine that the timber harvest and/or site preparation activities have produced site

conditions conducive to adequate stocking within five years following final harvest. Third year and any subsequent surveys must be fixed plots to determine stocking levels and distribution.

Since inception of the 1997 Forest Plan the silviculture objective has been to achieve natural regeneration success on harvested acres. Surveys have been conducted as required to assure restocking on suitable and available lands receiving a final harvest treatment. For the period of FY 1998 through FY 2005, 5200 acres of natural regeneration have been certified as satisfactorily restocked and 175 acres have been planted.

Natural regeneration surveys are done the first, third and fifth years following final timber harvest. The reporting that regeneration has met the Forest Plan standard is done upon completion of either the third or fifth year survey if sufficient regeneration has occurred. Therefore, these regeneration graphs are reflecting timber harvest in these prior years. The decrease in 2001 and 2002 reflect lesser timber sale activities as early as 1996 (see Appendix B, Graph 1). The artificial regeneration graph (see Appendix B, Graph 2) shows that planting occurred only one year of the eight-year period.

For timber offered, timber stand improvement, and salvage offered see Appendix B, Graphs 3-5.

Lands Not Suited For Timber Production - 36 CFR 219.12(k)(5)(ii)

This CFR requires that lands identified as not suited for timber production are examined at least every ten years to determine if they have become suited; and that, if determined suited, such lands are returned to timber production. Since it has been only eight years since suitability for timber production was determined and since there has been no indication that suitability was inappropriately determined, this examination will be deferred until a future plan revision or review at year 10 as required.

Harvest Unit Size - 36 CFR 219.12(k)(5)(iii)

This CFR requires the maximum size limits for harvest areas are evaluated to determine whether such size limits should be continued. Forest Plan Standard 63, page 22, establishes 40 acres is the maximum allowable opening acreage for all forest types. This standard was established per 36 CFR 219.27(d)(2). There was no ecological basis for this size limitation identified in the Forest Plan or its Environmental Impact Statement (EIS). However, due to salvage of dead and dying lodgepole pine from mountain pine beetle outbreaks in Grand County, exceptions that allowed for openings greater than 40 acres have occurred.

Control Of Destructive Insects And Diseases - 36 CFR 219.12(k)(5)(iv)

This CFR requires a determination that destructive insect and disease organisms do not increase to potentially damaging levels following management activities. The most damaging insect and disease organisms currently occurring on the Forest are mountain pine beetle, *Dendroctonus ponderosa,* and dwarf mistletoe, *Arceuthobium spp.* Mountain pine beetle has reached epidemic proportions in Grand County on the Sulphur Ranger District. Various treatments of vegetation have taken place. These

include timber sale contracts to thin mountain pine beetle infested and dead lodgepole pine trees; preventative spraying lodgepole pine susceptible to mountain pine beetle on 364 acres in high-value recreation areas; and thinning of infested lodgepole pine trees on 100 acres of the Winter Park Ski Resort. Dwarf mistletoe is wide-spread throughout lodgepole pine and ponderosa pine stands on the Forest. Some removal of dwarf mistletoe infested lodgepole pine trees within timber sale contract areas has been done. However, the occurrence of both of these organisms occurs naturally in forested area and has not been shown to be a result of management activities.

Both mountain pine and spruce beetle populations and related mortality continue to increase on Canyon Lakes, Boulder and Clear Creek Ranger Districts. Areas of bark beetle infestations include; Buckeye and Tennessee Mountain, Loveland Ski Area, Berthoud Pass, and Peaceful Valley. White pine blister rust has been observed for the first time o the Boulder Ranger District in 2005.

The Forest continues to experience a small isolated outbreak of *Ipps* beetle on hazardous fuels reduction projects on the Canyon Lakes Ranger District. It appeared that the cutting and piling of ponderosa pine slash led to a small buildup of the beetles which subsequently infested and killed nearby live trees.

Population Trends Of Management Indicator Species In Relationship To Habitat Changes - 36 CFR 219.19(a)(6)

This CFR requires that population trends of the management indicator species (MIS) will be monitored and relationships to habitat changes will be determined. This monitoring will be done in cooperation with State fish and wildlife agencies to the extent possible.

MIS were selected according to NFMA ensuing regulations and Forest Service (FS) policy in the 1997 Forest Plan. Species were selected to serve as meaningful indicators of population-habitat relationships in ecosystems where management activities and habitat change were likely to occur. Important management indicator communities (MICs) for plants and animals were defined for both the ARNF and the PNG. MIS for each MIC, and all state and federal threatened and endangered that may be affected by management were selected. A total of 34 MIS were selected for the entire ARP Planning unit (9 mammals, 15 birds, 7 fish and 3 amphibians). Four MIS are common to both forests and grassland, with 26 species selected for ARNF and 12 species for PNG.

While the 1997 Revised Forest Plan MIS requirements were developed according to law and policy that remain in effect today, experience and findings during FP implementation since 1997 with monitoring and evaluation has shown that the ability to monitor population trends is less than expected for certain MIS. Additionally, a process for selection of MIS was developed in June 2001 as part of the Rocky Mountain Region Plan Revision Desk Guide. Experience with implementing forest plans during the past decade, court rulings, better scientific understanding of the role of MIS, refined survey protocols and the second round of forest planning indicated that a review and possible revision of the 1997 MIS list for ARP was appropriate.

Using the Region 2 MIS selection process as a guide, a reevaluation indicated that revision of the 1997 MIS list was most appropriate to assure that all MIS were able to be monitored during the life of the Forest Plan, and were meaningful indicators of management effects to habitat condition or change (USDA Forest Service 2005). The Forest Plan was subsequently amended to remove 13 species due to inability to monitor and 5 species as not being meaningful indicators of management actions. MIS

population data through 2004 were available and used in the reevaluation and a Forest Plan amendment was approved in early 2005. The amended MIS list of May 3, 2005 follows.

Amended list of MIS for ARP (2005)
(21 individual species, with one common MIS* to both AR and PNG).

	ARNF (14*)	PNG (8*)
Mammals (4*)	elk	black-tailed prairie dog
	mule deer*	mule deer*
	bighorn sheep	
Birds (10)	hairy woodpecker	ferruginous hawk
	pygmy nuthatch	burrowing owl
	golden-crowned kinglet	mountain plover
	mountain blue bird	ark bunting
	warbling vireo	
	Wilson's warbler	
Amphibians (1)	boreal toad	
Fish (6)	brook trout	plains topminnow
	brown trout	plains killifish
	greenback cutthroat trout	
	Colorado River cutthroat trout	

Population Trends of MIS for ARP

The following summarizes trends based on ARP-wide data tables in Appendix A that are updated through 2005

Mammals (4)

1) elk
- ARNF population trend has been stable 1997-2005.
- Colorado population estimates have increased 40% from 1997-2001, and have been gradually decreasing since (Table 1).

2) mule deer
- ARNF trend has varied since 1997, with population being highest in 1998 and lowest in 2005.
- PNG trend has declined yearly, dropping 29% since 2000.
- Combined ARNF/PNG trend has been generally stable since 2000, with population being lowest in 2005.
- For Colorado, population trend was generally upward 1997-2005, increasing 19% overall (Table 2).

3) bighorn sheep

- ARNF and Colorado trends have both varied and decreased slightly from 1997 to 2005 (7.6 and 6.0%, respectively) (Table 3).

4) black-tailed prairie dog

- The highest acreage in 25 years occurred in 2005, totaling 3673 acres. Three plague events occurred after the towns were surveyed in 2005, resulting in a loss of about 1/3 or a year-end total of about 2460 acres.
- Number and size of prairie dog towns best indicate population levels (Colorado Division of Wildlife 2003, Severson and Plumb 1998, Cinotta et al. 1987, Garrett et al. 1982).
- Since 1981 acres of towns have varied between 179 acres in 1983 and 3763 acres in 2005, with reductions primarily caused by plague.
- Since 1994 annual increases have occurred, except for one year (Table 4).

Birds (10)

5) burrowing owl – Population trends have continued to increase on the PNG since 1999, with 2005 numbers 2.5 times higher than in 1999 (Table 5).

6) mountain plover - Dramatic drop in population beginning in 1995 on PNG (Table 6).

7) ferruginous hawk - Long-term decline of nesting birds on PNG, but relatively stable RMBO transect bird counts with low detection rates (Tables 7a and 7b, respectively).

8) golden-crowned kinglet – Overall trend on the forest is decreased dramatically beginning in 2001. All transects with historic hits of GCKI were read in 2005 but still resulted in a continued downward trend (Table 8).

9) hairy woodpecker - Population numbers dipped from 1999 through 2003 for ARNF, but numbers have rebounded to their 1998 levels in 2004 and 2005 (Table 9).

10) lark bunting - Population trends on PNG appear variable but relatively stable since 1999 when survey transects were established (Table 10).

11) mountain bluebird – Transect survey data for ARNF indicate that mountain bluebird population trends are somewhat variable but stable (Table 11).

12) pygmy nuthatch – Transect surveys indicate a highly variable trend. Appearing stable from 1998 thru 2001, then a dramatic increase in 2002 and 2004 and a return to lower and more stable levels in 2005. Note that transect surveys in typical habitat (ponderosa pine) were not conducted in 2003 (Table 12).

13) warbling vireo – Transect survey counts indicate variable population trends on ARNF, with decreases from 2001 thru 2004 and a return to levels similar to 1998-1999 in 2005, noting that several transects were not read in 2003 (Table 13).

14) Wilson's warbler – ARNF transect counts reveal a highly variable trend with increases from 1998-2001, drop in 2002, and a return to average yearly levels in 2003-2005 (Table 14).

Amphibians (1)

15) boreal toad – Despite the discovery of new breeding sites on ARNF, survey data indicate a downward trend for numbers in and near ARNF (Table 15).

Fish (6)

16) brook trout - trend appears to be stable or upward on ARNF (Table 16).

17) brown trout - trend appears to be stable on ARNF (Table 17).

18) greenback cutthroat trout - breeding populations are low but trends appear to be stable on ARNF (Table 18).

19) Colorado River cutthroat trout - breeding populations are low but trends appear to be stable on ARNF (Table 19).

20) plains topminnow - trend appear to be stable on the PNG (Table 20).

21) plains killifish - trend appear to be stable on the PNG (Table 21).

See Appendix A for Tables 1-21 of MIS population trend data.

MIS Habitat Changes

Updates to ARP basic resource inventories and databases are in progress (vegetation type and structure; roads/trails and use; present amounts and locations). These are needed to assess existing wildlife habitat conditions and changes since 1997. Once complete, determining relationships between MIS population trends and habitat changes will be possible.

It should be noted that these basic forest and grassland vegetation data are also needed to adequately manage and monitor many resources and programs within the ARP. Assuring reliable data and updates is a fundamental requirement for Forest Plan implementation. Currently, resource condition data updates are not adequate to ascertain whether expected Forest Plan outputs and effects are on track.

> Recommendation: Updating of basic resource databases should continue to be a priority in the next few years to meet Forest Plan commitments by year 10 of Forest Plan implementation.

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Effects Of Off-Road Vehicles - 36 CFR 219.21(g)

This CFR requires evaluation of the potential effects of vehicle use off roads to protect land and other resources, promote public safety, and minimize conflicts with other uses of National Forest System lands.

The unauthorized use of Off-Highway Vehicles (OHVs) (a.k.a, Off-Road Vehicles) within the ARP is increasing. This increase is driven by the large population living within one hour of many parts of the Arapaho and Roosevelt National Forests and Pawnee National Grassland and this increase is also driven by the increase in the technological capabilities of OHVs and the increased marketing and sales of them.

The Forest Plan contains appropriate guidance to address this problem. Therefore, the solution to this increasing unauthorized use does not mean the Forest Plan needs to be changed. What is needed is first a social change relative to use of National Forest System lands by the public. The National Forests have long been viewed as the Nation's playground where most activities are permissible. However, in National Forest lands adjacent to large urban areas, this type of use may no longer be possible. The second need is increased funding. Unlike the need to reduce hazardous fuels, where catastrophic wildfires each year provide graphic examples of the need for hazardous fuels treatments, the adverse effects from unauthorized OHV use are more insidious. The adverse effects from this unauthorized OHV use are immeasurable on a larger scale over a time period of one, five, or even ten years. The ARP has had limited funding to deal with solutions such as increasing field presence of Forest Service personnel, completing inventories of all classified and unclassified roads and trails for large-scale transportation planning, and completing signing throughout the ARP to assist visitor compliance with travel regulations. However, some progress was made in General Forest Areas (GFA) by emphasizing efforts to provide uniformed Forest Service presence in the field during critical high-use periods, recording 660 GFA days managed to standard (DMS) in 2005.

There have been other successes in OHV and other motorized recreation management. On the Pawnee National Grassland, we have been aggressively planning our grassland transportation system and have closed or obliterated roads that were no longer needed. Many of the ranger districts on the Arapaho and Roosevelt National Forests have designated camping areas, improved signing, and installed buck and rail fences to direct the motorized recreation visitor. Many volunteer projects with jeep and ATV clubs have improved safety and rehabilitated degraded resources. Areas such as Left Hand Canyon near Boulder and Green Ridge Trail near the Poudre Canyon are examples.

There are many large and small areas that have been designated and managed for off-highway vehicles (OHV's). On the Pawnee National Grassland the Main OHV Area serves as the OHV focal point on the

grassland and receives use throughout the winter when other areas are snowed-in. On Sulphur RD, there is the Stillwater OHV Trail System, which provides a variety of road and trail connector routes for a comprehensive and varied OHV experience. On the Canyon Lakes RD there are some small and several large areas with well established and managed OHV routes. These include The Roach, Cherokee Park, Chicken Park, Deadman, Crown Point, Crystal Mountain, Pole Hill, Johnny Park, and Pierson Park areas. They also have a high quality publication with maps of these areas titled "Canyon Lakes Ranger District, Roosevelt NF, OHV Routes."

Below, are some of the more visible resource effects of OHVs and motorized recreation use.

WILDLIFE:
There is more off-road use or use of unclassified roads (identified as "ways" in the Forest Plan, basically, user-created roads) than estimated in the Forest Plan. Accordingly, this may be resulting in higher amounts of human-disturbed wildlife habitat than predicted in the Forest Plan. Closing of certain Forest Service roads and "ways" that have established use is at times unsuccessful. Gaining public support for closing travelways is seldom successful, and some public reaction to proposals has at times been potentially violent. An average of 30% of the expected Forest Plan objective of 44 miles of closures per year (Forest Plan, p. 4) is being realized that improve habitat effectiveness.

> Emerging issue: Due to lack of Forest Service field presence off-road vehicle use apparently continues to increase, unconstrained in many areas on the ARP.

WATERSHED AND FISHERIES:
Roads and trails continue to be primary chronic sources of sediment that degrades water quality. Increased vegetation management has the potential to contribute to this as temporary roads and trails are used to access project areas. Additional sediment from unclassified roads and unauthorized off-road vehicle use contributes to hillslope erosion and sedimentation. Areas of particular concern are those areas such as the Left Hand Canyon area where concentrated use has denuded much of the area of vegetation. Several projects have been implemented in the Left Hand area to rehabilitate damaged areas. Planning for designation of a suitable trail network and identification of trails to be closed and rehabilitated is nearing completion.

Watershed improvement projects have been used to address effects of off-highway vehicle use in other areas. In 2005, more than 20 miles of roads were decommisioned in the Crimson project area, located in the Williams Fork drainage of the Sulphur Ranger District.

Improvements in existing road conditions and reduction in road density in some project areas have been realized, although below Forest Plan levels. This provides for incremental improvements in water quality and aquatic habitat. Developed OHV trail systems, such as the Stillwater OHV, area provide a template for providing a desired user experience while maintaining acceptable resource conditions.

RECREATION:
National prohibitions for "Use of Vehicles Off Roads" (36 CFR 261.13) prohibit any vehicle from traveling off National Forest roads:
(g) "…in a manner that endangers, or is likely to endanger, any person or property."
(h) "In a manner, which damages or unreasonably disturbs the land, wildlife, or vegetative resources."

Forest Closure Order No. 10-00-03 (signed 5-27-98 and updated 6-10-99 by Forest Supervisor, Peter Clark) prohibits "Using or possessing a motorized vehicle off numbered Forest Development roads or

designated travel routes (36CFR 261.56)" and "Using a motorized vehicle on a closed Forest Development Road (36 CFR 261.54 (a)". The order also lists by Ranger District, specific roads and trails closed to motorized vehicle travel, year-round and seasonally.

Districts are in various stages of implementing the above closure order, as well as planning for any needed additional closures and opportunities for motorized travel. This is an ongoing process and in 2005 included planning for Lefthand Canyon in BRD, Mt. Margaret, Laramie River and the Bobcat Ridge areas on CLRD, and the James Peak and Crimson areas on SRD.

Potential effects from OHV use include soil erosion and siltation of water courses, displaced wildlife due to noise and traffic movement in the forest, wildlife habitat impacts to vegetation, soil and water, and impacts to other recreationists from noise, dust, speed, obnoxious behavior, off-road use, and collision potential with other vehicles, horse riders, mountain bikers, hikers, etc.

Much progress has been made to direct motorized use on the ARP as well as the associated dispersed camping that often occurs with the use. Toilets have been installed to address human waste issues and buck-and-rail fences were installed to confine much camping and motorized use to road, trail and hardened surfaces to prevent damage to soil, water and vegetation resources. Signing has been installed to help users know where they are and which routes to stay on as well as to impart a Tread Lightly message.

HERITAGE RESOURCES:
Off-road vehicles present a major problem for cultural resource sites. The creation of social (not designed, engineered, or constructed by USFS) trails and roads are not subject to planning or cultural resource inventories before they are utilized and have the potential to adversely affect prehistoric and historic cultural resources. These detrimental effects are generally not reversible and are found only after they have occurred.

Effects To Lands And Communities Adjacent To Or Near The National Forest And Effects To The Forest From Lands Managed By Government Entities - 36 CFR 219.7(f)

This CFR requires that the effects of National Forest and Grassland management be considered as it affects resources and communities adjacent to or near the ARP.

The most obvious effects to communities occur during wildfire outbreaks. Over the first six years of Forest Plan implementation, the ARP was in drought conditions. These conditions led to numerous wildfires, which unfortunately consumed not only publicly owned resources but also private structures and property. To address this the Forest Service launched an effort to treat the hazardous fuels, which have built up over years of fire suppression and reduced vegetation management activities, which could have reduced the density of trees and amounts of fuel build-up. The Front Range Fuels Treatment Partnership has been in effect since 2002 and is an active partnership of public, state, local agencies and private landowners. Budgets have been increasing on the ARP to deal with these hazardous fuels, especially near the intermix lands of public/private ownership. By the end of fiscal year 2005 fuel reduction planning has been completed on 40,000 acres.

Insect outbreaks such as those around Lake Granby are changing the look of the forested lands from green live trees to orange dead trees. Many private homes are located in or near these mountain pine

beetle infested areas. The Sulphur Ranger District of the ARP is implementing projects to treat beetle-infested trees in the Grand County area. Through public involvement these homeowners and other interested publics and agencies helped to determine the best method to treat this infestation.

Recreation is the other obvious large impact on communities near or adjacent to the National Forests and Grassland. Communities reap many benefits, both economically and socially, from visitors to the ARP. However, there are also impacts to these communities when excessive or inappropriate visitor use affects these communities quality of life (crowding, drinking water quality). The ARP has been working with these communities and private landowners to minimize impacts and maximize economic benefits.

Comparison Of Projected And Actual Outputs – 36 CFR 219.12(k)1 and Comparison Of Estimated And Actual Costs – 36 CFR 219.12(k)3

These CFRs require a quantitative estimate of performance comparing outputs and services with those projected by the Forest Plan and a documentation of the costs associated with carrying out management prescriptions as compared to the costs estimated in the Forest Plan.

Graphs addressing this question are included in Appendix B. These graphs compare the program (e.g., hazardous fuels treatments) budget with its accomplishment for the 8-year period of 1998 to 2005. In addition, these graphs show the Forest Plan objective for this program. This allows a comparison of Forest Plan projected outputs with the actual budgets allotted to the program. In addition to these graphs a narrative for wildlife and recreation is included in this section.

WILDLIFE:
There has been a downward trend from fiscal year 1998 when 'more-than expected' acres of treated wildlife and Threatened, Endangered or Sensitive species (TES) habitat were accomplished, to fiscal year 2005 when 'near-expected' acres were accomplished relative to budget levels. The following describes aspects that comprise the habitat treatment acres.

- Improved habitat due to hazardous fuels management has been substantial, making up about half of the acreage accomplishments. Hazardous fuels treatments can be largely beneficial and Forest Plan habitat objectives can be met faster than expected if wildlife/botany objectives are adequately designed into hazardous fuels treatments. ARNF has anticipated the increased fuel treatment program well and has correspondingly increased biology/botany staff to assure favorable outcomes for wildlife.
- Old growth of all conifer types has been largely retained over the past 8 years, even with recent wildfires. Development of more, future low-elevation old growth is being best assured by reduction of forest fuels in hazardous fuels treatment areas along the Front Range and by acquisition of low-elevation lands by the Forest Service in the Evergreen, Colorado area. Implementation is beginning which will allow us to achieve the Forest Plan objective of treating about 7000 acres per year. More low-elevation old growth (ponderosa pine (PP) and Douglas-fir (DF)) is being found than was known at the time of the Forest Plan revision (1997). Newer aerial photos (taken since insect epidemics) are providing a more complete and reliable inventory of the locations of PP and DF old growth. Pre-project surveys to field truth many PP/DF old growth sites are confirming recent photo interpretation findings. An entire inventory along the Front Range was recently completed in FY03 to assure that locations are known, and to allow for planning and implementation according to Forest Plan direction. The recent inventory located additional sites

that were previously undetected, but also ascertained that PP/DF old growth still remains the most limited type of old-growth forest within the ARNF.
- TES habitat improvements have mostly (except for 1 year) achieved the expected 3 (minimum number of) annual projects per year.
- Expectations of riparian restoration, structural improvements and habitat protection have not been fully realized due to limited funding and other priority habitat treatments.
- Aspen regeneration and reduced conifer encroachment in openings have mostly been realized as expected through design of fuels/timber management projects.

RECREATION:
Comparisons of projected vs. actual outputs show Forest Plan objective estimates are high and actual accomplishments are low for:
- Reconstructing or rehabilitating dispersed camping areas.
- Providing new designated wilderness campsites (no actual target)
- Constructing new dispersed-use campsites

This discrepancy in output vs. accomplishment vs. budget availability indicates that these Forest Plan listed objectives are not all-inclusive of the full scope of the recreation program and in fact, represent just a minor portion of the work involved.
- Recreation Special Uses, Heritage, Interpretation and VIS, Landscape/Scenery Mgt., and Accessibility programs are also subsets of the overall recreation program as are Developed Recreation, Wilderness and General Forest Areas.
- Maintenance activities were not recognized as high importance (no objectives) but new construction, reconstruction, and rehabilitation were. However, funds for new construction are very limited. A lot of the work of the Recreation program involves maintenance, yet it has no Forest Plan connection for tracking these accomplishments.
- Public contact for information, education, prevention and enforcement purposes is very important and a desired workload.
- Interpretation and education functions are also important but not part of our Forest Plan monitoring system.
- Volunteer coordination is a function that results in some kind of recognized reportable activity but is rarely viewed as an activity unto itself, yet much of our dollars and efforts are spent working with volunteers.
- The allotted budget for the Recreation program is below predictions shown in the Forest Plan. The program is being funded at less than one half of the Forest Plan projections. Yet, the ARP is the second most heavily visited National Forests/Grassland in the Nation.

Despite these challenges, the ARP Recreation Program accomplished the following targets in FY2005:
- 1,293,677 People at One Time (PAOT's) to standard for developed rec. sites.
- 660 Days Managed to Standard (DMS) for General Forest Area management.
- 213 Miles of Trail maintained to standard.
- 118 Recreation Special Use Permits managed to standard.
- 88 Interpretive and Educational Products completed to standard.
- 27 Heritage Resources managed to standard.
- Completed Forest Interpretive Plan, Berthoud Pass Interpretive Plan, EA and design, Brainard Lake Recreation Management Plan and EA, and built Hewlett Gulch Trailhead.

Prescriptions and Effects – 36 CFR 219.12(k)2 and Effects of Management Practices - 36 CFR 219.11(d)

These CFRs require evaluation of prescriptions and effects and management practices and require reporting of any significant changes in land productivity.

TRANSPORTATION SYSTEM:
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. Human Uses Objectives 6 and 9 need to be reevaluated for their continued appropriateness considering National trends and new transportation system management philosophies. 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.

Effectively closing roads is a problem. Many closures are illegally reopened or detoured around to obtain access. These point to a need for greater field and law enforcement presence.

WATERSHED:
Effects of management – Watershed conservation practices found in the 1997 Revised Forest Plan standards and guidelines have largely been effective in protecting water and riparian resources (see Hydrology, Soils, Air, and Fisheries monitoring reports, 1997-2002). Monitoring has documented protection or improvement of resource conditions for a variety of projects. Where conservation measures were ineffective, it was typically because they were incorrectly applied, or because activities occurred during implementation that were not foreseen during project planning, so that appropriate conservation measures were not prescribed.

LANDS:
Fuels funding has supplemented the boundary budget to enable some accomplishment to meet Forest Plan objectives for conflict free boundaries. In addition, the newly hired Forest Surveyor is moving ahead the landline program. The district lands staffs have decreased the special use authorization backlog, though a backlog still exists. The ARP has been emphasizing obtaining legal access across private lands. Another phase of the Beaver Brook land purchase in the Evergreen area was accomplished.

RECREATION:
Hazardous fuels reduction projects and wildfires can open up forest stands and facilitate motorized vehicle access to areas previously inaccessible due to the dense nature of the pre-burned or pre-thinned forest stands. When appropriate, travel management effects from thinning and other fuels reduction prescriptions need to be fully considered in the environmental analysis for hazardous fuels reduction projects. Recreation/ transportation monitoring after completing hazardous fuels reduction projects or wildfires is necessary to ensure that the effects from increased access caused by the opening of forest stands are mitigated.

AIR:
The long-term synoptic lake sampling program is in its eleventh year and this data is being used to assess air quality impacts in Wilderness Areas. The Forest Service Regional Office in PSD permit reviews also used this data.

All necessary permits related to prescribed fire and emissions were submitted and approved by EPA and the State of Colorado and generally all conditions of the permits were met.

