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 2004

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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 seventh season of implementing plan goals and objectives. Lessons learned from these seven 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 initiated on Forest Plan amendments for management indicator species and stream flows, and incorporating 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/ Jim Bedwell

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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.

Seven 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 seven 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, we are seeing the acreage of wildlife habitat improvement grow on an increasingly upward trend.

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. A new visitor 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 2004 (Oct 1, 2003 - September 30, 2004) the ARP treated over 10,000 acres of hazardous fuels. By the end of Fiscal Year 2005 (FY 2005) we are expecting to complete planning to treat an additional 3,000 acres.

The timber program was able to offer and sell over 1,700 acres of timber. In FY 2004, over 3,500 acres of timber were harvested from the Forests from previously sold sales.

The ARP is pockmarked with abandoned mines. Many of these old mines need to be rehabilitated, closures need to be improved, and sediments need to be contained. With the hiring of an expert on abandoned mines we are moving forward on this faster than we have in the past.

Accomplishments were made in land ownership adjustments in 2004. The third 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. A small land exhange on the Pawnee National Grassland (PNG) improved boundary management and wildlife habitat.

The Pawnee National Grassland has utilized prescribed fire to improve mountain plover habitat. 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. Hundreds of acres of weeds were treated across the ARP.

Many activities on the Forests and Grassland affect the soils. A forest-wide soil monitoring program was initiated this year on the forest. 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 828 GFA days managed to standard (DMS) in 2004. This is a 582-DMS increase from FY2003.

Of particular note in FY 2003-2004 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 seventh 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 2004, 5,200 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 seven-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 seven 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 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 near Lake Granby in Grand County on the Sulphur Ranger District. An Enivironmental Impact Statement was developed to analyze the effects of treating mountain pine beetle infested trees around Lake Granby. A

decision for a portion of this area (outside the roadless area) was made in March, 2004. Implementation has not yet begun. Dwarf mistletoe is wide spread throughout lodgepole pine and ponderosa pine stands on the Forest. 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.

In 1998 we experienced an increase in mountain pine beetle activity following the Jamestown prescribed burn. Survey indicated about a 2.5 times increase in mountain pine beetle attacks from 1997 to 1998 in the burn area. This was not abnormal during the mountain pine beetle population increase we were experiencing in areas along the Front Range. Regardless of the cause of the increase we successfully implemented insect suppression treatments in the area to reduce additional mortality.

The Forest continues to experience a small isolated outbreak of *Ipps* beetle on a hazardous fuels reduction project 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 needed 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. MIS population data from 1998 through 2004 will be used in this reevaluation and a Forest Plan amendment is anticipated for 2005.

Population Trends of MIS for ARP

The following summarizes trends based on ARP-wide data tables in Appendix A.

Birds (15)

1) ferruginous hawk - Apparent long-term decline of nesting birds on PNG and relatively stable transect bird counts (Appendix A, List 1, Tables 7 and 8).
   - Increasing breeding bird trends at larger geographic scales (RMBO 2002).
   - Increasing winter bird trends at larger geographic scales (RMBO 2002).
2) peregrine falcon – On ARNF, nest sites occupancy has been relatively stable since 1994 but decreased in 2004; and number of fledged young was slightly variable since 1994 but decreased in to the lowest levels in 2003 and 2004 (Appendix A, List 1, Table 17).
   - Upward population trends at larger geographic scales (RMBO 2002).
3) bald eagle – Until recently, population trends not applicable to ARP but 1-2 nest have been active on or near ARNF since 1995 (Appendix A, List 1, Table 18).
   - Strongly positive trend at continental level (RMBO 2002).
4) burrowing owl – Population trends are up on PNG since 1999 (Appendix A, List 1, Table 5).
   - Trends at larger scales are uncertain (RMBO 2002).
5) mountain plover - Dramatic drop in population beginning in 1995 on PNG (Appendix A, List 1, Table 6).
   - Counts at larger geographic scales unable to discern trends (RMBO 2002).
6) lark bunting - Population trends on PNG appear variable but relatively stable since 1999 when survey transects were established (Appendix A, List 1, Table 11).
   – 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).
7) brown thrasher – No population level or trend data is available for PNG (RMBO 2002).
   - In Colorado, too few breeding bird survey routes count them to detect a trend (Kingery 1998).
8) flammulated owl - Transect surveys in and near ARNF and PNG from 1998-2004 have been conducted as part of the Monitoring Colorado Birds (MCB) effort by Rocky Mountain Bird Observatory (RMBO). During this time the numbers of flammulated owls detected with each transect was zero. RMBO conducts nocturnal surveys for owls as part of its MCB program, and 4–7 surveys take place on the ARNF. However, the surveys done from 1999–2001 have been conducted before flammulated owls return from their wintering grounds. In continuing efforts, some future surveys will be conducted later in the breeding season (in June) to detect flammulated owls on breeding territories. While systematic monitoring for counts relative to populations are being made, no detections have been made that would indicate trend yet (RMBO 2002 and 2004).
   - Mean annual densities were determined at Manitou Experimental Forest during a 19 year study to south of ARNF at 1 breeding pair/ 278 acres and 1 unpaired male/357 acres.

   - No trend data are available for ARNF or larger geographic regions due to lack of historic data (RMBO 2002).
9) hairy woodpecker - Population trend has dipped from 1999 through 2003 for ARNF, but numbers in years 1998 and 2004 are similar (Appendix A, List 1, Table 10)
   - Breeding surveys show increasing trend at continental level (RMBO 2002).
10) three-toed woodpecker - Transect counts for ARNF are low and trends uncertain (Appendix A, List 1, Table 14).

- Most counts across its range have been in recently burned areas where the species reaches the highest densities.
- No population trends are available for larger geographic areas (RMBO 2002).

11) pygmy nuthatch – Transect surveys indicate an increased population for ARNF in 2004 from previous counts since 1998 (Appendix A, List 1, Table 13). Note that transect surveys in typical habitat (ponderosa pine) were not conducted in 2003.
- No trend was discernable at larger geographic scales (RMBO 2002).

12) golden-crowned kinglet – Transect survey numbers show an increase in 2000 and a decrease since when several typical habitat (spruce-fir) transects were not read (Appendix A, List 1, Table 9).
- Breeding trends since 1979 and winter trends since 1988 are not available at larger geographic scales (RMBO 2002).

13) mountain bluebird – Transect survey data for ARNF indicate that mountain bluebird population trends are somewhat variable (Appendix A, List 1, Table 12).
- Breeding trends at continental level slightly increased during 1966-2000 but winter trends are too variable to exhibit a trend (RMBO 2002).

14) warbling vireo – Transect survey counts indicate variable population trends on ARNF, with decreases since 2001, noting that several transects were not read in 2003 (Appendix A, List 1, Table 15).
- A slight increasing breeding trend is apparent at the continental scale in each of 3 different time periods during 1966-2000 (RMBO 2002).

15) Wilson's warbler – ARNF transect counts increase each year from1998-2001, drop in 2002, and increase to average yearly levels in 2003-2004 (Appendix A, List 1, Table 16)
- A slight downward breeding trend but no discernable winter trend at the continental scale (RMBO 2002).

<u>Mammals (9)</u>

16) elk
- ARNF population trend has been stable 1997-2003, but decreased 7.5% from 2003 to 2004.
- The estimated population numbers for Colorado increased about 28% 1997-2003, but decreased 9.6% from 2003 to 2004 (Appendix A, List 1, Table 1).

17) mule deer
- ARNF trend has varied since 1997, being highest in 1998, and lowest in 2004.
- PNG trends have declined yearly, dropping about 32% since 2000.
- Trends for ARNF/PNG combined were relatively stable 2000-2003, but decreased 8 percent from 2003 to 2004.
- For Colorado, population trend was generally upward 1997-2004, increasing about 14% overall (Appendix A, List 1, Table 2).

18) bighorn sheep - ARNF and Colorado trends have varied between 1997 and 2004, decreasing somewhat over that time (9.6 and 3.3%, respectively) (Appendix A, List 1, Table 3).

19) black bear – While direct estimates of population are not available, hunter harvest data are available that provide indices of trend.
- ARNF population numbers based on harvest estimates 2000-2003 were highest in 2001, and at similar levels in 2000 and 2003.
- Colorado harvest estimates are relatively similar 2000-2002 but drop in 2003 (Appendix A, List 1, Table19).

20) river otter
- Considered extirpated in Colorado, reintroduction efforts began in 1976.
– Now occur in several drainages on ARNF including Colorado River, Cache la Poudre and Laramie River areas (Appendix A, List 1, Table 20 and text).
- Population estimates are generally lacking in Colorado due to lack of satisfactory field methods (CNHP 2002).

21) wolverine – Occurrence is uncertain, although ARNF (north and west of RMNP) is one of few areas in Colorado believed to be occupied (Appendix A, List 1, Table 21 and text).

22) lynx – Almost extirpated, reintroduction of 166 adults occurred during 1999-2004.
- At least 80 transplanted lynx were alive in 2004, and at least 55 lynx born.
- Transplanted lynx have moved to and through portions of ARNF where two were know to have died (one on I-70 by vehicle, and one near Guanella pass apparently by bobcat) (Appendix A, List 1, Table 22, Figure 1 and text).

23) black-tailed prairie dog - 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 2863 acres in 2004 with reductions primarily caused by plague.
- Since 1994 annual increases have occurred, except for one year (Appendix A, List 1, Table 4).

24) Townsend's big-eared bat - While not found in great numbers, it is frequently encountered in surveys of caves and mines.
- Currently available monitoring data does not allow population trends to be discerned for ARNF (Appendix A, List 1, Tables 23, 24 and text).
- Similarly, population trends are not available for Colorado (CNHP 2002).

Amphibians (3)

25) boreal toad – Although rare, data exists to establish population trends on ARNF.
- Currently 23 breeding sites in or near ARNF and at least 40 more in Colorado are periodically monitored.
- Breeding populations are low and trend has been declining on ARNF since the early- to mid-1990s (Appendix A, List 2, Table 29).
- Similarly, the population trend in Colorado since the late-1970s and early-1980s has decreased to recently low levels (CNHP 2002).

26) northern leopard frog – Recent population data are lacking on ARNF and findings are low on PNG (Appendix A, List 1, Tables 25 and 26).
- Common in many parts of Colorado, but local declines have occurred especially at higher elevations.
- At continental scale still generally common with declines in a few areas (CNHP 2002).

27) wood frog – The species has occupied (Appendix A, List 1, Table 27) and continues to occupy Chambers Lake and Laramie River areas on ARNF, and several populations exist nearby in RMNP.
- Population trend is not known from available monitoring data for ARNF or Colorado (CNHP 2002).

Fish (7)

28) brook trout
- data exist to establish population trends on the ARNF (Appendix A, List 3, Table 32)
- trend appears to be stable or upward

29) brown trout
- data exist to establish population trends on the ARNF (Appendix A, List 3, Table 33)
- trend appears to be stable

30) rainbow trout
- data exist to establish population trends on the ARNF
- due to whirling disease and stocking history, apparent trend is not meaningful

31) greenback cutthroat trout
- although rare, data exist to established population trends on the ARNF(Appendix A, List 3, Table 30)
- breeding populations are low but trends appear to be stable on the ARNF and in Colorado
- Currently 8 sites on the ARNF are periodically monitored.

32) Colorado River cutthroat trout
- although rare, data exist to established population trends on the ARNF (Appendix A, List 3, Table 31)
- breeding populations are low but trends appear to be stable on the ARNF and in Colorado
- currently 12 sites on the ARNF are periodically monitored

33) plains killifish
- although rare, data exists to established population trends on PNG (Appendix A, List 3, Table 35)
- trends appear to be stable on the PNG
- currently 10 sites on the PNG that are periodically monitored

34) plains topminnow
- although rare, data exists to established population trends on PNG (Appendix A, List 3, Table 34)
- trends appear to be stable on the PNG
- currently 19 sites on the PNG are periodically monitored

On PNG, the FS has monitored the *ferruginous hawk* and *prairie dog* annually for over two decades. Since 1990, annual inventories are continuing for *mountain plover* by USGS and other agencies. The *burrowing owl* has seven years of population count data on PNG and the FS continues to monitor this species. The *mule deer* continues to be monitored annually by CDOW.

On ARNF, *elk, mule deer, bighorn sheep, black bear, peregrine falcon and bald eagle* have been monitored annually for years and monitoring continues by CDOW.

Monitoring Colorado Birds (MCB) is a bird-monitoring program conducted by Rocky Mountain Bird Observatory (RMBO), funded by FS, CDOW and BLM. On ARNF and PNG, MCB transect surveys monitored since year 1998 demonstrate number changes of *ferruginous hawk, golden-crowned kinglet, hairy woodpecker, lark bunting, mountain bluebird, pygmy nuthatch, three-toed woodpecker, warbling vireo* and *Wilson's warbler*. *Boreal toad* monitoring has and continues to be carried out annually by several cooperating agencies, including Forest Service, participating on the Boreal Toad Recovery Team.

The Forest monitors sensitive, threatened and desirable non-native trout species annually. Species monitored include Colorado River cutthroat trout, greenback cutthroat trout, brown trout, brook trout, and rainbow trout on the Forest and plains topminnow and plains killifish on the Pawnee Grasslands.

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.

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 is immeasurable on a larger scale over a time period of one, five, or even ten years. Therefore, the social and political need to increase funding to address this problem is slow to develop. So 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 visitors comply with travel regulations. However, as stated in the general summary previously, 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 828 GFA days managed to standard (DMS) in 2004. This is a 582-DMS increase from FY2003.

There have been many 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. In addition, an Environmental Assessment was completed in 2004 for the proposed action of restricting motorized use into the 23,000 acre Fraser Experimental Forest on the Sulphur Ranger District to limited trailhead locations. This was done to reduce total miles available for motorized use to protect existing and future forest and water quality scientific research there. A decision based on effects analysis from the EA was rendered in July 2004 and implemented in the fall of the year.

There are two areas that have been designated and managed for off-highway vehicles (OHVs), the Main, on the Pawnee National Grassland and the Stillwater OHV trial system on the Sulphur Ranger District. Through the roads analysis process the need for additional areas will be evaluated.

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 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 off-road vehicle use is apparently increasing, unconstrained in many areas on the ARP.

WATERSHED AND FISHERIES:
Roads and trails continue to be primary chronic sources of suspended 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. Progress is being made in Left Hand toward rehabilitation damaged areas and designating a suitable trail network. Watershed improvement projects have been used to address effects of off-highway vehicle use in other areas. A few examples are closure and rehabilitation of unauthorized vehicle trails in the Deadman Creek area on the Canyon Lakes District and fencing of wetlands to prevent vehicle access on the Boulder and Clear Creek Districts. 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 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.

Much progress has been made to direct dispersed motorized use on the ARP. Toilets have been installed to address human waste issues. Restrictions were established and enforced and buck-and-rail fences were installed to maintain motorized use to road and trail surfaces and prevent driving off roads.

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 has been 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 2004 fuel reduction planning has been completed on 20,000 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 analyzed the effects of treating beetle-infested trees in the Grand Lake area in an Environmental Impact Statement. Through public involement these homeowners and other interested publics and agencies helped to determine the best method to treat this infestation. A decision on a portion of the area not in an inventoried roadless area was issued in March, 2004.

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 the discussions in the section of this report titled, Table 4.2 Forest Plan Monitoring Questions for Priority Management Emphasis and Stakeholder/Public Involvement. These graphs compare the program (e.g., hazardous fuels treatments) budget with its accomplishment for the 7-year period of 1998-2004. 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 2004 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 7 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.

- Aspen regeneration and reduced conifer encroachment in openings have mostly been realized as expected through design of fuels/timber management projects.
- Expectations of riparian restoration, structural improvements and habitat protection have not been fully realized due to reduced funding.

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 and Heritage programs are also now subsets of the overall recreation program as is the Landscape/Scenery Management program.
- Maintenance activities were not recognized as high importance (no objectives) but new construction, reconstruction, and rehabilitation were. A lot of the work of the Recreation program involves maintenance, yet, it has no tracking mechanism such as a Forest Plan objective.
- 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.

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:

Yearly budget allocation, competing priorities for the ARP as well as the long public process to obtain informed consent among polarized users substantially lengthens the planning process. Effectively closing roads is a challenge. Some closures are illegally reopened or detoured around to obtain access. There is a need for greater field and law enforcement presence.

WATERSHED:
Prescriptions - Two changes in prescriptions that directly affected water resources from the original Forest Plan (1984) to the revised Forest Plan (1997) were the elimination of the management prescriptions for water yield enhancement through vegetation manipulation and for riparian area management. The primary effect of dropping the water yield management prescription has been that changes in water yield due to vegetation management are considered to be an effect or a product of vegetation management rather than a primary goal for implementing such management. Water yield continues to be increased in those areas that are managed to reduce forest cover, through commercial and non-commercial timber removal and fire. The riparian area management prescription was dropped because all riparian areas on the Forest and Grasslands were covered by the prescription and is was assumed that riparian areas could be protected as well through Forest-wide standards and guidelines. That has proved to be the case. Standards and guidelines to protect riparian and aquatic resources were simply moved from the management area prescription to the Forest-wide standards and guidelines.