TIMBER:
Soil quality monitoring transects on timber sales have indicated that conventional harvesting and site preparation techniques may cause detrimental soil compaction exceeding 15% of any land unit (Forest Plan Standard #19, p. 14). Additional monitoring data should be collected to determine the significance of this finding. Review the application and applicability of the 15% standard to assure that it is appropriate. Recommendations should be developed to avoid and/or mitigate detrimental soil compaction.

HERITAGE RESOURCES:
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 evaluation and 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 fuels reduction and timber sale analyses, range allotment management plans, road construction activities, etc

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 the individual line officer to decide what work will be done. 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.

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Table 4.2 Forest Plan Monitoring Questions for Priority Management Emphasis and Stakeholder/Public Involvement.

The following questions are displayed in Table 4.2 (Forest Plan, pages 394-396). These questions address priority management emphasis, goals and objectives in Chapter 1 of the Forest Plan. As described in Chapter 1, page 3 of the Forest Plan the ARP has an overall mission to achieve over time; **Forest-wide management implementation must balance the demands of people's vastly different resource-use values with maintaining ecosystem health.** To focus the ARP management towards meeting this mission the Forest Plan identified three management emphasis areas: 1) biological diversity, ecosystem health and sustainability; 2) human use; and 3) land use and ownership. The following questions fall into one of these three areas.

Biological Diversity, Ecosystem Health, Sustainability

General: Successional - Structural Stages	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 has the representation of successional stages been accomplished? (Biodiversity; General - Objective #12)

On the ARNF, increases have occurred in early forest successional stages from management treatments and natural events (primarily wildfire) in young- to mature-forests as planned. The ARP emphasis on hazardous fuels treatment is making this possible for the most part. The increase of early stages has occurred while old growth forests were generally retained Forest-wide.

Old growth of all conifer types has been largely retained over the past 8 years, even with recent wildfires. Development of more, future low-elevation old growth is being best assured by reduction of forest fuels in fuels treatment areas along the Front Range and by acquisition of low-elevation lands by the Forest Service in the Evergreen, Colorado area. Implementation is beginning which will allow us to achieve the Forest Plan objective of treating about 7000 acres per year. More low-elevation old growth (ponderosa pine (PP) and Douglas-fir (DF)) is being found than was known at the time of the Forest Plan revision (1997). Newer aerial photos (taken since insect epidemics) are providing a most complete and reliable inventory of the locations of PP and DF old growth. Pre-project surveys to field truth many PP/DF old growth sites are confirming recent photo interpretation findings. An entire inventory along the Front Range was recently completed in FY03 to assure that locations are known, and to allow for planning and implementation according to Forest Plan direction. The recent inventory located additional sites that were previously undetected, but also ascertained that PP/DF old growth still remains the most limited type of old-growth forest within the ARNF.

A quantified comparison of forest structural stages from 1997 to present is not available since updates to Forest resource data are not yet complete.

On the PNG increases have occurred in grassland mid-structure grasses especially due to several wet seasons. A revised grazing management plan for the west side of the Grassland will best assure both short-grass and mid-grass stages. The short-grass structural stage is adequate for nesting mountain plover (a previously proposed threatened species that was recently withdrawn from proposed listing), and the mid-grass structural stage is necessary for nesting lark buntings (a regionally declining species).

General: Ecological Processes & Human Influences	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? (Biodiversity; General - Objective #1)

WATERSHED CONDITION:
While roads continue to be one of the major sources of sedimentation and cause other impacts to streams and riparian ecosystems on the Forest, some progress has been made. Nearly all roads affect soil and watershed processes by providing continuously bare ground that serves as a source of erosion and by providing compacted areas that produce and concentrate surface runoff, and reduction in roaded area in the Forest tends to benefit soil and water resources. However, the roads that have the greatest impact to water resources are those that are located adjacent to stream channels. Consequently, the greatest benefit is from the obliteration or relocation of those roads. In addition to other roads decommissioned during the current planning period, approximately 20 miles of old timber sale roads were obliterated in the Crimson project area of the Sulphur Ranger District. It should be noted that hundreds of miles of stream-adjacent roads remain and that we have been only partially successful at reaching out objective of decommissioning approximately 44 miles of road per year.

WILDLIFE HABITAT:
Some progress has been made toward improving wildlife habitat through modification of system roads, trails and ways. However, the progress made is less than full implementation of the Forest Plan. There is more off-road use or use of unclassified roads (identified as "ways" in the Forest Plan, basically, user-created roads) than estimated in the Forest Plan. Accordingly, this may be resulting in higher amounts of human-disturbed wildlife habitat than predicted in the Forest Plan. Closing of certain Forest Service roads and "ways" that have established use is at times unsuccessful. Gaining public support for closing travelways is seldom successful, and some public reaction to proposals has at times been potentially violent. Numbers of unauthorized routes appears to be increasing every year. An average of 76% of the expected Forest Plan objective of 44 miles of closures per year (Forest Plan, p. 4) is being realized that improve habitat effectiveness.

> Emerging issue: Due to lack of Forest Service field presence, unconstrained off-road vehicle use is apparently increasing in many areas on the ARP.

General: Old Growth	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? (Biodiversity; General - Objective #2) (36 CFR219.)

Old growth forest quantity and quality have been maintained, and adequate/sufficient old growth is assured in the future. In 2002 the ARP acquired approximately 2700 acres in the Evergreen, Colorado area from the City of Golden (Beaver Brook acquisition). This land serves as an important wildlife refuge and as one of the last remaining intact low-elevation, forested ecosystems along the Front Range of Colorado offers a high potential to develop into low-elevation old growth.

> Recommendation: Awareness and application of Forest Plan old growth direction should continue to be a primary objective in any forest treatment project, during both planning and implementation.

General: Threatened Endangered and Sensitive Species	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? (Biodiversity; General - Objective #3)

See Appendix B, Graph 6, Terrestrial Habitat Improvement

Habitat improvement projects have generally protected, restored and enhanced habitat for TES species. Examples of projects that have 'made the most difference' in both protection and enhancement are prescribed burning to benefit mountain plover nesting, and travel access management to protect the plover, native cutthroat trout, boreal toads, nesting raptors and numerous other TES species across the PNG and ARNF. Advances have been made in recognizing and managing for rare plants in all management activities since the 1997 Forest Plan revision, but deliberate projects for improved rare plant habitats have been few to-date.

TES projects by nature are often site-specific, limited in extent, but very important to small populations or few individuals. Work and progress in this area often goes unnoticed by all but the biologists and botanists on the ARP since it is not widespread or showy. As previously noted, annual accomplishments have been at the minimum level expected (3 projects per year).

> Recommendation: Given the high emphasis for biological diversity committed to in the Forest Plan, increased effort in this area is appropriate. Opportunities include working with partners; restoring riparian areas; translocation of native cutthroat into currently unoccupied streams; expansion of current cutthroat habitat by removal of non-native trout; habitat restoration and maintenance for amphibians, raptors and rare plants; and more intensive access management (see off-road and travel management discussions) in TES habitat.

Air, Soil, and Water: Air Quality Related Values	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? (Biodiversity; Air, Soil & Water – Objective. #4) (CFR 219.23 e)

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.

Monitoring air quality related values has focused on measuring lake water chemistry in the Class 1 Rawah Wilderness, Indian Peaks Wilderness and the nearby Colorado State Forest land. A total of eight lakes were being sampled twice a year. Year 2005 lake sampling was completed with the assistance of Bob Musselman and other staff of the Rocky Mountain Research Station (RMRS). Currently, the RMRS is compiling this data for future analysis and publication.

Currently, lake water quality data is being used to help assess baseline levels as well as trends in lake chemistry on the forest and how they reflect impacts from off-forest air pollution. Data is also being entered into the NRIS Air Database by Washington Office staff.

The Forest continued to work with Regional Office staff and adjacent land managers (eg Rocky Mountain National Park) to evaluate impacts from increases in ambient ozone concentrations and other pollution and recommend mitigations to minimize those impacts. Air quality impacts might be affecting human health and alpine ecosystem stability. Baseline information on high elevation lake water quality, visibility data and other sources of air quality information continues to be used in the CALPUFF deposition model to compute effects to forest by N and S emission point sources on the Front Range. Model results were subsequently used by the regional office to provide comment and review of Permits for Significant Deterioration in the general area of the Front Range of Colorado.

To maintain existing air quality, Forest and Grassland personnel continued to work closely with the Colorado Air Pollution Control Division to meet all applicable state and federal air quality requirements related to smoke emitted during prescribed burning projects in 2005.

The Forest has also continued to work with Colorado Department of Transportation, Federal Highways Commission, Winter Park Ski Area and Federal Energy Regulatory Commission to evaluate, and modify if necessary, potential impacts of projects that could impact the air quality of national forest system lands.

Air, Soil, and Water: Forest Emission Budget	Has progress been made on developing a Forest and Grassland emission budget? How was the Forest emission budget developed? (Biodiversity; Air, Soil & Water - Obj. #5)

According to the Clean Air Act, an emissions budget is generally considered a portion of an applicable implementation plan that estimates emissions and describes the levels of those emission required for meeting set air quality goals for criteria pollutants.

To achieve this, Forest and District personnel continue to model and estimate smoke emissions. Methods, including the use of the SASEM model, include measurements; smoke analysis, and impacts assessments for individual prescribed fire projects. These data are currently tracked and recorded in project files and annual spreadsheets since 1997 and have also been compiled as part of the State of Colorado Smoke Permit process. These available data and information could be used to estimate an annual PM_{10}, $PM_{2.5}$, and possibly CO prescribed fire emissions inventory for the Forests and Grassland using Gaussian dispersion and emission production models. Due to needs, personnel, budget, and prioritization constraints, a PM_{10}, $PM_{2.5}$ and CO emission budget has not been finalized and might not even be considered necessary. Other criteria pollutant emissions from other ongoing projects in the Forests and Grassland are well below National Ambient Air Quality Standards; therefore an emission budget for ozone, sulfur dioxide, and volatile organic compounds is not warranted.

To supplement available data on emissions and their possible effects, 3 monitoring stations will be installed this winter in the Boulder Ranger District (Nederland area) to monitor smoke, PM_{10} and $PM_{2.5}$ concentration in the immediate area of communities and sensitive receptors.

Air, Soil, and Water: Functional Watersheds	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? (Biodiversity; Air, Soil & Water - Objective #7)

While incremental progress has been made through watershed improvement projects, facilities improvement projects ("10% fund" projects), and through changes in grazing management, no sixth-level watershed has been improved in condition enough to change its condition class.

Recommendation: No change to the objective is recommended. Focus implementation on identifying and completing sufficient watershed improvement within priority watersheds so that improvement in watershed condition can be demonstrated. Priority watersheds, and watershed improvement needs within the watersheds, have been identified for all Ranger Districts on the Forest, and prioritization will be completed for the Pawnee National Grassland by the end of 2006.

Though not directly part of this question, an objective to improve channel stability is listed in the Forest Plan. Improving channel stability is a key component to improving the watershed condition. Some progress has been made towards some channel stability. See Appendix B, Graph 7, Improve Stream Channel Stability.

Air, Soil, and Water: Ecological Land Units	Has the Forest made progress toward moving Ecological Landtype Units from at-risk to a maintenance or higher functioning level? How was this accomplished? (Biodiversity; Air, Soil, & Water - Objective #6) (CFR 219.23 e)

The forest staff is working at improving implementation of water and soil conservation practices during project activities. The ARNF soil-terrestrial ecological unit survey is nearing final correlation by the USDA Natural Resources Conservation Service.

Recommendations:

- Continue to develop a more measurable goal for soil quality and at-risk soils.
- Continue to use/develop standard protocols for soil quality monitoring. Begin to work with regional office personnel if necessary to ensure protocols, standards and measures used are acceptable and applicable.
- Ongoing research projects from Rocky Mountain Research Station personnel and other forests/institutions need to be applied, and possibly incorporated, with ongoing monitoring of management activities on the forest.
- Continue to work with marking crews, silviculturists, and engineers to educate them about soil/water resource issues and solutions.

Air, Soil, and Water: Stream Flows	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? (Biodiversity; Air, Soil & Water - Objective #8)

The Forest has minimally achieved this objective through the completion of an easement with the City of Boulder for the Lakewood pipeline in 2002. The pipeline diverts water from North Boulder Creek and the reach protected extends from the City's diversion at Lakewood reservoir to the confluence with North Boulder Creek. The easement contains language that limits the maximum daily withdrawals and recognizes the City's instream flow program as providing protection for minimum flows. No new stream flow protection has been attained since 2002. It is important to recognize that streamflow protection is usually realized through land use authorizations of water facilities. No facilities that have required streamflow protection have been authorized or re-authorized since 2002. See Appendix B, Graph 8, Obtain Stream Flows to Maintain Stream Processes.

In 2005, the Forest completed a plan amendment to change two standards and one guideline related to streamflow as directed by a discretionary review by the of Agriculture Deputy Under Secretary for Natural Resources and Environment. The wording for the old and new standards and guideline are shown below.

Old Wording

Standard 12 – Maintain enough water in perennial stream reaches to sustain existing stream health. Return some water to dewatered perennial streams where needed and feasible.

Standard 135 – Generally, Standard 12 provides for most recreation-related water uses, but additional water may be needed for special recreational features and heavy-use recreational areas. Maintain enough additional water in associated streams to sustain the water-dependent recreational values. A preliminary assessment identified the key areas where these values exist and they are shown in Table 1.16. Additional areas may be identified during plan implementation.

Guideline 136 – Protect instream flows at outstanding recreation features. Such features include, but are not limited to, designated/study wild, scenic, or recreational rivers, stream segments used for commercial boating, or segments having developed recreation sites or vistas; or national recreation/historic/scenic trails or scenic byways from which the segment(s) is visible in the foreground or middleground. Protection of water quantity and quality is vital to recreation experiences. See Table 1.16. Bypass flows and instream-flow water rights are distinctly different, but settlement of reserved water rights claims can meet this criterion if the negotiated flows are decreed to the United States by a court of jurisdiction. In addition, the word "outstanding" in this guideline is meant in the generic sense, and should not be confused with the use of the word to describe and analyze Wild and Scenic characteristics.

New Wording

Standard 12 – Cooperate with state, tribal, and local governments and holders of water rights, and other interested parties to manage water resources to minimize damage to scenic and aesthetic values, fish and wildlife habitat, and to otherwise protect the environment.

Standard 135 – Generally, Standard 12 provides for most recreation-related water uses, but additional water may be needed for special recreational features and heavy-use recreational areas.

Cooperate with state, tribal and local governments, holders of water-rights and other interested parties to maintain enough additional water in associated streams to sustain the water-dependent recreational values. A preliminary assessment identified the key areas where these values exist and they are shown in Table 1.16. Additional areas may be identified during plan implementation.

Guideline 136 – Cooperate with state, tribal, and local governments and holders of water rights, and other interested parties to manage water resources to protect instream flows at outstanding recreation features. Such features include, but are not limited to, designated/study wild, scenic, or recreational rivers, stream segments used for commercial boating, or segments having developed recreation sites or vistas; or national recreation/historic/scenic trails or scenic byways from which the segment(s) is visible in the foreground or middleground. Protection of water quantity and quality is vital to recreation experiences. See Table 1.16. Bypass flows and instream-flow water rights are distinctly different, but settlement of reserved water rights claims can meet this criterion if the negotiated flows are decreed to the United States by a court of jurisdiction. In addition, the word "outstanding" in this guideline is meant in the generic sense, and should not be confused with the use of the word to describe and analyze Wild and Scenic characteristics

Air, Soil, and Water: Non- Point Source Pollution	Has the Forest made progress toward reducing non-point source pollution in Class II and III watersheds and in streams, which are not fully supporting State-designated uses? How has this been accomplished? (Biodiversity; Air, Soil & Water - Obj. #10)

Progress has been made through the implementation of watershed improvement projects, road decommissioning, and abandoned mine reclamation, although the pace has been more moderate than the 49-160 acres annually listed in the Forest Plan objectives. Annual accomplishment in 2005 was 34 acres. Determining the effectiveness of improving State-listed streams is more problematic. The State lists stream segments that are not fully supporting State-designated uses on a list that is referred to as the 303(d) list. When the Plan revision was completed, there were 12 stream segments on the Forest that appeared on the list. On the most recent list, the 2004 303(d) list, only six stream segments that occur on the Forest are listed. However, the change is mostly an effect of a change in the State's listing criteria. See Appendix B, Graph 9, Non-point Source Pollution Treated.

An abandoned mine reclamation project was completed in 2005 for the Fairday mine in the James Creek watershed. This stream appears on the 303(d) list. Staffing for the abandoned mine program has increased, which should continue to accelerate the pace of abandoned mine reclamation.

Roads are a significant source of non-point source pollution on the Forest and road decommissioning is an effective means of treatment. Trends in accomplishment of road decommissioning are shown under the "Travel Management" section, later in this document.

Vegetation: High Fire Hazard	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? (Biodiversity; Vegetation - Objective #11)

The objective is to reduce the number of high risk/high value, and high and moderate risk acres by 2,000 to 7,000 forested acres annually using mechanical and prescribed fire treatments. The Graph 10, High Hazard Fuels Treated, in Appendix B shows the annual accomplishment of acres treated meeting this objective.

The annual average accomplishment for the first eight years of the Forest Plan falls within the stated objective and in recent years shows progress toward accomplishment of this objective. Planned accomplishments were higher for most fiscal years but were not achieved due to a variety of reasons in some years. Most notable were not having suitable weather and fuel conditions to execute prescribed burns in 2003, a moratorium on prescribed burning during a portion of FY 2000, and the commitment of personnel to fire suppression assignments.

Accomplishment of this objective increased in 2005 and is expected to increase substantially during 2006 due to the emphasis of the National Fire Plan and the Front Range Fuels Treatment Partnership.

Human Uses

Wilderness	Is the Forest making progress toward providing designated wilderness campsites where resource impacts from users are evident? (Human Uses - Objective 2)

The Forest hasn't added designated wilderness campsites since they were established in the Indian Peaks Wilderness Area in the mid-1980's, and in the Comanche Peak Wilderness Area in 1996.

Developed Recreation	Has the Forest made progress toward providing a mix of facility reconstruction, expansion, and, when possible, new developments consistent with future use projections? Has this been done to assure quality developed recreational opportunities? (Human Uses, Developed Recreation - Objective #4)

Progress has been made. Within the past 8 years, the following campgrounds were reconstructed: Ansel Watrous, Narrows, West Lake, Sunset (new), Willow Creek, and Stillwater. Dowdy Lake Campground reconstruction project was surveyed, designed and contract-obligated in FY2005. Many other individual campsites were brought into standard for disabled accessibility and several developed campsites were reconstructed using Granger-Thye collections. Many other items were replaced, repaired, or installed such as water and electric lines, new pumps and chlorinator facilities, new picnic tables and fire rings. New tent pad areas were delineated with timbered borders and trails in a few developed campgrounds were hardened

The annual ARP toilet replacement contract has contributed to at least sixteen new toilets across the Forest. With the past few years the Sunset Boat Ramp and parking facility were reconstructed and the boat ramp was extended twice and a sailboat "gin" pole was installed at the Stillwater Boat Ramp. A

new kiosk was installed on Mt. Evans and the Dos Chappell Interpretive Nature Center building was constructed at the Mt. Goliath Natural Area along the Mt. Evans Scenic Byway.

Within the past several years, West Branch, Rawah, and Lower Maxwell Falls Trailheads were rebuilt. A bridge replacement was installed at Buffalo Creek. A new 4x4 trail bridge on Trail Creek Trail, a new bridge on Sunken Bridges Trail, and a new bridge on the Bakerville-Loveland Trail were installed. Twenty-three miles of new Continental Divide Trail, one mile of new trail on the Grays and Torreys peaks trail were constructed and a re-route work on the Chicago Lakes Trail was completed (FY2005 project). Over the past few years, roadside recreation/travel management kiosks were installed at Stillwater East, Stillwater West, North Supply, Cabin Creek, Young's Gulch and Herman Gulch.

The total Recreation Budget for the ARP in FY2005 was $3,166,000. Subtracting cost pool, R2 Rec. Director adjustments and OWCP/Unemployment expenses left the Recreation Program with $1,790,600 to program among Recreation staff at one Forest Supervisor's Office and 5 Ranger Districts, and across 6 primary recreation program elements of: Develop Sites, General Forest Areas, Interpretation/Education and VIS, Wilderness, Special Uses/Ski Area Mgt., and Heritage Operations.

Dispersed Recreation	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? (Human Uses, Dispersed Recreation - Objective #1, #3)

Progress has been made in dispersed recreation sites over the past few years. The Manhattan Road, Long Draw and Lost Lake areas (in the Canyon Lakes Ranger District) have designated-dispersed campsites. Toilets have been installed in the Stillwater backcountry dispersed camping area and at many trailheads across the Forest to concentrate and reduce human waste issues in these areas.

Restrictions have been established to prohibit shooting and/or overnight use in the Buckhorn Area of the Canyon Lakes Ranger District; Left Hand Canyon, Lefthand OHV Area, and South Saint Vrain Canyon of the Boulder Ranger District; and the Mt. Evans Road corridor, Barbour Forks area (in FY2005) and the Fourth of July Road corridor on the Clear Creek Ranger District.

Several annual Lefthand Canyon cleanups have been instituted to remove debris and rehabilitate this heavily impacted dispersed area. There have also been shoreline cleanup projects at Lake Granby and Shadow Mountain Reservoir. Buck-and-rail fences were installed around several dispersed campsites in the Stillwater area of the Sulphur Ranger District to prevent campers and OHVers from traveling beyond the designated dispersed campsite boundary.

In addition, in FY2005 the Boulder Ranger District completed the Brainard Lake Recreation Management Plan and the EA for Brainard Lake Recreation Projects.

Visitor Satisfaction	Have the Forest and Grassland made progress toward providing satisfactory recreational experiences to visitors? (Human Uses, Visitor Satisfaction - Objective # 5)

The ARP strives to provide satisfying recreation experiences to our visitors. The Mt. Evans Recreation Area has provided the public with a substantially enhanced recreation experience. The additional funding enabled by the standard amenity recreation fees via the newly passed Federal Lands Recreation

Enhancement Act of 2004 (REA) has provided for toilets cleaned to high standards and at high frequencies; interpretive programs and Forest Service interpreters to lead them; roving patrols to provide visitors with information, comfort, safety and security; new and improved signage; a new interpretive and nature center at Mt. Goliath; and other facilities maintained to better standards.

Within the Arapaho National Recreation Area standard amenity fees have provided increased service patrols; interpretive day events for first and fifth graders; boat safety patrols on Lake Granby and Shadow Mountain Lake; cleaned and maintained toilets and trash service in the ANRA picnic areas; and law enforcement patrol in the ANRA for enhanced visitor safety and security. The Christmas Tree special recreation permits at Clear Creek, Sulphur, and Canyon Lakes Ranger Districts provides for substantial information and educational opportunities, technical assistance, safety and security, and overall interaction and good will with the public.

More and better interpretive signs and information has increased visitor satisfaction. New signs on Guanella Pass Scenic Byway and three interpretive signs at the Lake Granby Overlook of the Colorado River Headwaters Scenic Byway were constructed within the past few years. At the Clear Creek Ranger District's Visitor center a new interpretive kiosk was recently built. New wildlife mounts and natural wood furniture for the Sulphur Ranger District visitor center have enhanced the visitor's experience. The Boulder Ranger District Visitor Center has also seen improvement with additional available maps, furniture and information racks. A substantial visitor center was designed and is being constructed for the Supervisor's Office/Canyon Lakes Ranger District's new office building.

Hundreds of recreation special-use permits are issued to providers who serve the public and provide recreation experiences via outfitter/guides, marinas, ski areas, boat docks, recreation events, recreation residences, and many others. Also, the Forest Campground Concession Permit provides for concession-managed developed campground (and some picnic areas) operations, maintenance, host staffing, and interpretive programs.

Roads and trails, signs, information bulletin boards, toilets at trailheads, facilities, dispersed camping areas, day use areas, historic and prehistoric sites, paleontological sites and other areas are maintained on the ARP for enhanced public recreation experiences.

The ARP also provides random interpretive programs in the field and sessions at schools, visitor contacts at district VIS centers and in the field and interpretive signage for our kiosks and bulletin boards. In addition, the ARP has invested in upgrading and hiring visitor services positions to increase service to the public.

Finally, the National Visitor Use Monitoring survey estimates approximately 6.2 million annual visits to the ARP, and relatively few complaints occur each year. The overall estimate is that the ARP is meeting and probably far exceeding our 70% satisfactory recreation experience objective in the Forest Plan.

Travel Management	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? (Human Uses, Travel Management - Objectives #6, #7, #8, #9, #10, #11)

The Forest Plan recognized the importance of managing travel and transportation planning on the ARP. It is the implementation of this, which has been difficult especially due to tight budgets, competing

priorities, personnel downsizing, as well as the long public process to obtain informed consent among polarized users. See Appendix B, Graph 11, Road Decommissioning, Graph 12, Road Maintenance, Graph 13, Road Construction, and Graph 14, Road Reconstruction, for a summary of ARP accomplishments.

WATERSHED:
Roads and trails are a major contributor to watershed and riparian impacts on the Forest. Others have noted that travel management planning, while an ongoing effort, has proceeded at a pace that has only lead to the partial attainment of Forest Plan objectives. There needs to be a continuing emphasis on interdisciplinary participation in travel management planning so that resource concerns are addressed while access needs are being met.

RECREATION:
Forest Closure Order No. 10-00-03 (signed 5-27-98 and modified on 6-10-99 by Forest Supervisor, Peter Clark) prohibits "Using or possessing a motorized vehicle off numbered Forest Development roads or designated travel routes (36CFR 261.56)" and prohibits "Using a motorized vehicle on a closed Forest Development Road (36 CFR 261.54 (a)". The order also lists by district, specific roads and trails closed to motorized vehicle travel, year around and seasonally.

Districts are in various stages of implementing the above closure order, as well as planning for additional closures and opportunities for motorized travel. This is an ongoing process.

TRANSPORTATION:
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.

Planning: All districts on the ARP have begun travel management planning. In some instances, it has occurred in conjunction with planning for other projects or during landscape analysis. On the Boulder and Sulphur Ranger Districts and the Pawnee National Grassland, specific travel management plans have been made for portions of the units. Travel management is very controversial in the surrounding communities. The public involvement process is complex and time-consuming. For that reason, there has been a reluctance to include travel management planning with planning for targeted projects such as hazardous fuels reduction. The ARP has been unable to make the financial or time commitment to a regular, unified travel management program. The majority of the effort has been placed on inclusion of travel management in large project planning efforts. One exception is the Left Hand area on the Boulder Ranger District that is scheduled for transportation planning in 2005.