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 increased access caused by the opening of forest stands are mitigated

AIR:
The long-term synoptic lake sampling program is in its tenth 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:
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 projedt monitoring, thus, it has not been determined how well mitigation direction is being followed as stated in the project NEPA documents.

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 7 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 1 mile of user-created roads and trails were obliterated in Deadman Park (Canyon Lakes Ranger District) and 6 miles of road were obliterated in the Caribou Creek-West Magnolia area of the Boulder 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 increasing and apparently unconstrained in many sensitive 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. 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.

During some monitoring field reviews prior to 2004, it was discovered certain management activities were carried out and/or planned without knowledge and consideration of old growth presence o old

growth Forest Plan direction. By chance no old growth was lost to prescribed fire or mechanical treatments.

Planning teams were informed of this lack and made aware that all direction in the Forest Plan must be considered and evaluated.

> 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. Despite lack of funding for this monitoring program during 2004, monitoring was continued with only 1 sample per lake during the 2004-monitoring year. Year 2004 lake sampling was completed with the assistance of Bob Musselman, Chuck Rhoades and other staff of the Rocky Mountain Research Station (RMRS). Currently, the RMRS is compiling this data for future analysis and publication.

Results of this year and previous year's sampling were statistically analyzed and summarized by Indiana University-Bloomington Graduate students during 2004. Results concluded that monitoring methods are not statistically valid since sampling protocol does not take into account enough variables. The national air program will conduct another data analysis of all water data this year. This final analysis will determine whether lake sampling program can be designed in a more cost-effective manner. 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 2004.

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 on the Boulder and Canyon Lakes Ranger Districts and prioritization will be completed for the other Ranger Districts by the end of 2005.

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. 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 in the last two years. See Appendix B, Graph 8, Obtain Stream Flows to Maintain Stream Processes.

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 has been more typically in the 10-20 acre range. 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 2002 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 has been implemented for an abandoned mill site in the Leavenworth Creek watershed. This stream appears on the 303(d) list. The Forest now employs a full-time abandoned mine reclamation specialist, 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 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 seven years of the Forest Plan falls within the stated objective but does not show substantial 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 2004 and is expected to increase substantially during the next three years 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 7 years, the following campgrounds were reconstructed: Ansel Watrous, Narrows, West Lake, Sunset (new) and Willow Creek, and Stillwater. 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. A sailboat "gin" pole was installed at the Stillwater Boat Ramp. The 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. Many individual campsites were brought to Americans with Disabilities Act accessible standards. Many 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. Trails in developed campgrounds were hardened. A few new campsites and group-use areas were also built. A new kiosk was installed on Mt. Evans and a new nature center is currently being built on the Mt. Evans Road by the Mt. Goliath Trail. Twenty-three miles of new Continental Divide Trail and one mile of new trail on the grays and torreys peaks trail were constructed and a new boardwalk was installed on the Bierstadt Trail. In 2004, the Hewlett Gulch Trailhead was reconstructed, an interpretive kiosk was installed in the Arapaho National Recreation Area, and roadside recreation/travel management kiosks were install at Stillwater East, Stillwater West, North Supply, Cabin Creek, Young's Gulch and Herman Gulch. In addition, the Dos Chappell Nature Center at Mt. Goliath Natural Area on the Mt. Evans Scenic Byway was constructed.

The total Recreation Budget for the ARP in FY2004 was $2,652,000. Subtracting cost pool expenses of $$740,600 left the Recreation Program with $1,911,400 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 and Education, 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 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. 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 dispersed

campsite boundary. In addition, in 2004 the Boulder Ranger District began analyzing the developed and dispersed camping use at the Brainard Lake area and developed a proposed action to develop additional camping and restrict dispersed camping in some areas and designate dispersed camping in others. Analysis was ongoing into FY2005.

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 Fee Demo (RFD) project area has provided the public with a substantially enhanced recreation experience. The additional funding enabled by the RFD 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 nature center at Mt. Goliath; and other facilities maintained to better standards. As a result of the Arapaho National Recreation Area (ANRA) RFD; service patrols have increased; interpretive day events for first and fifth graders have occurred; boat safety patrols on Lake Granby and Shadow Mountain Lake have increased; cleaned and maintained toilets and trash service in the ANRA picnic areas have improved; and law enforcement patrol in the ANRA for enhanced visitor safety and security has also increased. The Christmas Tree RFD program 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 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. At the Clear Creek Ranger District's Visitor center a new interpretive kiosk was built. New wildlife mounts and natural wood furniture for the Sulphur Ranger District visitor center enhanced the visitor's experience. The Boulder Ranger District Visitor Center also saw improvement with additional available maps, furniture and information racks. A substantial visitor center is being designed for the Supervisor's Office/Canyon Lakes Ranger District's new office building. The ARP has invested in upgrading and hiring visitor services positions to increase service to the public.

The Forest Concession permit provides for concession-managed developed campground (and some picnic areas); operations, maintenance, host staffing, interpretive program. This provides additional dollars to spend on site improvement projects.

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.

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, campground coffees at CCRD, visitor contacts at district VIS centers and in the field, Passport In Time archaeological based recreational experiences and interpretive signage for our kiosks and bulletin boards.

Finally, the ARP uses the customer comment cards at visitor centers, Christmas tree areas, RFD sites, and concession operated campgrounds to gather public response and assess satisfaction to our programs and service. The National Visitor Use Monitoring survey estimates approximately 6.2 million annual visits to the ARP, and relatively few complaints per year. The overall estimate is that thr 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 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. On 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.

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. Implementation of major travel management decisions has occurred on the Sulphur Ranger District (Sweetwater OHV area) and Pawnee National Grassland. These and other projects have included OHV trail designations, classified and unclassified road decommissioning, road restrictions and closures, and implementation of road construction or reconstruction via other projects whose objectives were 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 such as campground reconstruction.

The average accomplishments for converting "ways" to system roads has been within Forest Plan objectives, but conversions occurred in only one year. The 2001 regulations as discussed in the previous paragraphs shed a different light on the need and our ability to convert "ways" (now called unclassified travelways) to system roads (now called classified roads). If anything, the new regulations and executive intent has been to reduce the number of miles of classified roads in the National Forests. National emphasis has been on decommissioning of both classified and unclassified roads.

The Forest Plan objective for decommission roads has been met in two out of the five years, but the average accomplishment is 76% of that objective. Most of the reason for not meeting the objective is in the requirements of the RAP process and complexity/controversy involved in the public involvement. The easy, non-controversial roads have been decommissioned. The Forest and Grassland remains committed to decommissioning of unnecessary classified and unclassified travelways.

Average implementation of road reconstruction has exceeded the Forest Plan. This is primarily due to variations in the timing and needs of the timber sale program. National emphasis has been on reconstruction and maintenance of our existing road system rather than new construction.

The ARP has not met Forest Plan objectives for new road construction. This is not necessarily a negative indication of Forest Plan implementation. It is an indicator of the ARP following national directions and policies. The need for new, permanently open roads is less than anticipated by the Forest Plan. More data is needed before recommendations can be made for changes to this particular objective.

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 of our existing roads has been accomplished during the five years. 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 Forest Plan objectives for maintaining system roads. Contracting and agreements with our local county governments have helped us meet this objective.

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 25 miles per year in the seven 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. Virtually all of the boundary location work is now performed by contract or through agreements with the Bureau of Land Management. The ARP program was managed from a zone office on the Medicine Bow NF in Laramie after the Forest land surveyor position was vacated in fiscal year 2000. It is now managed by a Forest land surveyor which was filled in June 2004 with the expectation of an increase of production and service. 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 new 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 2004 included:

- Phase III of the Beaver Brook Watershed Acquisition on the Clear Creek Ranger District added 555 acres of National Forest System land. 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.
- A land exchange on the Pawnee National Grasslands resulted in the exchange of 160 acres for 160 acres, consolidating land ownership and acquiring important resource values.
- A land exchange with Loveland Rural Fire Department resulted in the acquisition of 6 acres of National Forest System land.

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 which 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" allows motorized use 300 feet off any designated Forest Road for dispersed camping 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.
- 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.
- The Recreation Fee Demo (RFD) program brought some positive effects to the public, as described above, but it also created some negative issues. 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 permanent authority has created uncertainty of the future for investment in personnel & infrastructure, commitment, support, etc.
- The Forest Service Regional Office commitments made through Memorandum of Understanding (MOU) with groups like the Continental Divide Trail Alliance and the Colorado Fourteeners Initiative 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.

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.

TRAVEL MANAGEMENT

Ongoing or Emerging Issues

- 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 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 increased access caused by the opening of forest stands are mitigated.
- 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. 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. . The increasing cost of planning is diverting funding from on-the-ground transportation system improvement, maintenance and decommissioning.

- New national performance measures are being developed that will be better indicators of transportation system management. The measures may result in new or different method of travel/transportation management.
- 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 roaded 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 7 years). The cost of surveys and data management will take funding from on-the-ground maintenance activities.
- The Forest Service published a draft OHV rule in July, 2004, and the public is now commenting on this rule prior to a final published rule. This rule directs that OHVs will be allowed only on designated OHV routes (roads or trails) on all National Forest lands.

Recommendations

- Include mitigation measures in any NEPA decisions, which include travel management decisions or when there is increased access caused by the opening of forest stands by hazardous fuels treatments and provide sufficient mitigation funding by the project.
- Continue to follow the Roads Analysis Process (RAP) for travel management recommendations.
- The Forest Plan made a commitment to transportation planning. Forest management should make transportation planning a priority to complete. On a forest- and grassland-wide basis, prioritize the areas, which 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 efficient utilization of limited funding. Proceed with planning and implementation based on those priorities.
- Continue to improve relationships with volunteer groups and aggressively seek out challenge cost share projects.
- Establish road and trail signing protocols and coordinate consistency across Ranger Districts.
- Fully sign that roads and trails to minimize public confusion, which can at times lead to creation of unclassified roads.
- For roads that are decommissioned, an explanation of why this is 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 ARP travel regulations.
- Establish a method to more adequately plan and track accomplishments and utilization of funds allocated for "ongoing" activities. This might be accomplished by consolidating Forest travel management oversight (objectives, emphasis areas, budget, workload analysis, and staffing recommendations) into a 3-person core team of representatives from Recreation, Engineering and Ecosystems Support.

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 three 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.
- 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

- 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.
- Soil conditions prior to treatment (project implementation) and additional effects of management activities in some projects areas might indicate that the activity area rates of compaction and disturbance are greater than rates of recovery.
- Mitigations included in some Environmental Assessment Decision Notices and in some cases, Timber Sale Contracts are not being implemented.
- 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 fine-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 for Forest Sale Administrator use to determine when equipment operations can result in soil damage. Consider using designated skid trails in certain soil types.
- Winged-subsoiler is effective for mitigating compacted soils and road obliteration.
- Winter burning of hand piles has minimal soil effects.

Recommendations

- Mitigations not implemented during operation close out, be included as part of the KV activities.
- Post-implementation monitoring indicates that a winged subsoiler can effectively and feasibly decompact landings, skid trails, and obliterate roads on the Forest.
- Winter burning of hand piles appears to have minimal effects on soil conditions.
- 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

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.
- Last year's lack of funding reduced the number of samples per lake from 1 to 2 samples per year.

- 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 7 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 *most* projects in a timely and legal fashion. However, there have been instances when NEPA decisions have been signed by the Line Officer without the completion of the Section 106 process.
- Lack of reliable and easily accessible baseline heritage data continues to be a nagging problem that hampers the efficient execution of compliance work. In order to help establish accurate baseline heritage data, and to more effectively and efficiently accomplish our compliance

obligations, we have been working to move all of the Forests and Grassland heritage site and survey data into GIS layers.

- 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 the heritage resource, thus, it has not been determined how well mitigation direction is being followed as stated in the project NEPA documents.

Recommendations

- The heritage staff should be fully integrated into the NEPA process on large projects, and on smaller projects should be involved much earlier in the planning stages to ensure Section 106 compliance has been completed before NEPA decisions are signed.
- 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 betteerdeveloped in an interdisciplinary fashion than 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

- Revise the Management Indicator Species List
- Incorporate the Williams Fork Area into the Forest Plan
- Incorporate James Peak Wilderness/Protection Area legislation changes 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)								
Game Mgmt Units	Herd Name	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
In and near ARNF	(rounded to10)								
7,8,9,19,191	Poudre River	4490	4390	4540	4240	4280	4210	3920	3310
20	Saint Vrain	2670	2570	4140	4220	4370	3980	3810	3400
29,38	Clear Creek	1240	1230	1280	1250	1290	1300	1180	1140
39,46,391,461	Mount Evans	2460	2620	3000	3170	3140	3220	3020	2630
18,181	Troublesome Cr	3640	4700	3560	3340	3590	4020	3590	2740
28,37,371	William's Fork	4770	5200	4160	3880	3490	3340	4200	3050
In and near ARNF	**Totals**	**19270**	**20710**	**20680**	**20100**	**20160**	**20070**	**19720**	**16270**
State-wide Totals	(rounded to100)	218500	229400	264600	292600	305500	297500	278700	252000

Table 2.

Mule deer	Post-hunt population estimates (Big game statistics, Colorado Division of Wildlife)								
Game Mgmt Units	Herd Name	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
In and near ARNF	(rounded to10)								
7,8,9,19,191	Redfeather	12290	13810	11190	9730	9720	9070	8340	7240
20	Big Thompson	7960	8240	5830	6320	6470	6120	6470	5820
29,38	Boulder	7220	7400	8550	7890	7270	7080	7470	7150
39,49,51,461	Bailey	8330	6890	6750	7070	7570	8410	8420	8210
18,181,27,28,37,371	Middle Park	10150	11960	14180	10900	12250	13150	13240	11930
	Subtotals	**45950**	**48300**	**46500**	**41910**	**43280**	**43830**	**43940**	**40350**
In and near PNG									
87,88,89,90,93,95	Table Lands	1/	1/	1/	2110	1880	1600	1480	1430
In and near ARNF/PNG Totals					**44020**	**45160**	**45430**	**45420**	**41780**
State-wide Totals	(rounded to100)	516500	526400	528700	551600	565300	563700	602700	590,600

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

Table 3.

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

Game Mgmt Units In and near ARNF	Herd Name	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
S1	Poudre River	150	120	120	120	115	105	95	95
S3	Mount Evans	240	200	200	200	200	160	125	125
S18	Rawah	**	40	40	40	30	30	45	45
S19	Never Summer Range	175	100	100	50	50	50	50	25
S32	Georgetown	350	350	450	450	450	400	250	300
S37	St Vrain	***	80	80	80	80	100	100	100
S57	Big Thompson	140	60	50	50	60	80	80	80
S58	Lower Poudre	60	40	40	40	30	30	30	30
N/A	Rocky Mtn National Park	130	130	400	350	350	350	450	450
In and near ARNF Totals		**1245**	**1120**	**1480**	**1380**	**1365**	**1305**	**1225**	**1250**
State-wide Totals		7720	7245	7455	7535	7590	7495	7465	7295

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

Table 4.

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

PNG

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

Mammals (continued on page 15)

Birds

Table 5.

Burrowing Owl (PNG annual owl surveys)

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**

Table 6.

Mountain Plover (USGS annual surveys; Knopf 2004)

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			

Table 7. (Also see ferruginous hawk transect counts; next table)

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**

Table 8. (Also see ferruginous hawk active nest counts; previous table)

Ferruginous Hawk (Monitoring Colorado Birds data, RMBO 2004)

In and near ARNF	Number/transect/year							
Transect	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**Avg/yr**
AS28	0	NR	0	NR	NR	NR	0	0.0
AT02	NR	NR	NR	NR	0	0	0	0.0
AT03	NR	0	NR	0	0	0	NR	0.0
AT04	NR	0	NR	NR	0	0	0	0.0
AT05	NR	0	0	0	0	0	0	0.0
AT06	NR	0	0	0	0	0	0	0.0
GR01	NR	0	0	0	0	0	0	0.0
GR02	NR	0	1	0	2	0	0	0.5
GR03	NR	1	NR	0	1	1	0	0.6
GR05-02	NR	NR	NR	NR	0	NR	NR	0.0
GR15	NR	NR	0	NR	0	0	0	0.0
HR05	NR	NR	0	0	NR	0	0	0.0
HR09	NR	0	0	0	0	NR	0	0.0
HR10	NR	NR	0	0	0	NR	0	0.0
HR18	NR	0	NR	NR	0	0	0	0.0
HR25	NR	0	0	0	0	0	0	0.0
MC03	NR	0	0	0	0	0	0	0.0
MC27	NR	0	0	0	0	0	0	0.0
PP13	0	0	0	0	0	NR	NR	0.0
PP15	0	0	NR	0	0	NR	0	0.0
PP16	0	0	0	0	0	NR	0	0.0
PP21	0	0	0	0	0	NR	0	0.0
PP29	0	0	0	NR	0	NR	NR	0.0
SF16	0	NR	0	0	NR	NR	0	0.0
SF17	0	0	NR	0	0	NR	0	0.0
SF30	NR	0	0	NR	NR	NR	0	0.0
Total birds	**0**	**1**	**1**	**0**	**3**	**1**	**0**	**0.9**
# of transects w/ hits	**0**	**1**	**1**	**0**	**2**	**1**	**0**	**0.7**

NR = Transect not conducted in this year

Table 9.