In January of 2001, new legal requirements for travel/transportation planning for roads were adopted. The new requirements called for a scientific-based transportation planning process. The Forest Service developed a national process called *Roads Analysis: Informing Decisions About Managing the National Forest Transportation System*. The new system provides scientific-based recommendations to land managers for management of the roaded transportation system. Decisions involving new or changes to the National Forest road system are required to be "informed" by a Roads Analysis Process (RAP). In FY 2003, the Forests and Grassland completed a RAP for all of the maintenance level 3, 4, and 5 roads on the inventory. This RAP document will serve as an umbrella document for future roads analyses at the area, watershed or project level for our remaining road system.

In 2005 the Travel Management Rule was issued which required the designation of roads, trails, and open areas to motor vehicle use by vehicle class and time of year. This rule provided for a national

framework to complete the designation while allowing for local decisions. The ARP has established a 5-year timetable to complete the initial publication of the motor vehicle use map. A major portion of the work will be to establish the baseline transportation systems of roads, trails, and open areas. Most Districts have various travel management plans completed at the projects level and these decisions will form the baseline of the development and implementation of the Travel Rule.

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. As defined by the ARP, the implementation phase is implementation of recent travel management decisions and not the annual or routine activities necessary to maintain previous decisions or actions. Typical projects include OHV trail designations, authorized and unauthorized road decommissioning, road restrictions and closures, and implementation of road construction or reconstruction in other projects whose objective is not directly related to travel/transportation management. These projects include road work in timber sales, roadside erosion control, moving of roads out of drainage bottoms and roadwork included as part of other capital investment projects.

Road closures are covered under multiple activities which include the soils program, wildlife program, fuels vegetation program, and the travel management program. In general, the Forest is meeting the base outcome as an aggregate. The accomplishment and funding of these closures has varied each year based on the various program objectives. Most of the reason for not meeting a higher outcome is in the requirements of the RAP process, complexity/controversy involved in the public involvement, and the general decrease in funding across most program areas. In particular the roads program has seen a reduction in road maintenance funding for 4 of the past 5 years. Despite these challenges the ARP remains committed to decommissioning of unnecessary authorized and unauthorized routes.

Average implementation of road reconstruction has been at the base level. This is primarily due to most timber roads and fuels projects utilizing existing roads with very little need for reconstruction. The fuels program access needs changed with the varying treatment methods being utilized. Little road reconstruction is necessary for fuel treatment such as piling and burning or chipping. In general the timber program provides road reconstruction at the base level while the fuels vegetation program needs are provided by increased efforts in road maintenance activities.

The ARP has not met Plan Objectives for new open system road construction. National emphasis has not been for new road construction, but is toward maintaining and/or improving the existing road system. This is not necessarily a negative indication of Plan implementation. It appears to be an indicator of the ARP following national directions and policies. The need for new, permanently open roads appears to be less than anticipated by the Plan. More data is needed before recommendations can be made for changes to this particular objective. The Forest/Grassland RAP, when finished, will provide a basis for that recommendation.

O*n-going Maintenance and Monitoring:* Ongoing maintenance includes the recurring work such as system road and trail maintenance, sign maintenance, managing seasonal gate closures, installing information boards and signs, reinforcing existing closures and obliteration of parallel roads and resource damage. An inordinate amount of time was spent on decommissioning previously decommissioned (closed or obliterated) roads. This work involved replacing damaged gates, fences, boulders and signs. Inventorying and performing road deferred maintenance surveys of all Maintenance Level 3 to 5 continues and is accomplished on a reoccurring five year cycle. The ARP personnel doing the on-going management activities are continually monitoring, evaluating and prioritizing the work for following years.

The ARP has met the Plan Objectives for maintaining system roads.

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

WILDLIFE:
Converting 'ways' to system roads and trails as well as reconstructing, constructing, developing and maintaining system travel-ways have important implications to ARP-wide habitat effectiveness objectives. RAP efforts have appropriately incorporated wildlife/botany resource input, although the ARP has little room to change the type of roads considered to-date by RAP. This is because the ARP-wide RAP in accordance with national policy only analyzed the two-wheel drive roads (maintenance level 3, 4, and 5), which are the main transportation system for the ARP. It is the four-wheel drive roads (maintenance level 2) and unclassified (user-created) routes, which poses the problems for wildlife. Similar wildlife/botany resource input is most needed in the more specific project- or watershed-scale RAPs dealing with these four-wheel drive roads and unclassified routes. Referencing what has been said in *General - Ecological Processes and Human Influences* (above), the implementation of management of most system road and 'ways' has not fully met Forest Plan direction relating to expected wildlife habitat improvements.

Land Uses and Ownership

Boundary Mgt., Access and Land Ownership Adjustments	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 Uses & Ownership, Boundary Mgt., etc. - Objective #1, #2)

Identification of boundary lines has averaged almost 28 miles per year in the eight years being reported. With the increased population and the demands for recreation, the ARP is experiencing dramatic increases in use which causes increasing problems of trespass, encroachment and loss of access by the public. However, the boundary line program emphasis has shifted to support the hazardous fuels reduction program. Boundary location work is now performed by a mix of service contracts, force account and through agreements with the Bureau of Land Management. The ARP program is now managed by a Forest land surveyor who accomplished 46 miles of boundary line marking and posting while maintaining 14 miles in 2005. This is an increase of production by 80% when compared to last years reported eight year average of 25 miles per year and an increase of 20% when compared to 2004 total boundary line accomplishments. See Appendix B, Graph 15, NFS Boundary Maintained, and Graph 16, NFS Boundary Identified.

Land adjustments are multi-year projects in most cases. In order to complete Forest Plan targeted cases in any one fiscal year; casework must be started on approximately twice the number of cases in preceding years. Cases can be dropped or frequently changed because of changing land values, indecision, delays in finalizing the environmental analysis (NEPA), changed proposals, and the changing economic climate. Progress has been made toward Forest Plan Objectives in all areas except reduction of encroachments. With the new emphasis to the fuels reduction program, funding to process complex encroachments is not available. However, easy to resolve encroachments, such as fences, are being removed in conjunction with the fuels projects. See Appendix B, Graph 17, Encroachment Cases Processed.

Case Backlog for SUPs, ROW Grants and Land Ownership Adjustments	Have the Forest 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? (Land Uses & Ownership, Special Use Permits (SUPs), Right-of-way (ROW) Grants & Landownership Adjustments - Objective #2)

Minimal progress has been made to reduce the special uses backlog. The ARP Leadership Team has recognized this shortfall; however, because of the emphasis in fuels reduction the budget has been adjusted to support boundary management. Therefore a minimal amount of funding is available to process special uses. See Appendix B, Graph 18, Backlogged Special Use Permit Processed, Graph 19, Right-of-Way Cases, and Graph 20, NFS Lands Consolidated.

Accomplishments in land ownership adjustments made in Fiscal year 2005 included:

- Phase IV of the Beaver Brook Watershed Acquisition on the Clear Creek Ranger District added 410 acres of National Forest System land. This acquisition was a purchase using the Land and Water Conservation Fund Act. The Beaver Brook Watershed is a 2,700-acre parcel that serves as an important wildlife refuge and as one of the last remaining intact low-elevation, forested ecosystems along the Front Range of Colorado.
- Acquisition of a parcel of land on the Sulphur Ranger District added 40 acres of National Forest System land. This acquisition was purchased using the Land and Water Conservation Fund. The property is located in the south edge of the Town of Grand Lake, above the south shore of Grand Lake itself, within the Arapaho National Recreation Area (ANRA). The ANRA is managed to provide high quality recreation, conservation of scenic and historic values, and the stewardship of natural resources. The area receives national and international visitors as well as local use.

Permit Review, Cost Recovery	Have the Forest 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? (Land Uses & Ownership, Permit Review - Goal #2)

Cost recovery is not yet implemented at the National level. Whenever possible, collection agreements are made with project proponents that allow the collection of certain costs to the government from the proponent. The Forest has recognized the value of collection agreements and is moving forward with a special projects manager position to help utilize this tool more effectively.

Public Involvement	How and to what extent have the public and stakeholders been involved in assisting implementation, monitoring and evaluation of the Forest Plan.

In recreation, stakeholders have primarily been involved in the implementation of trail maintenance, noxious weed removal, and information and education work across the Forest. Many volunteer groups contact visitors, patrol wildernesses and summer/winter trails, restore watersheds, improve stream habitat, and record specific data for monitoring purposes.

All the Ranger Districts have extensive public involvement such as presentations to schools, outreach (scoping) during project planning, coordination of volunteer projects and so on.

Emerging Issues	Have changes in agency management activities resulted in unforseen issues that the ARNF and PNG need to address? How were needed changes determined and what recommendations or solutions did the public [or ARP personnel] offer?

RECREATION

Ongoing or Emerging Issues

- The "300 foot rule" currently allows motorized use 300 feet off any designated Forest Road for dispersed camping and other recreational purposes. Some forest visitors have been extending unauthorized roads beyond the 300-foot limit causing a cumulative creation of new unclassified roads where none were planned. This has created sanitation and erosion problems, and also creates confusion resulting in users not knowing where the travel route legally ends. In addition, enforcement is currently based on adequate road and trail signing in the field and has not proven effective to stop motorized incursions into the forest because signs are easily damaged or entirely removed.
- Renewed emphasis in inventory and data management (INFRA database) of Developed Recreation Sites, Trails, Wilderness Areas and General Forest Areas, as well as real property inventories for all Recreation Facility assets has created a higher than expected workload and cost to the agency, both in terms of dollars and opportunity cost of not doing other necessary work.
- Prior to December 8, 2004, the Recreation Fee Demo (RFD) program brought some positive effects to the public but it also created some negative issues. Now with the Federal Lands Recreation Enhancement Act of 2004 (REA), a small but very vocal segment of the public has used the program as a poster child for protesting fees, government management authority over public lands, taxes, and general fairness issues. Internally, lack of agency fortitude to move forward with implementation of REA has created uncertainty of the future for investment in personnel & infrastructure, commitment, support, etc.
- The Forest Service commitments made through Memorandum of Understanding (MOU) with groups like the Continental Divide Trail Alliance and the Colorado Fourteeners Initiative can establish partner expectations for funding, planning, and project implementation that the Forest or Districts may or may not be capable of upholding. Certain negotiation aspects are outside local control and we are faced with timing issues, funding issues and issues of other higher priority work which often conflict with partner expectations.
- Costs of providing safe drinking water that meets State standards and regulations are rising sharply. Microscopic Particulate Analysis testing for all water systems is now on a 3- year cycle and costs between $1,500 - $2,000 each test. Some campgrounds and picnic areas do not collect enough revenue to offset these costs.
- Carrying capacity for specified recreation areas that are undergoing planning processes are needed to help plan for existing and future human use.
- Recreation use in the urban front country is increasing rapidly, as are the corresponding impacts and conflicts between users. Urban front country areas need to be assessed for their capacity to

provide specified recreational experiences and not to provide others. This assessment should then lead to management changes on the ground in the future.
- Epidemic conditions of the mountain pine beetle have created very dire conditions in many of our developed site campgrounds and picnic areas.

Recommendations

- The "300 foot rule" stated on the Forest Map needs to be re-evaluated on a regional basis.
- Capacity issues, in some areas, need to be addressed.
- Travel management planning and decision-making needs to occur.
- The new Scenery Management System needs to be amended into the Forest Plan and officially supersede the Visual Quality Management System.
- Additional Wilderness management elements need to be attained as well as additional Wilderness areas managed to standard.
- Special-use permits need to be administered to minimum standards, and more need to be administered fully.
- INFRA databases for Wilderness, Developed Recreation and Trails should be fully populated and operating at a functional level. INFRA for General Forest Areas will most likely be in some phase of implementation.
- More "field presence" is needed to educate the public and enforce regulations. The Forest Service "field presence" personnel should have training to be certified as Forest Protection Officers.
- James Peak Wilderness issues and obligations need to be met.
- Consider converting some small campgrounds and day-use areas to dry-sites (no developed water system) as circumstances allow.
- Plan to address carrying capacity as part of management planning and/or environmental analysis for recreation areas undergoing some kind of existing planning process or potential planning based on need or demand.
- Assess ARP urban front country areas for their capacity to provide specified recreational experiences and determine what experiences are better provided in other locations on the Forest or on other lands.
- We need to increase protection measures for existing stands of healthy trees in our developed sites and begin vegetation management planning for eventual stand vegetation replacement and in some cases, catastrophic vegetation loss replacement.

TRAVEL MANAGEMENT

Ongoing or Emerging Issues

- 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. The increasing cost of planning is diverting funding from on-the-ground transportation system improvement, maintenance and decommissioning.
- 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.

- The Forest Service has declared itself a public road agency and is taking steps to identify previous non-public roads as public. The Public Forest Service Road program will have a significant affect on the management of the Forest and Grassland road transportation system.
- Upkeep of transportation system inventory information, including needed, planned and accomplished annual and deferred maintenance will require more time and effort. National deferred maintenance protocols require inventory and deferred maintenance surveys be performed on 20% of all inventoried roads each year (100% in 5 years). The cost of surveys and data management will take funding from on-the-ground maintenance activities.
- The Forest Service published an OHV rule in November, 2005. This rule directs that OHVs will be allowed only on designated OHV routes (roads or trails) on all National Forest lands.

Recommendations

- Continue to make the requirement of the Travel Rule a Forest priority.
- Continue to follow the Roads Analysis Process for travel management recommendations.
- Continue to improve relationships with volunteer groups and aggressively seek out challenge cost share projects.
- Continue to sign roads and trails for the types of uses allowed.
- For roads that are decommissioned, an explanation of why this was necessary should be clearly displayed in the field to help deter future trespass.
- 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.
- Work with the public and adjacent landowners to inform them of Arapaho and Roosevelt National Forests and Pawnee National Grassland travel regulations.
- Establish a method to more adequately plan and track accomplishments and utilization of funds allocated for "ongoing" activities.
- The Forest and Grassland should make a commitment to transportation planning and facilitate its completion. 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. Incorporate travel management planning and the RAP process with other area or project level assessments and analyses for best efficiency. Proceed with planning and implementation based on those priorities.
- Evaluate Human Uses Goals #6 for applicability to present National Policy and the transportation needs of the Forest and Grassland. National policy leans more toward decommissioning unauthorized roads than converting them to authorized roads. Decisions should be based on sound RAP procedures.
- Evaluate Human Use Goal #9 for applicability to present National Policy and the transportation needs of the Forest and Grassland. National Policy leans more toward reconstructing and maintaining our existing transportation system. Most of the areas of the Forest and Grassland in need of open road access already have that access. Decisions should be based on sound RAP procedures.
- Revise Objective output measures to match those of Road Accomplishment Report and INFRA so reportable objective accomplishments and annual accomplishments are measuring the same thing. Will also make M&E reporting easier.

WILDFIRE/HAZARDOUS FUELS TREATMENT

Ongoing and Emerging Issues

- There are many management issues related to the interweaving of public land and private property. This public land/private property intermixing is commonly known as the Wildland-Urban Interface (WUI). One of the most public issues is the danger of wildfires. Since 2000 four of the largest wildfires for recorded ARP wildfire history have occurred. The sizes of these fires can be related to the severe drought and the increased build-up of dead, woody material (hazardous fuels) in the forested ecosystems. The high losses of personnel property is due to the increasing inroads into these forested environments by private landowners and mountain communities.

Recommendations

- Congress has recognized this problem through increased funding and the ARP's hazardous fuels treatment program has expanded with the objective of reducing hazardous fuels; in the WUI, around domestic water supplies and watersheds, and to protect threatened and endangered wildlife/plant species. The ARP should continue all efforts to work with our neighbors (private property owners and public agencies) towards achieving reductions of hazardous fuels. Emphasis on the National Forest Plan and the Front Range Fuels Treatment Partnership should continue.

WATERSHED

Ongoing and Emerging Issues

- Meeting the needs for instream flows on streams in the Forest continues to be an issue. Increased interest in additional water development in response to the continuing drought has the potential to push this issue to the forefront. There continues to be tension concerning State and Federal authorities with regard to water development on Forest lands. In 2005, the Forest completed a plan amendment to change two standards and one guideline related to streamflow as directed by a discretionary review by the of Agriculture Deputy Under Secretary for Natural Resources and Environment. The wording for the old and new standards and guideline are shown on pages 24-25 of this document.
- Off-highway vehicle use, including mountain bikes, continues to increase. Unauthorized travel is a continuing source of watershed damage that continues to grow. Recreational use of designated roads and trails increases the controversy of travel management and can limit our ability to decommission and obliterate roads and trails for resource protection and recovery.
- The anticipated continuing increase in land area treated to reduce fuels could lead to cumulative watershed impacts. The cumulative impact could increase as treated areas are retreated in the future to maintain acceptable fuels profiles.

Recommendations

- Continue to seek innovative methods of providing for municipal and agricultural water supply while fulfilling our responsibility to provide for streamflow for Forest uses.
- Additional research is needed to provide tools to better quantify instream flow needs.
- Explore ways to provide for desirable OHV recreational experiences while protecting resources. Determine whether developed OHV trail systems such as the Stillwater OHV area have applicability elsewhere on the Forest.

- Explore methods for better analyzing, disclosing and mitigating the cumulative watershed impacts of landscape scale vegetation management, and for comparing the risks of no treatment alternatives with regard to wildfire with the impacts of fuels treatment.

SOILS

Ongoing or Emerging Issues

- Detrimental soil compaction exists in some proposed project areas before treatment implementation and is likely associated with past harvesting activities (old skid trails, landings), non-system roads, and dispersed recreation. New disturbances need to be mitigated to meet activity area standards.
- Operations on finer-textured and wet soils are resulting in compaction; operations need to be discontinued when soils are wet. A wet weather operations field guide was developed 2 years ago for Forest Sale Administrator use to determine when equipment operations can result in soil damage. Consider using designated skid trails in certain soil types.
- It is recommended that decompaction and revegetation of landings, skid trails and ash piles be implemented during operations before timber sale contract close out or during KV activities.
- Monitoring indicates that a winged subsoiler is more effective at decompacting landings, skid trails, and obliterating roads on the Forest than conventional ripping. However, conventional ripping can decompact shallow compaction on shallow, rocky soils.
- Winter burning of small hand piles appears to have minimal effects on soil conditions but increases footprint (increases the amount of severely burned activity area); large piles have variably severe effects- footprint minimized. Light-severely burned burn piles have invasive weeds present.
- Using feller processors operating over slash and masticators minimize soil compaction.
- Harvest activities using skidders with non-designated trails are resulting in excessive detrimental soil impacts on whole tree harvesting units; Forest Plan activity area standards are not being met in some project areas.
- Harvest and site prep activities using feller-bunchers with non-designated skid trails and dozers for machine trampling and site prep might be resulting in excessive detrimental soil impacts on fine textured soils. Forest Plan activity area standards are not being met in some project areas.
- Mitigations included in some Environmental Assessment Decision Notices and in some cases, Timber Sale Contracts are not being implemented.

Recommendations

- Continue to develop a more measurable goal for soil quality and at-risk soils.
- Continue to use/develop standard protocols for soil quality monitoring. Begin to work with regional office personnel if necessary to ensure protocols, standards and measures used are acceptable and applicable.
- Continue to work with marking crews, silviculturists, and engineers to educate them about soil/water resource issues and solutions.
- Ongoing research projects of Rocky Mountain Research Station personnel and other forests/institutions need to be applied, and possibly incorporated, with ongoing monitoring of management activities on the forest.

AIR

Ongoing or Emerging Issues

- Ambient ozone concentrations during the summers of 2003 and 2004 were exceedingly high at Rocky Mountain National Park and could potentially be affecting human well-being and ecosystems on the Arapaho-Roosevelt National Forest.
- Nitrogen deposition due to off-forest, anthropogenic emissions might be detrimentally affecting higher elevation ecosystems.
- Increased smoke emissions from prescribed and wild fire could affect sensitive receptors and Class 1 areas on and off the Forest.

Recommendations

- Continue funding AQRV sampling program and possibly modify sampling protocols to achieve a more cost-effective methodology.
- Continue to work with the Forest Service Regional, Washington Office, and RMRS air specialists and other agencies (i.e. Rocky Mountain National Park) to change management or modify emission sources off-forest, if necessary to protect Wilderness, Class I areas, and human health on the Forest.
- 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.

WILDLIFE/BOTANY

Old Growth Ongoing or Emerging Issues

- Knowledge and use of Forest Plan old growth direction during the past 8 years had been lacking in some project planning and implementation. Some planning/implementation teams had not sought direction in the Forest Plan, or followed basic planning steps in proper sequence.

Old Growth Recommendation

- This issue was corrected by informing the planning teams of the problem. However, it remains necessary that awareness and application of Forest Plan old growth direction should be a primary objective in any forest treatment projects, during both planning and implementation.

Databases Ongoing or Emerging Issues

- Basic inventory data are needed to adequately manage and monitor almost all resources within the ARP. Assuring reliable data and updates is necessary for Forest Plan implementation. Currently, resource condition data updates are not adequate to ascertain whether expected Forest Plan outputs and effects are on track. Forestland and grassland structural stages and roads/trails databases (as well as other databases) are not totally reflecting existing condition, which makes quantifiable comparisons of habitat effects on wildlife difficult (if not impossible) to determine.

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Databases Recommendation

- Updating of basic resource databases should be a priority in the next few years to meet Forest Plan commitments by year 10. For example, once databases updates are complete, the mandatory comparisons of MIS population trends with habitat conditions will be possible.

Biological Diversity Ongoing or Emerging Issues

- Opportunities, including working with partners, restoring riparian areas, and improving/increasing access management in TES habitat have not been fully implemented.

Biological Diversity Recommendation

- Given the high emphasis for biological diversity committed to in the Forest Plan, increased effort in this area should occur.

Travel Management Ongoing or Emerging Issues

- Unconstrained off-road vehicle use is increasing in different areas of the ARP.

Travel Management Recommendation

- Increase emphasis on travel management planning and implementation, which will enable better management/protection of wildlife and TES. This includes updating roads/trails databases and enabling the public to better assist as stewards of the land by having a well-planned, well-signed and well-managed travel system.

LAW ENFORCEMENT/FIELD PRESENCE

Ongoing or Emerging Issues

- Funding allows one law enforcement officer for every 700,000 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. For example there is limited ability to enforce travel management direction across the ARP due to the lack of field presence (seasonal and permanent employees).
- In an era of tight budgets and personnel downsizing, there is an increased dependence on volunteers to meet program needs. While these people do an excellent job, they lack the authority to enforce regulations. Another example is contracting with a concessionaire to manage Forest Service campgrounds rather than Forest Service employees interacting with campers.

Recommendations

- Minimize illegal use through expanded law enforcement and field presence. There is a need for follow-up on the districts where the transportation system is being actively signed. The “closed unless designated open: regulation should be actively enforced.

- 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.
- 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.

LANDS

Ongoing or Emerging Issues

- Funding issues continue to be a factor in meeting Forest Plan objectives for the Lands Program.
- Two road access litigation cases were filed last year. Access across National Forest System land to private land will continue to be an issue.
- On the horizon is the implementation of cost recovery regulations. 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. When the regulations are implemented the forest will be required to train line officers, permit administrators and others regarding this process. It will take time to implement and work out the forest procedures, again delaying the processing of special use authorizations.
- There are significant additional miles of boundary survey and rights-of-ways needed in support of the National Fire Plan (NFP) and Front Range Fuels Treatment Partnership. How this will be funded while maintaining normal Lands programs continues to be a challenge.
- Increased accomplishments in survey in support of the NFP will create additional opportunities and needs to resolve encroachments, Small Tracts Act (STA) cases, and boundary disputes.
- With the increased population, the demands for recreation and quality of life, the Forests and Grassland are experiencing increasing problems of trespass, encroachment, and loss of access by the Public. Increased requests for access to private land and use of NFS land are also associated with the demands.
- The easy cases for acquisition, exchange and STA have been completed. Casework is becoming more complex and time consuming.
- Performance measures are being developed that will more accurately describe accomplishments in program areas. Forest Plan objectives and the S-Tables may have to be revised to reflect these new national performance indicators.

Recommendations

- 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.
- Emphasis to process ANILCA access cases should be developed to try and eliminate litigation cases.
- Revise the outputs in Table 1.6 for *NFS Lands Without Adequate Access* to something that can be more easily measured without extensive GIS analysis.

- The S-Tables need to be updated to reflect BFES and MAR outputs so measurements of progress can be coordinated with national reporting requirements.
- Discrepancies between Plan Objectives and outputs in S-Tables need to be resolved.
- 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.
- Review the proposed outputs in Plan Objectives and S-Tables to ensure that the proposed outputs recognize the complexity of land ownership on the front range, particularly BRD, CLRD, CCRD and PNG.
- Continue to emphasize elimination of the special use and STA backlogs. The Forest is not on track to reach the elimination of backlog by 2007.
- Use the new 36 CFR 251 regulations to eliminate inappropriate proposals before large amounts of time are spent analyzing permit applications.
- Continue to require proponent financing until cost recovery regulations are in place.
- Use the Lands Program Priorities to help establish a program of work for the district and supervisor offices.

MINERALS

Ongoing or Emerging Issues

- Energy continues to be a National priority. Short timelines to process oil and gas leasing nominations and applications for permit to drill may be a challenge if interest increases on the grasslands.
- The Forest Service is requiring Mineral Administrator Certification for the locatable minerals. The certification requires training and approval by the Washington Office. This will require the Forest to change its administration of the locatable minerals program.

Recommendations

- Mineral Administrator Certification: Have the Lands and Minerals Supervisor's Office and District Staffs discuss how who should be certified.

HERITAGE RESOURCES

Ongoing or Emerging Issues:

- An important emerging issue related to our 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 Indian Tribes and interested parties during project planning and analysis. While we are still working to interpret the new regulations, they have already changed 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. One of the more evident changes is the requirement to consult with Certified Local Governments (CLGs) on our compliance projects. This has required the addition of a third compliance report (NEPA Specialist report, 106 Compliance Report and a modified NEPA Specialist report for the CLG). More Governmental entities are becoming CLGs, at this time CLGs associated with the Forest

include the cities of Boulder, Central City, Fort Collins, George Town, Idaho Springs, and Boulder County. Because Boulder County is a CLG all projects on the Boulder Ranger District must have additional consultation with the Boulder County Historic Preservation Advisory Board that is very labor intensive and requires additional Heritage staff time. As more counties become CLGs the workload for the heritage staff will increase for the entire Forest.