Golden-crowned Kinglet (Monitoring Colorado Birds data, RMBO 2004)

In and near ARNF Number/transect/year

Transect	1998	1999	2000	2001	2002	2003	2004	Avg/yr
AS28	0	NR	0	NR	NR	NR	0	0.0
AT02	NR	NR	NR	NR	0	0	0	0.0
AT03	NR	0	NR	0	0	0	NR	0.0
AT04	NR	0	NR	NR	0	0	0	0.0
AT05	NR	1	0	0	0	0	0	0.2
AT06	NR	0	0	0	0	0	0	0.0
GR01	NR	0	0	0	0	0	0	0.0
GR02	NR	0	0	0	0	0	0	0.0
GR03	NR	0	NR	0	0	0	0	0.0
GR05-02	NR	NR	NR	NR	0	NR	NR	0.0
GR15	NR	NR	0	NR	0	0	0	0.0
HR05	NR	NR	17	0	NR	0	0	4.3
HR09	NR	4	0	0	0	NR	0	0.8
HR10	NR	NR	0	0	0	NR	0	0.0
HR18	NR	0	NR	NR	0	0	0	0.0
HR25	NR	0	0	0	0	0	0	0.0
MC03	NR	0	0	0	0	0	0	0.0
MC27	NR	1	0	0	0	0	0	0.2
PP13	0	0	0	0	0	NR	NR	0.0
PP15	0	0	NR	0	0	NR	0	0.0
PP16	0	0	0	0	0	NR	0	0.0
PP21	0	0	0	0	0	NR	0	0.0
PP29	0	0	0	0	0	NR	NR	0.0
SF16	0	NR	0	NR	NR	NR	0	0.0
SF17	10	2	NR	0	1	NR	0	2.6
SF30	NR	2	4	NR	NR	NR	1	2.3
Total birds	**10**	**10**	**21**	**0**	**1**	**0**	**1**	**6.1**
# of transects w/ hits	**1**	**5**	**2**	**0**	**1**	**0**	**1**	**1.4**

NR = Transect not conducted in this year

Table 10.

Hairy Woodpecker (Monitoring Colorado Birds data, RMBO 2004)
In and near ARNF Number/transect/year

Transect	1998	1999	2000	2001	2002	2003	2004	Avg/yr
AS28	2	NR	1	NR	NR	NR	1	1.3
AT02	NR	NR	NR	NR	1	0	0	0.3
AT03	NR	0	NR	0	0	0	NR	0.0
AT04	NR	0	NR	NR	0	0	0	0.0
AT05	NR	0	0	0	0	0	0	0.0
AT06	NR	0	0	0	0	0	0	0.0
GR01	NR	0	0	0	0	0	0	0.0
GR02	NR	0	0	0	0	0	0	0.0
GR03	NR	0	NR	0	0	0	0	0.0
GR05-02	NR	NR	NR	NR	0	NR	NR	0.0
GR15	NR	NR	0	NR	0	0	0	0.0
HR05	NR	NR	0	0	NR	0	0	0.0
HR09	NR	0	0	0	0	NR	1	0.2
HR10	NR	NR	2	3	0	NR	0	1.3
HR18	NR	0	NR	NR	0	0	0	0.0
HR25	NR	0	0	0	0	0	0	0.0
MC03	NR	1	0	0	1	0	1	0.5
MC27	NR	0	0	0	0	0	1	0.2
PP13	6	2	2	0	0	NR	NR	2.0
PP15	0	0	NR	0	0	NR	0	0.0
PP16	4	0	1	0	4	NR	2	1.8
PP21	3	1	0	4	1	NR	5	2.3
PP29	0	1	1	NR	0	NR	NR	0.5
SF16	0	NR	0	0	NR	NR	0	0.0
SF17	0	0	NR	0	0	NR	0	0.0
SF30	NR	2	0	NR	NR	NR	2	1.3
Total birds	**15**	**7**	**7**	**7**	**7**	**0**	**13**	**8.0**
# of transects w/ hits	**4**	**5**	**5**	**2**	**3**	**0**	**7**	**3.7**

NR = Transect not conducted in this year

Table 11.

Lark Bunting (Monitoring Colorado Birds data, RMBO 2004)

In and near ARNF Number/transect/year

Transect	1998	1999	2000	2001	2002	2003	2004	Avg/yr
AS28	0	NR	0	NR	NR	NR	0	0.0
AT02	NR	NR	NR	NR	0	0	0	0.0
AT03	NR	0	NR	0	0	0	NR	0.0
AT04	NR	0	NR	NR	0	0	0	0.0
AT05	NR	0	0	0	0	0	0	0.0
AT06	NR	0	0	0	0	0	0	0.0
GR01	NR	75	85	68	66	112	77	80.5
GR02	NR	52	94	50	44	87	35	60.3
GR03	NR	43	NR	76	5	90	72	57.2
GR05-02	NR	NR	NR	NR	6	NR	NR	6.0
GR15	NR	NR	0	NR	0	0	0	0.0
HR05	NR	NR	0	0	NR	0	0	0.0
HR09	NR	0	0	0	0	NR	0	0.0
HR10	NR	NR	0	0	0	NR	0	0.0
HR18	NR	0	NR	NR	0	0	0	0.0
HR25	NR	0	0	0	0	0	0	0.0
MC03	NR	0	0	0	0	0	0	0.0
MC27	NR	0	0	0	0	0	0	0.0
PP13	0	0	0	0	0	NR	NR	0.0
PP15	0	0	NR	0	0	NR	0	0.0
PP16	0	0	0	0	0	NR	0	0.0
PP21	0	0	0	0	0	NR	0	0.0
PP29	0	0	0	NR	0	NR	NR	0.0
SF16	0	NR	0	0	NR	NR	0	0.0
SF17	0	0	NR	0	0	NR	0	0.0
SF30	NR	0	0	NR	NR	NR	0	0.0
Total birds	**0**	**170**	**179**	**194**	**121**	**289**	**184**	**162.4**
# of transects w/ hits	**0**	**3**	**2**	**3**	**4**	**3**	**3**	**2.6**

NR = Transect not conducted in this year

Table 12.

Mountain Bluebird (Monitoring Colorado Birds data, RMBO 2004)

In and near ARNF Number/transect/year

Transect	1998	1999	2000	2001	2002	2003	2004	Avg/yr
AS28	0	NR	0	NR	NR	NR	0	0.0
AT02	NR	NR	NR	NR	1	1	2	1.3
AT03	NR	4	NR	3	0	0	NR	1.8
AT04	NR	3	NR	NR	1	2	2	2.0
AT05	NR	2	0	0	0	0	1	0.5
AT06	NR	0	0	1	0	0	0	0.2
GR01	NR	0	0	0	0	0	NR	0.0
GR02	NR	0	0	0	0	0	0	0.0
GR03	NR	0	NR	0	0	0	0	0.0
GR05-02	NR	NR	NR	NR	0	NR	NR	0.0
GR15	NR	NR	0	NR	0	0	0	0.0
HR05	NR	NR	0	0	NR	0	0	0.0
HR09	NR	0	0	0	0	NR	0	0.0
HR10	NR	NR	0	0	0	NR	0	0.0
HR18	NR	0	NR	NR	0	0	0	0.0
HR25	NR	0	0	4	2	1	0	1.2
MC03	NR	0	0	0	0	0	0	0.0
MC27	NR	0	0	0	0	0	0	0.0
PP13	0	0	0	0	0	NR	NR	0.0
PP15	0	0	NR	0	6	NR	1	1.4
PP16	0	0	0	0	1	NR	1	0.3
PP21	3	0	0	0	0	NR	0	0.5
PP29	0	0	0	NR	NR	NR	NR	0.0
SF16	0	NR	0	0	NR	NR	0	0.0
SF17	0	0	NR	0	0	NR	0	0.0
SF30	NR	0	0	NR	NR	NR	0	0.0
Total birds	**3**	**9**	**0**	**8**	**11**	**4**	**7**	**6.0**
# of transects w/ hits	**1**	**3**	**0**	**3**	**5**	**3**	**5**	**2.9**

NR = Transect not conducted in this year

Table 13.

Pygmy Nuthatch (Monitoring Colorado Birds data, RMBO 2004)

In and near ARNF Number/transect/year

Transect	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**Avg/yr**
AS28	0	NR	0	NR	NR	NR	0	0.0
AT02	NR	NR	NR	NR	0	0	0	0.0
AT03	NR	0	NR	0	0	0	NR	0.0
AT04	NR	0	NR	NR	0	0	0	0.0
AT05	NR	0	0	0	0	0	0	0.0
AT06	NR	0	0	0	0	0	0	0.0
GR01	NR	0	0	0	0	0	0	0.0
GR02	NR	0	0	0	0	0	0	0.0
GR03	NR	0	NR	0	0	0	0	0.0
GR05-02	NR	NR	NR	NR	0	NR	NR	0.0
GR15	NR	NR	0	NR	0	0	0	0.0
HR05	NR	NR	0	0	NR	0	0	0.0
HR09	NR	0	0	0	1	NR	0	0.2
HR10	NR	NR	0	0	0	NR	0	0.0
HR18	NR	0	NR	NR	0	0	0	0.0
HR25	NR	0	0	0	0	0	0	0.0
MC03	NR	0	0	0	0	0	4	0.7
MC27	NR	0	0	0	0	0	4	0.7
PP13	0	0	0	0	0	NR	NR	0.0
PP15	0	0	NR	3	10	NR	0	2.6
PP16	0	0	0	0	0	NR	5	0.8
PP21	1	2	0	0	4	NR	14	3.5
PP29	3	0	0	NR	0	NR	NR	0.8
SF16	0	NR	0	0	NR	NR	0	0.0
SF17	0	0	NR	0	0	NR	0	0.0
SF30	NR	0	2	NR	NR	NR	0	0.7
Total birds	**4**	**2**	**2**	**3**	**15**	**0**	**27**	**7.6**
# of transects w/ hits	**2**	**1**	**1**	**1**	**3**	**0**	**4**	**1.7**

NR = Transect not conducted in this year

Table 14.

Three-toed Woodpecker (Monitoring Colorado Birds data, RMBO 2004)

In and near ARNF Number/transect/year

Transect	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**Avg/yr**
AS28	0	NR	0	NR	NR	NR	0	0.0
AT02	NR	NR	NR	NR	0	0	0	0.0
AT03	NR	0	NR	0	0	0	NR	0.0
AT04	NR	0	NR	NR	0	0	0	0.0
AT05	NR	0	0	0	0	0	0	0.0
AT06	NR	0	0	0	0	0	0	0.0
GR01	NR	0	0	0	0	0	0	0.0
GR02	NR	0	0	0	0	0	0	0.0
GR03	NR	0	NR	0	0	0	0	0.0
GR05-02	NR	NR	NR	NR	0	NR	NR	0.0
GR15	NR	NR	0	NR	0	0	0	0.0
HR05	NR	NR	0	0	NR	0	0	0.0
HR09	NR	0	0	0	0	NR	0	0.0
HR10	NR	NR	0	0	0	NR	0	0.0
HR18	NR	0	NR	NR	0	0	0	0.0
HR25	NR	0	0	0	0	0	0	0.0
MC03	NR	0	0	1	0	0	0	0.2
MC27	NR	0	0	0	0	0	0	0.0
PP13	0	0	0	0	0	NR	NR	0.0
PP15	0	0	NR	0	0	NR	0	0.0
PP16	0	0	0	0	0	NR	0	0.0
PP21	0	0	0	0	0	NR	1	0.2
PP29	0	0	0	NR	0	NR	NR	0.0
SF16	0	NR	0	0	NR	NR	0	0.0
SF17	0	0	NR	0	0	NR	0	0.0
SF30	NR	0	0	NR	NR	NR	0	0.0
Total birds	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0.3**
# of transects w/ hits	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0.3**

NR = Transect not conducted in this year

Table 15.

Warbling Vireo (Monitoring Colorado Birds data, RMBO 2004)

In and near ARNF Number/transect/year

Transect	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**Avg/yr**
AS28	21	NR	6	NR	NR	NR	1	9.3
AT02	NR	NR	NR	NR	0	0	0	0.0
AT03	NR	0	NR	0	0	0	NR	0.0
AT04	NR	1	NR	NR	0	0	0	0.3
AT05	NR	0	0	0	0	0	0	0.0
AT06	NR	0	0	0	0	0	0	0.0
GR01	NR	0	0	0	0	0	0	0.0
GR02	NR	0	0	0	0	0	0	0.0
GR03	NR	0	NR	0	0	0	0	0.0
GR05-02	NR	NR	NR	NR	0	NR	NR	0.0
GR15	NR	NR	0	NR	0	0	0	0.0
HR05	NR	NR	2	0	NR	0	0	0.5
HR09	NR	0	7	7	5	NR	1	4.0
HR10	NR	NR	7	14	0	NR	1	5.5
HR18	NR	0	NR	NR	0	0	0	0.0
HR25	NR	7	19	6	3	0	0	5.8
MC03	NR	4	1	7	0	2	3	2.8
MC27	NR	4	0	2	0	0	4	1.7
PP13	15	4	7	14	4	NR	NR	8.8
PP15	2	0	NR	0	0	NR	0	0.4
PP16	0	4	6	16	3	NR	5	5.7
PP21	0	0	0	3	6	NR	2	1.8
PP29	7	12	5	NR	5	NR	NR	7.3
SF16	0	NR	0	0	NR	NR	0	0.0
SF17	0	4	NR	1	0	NR	0	1.0
SF30	NR	0	0	NR	NR	NR	0	0.0
Total birds	**45**	**40**	**60**	**70**	**26**	**2**	**17**	**37.1**
# of transects w/ hits	**4**	**8**	**9**	**9**	**6**	**1**	**7**	**6.3**

NR = Transect not conducted in this year

Table 16.

Wilson's Warbler (Monitoring Colorado Birds data, RMBO 2004)

In and near ARNF Number/transect/year

Transect	1998	1999	2000	2001	2002	2003	2004	Avg/yr
AS28	1	NR	0	NR	NR	NR	0	0.3
AT02	NR	NR	NR	NR	0	0	0	0.0
AT03	NR	0	NR	0	0	0	NR	0.0
AT04	NR	0	NR	NR	0	1	0	0.3
AT05	NR	0	0	3	0	6	1	1.7
AT06	NR	0	0	0	0	0	0	0.0
GR01	NR	0	0	0	0	0	0	0.0
GR02	NR	0	0	0	0	0	0	0.0
GR03	NR	0	NR	0	0	0	0	0.0
GR05-02	NR	NR	NR	NR	0	NR	NR	0.0
GR15	NR	NR	0	NR	0	0	0	0.0
HR05	NR	NR	4	13	NR	0	4	5.3
HR09	NR	6	7	16	3	NR	0	6.4
HR10	NR	NR	4	1	3	NR	6	3.5
HR18	NR	0	NR	NR	0	0	0	0.0
HR25	NR	0	0	6	1	7	2	2.7
MC03	NR	0	0	0	0	1	0	0.2
MC27	NR	0	0	0	0	0	0	0.0
PP13	0	1	0	0	0	NR	NR	0.2
PP15	0	0	NR	0	0	NR	0	0.0
PP16	0	0	0	0	0	NR	0	0.0
PP21	0	0	0	0	0	NR	0	0.0
PP29	0	0	0	NR	0	NR	NR	0.0
SF16	0	NR	0	0	NR	NR	0	0.0
SF17	0	0	NR	0	0	NR	0	0.0
SF30	NR	0	0	NR	NR	NR	0	0.0
Total birds	**1**	**7**	**15**	**39**	**7**	**15**	**13**	**13.9**
# of transects w/ hits	**1**	**2**	**3**	**4**	**3**	**4**	**4**	**3.0**

NR = Transect not conducted in this year

Peregrine Falcon

Monitoring Results for Sites on or near the Arapaho-Roosevelt National Forest, 1994-2004 (Brent D. Bibles, Avian Researcher – Raptors, Colorado Division of Wildlife).

As of the 2004 breeding season, there are 10 known peregrine falcon breeding sites on, or within 2 miles, of lands administered by the Arapaho-Roosevelt National Forest. Six of these sites are on ARNF-managed lands, one is within the Routt National Forest, one is on Bureau of Land Management land, one is within Rocky Mountain National Park, and the remaining site is privately owned. The average occupancy rate over the 11 years from 1994-2004 was 74%. Average success rate for the 45 breeding attempts at which the outcome was determined was 87%. On average 1.44 young were fledged per occupied site, with the average fledged brood size being 2.24 young. Table 1 provides the yearly summary statistics based on these 10 sites from 1994 through 2004.

Table 17. Summary statistics for peregrine falcon monitoring at sites on or near lands administered by the Arapaho-Roosevelt National Forest from 1994-2004.

	Year										
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Sites known	6	6	6	6	6	7	9	10	10	10	10
Sites checked	6	6	6	6	6	6	8	10	6	7	3
Occupied[1]	5	5	5	5	5	4	7	5	4	5	2
Known outcome[2]	5	4	5	5	5	3	6	4	3	4	1
Successful[3]	3	3	4	3	3	3	3	3	2	1	1
Young[4]	7	5	7	6	7	9	7	9	4	2	2
Productivity[5]	1.40	1.25	1.40	1.20	1.40	3.00	1.17	2.25	1.33	0.50	2.00
Fledged brood size[6]	2.33	1.67	1.75	2.00	2.33	3.00	2.33	3.00	2.00	2.00	2.00
Occupancy rate[7]	83	83	83	83	83	67	88	50	67	71	67

[1] Number of sites at which at least 2 adults were observed at the site, or at which eggs were known to have been laid.
[2] Number of sites checked with enough intensity to adequately determine if site was successful or failed.
[3] Number of sites at which young fledged.
[4] Number of young that fledged.
[5] Number of young fledged per known outcome occupied site.
[6] Number of young fledged per successful site.
[7] Percent of sites checked that were occupied.