- Compliance work is currently being accomplished on the majority of projects in a timely and legal fashion.
- There are no goals, objectives, standards or guidelines for the heritage resource. Law dictates much of what guides the work done in this area. However, laws do not cover all aspects of the heritage resource program and it is left up to the individual line officer to decide what work will be done.
- Funding for project monitoring has not focused on heritage resources, thus, it has not been determined how well mitigation direction is being followed as stated in the project NEPA documents.
- Isolated Cabins, Hazardous Mine Safety Closures and Non-Recreation Special Use projects are emerging as the type of project with un-avoidable adverse effects to historic properties. These types of projects are generally small in size so avoiding the effects by moving project boundaries is not possible. The Forest trend is to have more un-avoidable adverse effects that require mitigation. This is emerging as an issue due to the new implementing regulations for the NHPA, 36CFR Part 800. These new regulations greatly expand the Forest's requirements to seek out and involve interested parties and the public during project planning and analysis. While we are still working to interpret the new regulations, they have already changed the way that we do business. Generally, they are much more rigorous than the old regulations, and require extensive documentation and public comment. Isolated Cabins, Hazardous Mine Safety Closures and Non-Recreation Special Uses typically do not require as extensive public comment in NEPA analysis as do some of our larger projects. However, as the public becomes more aware of the changes to Section 106, the Forest will need to expend more effort in engaging the public in these projects for compliance with Section 106 of the NHPA.
- The Forest has made progress in maintaining baseline heritage data. 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 and verify all Forest and Grassland heritage data for heritage site and survey information into GIS layers.

Recommendations

- Compliance work is currently being accomplished on *most* projects in a timely and legal fashion. The heritage staff should be fully integrated into the NEPA process on large projects, and on smaller projects should be involved early in the planning stages.
- 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.
- Provide adequate project funding to do full implementation monitoring.
- Continue to enter data into the GIS Heritage Layers and INFRA Heritage Database.

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

Ongoing or Emerging Issues

- Mitigation measures are being better developed in an interdisciplinary fashion than first reported in 2003. However, this is not always the case and leads to project implementation difficulties due to conflicts between these mitigation measures.
- Mapping needs and database management (GIS) is proving to be a roadblock in moving planning projects through the NEPA process and then to implementation.
- Implementation does not always follow the NEPA decision.
- Travel management decisions are lagging compared to its emphasis in the Forest Plan. Some of the possible reasons for this may be lack of funding, other priorities, and the difficulty of decisions with polarized publics.

Recommendations

- Interdisciplinary Teams (IDTs) should have a meeting to discussion mitigations each team member has developed to have a truly interdisciplinary process. This meeting should lead to one unified list of mitigations per alternative.
- Some of the GIS roadblock is being relieved by the placement of GIS specialists on most of the Ranger Districts. However, technology transfer (training) is lacking, which would improve understanding and utilization of the ARP corporate databases to all project planning specialists and land managers.
- Project interdisciplinary team members should review project sites during project implementation to ensure mitigation measures are carried out. This will also require mitigation funding be included in the project implementation.
- Consider developing transportation planning team(s) similar to fuels planning teams.

FOREST PLANNING

Recommendations

Complete Forest Plan Amendments

- Incorporate the Williams Fork Area into the Forest Plan
- Replace the Visual Management System with the Scenery Management System in the Forest Plan

LIST OF PREPARERS

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LIST OF ACRONYMS

ADA: Americans with Disabilities Act
ANRA: Arapaho National Recreation Area
ARNF: Arapaho and Roosevelt National Forests
ARP: Arapaho and Roosevelt National Forests and Pawnee National Grassland
ATV: All terrain vehicle
BFES: Budget Formulation and Execution System
BLM: Bureau of Land Management
BRD: Boulder Ranger District
CCRD: Clear Creek Ranger District
CDOT: Colorado Department of Transportation
CDOW: Colorado Division of Wildlife
CFR: Code of Federal Regulations
CLG: Certified Local Government
CLRD: Canyon Lakes Ranger District
CNHP: Colorado Natural Heritage Program
CO: Colorado
DMS: Days Managed to Standard
EA: Environmental Assessment
EIS: Environmental Impact Statement
FP: Forest Plan
FPO: Forest Protection Officer
GFA: General Forest Area
GIS: Geographic Information System
IDT: Interdisciplinary Team
KV: Knutson-Vandenberg
MAR: Management Attainment Report
MIS: Management Indicator Species
MOU: Memorandum of Understanding
NEPA: National Environmental Policy Act
NFMA: National Forest Management Act
NFP: National Fire Plan
NRIS: National Resource Information System
OHV: Off-highway Vehicle
PNG: Pawnee National Grassland
RAP: Roads Analysis Process
RFD: Recreation Fee Demo
RMBO: Rocky Mountain Bird Observatory
SIA: Special Interest Area
STA: Small Tracts Act
TES: Threatened, Endangered, Sensitive Wildlife or Plant Species
VIS: Visitor Information Services

APPENDIX A – MIS Population Trend Tables

Mammals

Table 1.

Elk Post-hunt population estimates (Big game statistics, Colorado Division of Wildlife, 2006)

Herd Name	Data Analysis Unit	Game Mgmt Units In and near ARNF	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Poudre River	E4	7,8,9,19,191	4490	4390	4540	4240	4280	4210	3920	3890	3810
Saint Vrain	E9	20	2670	2570	4140	4220	4370	3980	3810	4020	4100
Clear Creek	E38	29,38	1240	1230	1280	1250	1290	1300	1180	1150	1190
Mount Evans	E39	39,46,391,461	2460	2620	3000	3170	3140	3220	3020	4090	3850
Troublesome Cr	E8	18,181	3640	4700	3560	3340	3590	4020	3590	3820	3030
William's Fork	E13	28,37,371	4770	5200	4160	3880	3490	3340	4200	3800	3300
In and near ARNF Totals			**19270**	**20710**	**20680**	**20100**	**20160**	**20070**	**19720**	**20770**	**19280**
State-wide Totals		(rounded to 100)	218500	229400	264600	292600	305500	297500	278700	274900	258400

-- ARNF population trend has been stable 1997-2005.

-- Colorado population estimates have increased 40% from 1997-2001, and have been gradually decreasing since.

Table 2.

Mule deer Post-hunt population estimates (Big game statistics, Colorado Division of Wildlife, 2006)

Herd Name	Data Analysis Unit	Game Mgmt Units In and near ARNF	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Redfeather	D4	7,8,9,19,191	12290	13810	11190	9730	9720	9070	8340	8650	8140
Big Thompson	D10	20	7960	8240	5830	6320	6470	6120	6470	6430	5880
Boulder	D27	29,38	7220	7400	8550	7890	7270	7080	7470	7000	7130
Bailey	D17	39,46,51, 391,461	8330	6890	6750	7070	7570	8410	8420	8010	7880
Middle Park	D9	18,181,27,28,37,371	10150	11960	14180	10900	12250	13150	13240	13250	12030
In and near ARNF Totals			**45950**	**48300**	**46500**	**41910**	**43280**	**43830**	**43940**	**43340**	**41060**
In and near PNG Totals											
Table Lands	D5	87,88,89,90,93,95	1/	1/	1/	2110	1880	1600	1480	1450	1500
In and near ARNF/PNG Totals						**44020**	**45160**	**45430**	**45420**	**44790**	**42560**
State-wide Totals		(rounded to 100)	516500	526400	528700	551600	565300	563700	602700	593,610	614100

1/ Not comparable at present scale. Prior to 2000, Table Lands data analysis unit included a larger area beyond PNG.

-- ARNF trend has varied since 1997, with population being highest in 1998 and lowest in 2005.

-- PNG trend has declined yearly, dropping 29% since 2000.

-- Combined ARNF/PNG trend has been generally stable since 2000, with population being lowest in 2005.

-- For Colorado, population trend was generally upward 1997-2005, increasing 19% overall.

Table 3.
Bighorn sheep Post-hunt population estimates (Big game statistics, Colorado Division of Wildlife, 2006)

Herd Name	Game Mgmt Units In and near ARNF	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Poudre River	S1	150	120	120	120	115	105	95	95	50
Mount Evans	S3	240	200	200	200	200	160	125	125	175
Rawah	S18	**	40	40	40	30	30	45	45	20
Never Summer Range	S19	175	100	100	50	50	50	50	25	25
Georgetown	S32	350	350	450	450	450	400	250	300	300
St Vrain	S37	***	80	80	80	80	100	100	100	100
Big Thompson	S57	140	60	50	50	60	80	80	80	80
Lower Poudre	S58	60	40	40	40	30	30	30	30	25
Rocky Mtn National Park	N/A	130	130	400	350	350	350	450	450	375
In and near ARNF Totals		**1245**	**1120**	**1480**	**1380**	**1365**	**1305**	**1225**	**1250**	**1150**
State-wide Totals		7720	7245	7455	7535	7590	7495	7465	7370	7260

** Lumped with S1. *** Lumped with S57

-- ARNF and Colorado trends have both varied and decreased slightly from 1997 to 2005 (7.6 and 6.0%, respectively).

Table 4.

Black-tailed Prairie Dog (Active towns; PNG annual surveys)

In and near PNG

Year	Towns	Acres	Year	Towns	Acres	
1981	14	**357**	**1994**	21	**329**	
1982	15	**360**	**1995**	17	**338**	
1983	14	**179**	**1996**	19	**515**	
1984	13	**249**	**1997**	21	**701**	
1985	14	**323**	**1998**	20	**892**	
1986	17	**282**	**1999**	19	**703**	
1987	15	**384**	**2000**	25	**934**	
1988	16	**331**	**2001**	26	**1032**	
1989	13	**602**	**2002**	30	**1674**	
1990	20	**419**	**2003**	29	**2053**	
1991	23	**566**	**2004**	27	**2863**	
1992	17	**322**	**2005**	42	**3673**	*
1993	28	**387**				

* 3673 acres is the highest in 2005. Three plague events occurred after the towns were surveyed in 2005, resulting in a loss of about 1/3 or a year-end total of about 2460 acres.

Number and size of prairie dog towns best indicate population levels (Colorado Division of Wildlife 2003,

Severson and Plumb 1998, Cinotta et al. 1987, Garrett et al. 1982).

Since 1981 acres of towns have varied between 179 acres in 1983 and 3763 acres in 2005 with reductions .

primarily caused by plague.

Since 1994 annual increases have occurred, except for one year.

Birds

Table 5.

Burrowing Owl (PNG annual owl surveys)

In and near PNG Year	# Dog Towns Surveyed	Total # Acres	Adult Owls	Juvenile Owls	Unknown Owls	Total # Owls
1998	23	585	40	90	47	**177**
1999	26	1070	43	56	23	**122**
2000	28	987	48	58	32	**138**
2001	30	1216	68	43	32	**143**
2002	32	18790	83	57	45	**185**
2003	31	2295	67	79	71	**217**
2004	33	3411	70	133	69	**270**
2005	51	4202	85	128	91	**304**

Population trends have continued to increase on the PNG since 1999, with 2005 numbers 2.5 times higher than in 1999.

Table 6.

Mountain Plover (USGS annual surveys - Knopf 2004, Wunder 2005)

PNG

Year	# Birds	Birds/ km² ± SE	Year	# Birds	Birds/ km² ± SE
1990	**77**	4.7 ± 1.2	**1998**	**24**	1.5 ± 0.1
1991	**33**	2.0 ± 0.5	**1999**	**0**	NA
1992	**67**	4.1 ± 0.8	**2000**	**8**	NA
1993	**44**	2.7 ± 0.6	**2001**	**2**	NA
1994	**59**	3.6 ± 0.4	**2002**	**1**	NA
1995	**2**	NA	**2003**	**1**	NA
1996	**9**	0.6 ± 0.1	**2004**	**0**	NA
1997	**5**	NA	**2005**	**12**	NA

Dramatic drop in population beginning in 1995 on PNG.
Counts at larger geographic scales unable to discern trends (RMBO 2002).

Table 7a. (Also see ferruginous hawk transect counts by RMBO)

Ferruginous Hawk (Active nests; PNG annual raptor surveys)

PNG Year	total # sites surveyed	# active nests	Year	total # sites surveyed	# active nests
1981	45	**13**	**1993**	73	**13**
1982	42	**14**	**1994**	73	**9**
1983	53	**10**	**1995**	73	**7**
1984	54	**11**	**1996**	78	**7**
1985	54	**4**	**1997**	76	**8**
1986	56	**12**	**1998**	76	**11**
1987	56	**11**	**1999**	75	**6**
1988	70	**14**	**2000**	78	**11**
1989	70	**10**	**2001**	76	**5**
1990	68	**12**	**2002**	80	**8**
1991	72	**15**	**2003**	81	**3**
1992	80	**9**	**2004**	81	**4**
			2005	81	**5**

Overall trend is downward with an average of 6.8 active nests in the ten year period
from 2005 to 1996, down from 11.2 from 1995-1986 and 10.4 from 1981-1985.

Table 7b. (Also see ferruginous hawk active nest counts by PNG)

Ferruginous Hawk (Monitoring Colorado Birds data, RMBO 2005)

PNG Number/transect/year

Transect	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**Avg/yr**
AS28	0	NR	0	NR	NR	NR	0	0	0.0
AT02	NR	NR	NR	NR	0	0	0	NR	0.0
AT03	NR	0	NR	0	0	0	NR	0	0.0
AT04	NR	0	NR	NR	0	0	0	0	0.0
AT05	NR	0	0	0	0	0	0	0	0.0
AT06	NR	0	0	0	0	0	0	0	0.0
GR01	NR	0	0	0	0	0	0	0	0.0
GR02	NR	0	1	0	2	0	0	0	0.4
GR03	NR	1	NR	0	1	1	0	1	0.7
GR05-02	NR	NR	NR	NR	0	NR	NR	0	0.0
GR15	NR	NR	0	NR	0	0	0	0	0.0
HR05	NR	NR	0	0	NR	0	0	0	0.0
HR09	NR	0	0	0	0	NR	0	0	0.0
HR10	NR	NR	0	0	0	NR	0	NR	0.0
HR18	NR	0	NR	NR	0	0	0	0	0.0
HR25	NR	0	0	0	0	0	0	0	0.0
MC03	NR	0	0	0	0	0	0	0	0.0
MC27	NR	0	0	0	0	0	0	0	0.0
PP13	0	0	0	0	0	NR	NR	0	0.0
PP15	0	0	NR	0	0	NR	0	0	0.0
PP16	0	0	0	0	0	NR	0	0	0.0
PP21	0	0	0	0	0	NR	0	0	0.0
PP29	0	0	0	NR	0	NR	NR	NR	0.0

SF16	0	NR	0	0	NR	NR	0	NR	0.0
SF17	0	0	NR	0	0	NR	0	0	0.0
SF30	NR	0	0	NR	NR	NR	0	0	0.0
Total birds	**0**	**1**	**1**	**0**	**3**	**1**	**0**	**1**	**1.0**
# of transects w/ hits	**0**	**1**	**1**	**0**	**2**	**1**	**0**	**1**	**0.9**

NA = Transect not in Arapaho/Roosevelt during this year

NR = Transect not conducted in this year

NOTE: In 2003, protocol changed for conducting HR transects from a 15-point point transect (3500m in length) to a 1000m line transect.

- Apparent long-term decline of nesting birds on PNG and relatively stable transect bird counts.
- Increasing breeding bird trends at larger geographic scales (RMBO 2002).
- Increasing winter bird trends at larger geographic scales (RMBO 2002).

Table 8.

Golden-crowned Kinglet (Monitoring Colorado Birds data, RMBO 2005)

ARNF Number/transect/year

Transect	1998	1999	2000	2001	2002	2003	2004	2005	Avg/yr
AS28	0	NR	0	NR	NR	NR	0	0	0.0
AT02	NR	NR	NR	NR	0	0	0	NR	0.0
AT03	NR	0	NR	0	0	0	NR	0	0.0
AT04	NR	0	NR	NR	0	0	0	0	0.0
AT05	NR	1	0	0	0	0	0	0	0.1
AT06	NR	0	0	0	0	0	0	0	0.0
GR01	NR	0	0	0	0	0	0	0	0.0
GR02	NR	0	0	0	0	0	0	0	0.0
GR03	NR	0	NR	0	0	0	0	0	0.0
GR05-02	NR	NR	NR	NR	0	NR	NR	0	0.0
GR15	NR	NR	0	NR	0	0	0	0	0.0
HR05	NR	NR	17	0	NR	0	0	0	3.4
HR09	NR	4	0	0	0	NR	0	0	0.7
HR10	NR	NR	0	0	0	NR	0	NR	0.0
HR18	NR	0	NR	NR	0	0	0	1	0.2
HR25	NR	0	0	0	0	0	0	0	0.0
MC03	NR	0	0	0	0	0	0	0	0.0
MC27	NR	1	0	0	0	0	0	0	0.1
PP13	0	0	0	0	0	NR	NR	0	0.0
PP15	0	0	NR	0	0	NR	0	0	0.0
PP16	0	0	0	0	0	NR	0	0	0.0
PP21	0	0	0	0	0	NR	0	0	0.0
PP29	0	0	0	0	0	NR	NR	NR	0.0
SF16	0	NR	0	NR	NR	NR	0	NR	0.0
SF17	10	2	NR	0	1	NR	0	2	0.8
SF30	NR	2	4	NR	NR	NR	1	5	2.3
Total birds	**10**	**10**	**21**	**0**	**1**	**0**	**1**	**8**	**5.5**
# of transects w/ hits	**1**	**5**	**2**	**0**	**1**	**0**	**1**	**3**	**1.7**

NA = Transect not in Arapaho/Roosevelt during this year

NR = Transect not conducted in this year

- Overall trend on the forest is decreased dramatically beginning in 2001. All transects with historic hits of GCKI were read in 2005 but still resulted in a continued downward trend.
- Breeding trends since 1979 and winter trends since 1988 are not available at larger geographic scales (RMBO 2002).

Table 9.

Hairy Woodpecker (Monitoring Colorado Birds data, RMBO 2005)
ARNF Number/transect/year

Transect	1998	1999	2000	2001	2002	2003	2004	2005	Avg/yr
AS28	2	NR	1	NR	NR	NR	1	2	1.0
AT02	NR	NR	NR	NR	1	0	0	NR	0.3
AT03	NR	0	NR	0	0	0	NR	0	0.0
AT04	NR	0	NR	NR	0	0	0	0	0.0
AT05	NR	0	0	0	0	0	0	0	0.0
AT06	NR	0	0	0	0	0	0	0	0.0
GR01	NR	0	0	0	0	0	0	0	0.0
GR02	NR	0	0	0	0	0	0	0	0.0
GR03	NR	0	NR	0	0	0	0	0	0.0
GR05-02	NR	NR	NR	NR	0	NR	NR	0	0.0
GR15	NR	NR	0	NR	0	0	0	0	0.0
HR05	NR	NR	0	0	NR	0	0	0	0.0
HR09	NR	0	0	0	0	NR	1	0	0.2
HR10	NR	NR	2	3	0	NR	0	NR	1.3
HR18	NR	0	NR	NR	0	0	0	0	0.0
HR25	NR	0	0	0	0	0	0	0	0.0
MC03	NR	1	0	0	1	0	1	0	0.4
MC27	NR	0	0	0	0	0	1	0	0.1
PP13	6	2	2	0	0	NR	NR	0	0.8
PP15	0	0	NR	0	0	NR	0	1	0.2
PP16	4	0	1	0	4	NR	2	13	3.3
PP21	3	1	0	4	1	NR	5	2	2.2
PP29	0	1	1	NR	0	NR	NR	NR	0.7
SF16	0	NR	0	0	NR	NR	0	NR	0.0
SF17	0	0	NR	0	0	NR	0	1	0.2
SF30	NR	2	0	NR	NR	NR	2	0	1.3
Total birds	**15**	**7**	**7**	**7**	**7**	**0**	**13**	**19**	**6.8**
# of transects w/ hits	**4**	**5**	**5**	**2**	**3**	**0**	**7**	**5**	**3.9**

NA = Transect not in Arapaho/Roosevelt during this year
NR = Transect not conducted in this year

- Population numbers dipped from 1999 through 2003 for ARNF, but numbers have rebounded to their 1998 levels in 2004 and 2005.
- Breeding surveys show increasing trend at a continental level (RMBO 2002).

Table 10.

Lark Bunting (Monitoring Colorado Birds data, RMBO 2005)
ARNF Number/transect/year

Transect	1999	2000	2001	2002	2003	2004	2005	Avg/yr
AS28	NR	0	NR	NR	NR	0	0	0.0
AT02	NR	NR	NR	0	0	0	NR	0.0
AT03	0	NR	0	0	0	NR	0	0.0
AT04	0	NR	NR	0	0	0	0	0.0
AT05	0	0	0	0	0	0	0	0.0
AT06	0	0	0	0	0	0	0	0.0
GR01	75	85	68	66	112	77	75	79.7
GR02	52	94	50	44	87	35	44	58.0
GR03	43	NR	76	5	90	72	36	53.7
GR05-02	NR	NR	NR	6	NR	NR	87	46.5
GR15	NR	0	NR	0	0	0	64	12.8
HR05	NR	0	0	NR	0	0	0	0.0
HR09	0	0	0	0	NR	0	0	0.0
HR10	NR	0	0	0	NR	0	NR	0.0
HR18	0	NR	NR	0	0	0	0	0.0
HR25	0	0	0	0	0	0	0	0.0
MC03	0	0	0	0	0	0	0	0.0
MC27	0	0	0	0	0	0	0	0.0
PP13	0	0	0	0	NR	NR	0	0.0
PP15	0	NR	0	0	NR	0	0	0.0
PP16	0	0	0	0	NR	0	0	0.0
PP21	0	0	0	0	NR	0	0	0.0
PP29	0	0	NR	0	NR	NR	NR	0.0
SF16	NR	0	0	NR	NR	0	NR	0.0
SF17	0	NR	0	0	NR	0	1	0.0
SF30	0	0	NR	NR	NR	0	0	0.0
Total birds	**170**	**179**	**194**	**121**	**289**	**184**	**307**	**189.5**
# of transects w/ hits	**3**	**2**	**3**	**4**	**3**	**3**	**6**	**3.4**

NA = Transect not in Arapaho/Roosevelt during this year
NR = Transect not conducted in this year

- Population trends on PNG appear variable but relatively stable since 1999 when survey transects were established.
- CO densities vary greatly due to semi-nomadic nature, related to unpredictable climate of Great Plains; from 1-pair/5 acres to 1-pair/143 acres.
- Downward trend at rate of 1-3% per year at larger scales (RMBO 2002).

Table 11.

Mountain Bluebird (Monitoring Colorado Birds data, RMBO 2005)

ARNF Number/transect/year

Transect	1998	1999	2000	2001	2002	2003	2004	2005	Avg/yr
AS28	0	NR	0	NR	NR	NR	0	0	0.0
AT02	NR	NR	NR	NR	1	1	2	NR	1.3
AT03	NR	4	NR	3	0	0	NR	0	1.8
AT04	NR	3	NR	NR	1	2	2	0	1.6
AT05	NR	2	0	0	0	0	1	0	0.4
AT06	NR	0	0	1	0	0	0	0	0.1
GR01	NR	0	0	0	0	0	NR	0	0.0
GR02	NR	0	0	0	0	0	0	0	0.0
GR03	NR	0	NR	0	0	0	0	0	0.0
GR05-02	NR	NR	NR	NR	0	NR	NR	0	0.0
GR15	NR	NR	0	NR	0	0	0	0	0.0
HR05	NR	NR	0	0	NR	0	0	0	0.0
HR09	NR	0	0	0	0	NR	0	0	0.0
HR10	NR	NR	0	0	0	NR	0	NR	0.0
HR18	NR	0	NR	NR	0	0	0	0	0.0
HR25	NR	0	0	4	2	1	0	0	1.0
MC03	NR	0	0	0	0	0	0	0	0.0
MC27	NR	0	0	0	0	0	0	0	0.0
PP13	0	0	0	0	0	NR	NR	0	0.0
PP15	0	0	NR	0	6	NR	1	1	1.6
PP16	0	0	0	0	1	NR	1	6	1.3
PP21	3	0	0	0	0	NR	0	2	0.3
PP29	0	0	0	NR	NR	NR	NR	NR	0.0
SF16	0	NR	0	0	NR	NR	0	NR	0.0
SF17	0	0	NR	0	0	NR	0	0	0.0
SF30	NR	0	0	NR	NR	NR	0	0	0.0
Total birds	**3**	**9**	**0**	**8**	**11**	**4**	**7**	**9**	**6.5**
# of transects w/ hits	**1**	**3**	**0**	**3**	**5**	**3**	**5**	**3**	**3.1**

NA = Transect not in Arapaho/Roosevelt during this year

NR = Transect not conducted in this year

- Transect survey data for ARNF indicate that mountain bluebird population trends are somewhat variable but stable.
- Breeding trends at continental level slightly increased during 1966-2000 but winter trends are too variable to exhibit a trend (RMBO 2002).

Table 12.

Pygmy Nuthatch (Monitoring Colorado Birds data, RMBO 2005)
ARNF Number/transect/year

Transect	1998	1999	2000	2001	2002	2003	2004	2005	Avg/yr
AS28	0	NR	0	NR	NR	NR	0	0	0.0
AT02	NR	NR	NR	NR	0	0	0	NR	0.0
AT03	NR	0	NR	0	0	0	NR	0	0.0
AT04	NR	0	NR	NR	0	0	0	0	0.0
AT05	NR	0	0	0	0	0	0	0	0.0
AT06	NR	0	0	0	0	0	0	0	0.0
GR01	NR	0	0	0	0	0	0	0	0.0
GR02	NR	0	0	0	0	0	0	0	0.0
GR03	NR	0	NR	0	0	0	0	0	0.0
GR05-02	NR	NR	NR	NR	0	NR	NR	0	0.0
GR15	NR	NR	0	NR	0	0	0	0	0.0
HR05	NR	NR	0	0	NR	0	0	0	0.0
HR09	NR	0	0	0	1	NR	0	0	0.2
HR10	NR	NR	0	0	0	NR	0	NR	0.0
HR18	NR	0	NR	NR	0	0	0	0	0.0
HR25	NR	0	0	0	0	0	0	0	0.0
MC03	NR	0	0	0	0	0	4	0	0.6
MC27	NR	0	0	0	0	0	4	0	0.6
PP13	0	0	0	0	0	NR	NR	1	0.2
PP15	0	0	NR	3	10	NR	0	1	2.8
PP16	0	0	0	0	0	NR	5	3	1.3
PP21	1	2	0	0	4	NR	14	0	3.3
PP29	3	0	0	NR	0	NR	NR	NR	0.0
SF16	0	NR	0	0	NR	NR	0	NR	0.0
SF17	0	0	NR	0	0	NR	0	0	0.0
SF30	NR	0	2	NR	NR	NR	0	0	0.7
Total birds	**4**	**2**	**2**	**3**	**15**	**0**	**27**	**5**	**8.2**
# of transects w/ hits	**2**	**1**	**1**	**1**	**3**	**0**	**4**	**3**	**1.9**

NA = Transect not in Arapaho/Roosevelt during this year
NR = Transect not conducted in this year

- Transect surveys indicate a highly variable trend. Appearing stable from 1998 thru 2001, then a dramatic increase in 2002 and 2004 and a return to lower and more stable levels in 2005. Note that transect surveys in typical habitat (ponderosa pine) were not conducted in 2003.
- No trend was discernable at larger geographic scales (RMBO 2002).

Table 13.

Warbling Vireo (Monitoring Colorado Birds data, RMBO 2005)

ARNF Number/transect/year

Transect	1998	1999	2000	2001	2002	2003	2004	2005	Avg/yr
AS28	21	NR	6	NR	NR	NR	1	8	3.5
AT02	NR	NR	NR	NR	0	0	0	NR	0.0
AT03	NR	0	NR	0	0	0	NR	0	0.0
AT04	NR	1	NR	NR	0	0	0	0	0.2
AT05	NR	0	0	0	0	0	0	0	0.0
AT06	NR	0	0	0	0	0	0	0	0.0
GR01	NR	0	0	0	0	0	0	0	0.0
GR02	NR	0	0	0	0	0	0	0	0.0
GR03	NR	0	NR	0	0	0	0	0	0.0
GR05-02	NR	NR	NR	NR	0	NR	NR	0	0.0
GR15	NR	NR	0	NR	0	0	0	0	0.0
HR05	NR	NR	2	0	NR	0	0	0	0.4
HR09	NR	0	7	7	5	NR	1	5	4.2
HR10	NR	NR	7	14	0	NR	1	NR	5.5
HR18	NR	0	NR	NR	0	0	0	0	0.0
HR25	NR	7	19	6	3	0	0	0	5.0
MC03	NR	4	1	7	0	2	3	8	3.6
MC27	NR	4	0	2	0	0	4	13	3.3
PP13	15	4	7	14	4	NR	NR	0	5.8
PP15	2	0	NR	0	0	NR	0	0	0.0
PP16	0	4	6	16	3	NR	5	4	6.3
PP21	0	0	0	3	6	NR	2	3	2.3
PP29	7	12	5	NR	5	NR	NR	NR	7.3
SF16	0	NR	0	0	NR	NR	0	NR	0.0
SF17	0	4	NR	1	0	NR	0	0	1.0
SF30	NR	0	0	NR	NR	NR	0	0	0.0
Total birds	**45**	**40**	**60**	**70**	**26**	**2**	**17**	**41**	**35.8**
# of transects w/ hits	**4**	**8**	**9**	**9**	**6**	**1**	**7**	**6**	**6.6**

NA = Transect not in Arapaho/Roosevelt during this year

NR = Transect not conducted in this year

- Transect survey counts indicate variable population trends on ARNF, with decreases from 2001 thru 2004 and a return to levels similar to 1998-1999 in 2005, noting that several transects were not read in 2003.
- A slight increasing breeding trend is apparent at the continental scale in each of 3 different time periods during 1966-2000 (RMBO 2002).

Table 14.

Wilson's Warbler (Monitoring Colorado Birds data, RMBO 2005)
ARNF Number/transect/year

Transect	1998	1999	2000	2001	2002	2003	2004	2005	Avg/yr
AS28	1	NR	0	NR	NR	NR	0	0	0.0
AT02	NR	NR	NR	NR	0	0	0	NR	0.0
AT03	NR	0	NR	0	0	0	NR	0	0.0
AT04	NR	0	NR	NR	0	1	0	1	0.4
AT05	NR	0	0	3	0	6	1	0	1.4
AT06	NR	0	0	0	0	0	0	0	0.0
GR01	NR	0	0	0	0	0	0	0	0.0
GR02	NR	0	0	0	0	0	0	0	0.0
GR03	NR	0	NR	0	0	0	0	0	0.0
GR05-02	NR	NR	NR	NR	0	NR	NR	0	0.0
GR15	NR	NR	0	NR	0	0	0	0	0.0
HR05	NR	NR	4	13	NR	0	4	0	4.2
HR09	NR	6	7	16	3	NR	0	5	6.2
HR10	NR	NR	4	1	3	NR	6	NR	3.5
HR18	NR	0	NR	NR	0	0	0	8	1.6
HR25	NR	0	0	6	1	7	2	5	3.0
MC03	NR	0	0	0	0	1	0	0	0.1
MC27	NR	0	0	0	0	0	0	0	0.0
PP13	0	1	0	0	0	NR	NR	0	0.2
PP15	0	0	NR	0	0	NR	0	0	0.0
PP16	0	0	0	0	0	NR	0	0	0.0
PP21	0	0	0	0	0	NR	0	0	0.0
PP29	0	0	0	NR	0	NR	NR	NR	0.0
SF16	0	NR	0	0	NR	NR	0	NR	0.0
SF17	0	0	NR	0	0	NR	0	0	0.0
SF30	NR	0	0	NR	NR	NR	0	0	0.0
Total birds	**1**	**7**	**15**	**39**	**7**	**15**	**13**	**19**	**16.0**
# of transects w/ hits	**1**	**2**	**3**	**4**	**3**	**4**	**4**	**4**	**3.4**

NA = Transect not in Arapaho/Roosevelt during this year
NR = Transect not conducted in this year

- ARNF transect counts reveal a highly variable trend with increases from 1998-2001, drop in 2002, and a return to average yearly levels in 2003-2005.
- A slight downward breeding trend but no discernable winter trend at the continental scale (RMBO 2002).

Table 15. Boreal toad population trend data in and near Arapaho Roosevelt National Forests (Boreal Toad Recovery Team 2005).

Despite the discovery of new breeding sites on ARNF, and a few others statewide, survey data indicate a downward trend for boreal toad numbers in and near ARNF (22 breeding sites – see following 22 sub-tables) and state-wide (Boreal Toad Recovery Team 2005).

BO01 – Lost Lake (Middle Boulder Creek) – ARNF
Bd: Not tested

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
1996	0/1/0	No	2(M,A)	Toadlets introduced
1997	0/1/0	No	3(M,1,A)	Toadlets introduced
1998	0/2/0	No	None	No breeding observed
1999	0/0/0	No	None	Minimal surveys done
2000	0/0/0	No	None	Adequate monitoring
2001	0/0/0	No	None	Adequate monitoring
2002	0/0/0	Unk	None	Adequate monitoring
2003	0/0/0	Unk	None	3 visits
2004	0/0/0	Unk	None	2 visits

CC01 - Vintage site (Clear Creek West Fork) – ARNF
Bd: Not tested

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
1994	?/?/?	Unk	Multiple	Little data available
1995	3/2/2	Unk	2(M,A)	Probably few metamorphs
1996	1/1/1	No	1(A)	No production
1997	1/1/1	No	1(A)	Eggs froze
1998	3/0/0	No	1(A)	No breeding observed
1999	3/0/0	No	1(A)	No breeding observed
2000	0/0/0	No	None seen	Minimal monitoring
2001	0/0/0	Unk	None seen	No breeding observed
2002				Not monitored
2003	0/0/0	Unk	None Seen	No evidence of breeding
2004				Not monitored

CC02 – Urad/Henderson (Clear Creek West Fork) – Henderson Mine
Bd: Positive (2004)

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
1995	131/19/19	Yes	4(M,1,S,A)	
1996	142/18/18	Yes	4(M,1,S,A)	Few metamorphs
1997	167/33/23	Yes	4+(M,1,S,A)	
1998	203/107/55	Yes	4(M,1,S,A)	Many metamorphs
1999	141/60/60	Unk	4(M,1,S,A)	Chytrid fungus mortality
2000	34/34/34	Unk	2(M,A)	
2001	14/14/14	Unk	3(M,1,A)	Some egg mortality
2002	25/22/22	Unk	2(M,A)	Several sites dry
2003	15/15/15	Yes	1(A)	
2004	10/16/16	Unk	3(M,A,1)	Several sites dried up

CC03 – Herman Gulch (Clear Creek) – ARNF
Bd: Positive (2004)

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
1993	?/?/?	Unk	2(M,A)	Breeding observed
1994	11/11/11	Unk	2(M,A)	
1995	52/12/12	Unk	3(M,S,A)	Good production
1996	20/12/12	No	1(A)	Poor larvae survival
1997	19/10/10	Unk	3(M,S,A)	Many metamorphs
1998	10/10/10	Unk	2(M,A)	Few metamorphs seen
1999	11/11/11	Yes	1(A)	High egg mortality
2000	9/5/5	Unk	3(1,S,A)	No metamorphs seen
2001	2/2/4	Unk	3(M,S,A)	<50 metamorphs
2002	0/1/0	Unk	1(A0	No evidence of breeding
2003	1/1/1	Yes	1(M)	<50 metamorphs
2004	4/4/4	Unk	2(1,A)	

CC04 – Mount Bethel (Clear Creek) – ARNF
Bd: Positive (2005)

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
1993	Yes	Unk	2(M,A)	Many metamorphs
1994	Yes	Unk	2(M,A)	
1995	4/1/1	No	2(S,A)	Few, if any metamorphs
1996	3/3/3	Unk	2(M,A)	Few metamorphs
1997	9/1/1	Unk	2(M,A)	
1998	11/3/3	Unk	2(M,A)	36 + metamorphs seen
1999	23/1/1	Yes	2(M,A)	500 + metamorphs
2000	29/3/3	Yes	4(M,1,S,A)	Many metamorphs seen
2001	28/6/5	Yes	4(M,1,S,A)	500+ metamorphs seen
2002	16/4/4	Yes	3(M,1,A)	Early metamorphosis
2003	7/7/7	Yes	3(M,1,A)	<50 metamorphs
2004	68/8/8	Unk	3(M,S,A)	<50 metamorphs

CC05 – Bakerville (Clear Creek) – ARNF
Bd: Not tested

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
1994	1/1/1	Unk	2(M,A)	Limited data
1995	Unk.	Unk	Unk	Site not monitored
1996	0/0/0	No	None seen	
1997	Unk.	Unk	Unk	Site not monitored
1998	0/0/0	Unk	None seen	Inadequate monitoring
1999	0/1/0	Unk	1(A)	Inadequate monitoring
2000	0/0/0	Unk	None seen	Monitoring adequate
2001	3/0/0	Unk	1(A)	Inadequate monitoring
2002				Site not monitored
2003	1/1/1	Unk	1(A)	Few tadpoles found
2004	0/0/0	Unk	None seen	

CC06 – Silverdale (Clear Creek South), ARNF
Bd: Negative (2003)

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
1993	?/?/0	Unk	Multiple	First survey of site
1994	?/?/0	Unk	Multiple	No metamorphs
1995	2/0/0	Unk	2(S,A)	No breeding observed
1996	5/0/0	No	1(A)	No breeding observed
1997	0/0/0	No	None	Inadequate monitoring
1998	1/1/0	Unk	2(S,A)	Monitoring marginal
1999	0/0/0	Yes	1(S)	41 sub-adults seen
2000	0/0/0	Unk	2(1,S)	Many sub-adults seen
2001	0/0/0	Unk	2(S,A)	Many subadults seen
2002				Site not monitored
2003				Site not monitored
2004	0/0/0	Unk	None Seen	

CC07 – Otter Mountain (Clear Creek South), ARNF
Bd: Negative (2003)

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
2003	1/1/1	Unk		200 tadpoles seen
2004	2/2/2	Unk	1(A)	50 tadpoles seen

GR01 – Jim Creek (Winter Park) – ARNF
Bd: Not tested

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
1995	5/1/?	Unk	3+(S,A)	Substantial population
1996	?/?/0	Unk	3+(S,A)	Substantial population
1997	0/0/0	Unk	None	Monitoring inadequate
1998	0/0/0	Unk	None	Monitoring inadequate
1999	0/0/0	Unk	None	No night survey done
2000	0/0/0	Unk	None	Monitoring adequate
2001	0/0/0	Unk	None	No breeding observed
2002	0/0/0	Unk	None	Not monitored
2003	0/0/0	Unk	None	Site visited 7 times
2004	0/0/0	Unk	None	

GR02 – Pole Creek – (Pole Creek)
Bd: Positive (2002)

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
1995	5/3/3	Unk	2(M,A)	Numerous metamorphs
1996	3/3/3	Yes	2(M,A)	Few metamorphs
1997	10/4/2	No	2(1,A)	Few, if any, metamorphs
1998	5/2/2	Yes	2(M,A)	Monitoring marginal
1999	5/5/5	Unk	2(M,A)	Metamorphs at #4
2000	6/2/2	Yes	3(M,S,A)	One clutch desiccated
2001	9/7/7	Unk	4(M,1,S,A)	>500 metamorphs
2002	14/6/6	Yes	4(M,1,S,A)	Metamorphs present
2003	7/2/2	Yes	4(M,1,S,A)	>500 metamorphs
2004	2/2/2	Unk	3(M,S,A)	>150 metamorphs

GR03 – Vasquez Creek (Vasquez Creek) – ARNF
Bd: Not tested

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
1999	1/1/1	Yes	1(A)	Found late in the season
2000	0/0/0	Unk	None	Monitoring adequate
2001	0/0/0	Unk	1(S)	1 sub-adult, no breeding
2002	0/0/0	Unk	None	
2003				Site not monitored
2004	0/0/0	Unk	None	

GR04 – McQueary Lake (Upper Williams Fork) – ARNF
Bd: Positive (2003)

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
2001	2/3/3	Yes	2(1,A)	Discovered in 2001
2002	8/6/6	Unk	2(M,A)	<50 metamorphs
2003	2/2/2	Unk	2(S,A)	Desiccation and predation
2004	0/0/0	Unk	None	

GR05 – Upper Williams Fork (Upper Williams Fork) – ARNF
Bd: Negative (2003)

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
2001	2/2/2	Yes	3(A,M,1)	Metamorphs observed
2002	1/1/1	Yes	3(A,S,1)	No metamorphs seen
2003	1/2/1	Yes	4(M,1,S,A)	<50 metamorphs
2004	2/2/2	Unk	4(M,1,S,A)	Cold water temps

GR06 – Big Meadow (Big Meadow) – RMNP
Bd: Positive (2004)

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
2004	1/1/0	Unk	3(M,1,A)	

LR01 – Lost Lake (North Fork Big Thompson) – Rocky Mountain NP
Bd: Positive (2000)

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
1990	?/?/22	Unk	1(A)	Incomplete data
1991	206/28/15	Unk	1(A)	No data on subadults
1992	143/23/23	Unk	1(A)	No data on subadults
1993	77/10/?	Unk	1(A)	Incomplete data
1994	110/35/35	Unk	Unk	No data on subadults
1995	122/32/32	Yes	1(A)	No data on subadults
1996	43/15/152	No	1(A)	No data on subadults
1997	112/15/15+	No	3(M,2,A)	15-20 egg masses
1998	106/12/12	Unk	2(M,A)	150+ metamorphs seen
1999	10/10/10	Unk	1(A)	Metamorphs possible
2000	3/3/3	Unk	1(A)	Chytrid positive
2001	0/3/0	Unk	1(A)	Only females observed
2002	0/1/0	Unk	1(A)	One female observed
2003	0/0/0	Unk	None	
2004				Juveniles found along trail

LR02 – Kettle Tarn (North Fork Big Thompson) – RMNP
Bd: Positive (2001)

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
1990	?/?/13	Unk	1(A)	Incomplete data
1991	21+/23/23	Unk	1(A)	No data on subadults
1992	63/18/18	Unk	1(A)	No data on subadults
1993	54/25/25	Unk	2(M,A)	
1994	120/21/21	Unk	2(M,A)	
1995	210/24/24	Unk	2(M,A)	
1996	29/13/8	Unk	3(M,2,A)	
1997	15/11/0	No	1(A)	
1998	18/13/10	Unk	1(A)	
1999	15/8/2	Yes	1(A)	No metamorphs seen
2000	13/5/3	Unk	2(1,A)	One 1 year old seen
2001	2/4/3	Yes	3(M,S,A)	Metamorphs observed
2002	2/2/2	Yes	3(M,1,A)	NASRF tadpoles released
2003	3/3/3	Yes	3(M,1,A)	500+ metamorphs
2004	2/2/2	Unk	3(1,S,A)	Site dry by late July

LR03 – Spruce Lake (Big Thompson) – RMNP
Bd: Negative (2003)

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
1996	Unk	Yes	Unk	Reproduction presumed
1997	3/1/?	Unk	3(A,1,S)	Limited monitoring
1998	9/3/1	Unk	1(A)	Inadequate monitoring
1999	9/3/1	Yes	2(S,A)	Inadequate monitoring
2000	10/4/2	Unk	3(M,1,A)	Three 1-year old seen
2001	10/2/2	Unk	2(S,A)	Tadpoles observed
2002	15/3/3	Unk	1(A)	No metamorphs observed
2003	12/1/1	Unk	1(A)	No tadpoles observed
2004	10/2/2	Unk	1(A)	No tadpoles observed

LR04 – Glacier Basin (Big Thompson) – RMNP
Bd: Not tested

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
1995	1/1/0	Unk	1(A)	
1996	1/1/1	Yes	1(A)	Translocation site
1997	0/1/0	No	2(1,A)	
1998	3/0/0	Unk	1(A)	No breeding activity seen
1999	3/0/0	Unk	1(A)	No night survey done
2000	0/0/0	Unk	None	Monitoring adequate
2001				Not monitored further – unsuccessful translocation

LR05 – Twin Lake (South Cache la Poudre) – ARNF
Bd: Positive (2001)

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
1998	1/1/1	Unk	1(A)	Tadpoles observed
1999	0/0/0	Unk	None	Site disturbed/dam work
2000	0/0/0	Yes	None	Low water
2001	3/2/2	Yes	3(1,S,A)	No metamorphs seen
2002	1/1/1	Unk	2(S,A)	No metamorphs seen
2003	0/0/0	Unk	0	Site disturbed
2004				Not monitored

LR07 – Trout Creek (Trout Creek) – ARNF
Bd: Not tested

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
2004	2/2/2	Unk	1(A)	Site found 6/15/04

LR08 – Panhandle Creek (Panhandle Creek) – ARNF
Bd: Not tested

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
2004	2/2/0	Unk	2(S,A)	New Site

LR09 – Ypsilon Lake Area (Ypsilon Lake) – RMNP
Bd: Negative (2004)

Year	Males/Females /Egg Masses*	Recruitment**	Age Classes***	Comments
2004	4/4/0	Unk	2(M,A)	New Site

*** Males/Females/Egg Masses: This column shows the minimum number of breeding age males and females and number of viable egg masses at the locality in each year.**
****Recruitment: A 'yes' entry means that one-year-old toadlets were observed at the site in the spring of the following year, or two-year-old toads were seen the second year.**
*****Age Classes: The first number in the entry indicates the minimum number of age classes observed/reported at a specific site. Numbers within parentheses indicate which age classes were observed: M=metamorphs (young of the year), 1=one year olds (new 'recruits'), S=subadults (generally two or three year old toads), 2 or 3=subadults which were specifically identified as either two or three year old toads, A=adult toads (generally 4 years old and older).**

**OLD ask Kris Sexton if she wants these

Table 30. Greenback cutthroat trout (*Oncorhynchus clarki stomias*) population estimates on the Arapaho-Roosevelt National Forests.

Stream Name	Years surveyed						
Bard Creek	1981	1985	1987	1989	1991	1999	2001
fish/mile	0	327.3	211.2	292.1	186	252	129
Como Creek	1986	1991	1995	1999			
fish/mile	739.2	713	985	667			
Roaring Creek	1981	1999	2002				
fish/mile	84	1764.3	1530				

Black Hollow Creek	1991	2000	2001	2002
fish/mile	188	290	132	383

Table 31. Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*) population estimates on the Arapaho-Roosevelt National Forests

Stream Name	Years Surveyed			
Jim Creek	1992	2000	2003	
fish/mile	5.3	36	21.1	
Little Vasquez Creek	1985	1992	1998	2001
fish/mile	185	181	20	25.2
Hamilton Creek	1992	2000	2003	
fish/mile	109	352	176	
Kinney Creek	1992	1997	2000	2003
fish/mile	91	422	29	123
Cabin Creek	1992	2000	2003	
fish/mile	704	380	174	

Table 32. Brook trout (*Salvelinus fontinalis*) population estimates on the Arapaho-Roosevelt National Forests

Stream Name	Years surveyed						
Fraser River	**1979**	**1993**	**1998**	**2003**			
fish/mile	106	211	437	299			
Vasquez Crk	**1990**	**1992**	**2001**	**2004**			
fish/mile	0	8	414	258			
St Louis Crk	**1978**	**1986**	**1987**	**1988**	**2003**		
fish/mile	317	612	201	1647	3408		
Kinney Crk	**1992**	**1997**	**2000**				
fish/mile	239	387	143				
Little Muddy Crk	**1979**	**1992**	**2000**				
fish/mile	0	352	1083				
Deadman Creek	**1981**	**2000**	**2004**				
fish/mile	211	1503	105				
WFK Clear Crk	**1973**	**1994**	**1995**	**1999**	**2000**	**2001**	
fish/mile	0	198	271	860	798	883	

Table 33. Brown trout (*Salmo trutta*) population estimates on the Arapaho-Roosevelt National Forests

Stream Name	Years surveyed						
Big Thompson	**1974**	**1987**	**1989**	**2000**			
fish/mile	195	333	555	1149			
Nunn Creek	**1981**	**2000**	**2003**	**2004**			
fish/mile	106	1475	97	90			
Cache la Poudre	**1994**	**2000**	**2001**	**2002**			
fish/mile	817	1790	1199	258			
Poudre River	**1980**	**1983**	**1990**	**1994**	**1996**	**2000**	**2002**
fish/mile	1476	1684	751	1625	782	614	832

Table 34. Plains topminnow (*Fundulus sciadicus*) abundance estimates on the Pawnee National Grasslands

Stream Name	Year of surveys				
Willow Creek	**1998**	**1999**	**2000**	**2001**	**2002**
fish/pothole	370	258	195	40	5
Howard Creek	**1999**	**2000**	**2001**	**2002**	
fish/pothole	36	902	268	602	

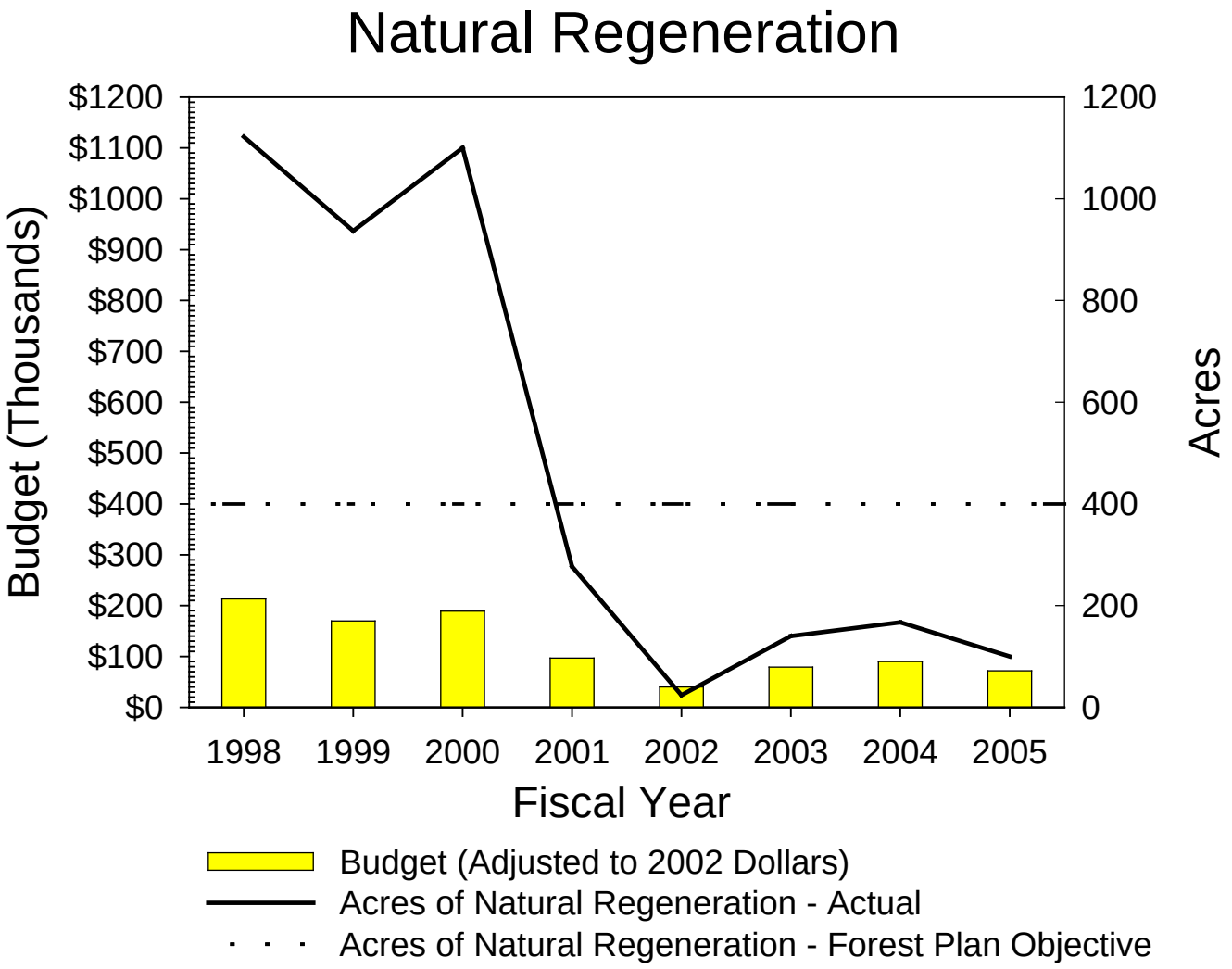
South Pawnee Crk	1998	1999	2001	2002
fish/pothole	n/a	68	25	819