Table 18.

Bald Eagle – Nesting in or near ARNF (Sulphur District FS survey data)

Year	Nest Name	Status
1995	Columbine Bay	Active (tree fell down post-fledging)
1996	Shadow Mtn Island 6	Active (Columbine Bay pair moved to SML)
1997	Columbine Bay	Active (pair returned to Columbine Bay and built new nest in adjacent tree)
1998	Columbine Bay	Active
1999	Columbine Bay	Active
	Kinney Creek	Active
2000	Columbine Bay	Active
	Kinney Creek	Active
2001	Columbine Bay	Active
	Kinney Creek	Active
2002	Columbine Bay	Active
	Kinney Creek	Inactive (branch and nest fell down during winter – nest not re-built)
2003	Columbine Bay	Active
	Kinney Creek	Inactive
2004	Columbine Bay	Active
	Kinney Creek	Inactive

Mammals (continued from page 2)

Table 19.

Black Bear Game Mgmt Units In and near ARNF	Total harvest estimates (Big game statistics, Colorado Division of Wildlife) **2000**	**2001**	**2002**	**2003**
7	1	1	0	2
8	0	2	3	2
18	2	4	3	1
19	4	4	4	3
191	3	6	4	1
20	10	17	11	2
28	3	2	1	3
29	2	1	3	2
38	2	5	3	6
39	1	3	3	0
46	0	0	1	0
461	2	1	6	5
In and near ARNF totals	**30**	**46**	**42**	**27**
State-wide Totals	819	759	857	603

River Otter

Past and recent river otter population data in and near ARNF (text and references in: CNHP 2002).

Colorado River – The suitability of the upper Colorado River watershed as an otter release area was determined during evaluations conducted by the CDOW around 1977 (Dronkert and Washington 1984, Mack 1985). The CDOW released 7 unmarked otters into Kawuneeche Valley in Rocky Mountain National Park (RMNP) during the fall of 1978, but subsequent sign surveys found no conclusive evidence of otter presence in the area (Hanna and Lytle 1979). Lytle et al. (1981) described efforts to monitor the seven unmarked otters and reported that no otters were seen and no definite otter sign was found. Reports of incidental sightings (by biologists and the public) of river otters in the Kawuneeche Valley began to accumulate, however, and Lytle et al. (1981) summarized such reports from 1979 and 1980.

The upper Colorado River drainage was rated very highly for its potential as habitat for reintroduced river otters (Dronkert and Washington 1984). CDOW radiotelemetry data subsequently showed that at least five released river otters remained along the North Fork of the Colorado River in Kawuneeche Valley for more than nine months, suggesting that the habitat was meeting the otters' needs (Dronkert and Washington 1984, Mack 1985). Otters used the reservoirs at the south end of Kawuneeche Valley (Grand Lake, Shadow Mountain Reservoir, and Granby Reservoir) for foraging (Dronkert and Washington 1984). During a six-month radiotelemetry study of three otters released into the upper Colorado River in RMNP in 1980, Mack and Lytle (1982) found that 85 percent of observations of otters were within beaver pond complexes. The importance of considering both beavers and otters in management plans has been emphasized by other authors (Polechla 1990, Chilelli et al. 1996).

Mack (1985) evaluated the success of the 1981-1984 releases of 51 river otters into the upper Colorado River drainage in RMNP. Eight otters died after release, including one lost to coyote predation and one trapped inadvertently by a beaver trapper (Mack 1985). Otters released in RMNP dispersed widely but their extensive movements did not differ from those of naturally-occurring or reintroduced otters in similar habitats (Mack 1985).
Berg (1999) conducted foot surveys to search for otters and their sign on the west side of RMNP and in adjacent portions of ANF. Her five-year (June 1992 through June 1997) study covered a 26-kilometer (km) stretch of the North Fork of the Colorado River in the Kawuneeche Valley (Berg 1999). Sign surveys documented the presence of otter scat, tracks, slides, roll areas, den sites, and holes in the ice used for breathing and water access/egress. Sightings of river otters also were made throughout the study period, both inside RMNP and in adjacent ANF. Many observations of otters were made along an 8.1 – 9.7-km (5-6-mile) stretch of waterway (outside the park in ANF) that included Arapaho Bay, Arapaho Creek, and Monarch Lake (Berg 1999).

River Otter (continued)

Like Mack (1985), Berg (1999) found that some river otters continued to use the release site and others dispersed into nearby drainages. Observations of young otters with one or more adults during 1993, 1994, 1995, and 1996 indicated successful reproduction and contributed to the conclusion that the otter reintroduction effort at RMNP was successful (Berg 1999).

The National Park Service (NPS) has conducted surveys for river otters in RMNP since 1988. These surveys began when Stevens (1988) conducted a limited search in March 1988 for signs of the river

otters that had been released from 1978 to 1984 in the Kawuneeche Valley of RMNP. From the otter sign he observed, Stevens concluded that at least 6 river otters (possibly including two young) inhabited the relatively small portion of the Kawuneeche Valley that he surveyed (Table 1). A survey of 19 km of stream in 1989 found evidence of at least 11 otters (Stevens 1989). Five years after the last releases, survival seemed good but evidence of reproduction was still rare (Stevens 1989). A sign survey conducted in March 1990 indicated that, just as in 1989, otters were using almost all available habitat along the main channel of the Colorado River (Stevens 1990). The 1990 survey produced an estimate of 13 river otters in RMNP (Table 20).

River otter surveys at RMNP have been conducted every other year since 1990 (Table 1). Most of the available habitat along the Colorado River has continued to be occupied by river otters. In the survey report for 1998 it was noted that sightings of river otters had been reported outside the park in Arapaho Creek and Monarch Lake (5 otters sighted during the summer), in Grand Lake (a family of four otters living beneath docks and boathouses), in the Colorado River at Windy Gap Dam and the Breeze Unit, and downstream from Tabernash in the Fraser River (Anonymous 1998). Otters seemed to be stable in RMNP and increasing in distribution outside the park by colonizing available habitat (Anonymous 1998). The otter survey conducted in RMNP in March 2002 produced an estimate of only 12 otters, a considerable decline from the 22 otters estimated to be present on the basis of the 2000 survey (Table 1). Weather and snow conditions were poor during the 2002 survey, and these conditions influenced the visibility of river otter sign (Anonymous 2002*a*, Johnston 2002). Fewer sign were observed in 2002 than during previous surveys (Anonymous 2002*a*). A tabular summary of population estimates based on the NPS's surveys for river otters at RMNP from 1989 through 2002 is presented on the internet by Johnston (2002).

River Otter (continued)

Table 20. River otter surveys at Rocky Mountain National Park, 1988-2002.

Year	Survey Date(s)	No. Otters Estimated	Source
1988	March 16	6	Stevens (1988)
1989	February 20-21	11	Stevens (1989)
1990	March 11-12	13	Stevens (1990)
1992	March 28-29	15	Stevens (1992)
1994	March 5	17	Anonymous (1994)
1996	February 24	15	Johnson (1996)
1998	February 28	16	Anonymous (1998)
2000	March 4	22	Anonymous (2001)
2002	March 2	12	Anonymous (2002*a*)

Herreman and Ben-David (2002) monitored otter scat deposition at latrine sites along the upper Colorado River during spring (7.4 km of stream on April 28-29, 2001) and fall (8.5 km of stream on September 22-23, 2001). The mean number of feces per latrine site was greater during the spring than fall, and the authors attributed this difference to higher activity levels among otters in spring than in fall rather than to a change in otter density. Herreman and Ben-David (2002) plan to continue their otter studies in RMNP for several more years, and their data may provide insight into otter distribution, movements, and density in RMNP.

Cache la Poudre and Laramie River areas – Malville (1988) conducted sign surveys for river otters in the Fort Collins area, in Poudre Canyon, and in the Laramie River valley. Malville (1988) found that otter tracks were widely distributed throughout all three of these areas, and noted that otters used the Poudre River (and adjacent ponds) from Chambers Lake to the eastern edge of the city of Fort Collins. Malville made what he considered a rough estimate of ten otters for the region. The source of the otters in this region is uncertain. It is likely that otters released into the upper Colorado River by the CDOW traveled upstream, crossed the Continental Divide, and entered the Poudre and Laramie River drainages (Mack and Lytle 1982, Malville 1988). On the other hand, it is possible that three otters that escaped from a holding facility near Fort Collins in 1982 and 1983 reached these drainages (Goodman 1984, Malville 1988).