Table 35. Plains killifish (*Fundulus zebrinus*) abundance estimates on the Pawnee National Grasslands

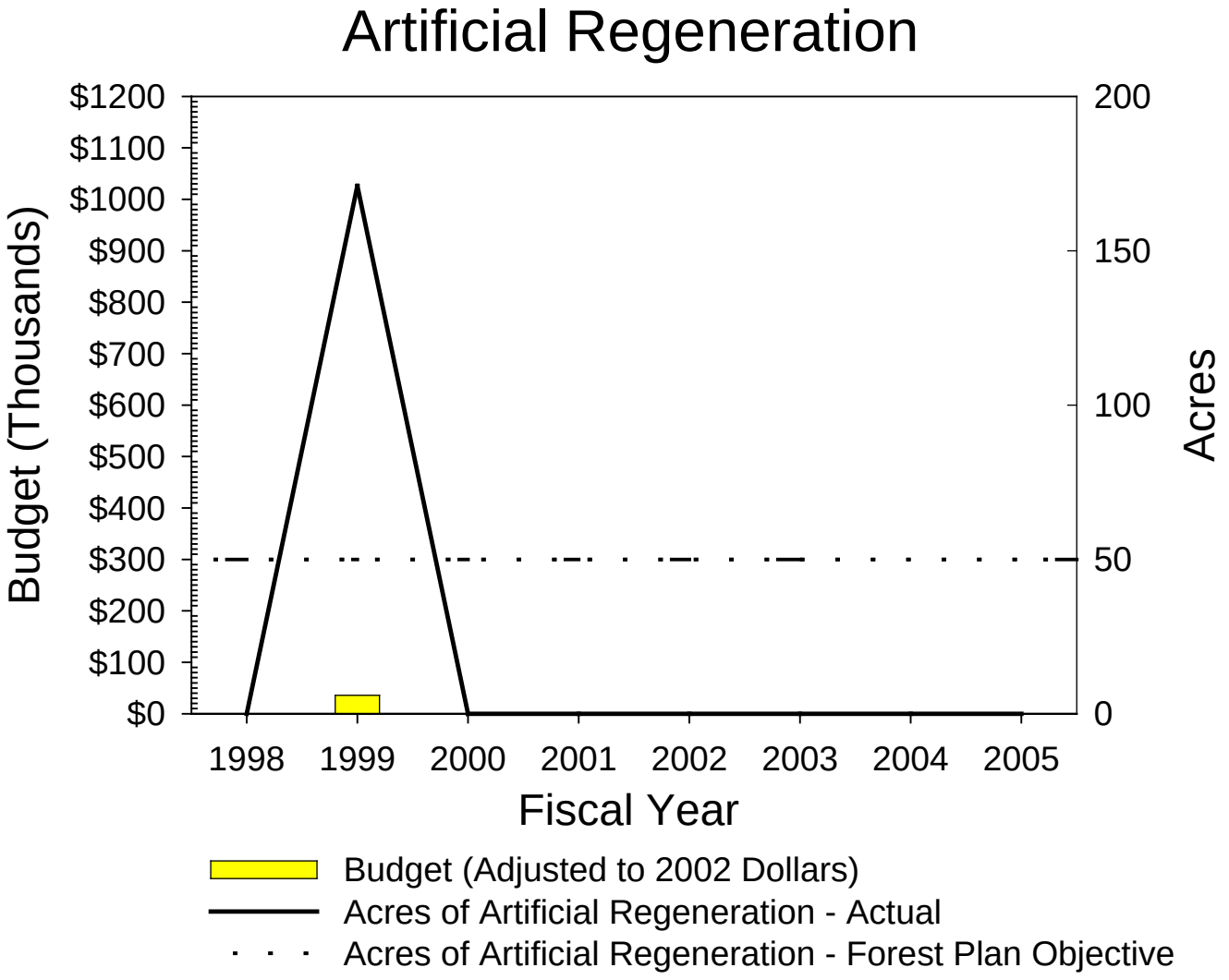
Stream Name	Years surveyed			
Little Crow Crk	**1998**	**1999**	**2000**	**2001**
fish/pothole	10	0	39	2
Little Owl Creek	**1998**	**1999**	**2001**	
fish/pothole	13	1	0	
South Pawnee Creek	**1998**	**1999**	**2001**	**2002**
fish/pothole	8	0	19	322

APPENDIX B: Graphs

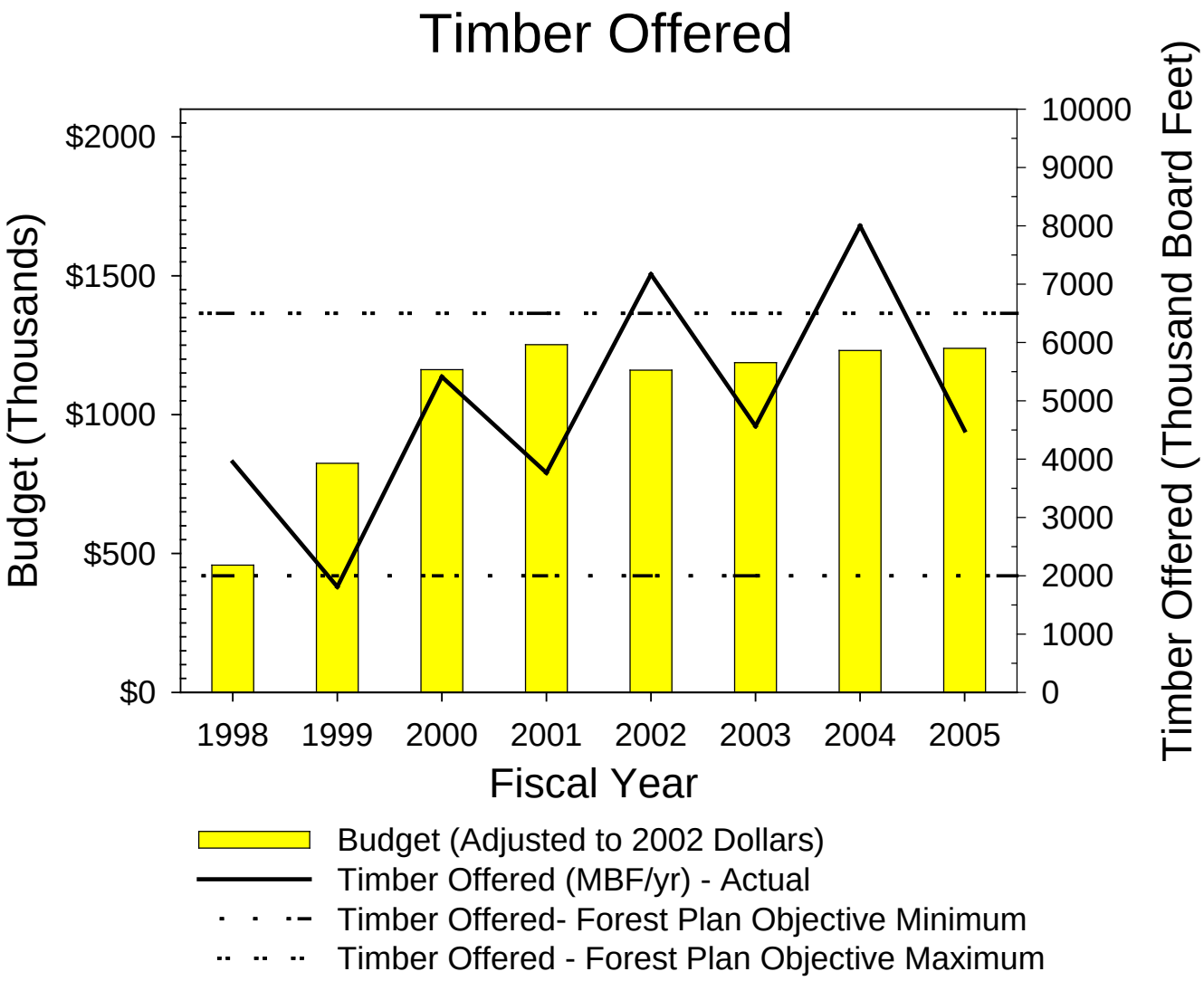
Graph 1



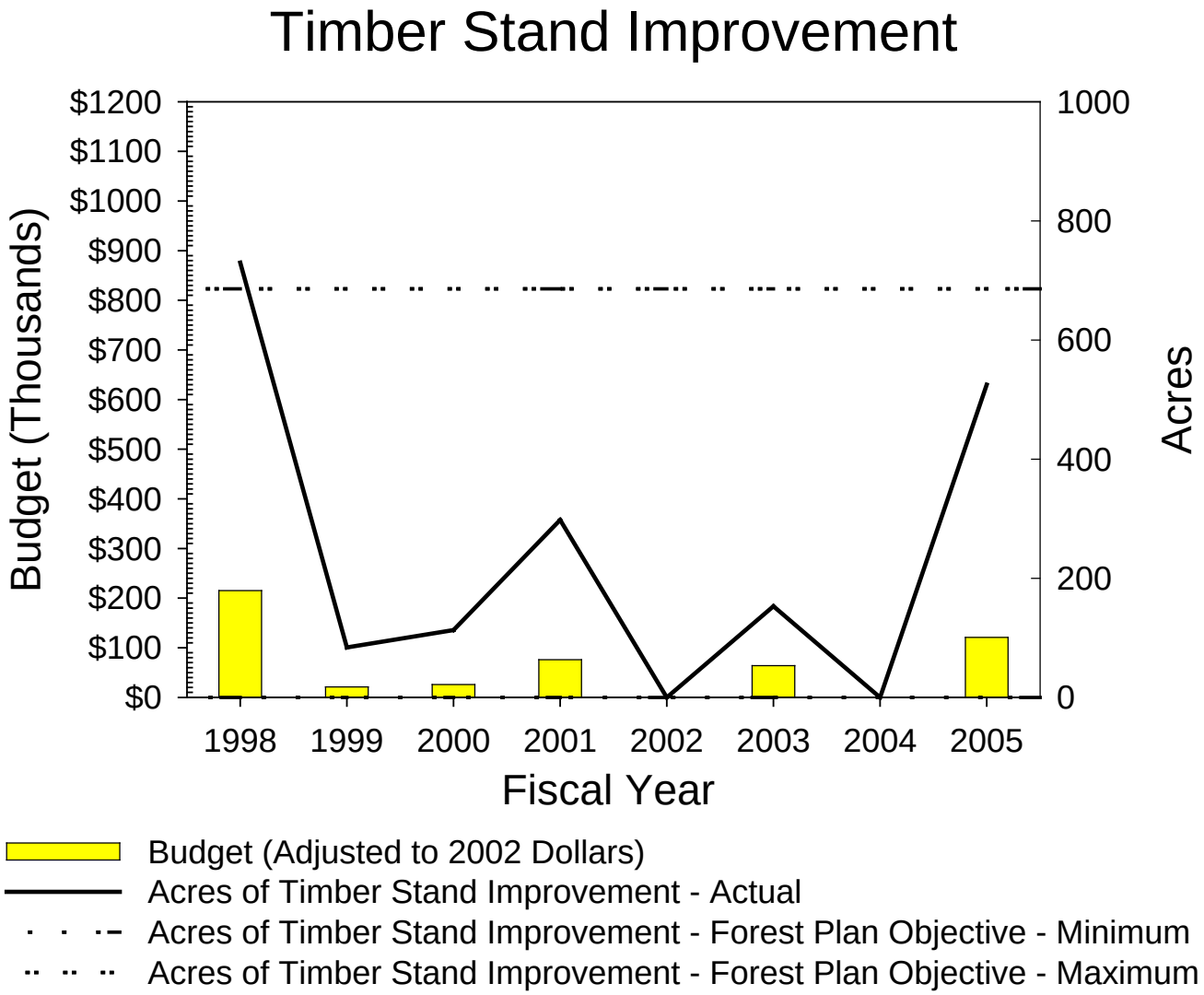
Graph 2


Artificial Regeneration
Budget (Thousands)
$1200
$1100
$1000
$900
$800
$700
$600
$500
$400
$300
$200
$100
$0
200
150
100
50
0
Acres
1998
1999
2000
2001
2002
2003
2004
2005
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Acres of Artificial Regeneration - Actual
Acres of Artificial Regeneration - Forest Plan Objective

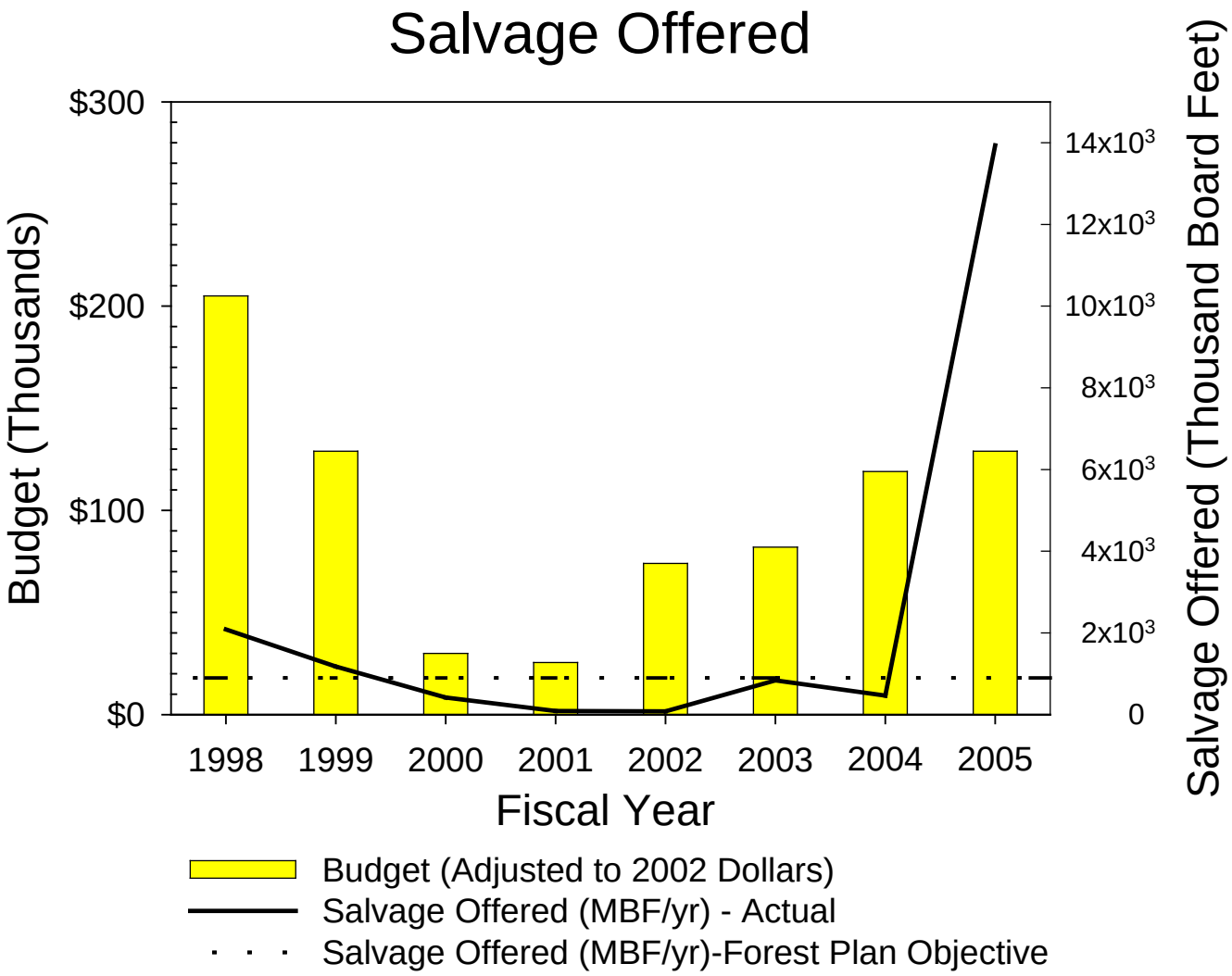
Graph 3


Timber Offered
Budget (Thousands)
$2000
$1500
$1000
$500
$0
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Timber Offered (Thousand Board Feet)
1998
1999
2000
2001
2002
2003
2004
2005
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Timber Offered (MBF/yr) - Actual
Timber Offered- Forest Plan Objective Minimum
Timber Offered - Forest Plan Objective Maximum

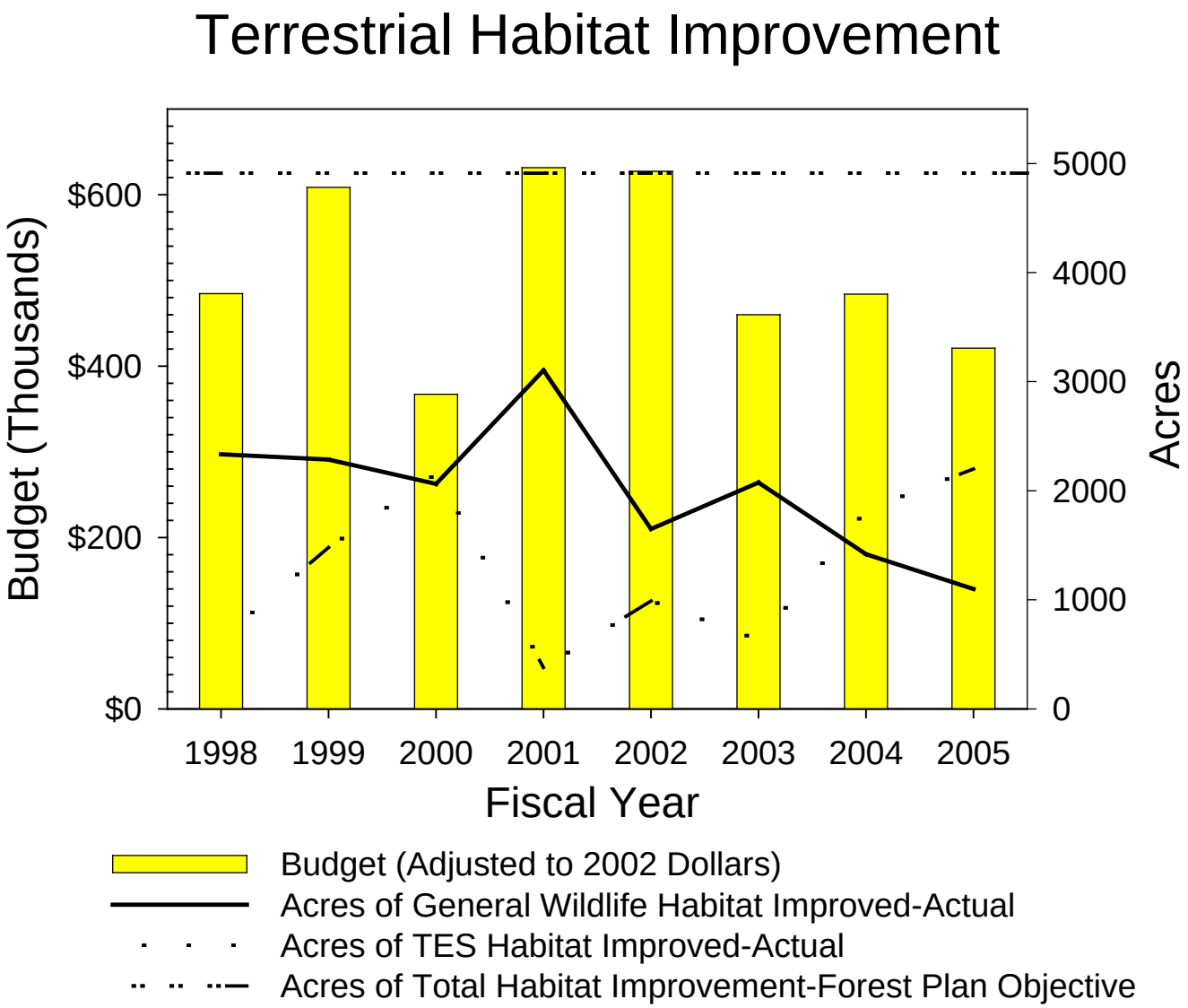
Graph 4


Timber Stand Improvement
$1200
$1100
$1000
$900
$800
$700
$600
$500
$400
$300
$200
$100
$0
Budget (Thousands)
1000
800
600
400
200
0
Acres
1998
1999
2000
2001
2002
2003
2004
2005
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Acres of Timber Stand Improvement - Actual
Acres of Timber Stand Improvement - Forest Plan Objective - Minimum
Acres of Timber Stand Improvement - Forest Plan Objective - Maximum

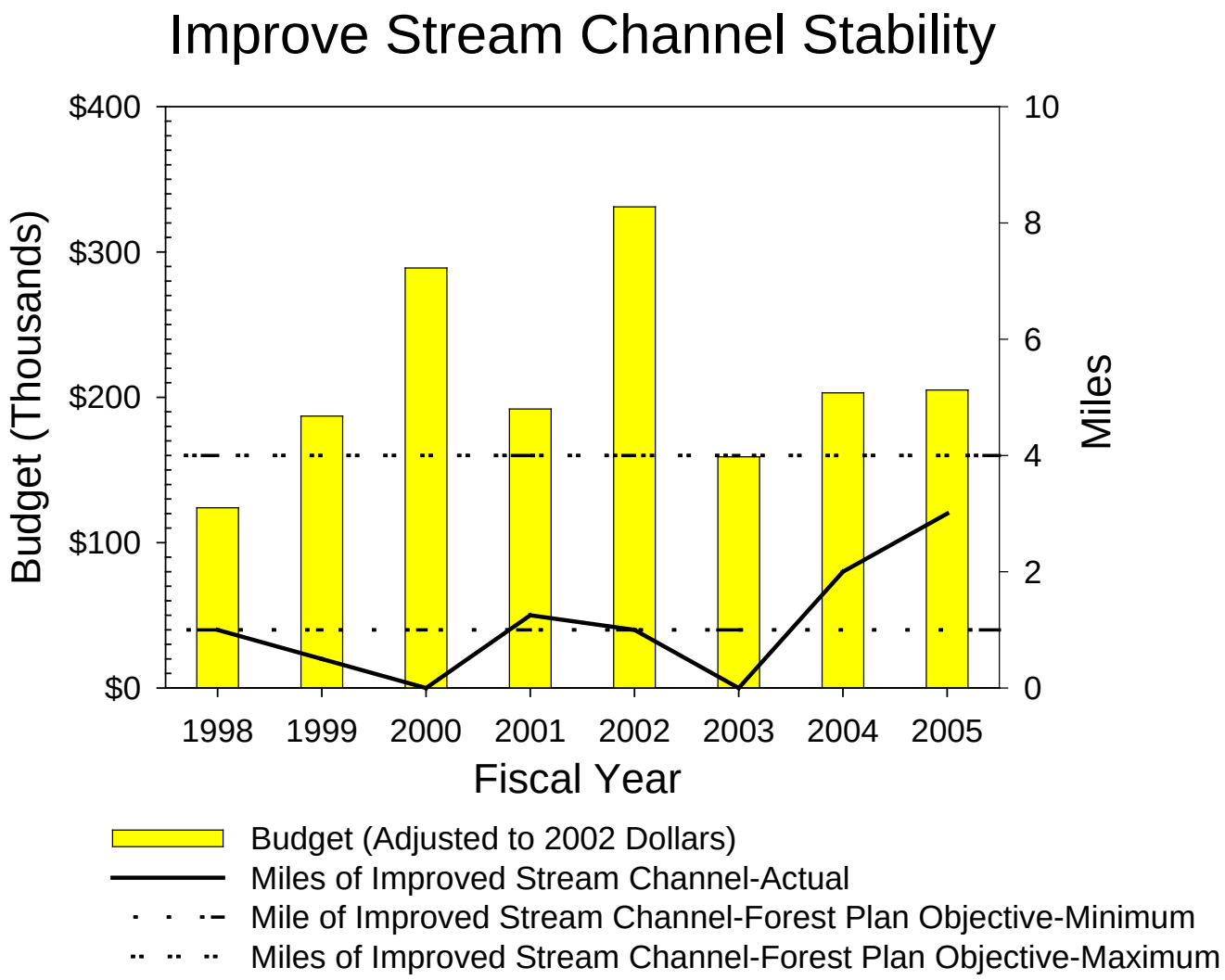
Graph 5


Salvage Offered
Budget (Thousands)
$300
$200
$100
$0
14x10³
12x10³
10x10³
8x10³
6x10³
4x10³
2x10³
0
Salvage Offered (Thousand Board Feet)
1998
1999
2000
2001
2002
2003
2004
2005
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Salvage Offered (MBF/yr) - Actual
Salvage Offered (MBF/yr)-Forest Plan Objective

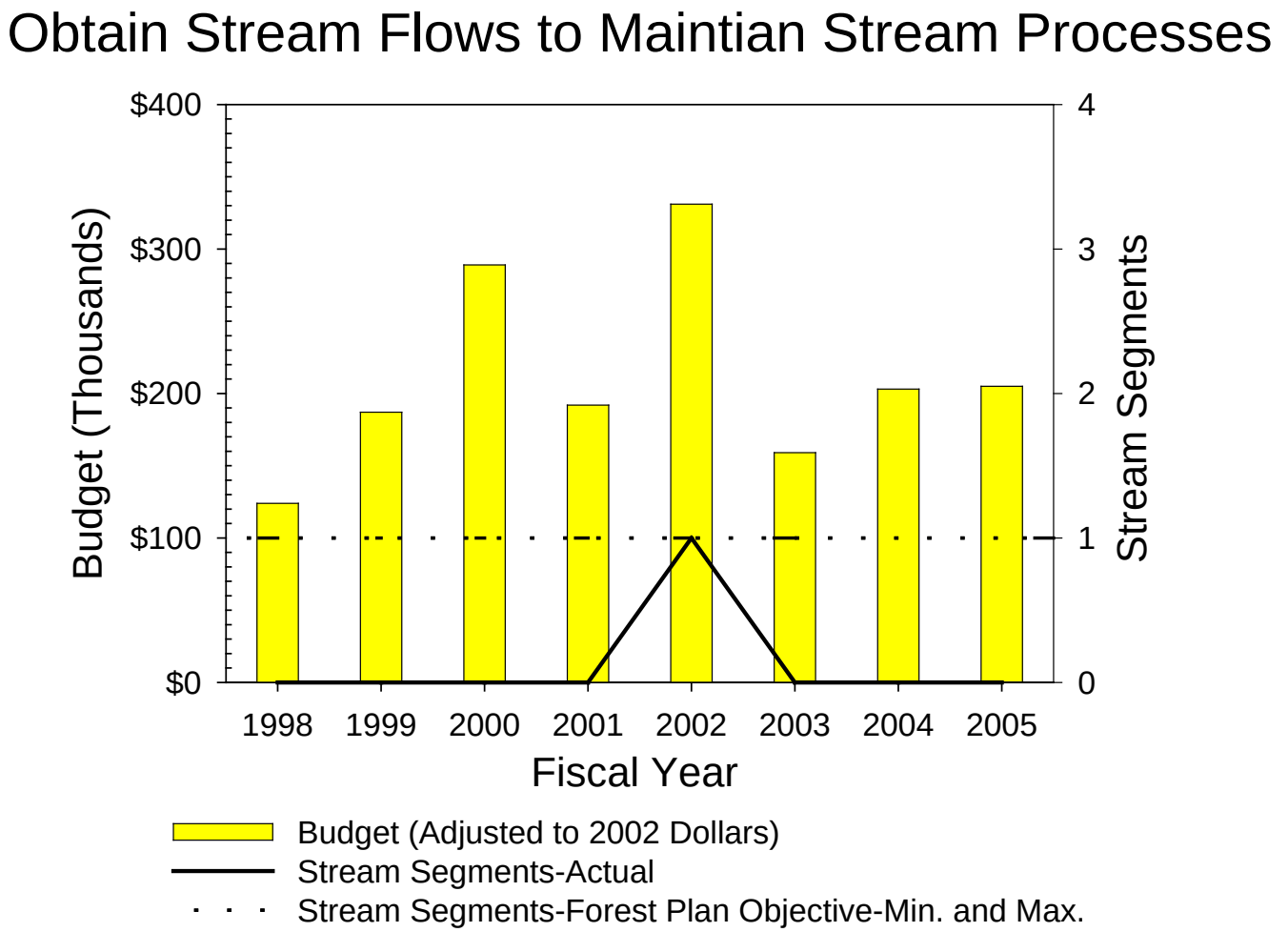
Graph 6


Terrestrial Habitat Improvement
Budget (Thousands)
$600
$400
$200
$0
5000
4000
3000
2000
1000
0
Acres
1998
1999
2000
2001
2002
2003
2004
2005
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Acres of General Wildlife Habitat Improved-Actual
Acres of TES Habitat Improved-Actual
Acres of Total Habitat Improvement-Forest Plan Objective

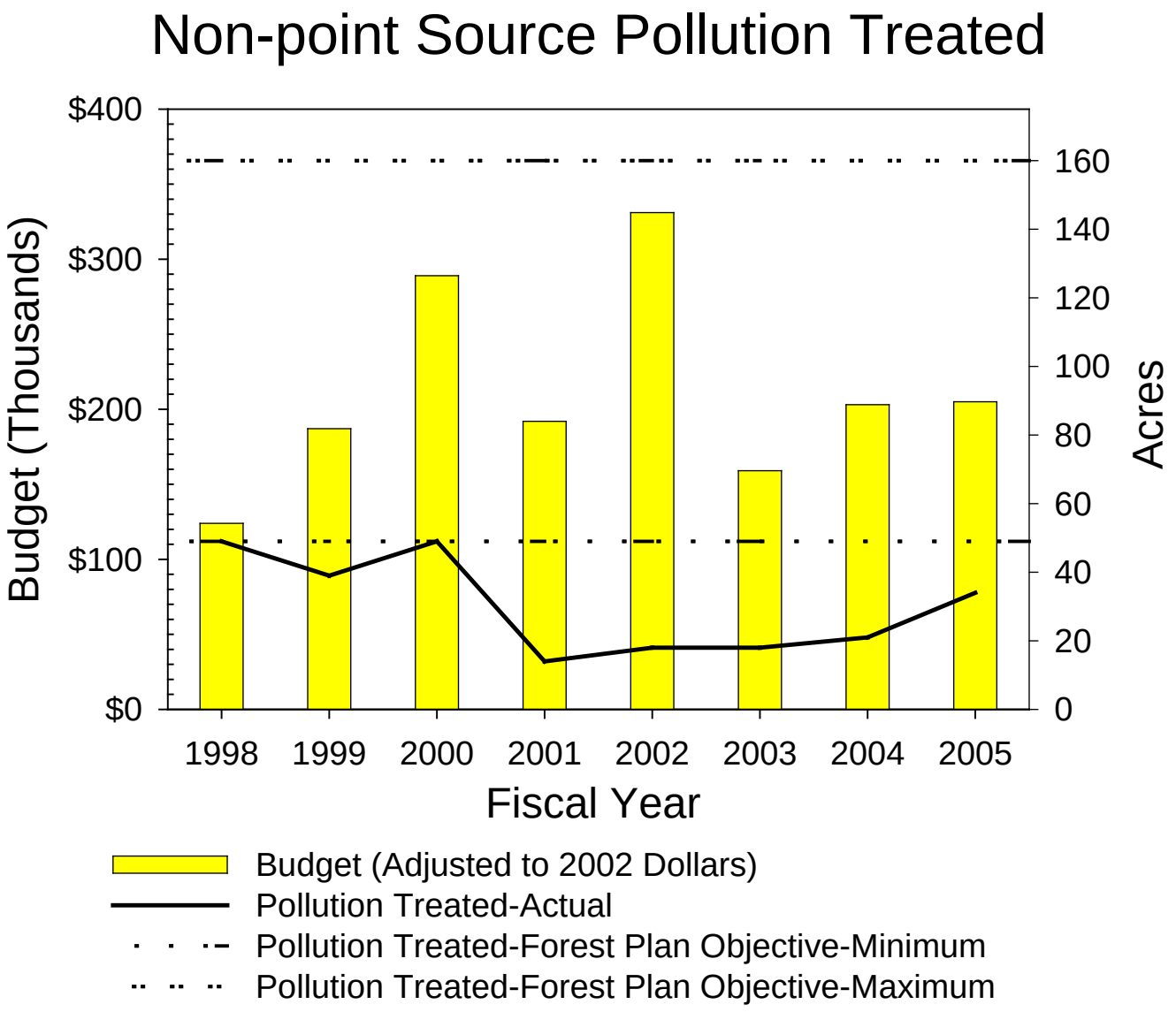
Graph 7


Improve Stream Channel Stability
$400
$300
$200
$100
$0
Budget (Thousands)
10
8
6
4
2
0
Miles
1998
1999
2000
2001
2002
2003
2004
2005
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Miles of Improved Stream Channel-Actual
Mile of Improved Stream Channel-Forest Plan Objective-Minimum
Miles of Improved Stream Channel-Forest Plan Objective-Maximum

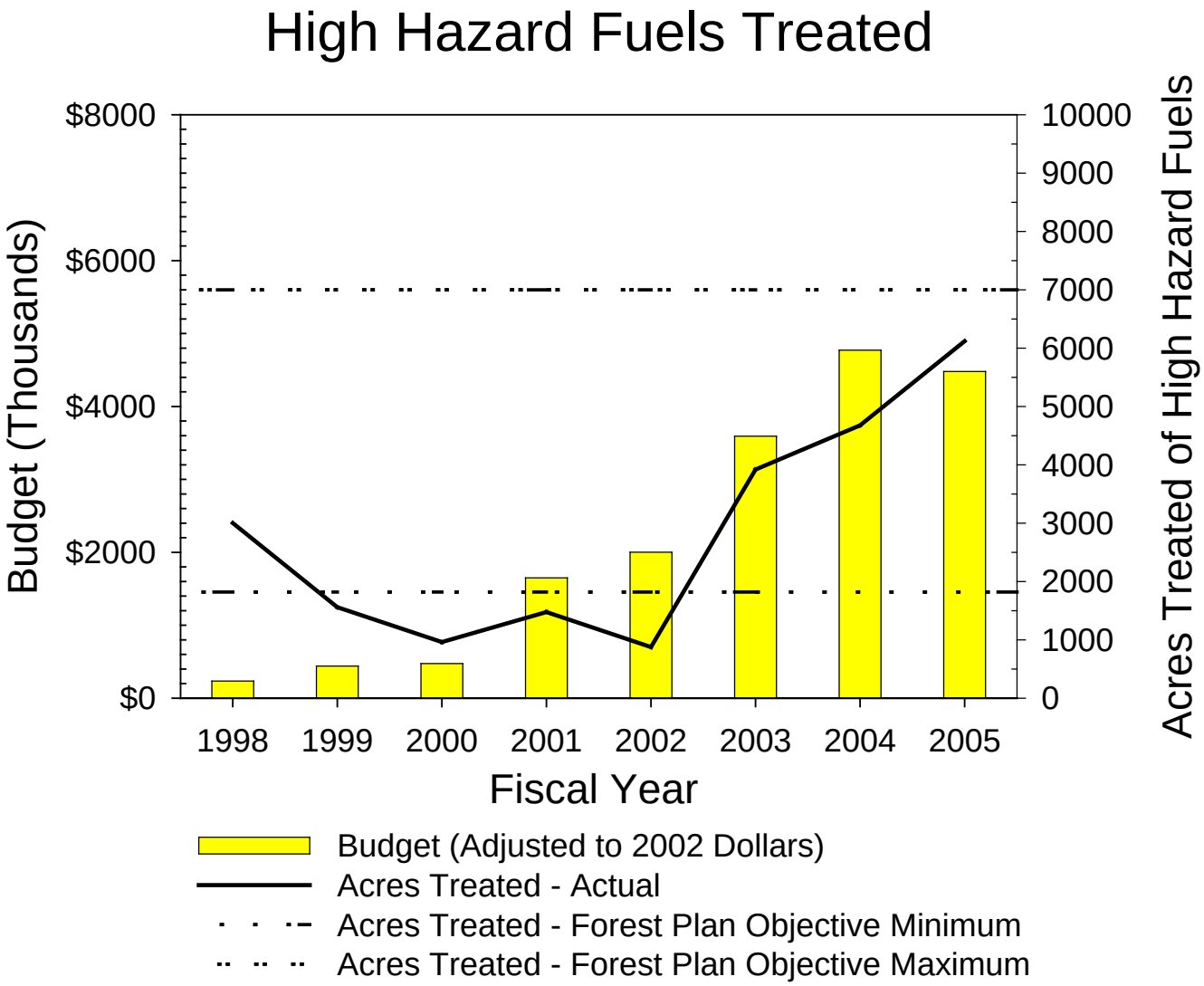
Graph 8


Obtain Stream Flows to Maintian Stream Processes
$400
$300
$200
$100
$0
Budget (Thousands)
4
3
2
1
0
Stream Segments
1998
1999
2000
2001
2002
2003
2004
2005
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Stream Segments-Actual
Stream Segments-Forest Plan Objective-Min. and Max.

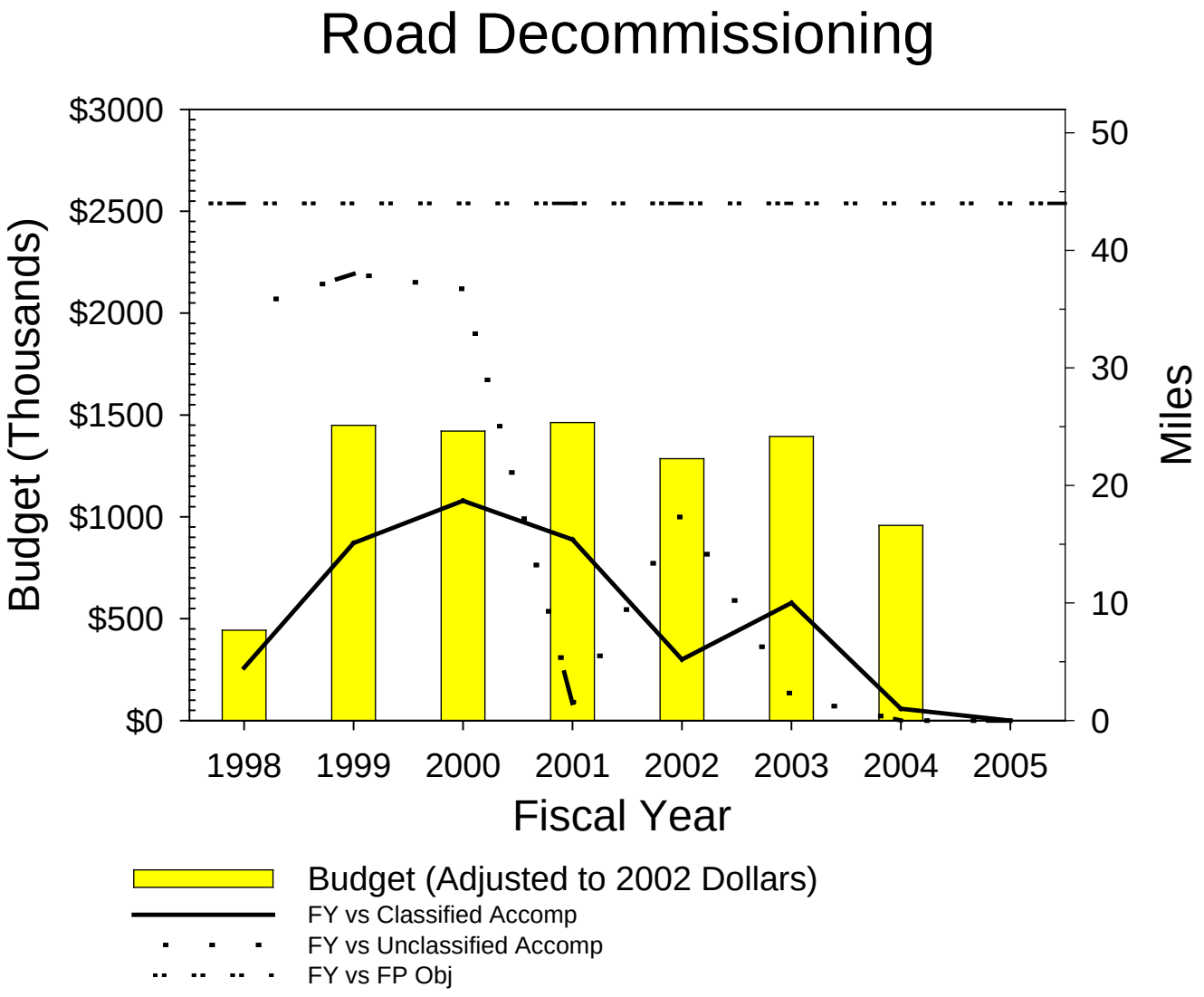
Graph 9


Non-point Source Pollution Treated
Budget (Thousands)
$400
$300
$200
$100
$0
160
140
120
100
80
60
40
20
0
Acres
1998
1999
2000
2001
2002
2003
2004
2005
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Pollution Treated-Actual
Pollution Treated-Forest Plan Objective-Minimum
Pollution Treated-Forest Plan Objective-Maximum

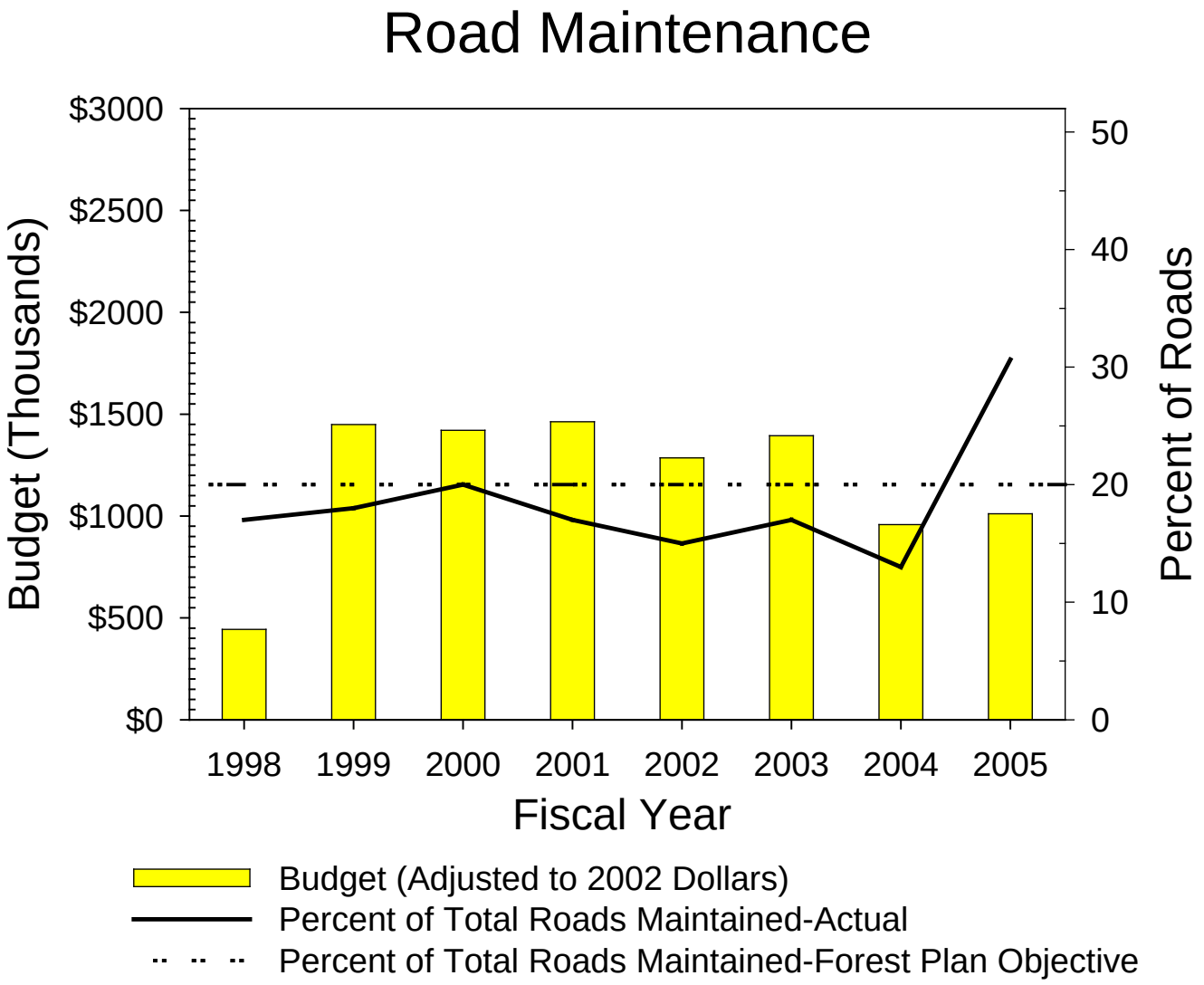
Graph 10


High Hazard Fuels Treated
Budget (Thousands)
$8000
$6000
$4000
$2000
$0
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Acres Treated of High Hazard Fuels
1998
1999
2000
2001
2002
2003
2004
2005
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Acres Treated - Actual
Acres Treated - Forest Plan Objective Minimum
Acres Treated - Forest Plan Objective Maximum

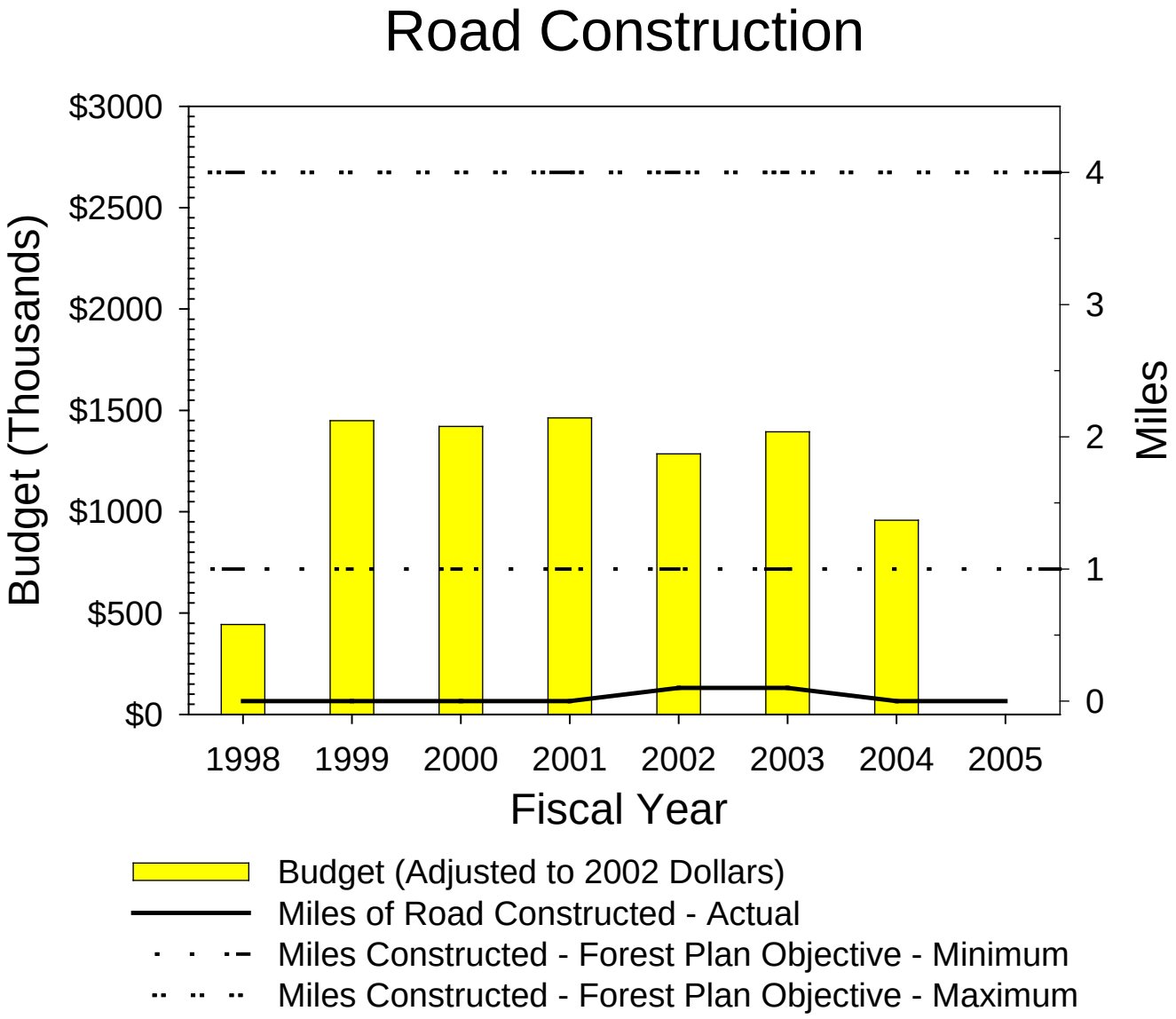
Graph 11


Road Decommissioning
Budget (Thousands)
$3000
$2500
$2000
$1500
$1000
$500
$0
Miles
50
40
30
20
10
0
1998
1999
2000
2001
2002
2003
2004
2005
Fiscal Year
Budget (Adjusted to 2002 Dollars)
FY vs Classified Accomp
FY vs Unclassified Accomp
FY vs FP Obj

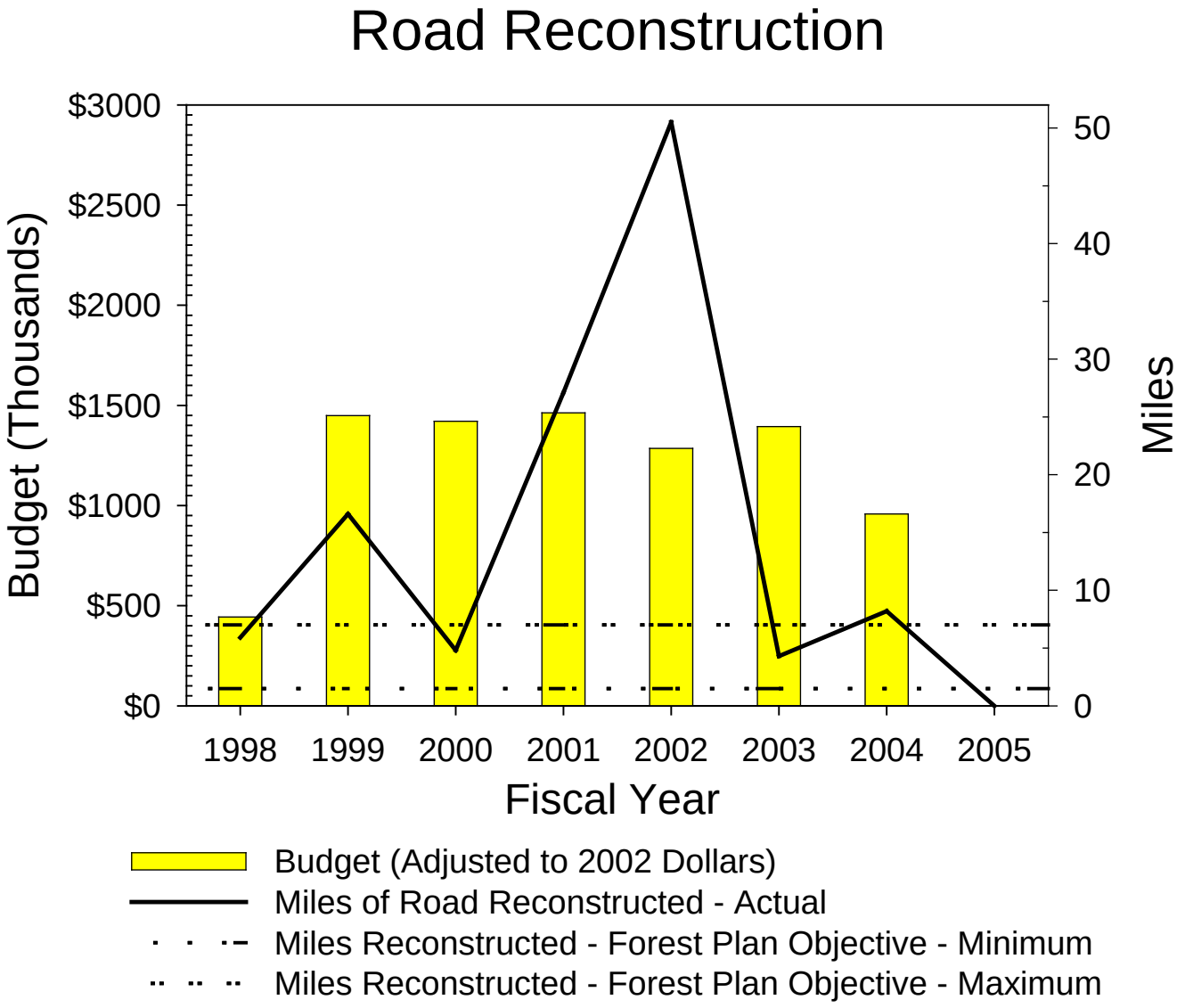
Graph 12


Road Maintenance
Budget (Thousands)
$3000
$2500
$2000
$1500
$1000
$500
$0
50
40
30
20
10
0
Percent of Roads
1998
1999
2000
2001
2002
2003
2004
2005
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Percent of Total Roads Maintained-Actual
Percent of Total Roads Maintained-Forest Plan Objective

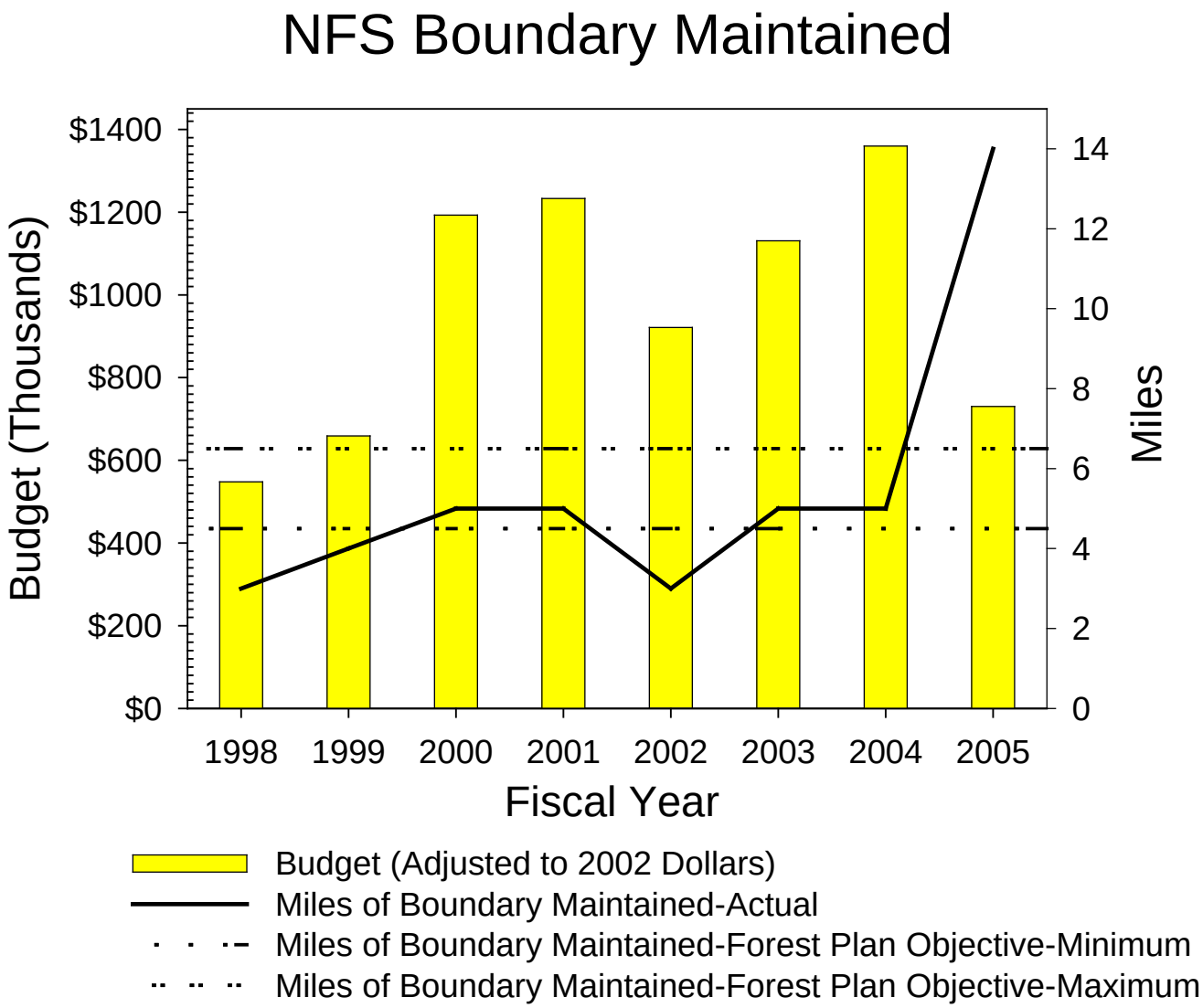
Graph 13


Road Construction
$3000
$2500
$2000
$1500
$1000
$500
$0
Budget (Thousands)
4
3
2
1
0
Miles
1998
1999
2000
2001
2002
2003
2004
2005
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Miles of Road Constructed - Actual
Miles Constructed - Forest Plan Objective - Minimum
Miles Constructed - Forest Plan Objective - Maximum

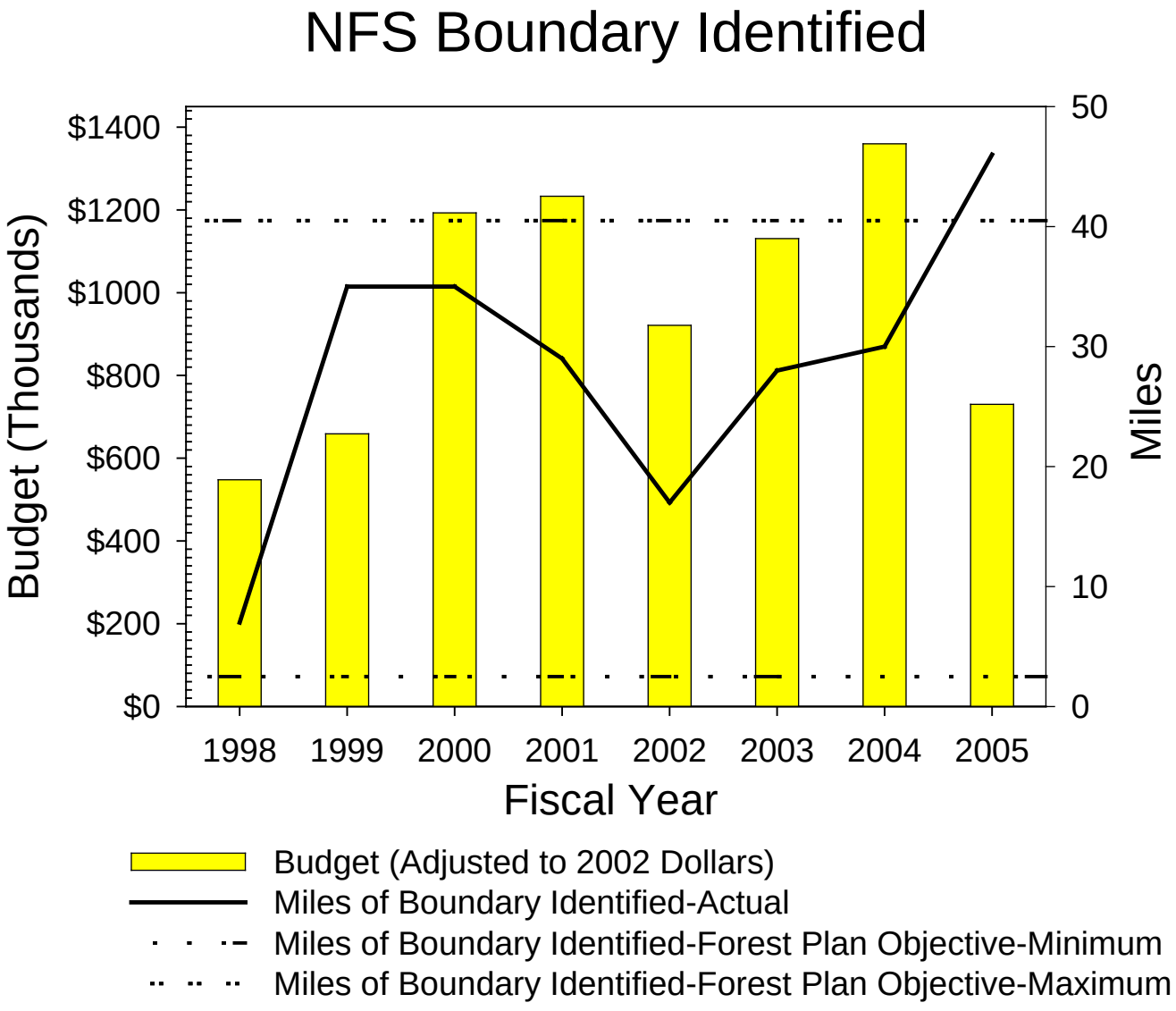
Graph 14


Road Reconstruction
Budget (Thousands)
$3000
$2500
$2000
$1500
$1000
$500
$0
Miles
50
40
30
20
10
0
1998
1999
2000
2001
2002
2003
2004
2005
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Miles of Road Reconstructed - Actual
Miles Reconstructed - Forest Plan Objective - Minimum
Miles Reconstructed - Forest Plan Objective - Maximum

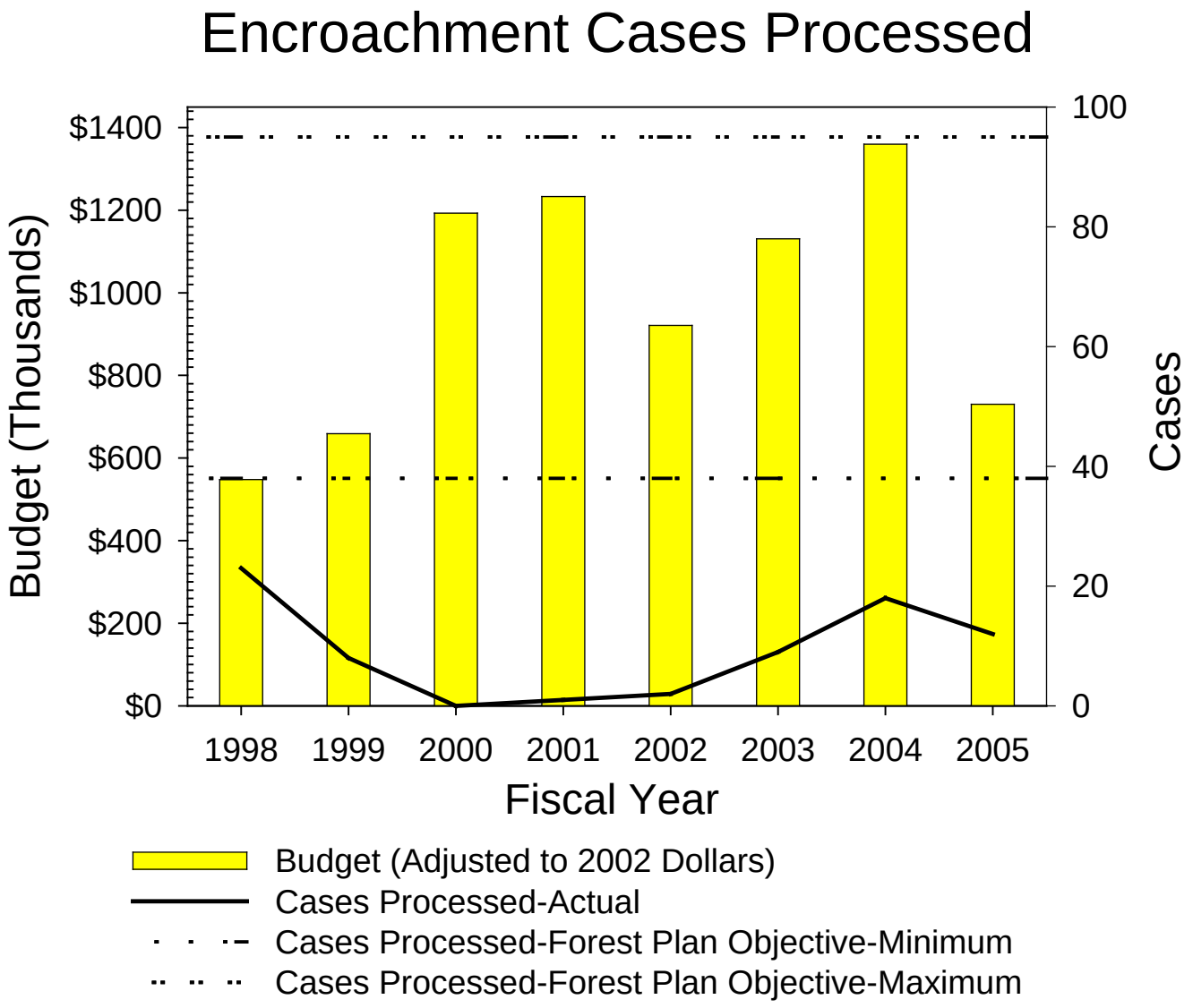
Graph 15


NFS Boundary Maintained
Budget (Thousands)
$1400
$1200
$1000
$800
$600
$400
$200
$0
Miles
14
12
10
8
6
4
2
0
1998
1999
2000
2001
2002
2003
2004
2005
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Miles of Boundary Maintained-Actual
Miles of Boundary Maintained-Forest Plan Objective-Minimum
Miles of Boundary Maintained-Forest Plan Objective-Maximum

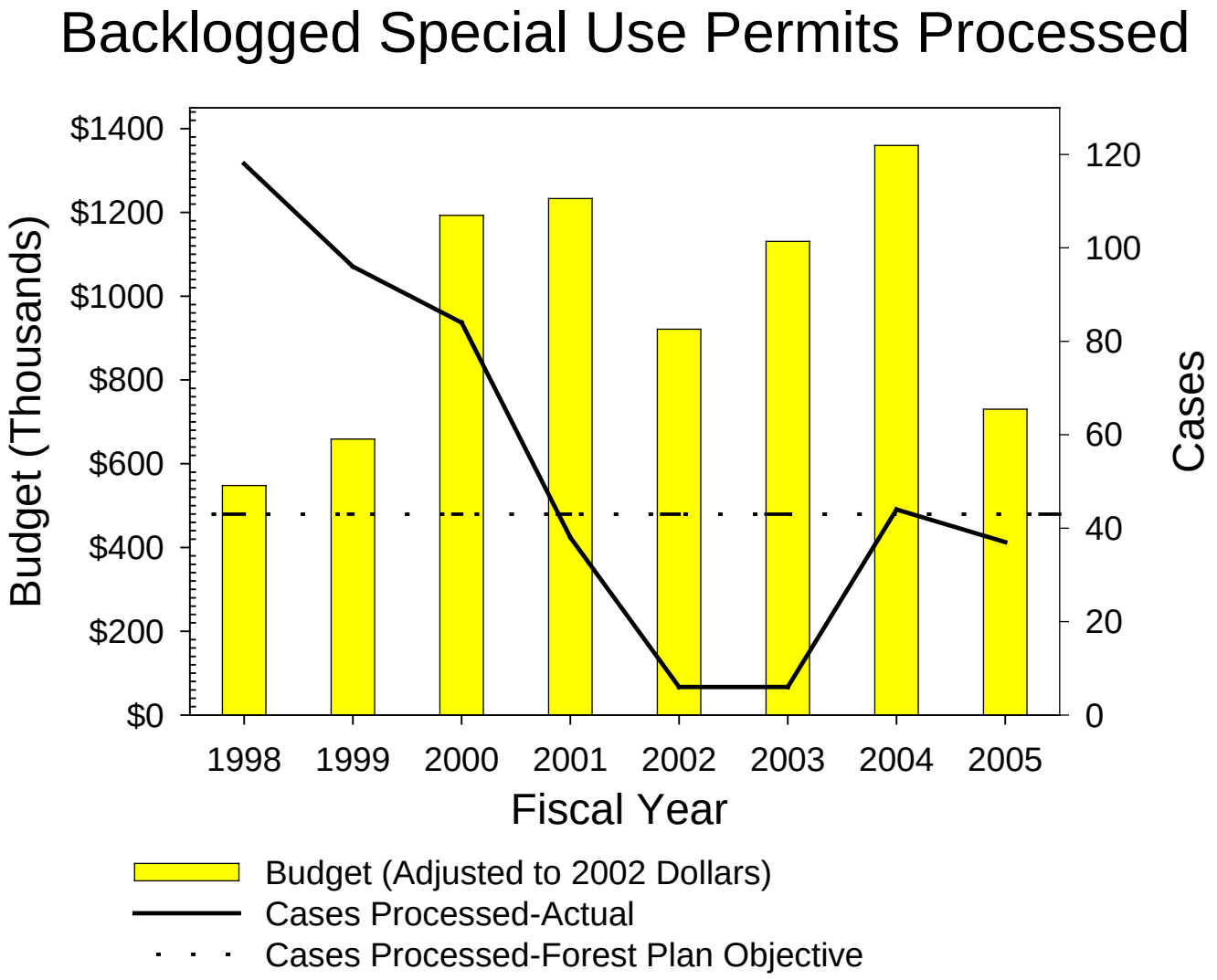
Graph 16


NFS Boundary Identified
Budget (Thousands)
$1400
$1200
$1000
$800
$600
$400
$200
$0
50
40
30
20
10
0
Miles
1998
1999
2000
2001
2002
2003
2004
2005
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Miles of Boundary Identified-Actual
Miles of Boundary Identified-Forest Plan Objective-Minimum
Miles of Boundary Identified-Forest Plan Objective-Maximum

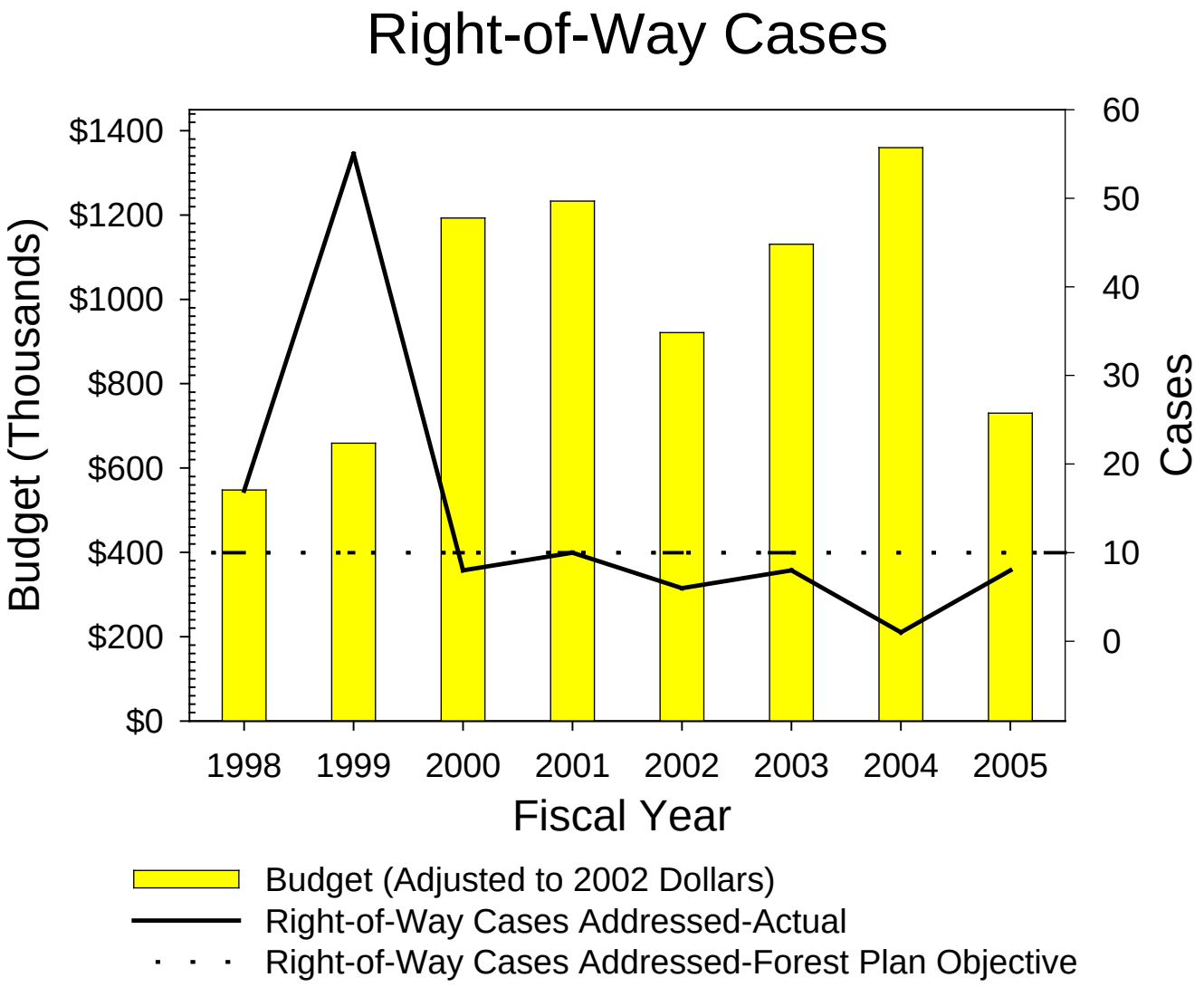
Graph 17


Encroachment Cases Processed
Budget (Thousands)
$1400
$1200
$1000
$800
$600
$400
$200
$0
100
80
60
40
20
0
Cases
1998
1999
2000
2001
2002
2003
2004
2005
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Cases Processed-Actual
Cases Processed-Forest Plan Objective-Minimum
Cases Processed-Forest Plan Objective-Maximum

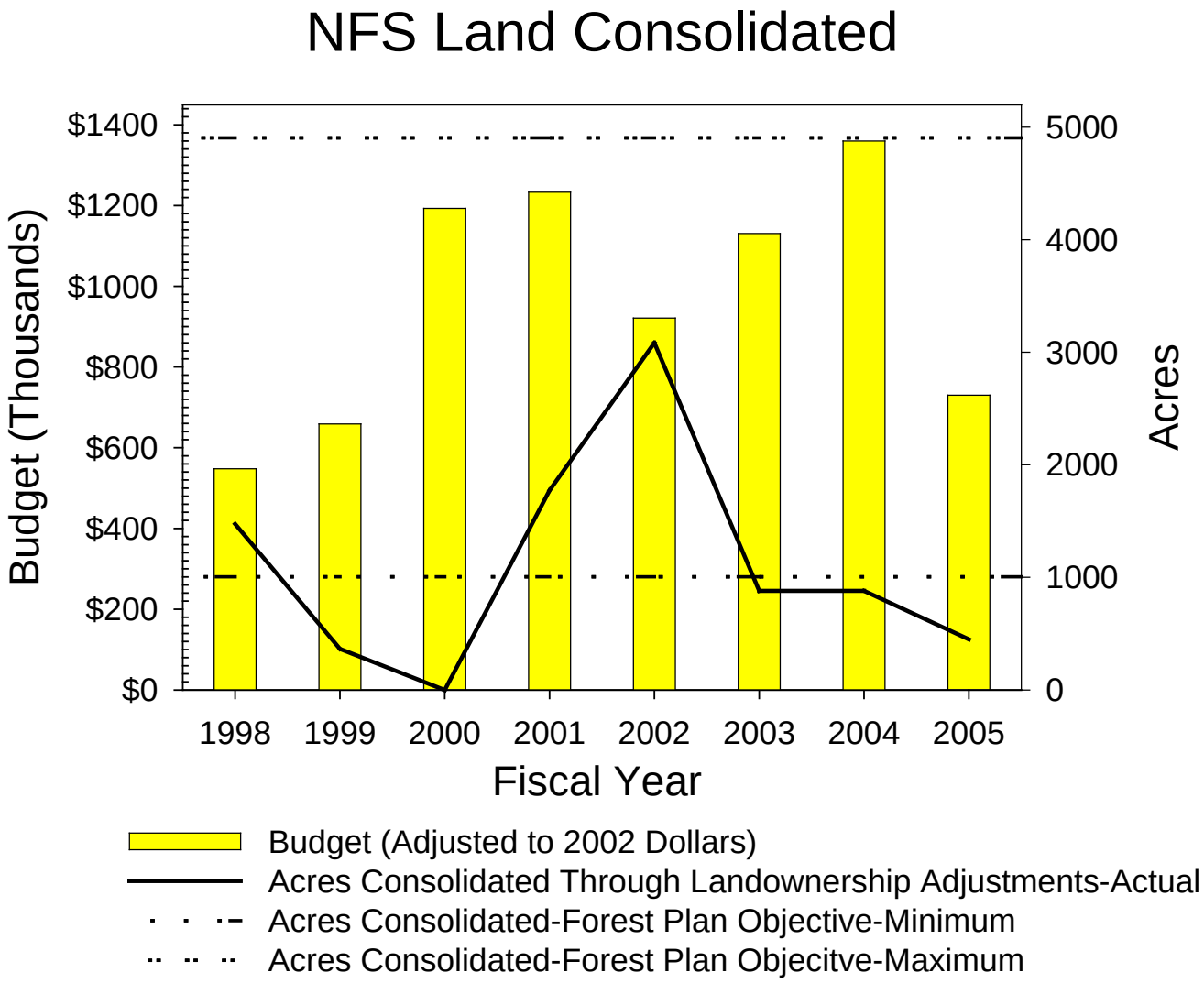
Graph 18


Backlogged Special Use Permits Processed
Budget (Thousands)
$1400
$1200
$1000
$800
$600
$400
$200
$0
120
100
80
60
40
20
0
Cases
1998
1999
2000
2001
2002
2003
2004
2005
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Cases Processed-Actual
Cases Processed-Forest Plan Objective

Graph 19


Right-of-Way Cases
Budget (Thousands)
$1400
$1200
$1000
$800
$600
$400
$200
$0
60
50
40
30
20
10
0
Cases
1998
1999
2000
2001
2002
2003
2004
2005
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Right-of-Way Cases Addressed-Actual
Right-of-Way Cases Addressed-Forest Plan Objective

Graph 20


NFS Land Consolidated
Budget (Thousands)
$1400
$1200
$1000
$800
$600
$400
$200
$0
5000
4000
3000
2000
1000
0
Acres
1998
1999
2000
2001
2002
2003
2004
2005
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Acres Consolidated Through Landownership Adjustments-Actual
Acres Consolidated-Forest Plan Objective-Minimum
Acres Consolidated-Forest Plan Objecitve-Maximum