Overall, from 1976 through 1991, 107 river otters (42 males, 42 females, and 23 unknown sex) trapped in Oregon, Washington, Minnesota, Wisconsin, Michigan, Newfoundland, and Louisiana were released in Colorado into Cheesman Reservoir and into the Gunnison, Piedra, Dolores, and upper Colorado rivers (Melquist and Dronkert 1987, Breitenmoser et al. 2001, Raesly 2001, Anonymous 2002*b*). Because of these reintroductions, several non-native subspecies of river otters now occupy Colorado's waters (Denney 1976, Compton 2002). The outcome of Colorado's river otter reintroduction program is considered uncertain (Breitenmoser et al. 2001).

Wolverine

The following paragraphs summarize wolverine findings in Colorado and vicinity of ARNF (data and citations in CNHP 2002):

Colorado - Many authors have concluded that the wolverine never was abundant in Colorado (Cary 1911, Armstrong 1972, Nead et al. 1985, Fitzgerald et al. 1994), although, until about 1890, it occurred in many of the dense, high-elevation forests of Colorado (Armstrong 1972). Early in the twentieth century, Warren (1910:204) stated "In Colorado, it is found sparingly through the heavy forests in the high mountains …" Cary (1911:191) noted that the wolverine was "still commonly seen" in high, mountainous, remote areas of Colorado, including the mountain ranges surrounding North and Middle Parks, the mountains of northern Gunnison County, and the San Juan and La Plata Mountains. The last confirmed kill of a wolverine in Colorado was in 1919 (Grinnell 1926). Surveys conducted in western national parks around 1940 found only 5 animals in Colorado (Sprunt 1944). Isolated sightings in Colorado of wolverines or their sign during subsequent decades were sufficiently rare to evoke notice and comment (Spahn 1954, Nowak 1973, Field and Feltner 1974, Hekkers 1979). Armstrong (1972) reviewed wolverine records for the state and concluded that wolverines were rare or possibly extirpated in Colorado.

In 1978, the Colorado Division of Wildlife initiated a program to verify the existence of wolverines (and lynx, *Lynx canadensis*) in the state (Halfpenny et al. 1979). Although evidence was found during winter 1978-79 that wolverines still occurred in Colorado (Hekkers 1979), the program found no indication that a viable breeding population of wolverines existed in Colorado (Nead et al. 1985, Fitzgerald et al. 1994). After reviewing historical wolverine records for Colorado, including those gathered through the verification program, Nead et al. (1985) were convinced that wolverines still occurred in the state. Among the areas they believed to be occupied by wolverines were the region to the north and west of Rocky Mountain National Park (Arapaho-Roosevelt National Forest), the San Juan Mountains, and the southwestern portion of the Flattops Wilderness Area.

Andrews (1991) conducted a systematic field survey during winter 1990-1991 in Rocky Mountain National Park and in nearby portions of the Arapaho and Roosevelt National Forests. During 66 full days of fieldwork, he completed 1364 kilometers (848 miles) of snow-track surveys. He found no evidence of wolverines and concluded that it was unlikely that a viable population of wolverines was present (Andrews 1991). In their monograph on the mammals of Colorado, Fitzgerald et al. (1994) stated that the status of wolverines in Colorado was "uncertain." Colorado's wolverines are geographically isolated from occupied habitats to the north by the Central Rocky Mountain and Wyoming Basins, making dispersal to Colorado from the northern Rockies unlikely (Andrews 1991, Banci 1994). The closest secure regional wolverine population occurs in the Bob Marshall Wilderness of Montana (Andrews 1991) (data and citations in CNHP 2002).

Data on wolverine sightings in and near ARNF for more than a century is summarized in the following table.

Table 21. Wolverine Sightings in and near ARNF (Colorado Division of Wildlife, 2005)

Yr Known	Yr Est	County	GMU	Elevation	Reliability UTMX	UTMY	Land Admin	Rating */
	1870	BOULDER	29		450000	4430000	ARNF	A
1876		SUMMIT	37		403000	4408000	ARNF	A
1883		GRAND	27		365000	4435000	ROUTT NF	A
1903		GRAND	28		435000	4420000	ARNF	A
1903		GRAND	28		410000	4410000	ARNF	A
	?	CLREAR CK	39		456000	4400000	ARNF	A
1952		LARIMER	20	10000	440000	4475000	RMNP	C
1953		LARIMER	20	11200	437500	4476500	RMNP	B
1953		LARIMER	20	10000	447000	4477000	RMNP	C
1953		LARIMER	20	11800	436000	4476900	RMNP	B
1954		GRAND	18	11400	424500	4476300	RMNP	C
1954		BOULDER	20	9200	450000	4450000	RMNP	C
1955		GRAND	18	10900	431000	4474000	RMNP	C
1957		LARIMER	20	11560	437000	4477000	RMNP	C
	1960	GILPIN	38	9500	445000	4415000	ARNF	C
1962		LARIMER	20	9200	444600	4472000	RMNP	C
1964		LARIMER	20	11000	440800	4487700	RMNP	B
1965		LARIMER	20	9500	445000	4462500	RMNP	C
	1965	SUMMIT	37		403000	4403000	ARNF	C
	1969	LARIMER	19		428000	4493000	ARNF	B
1971		LARIMER	20	11800	436000	4476800	RMNP	C
1971		GRAND	181		379000	4463000	ARNF	C
1972		GRAND	18	11430	424500	4476000	RMNP	C
1972		JACKSON	6		400000	4524000	CO ST FOR	C
1972	1972	LARIMER			400000	4540000	ARNF	C
1973		LARIMER	7	8400	425000	4518000	ARNF	C
1973		JACKSON	6	10000	419000	4510000	CO ST FOR	C
1973		LARIMER	20	11560	437000	4477000	RMNP	C
1973		LARIMER	20	10600	439000	4477000	RMNP	C
1973		LARIMER	8		440000	4530000	ARNF	B
1973		BOULDER	29		447800	4425000	ARNF	B
	1973	LARIMER	7	9000	440000	4510000	ARNF	C
	1973	LARIMER	20	10600	439000	4477000	RMNP	C
1973	1973	CLREAR CK	39	10500	443500	4390000	ARNF	C
1973		GILPIN	29	12500	441700	4411100	ARNF	C
1974		LARIMER	6	9600	427400	4501500	ARNF	C
1974		CLREAR CK	38	12000	438800	4406200	ARNF	F
1974		SUMMIT	371	8500	406000	4393000	ARNF	C
1974		GRAND	28	11500	441000	4419000	ARNF	C
1974		LARIMER	20	11200	436000	4476500	RMNP	B
1974		BOULDER	20	10480	445700	4452000	RMNP	C
0	1974	BOULDER	29	9000	453500	4442400	ARNF	C
1975		BOULDER	29	10900	450000	4437000	ARNF	C
1975		LARIMER	20	10800	431000	4474500	RMNP	C
1975		BOULDER	20	6400	471300	4448400	ARNF	C
1975		GILPIN	38	11100	442000	4425000	ARNF	F
1975		GRAND	18	8500	409900	4453700	ARNF	C
1976		LARIMER	20	10120	436700	4486400	RMNP	C

Wolverine Sightings in and near ARNF (continued)

Yr Known	Yr Est	County	GMU	Elevation	UTMX	UTMY	Land Admin	Reliability Rating */
1976		LARIMER	20	11950	436300	4475000	RMNP	C
1976		LARIMER	20		437500	4476000	RMNP	C
1976		GRAND	18	8800	424000	4453000	ARNF	C
1976		BOULDER	29		443000	4442000	ARNF	C
1976		CLREAR CK	39	8100	450000	4400000	ARNF	C
1977		CLREAR CK	39		424900	4391200	ARNF	C
1978		GILPIN	38		438000	4423000	ARNF	C
1978		BOULDER	29		445900	0	ARNF	C
1978		GRAND	18		417000	4459000	ARNF	C
1978		GRAND	18		423000	4445000	ARNF	C
1978		LARIMER	19	9840	450000	4505000	ARNF	C
1978		GRAND	18	11000	432000	4470000	RMNP	C
1978		BOULDER	38	9000	460000	4419000	ARNF	C
	1978	GILPIN	38		465000	4410000	ARNF	C
1979		LARIMER	19	12000	443700	4485100	RMNP	B
1979		BOULDER	0	9200	457500	4433900	ARNF	C
1979		BOULDER	38	9800	447000	4415000	ARNF	C
1979		BOULDER	29	11600	441400	4424800	ARNF	C
1979		CLREAR CK	39	8500	443000	4401000	ARNF	C
1979		BOULDER	29	11000	446200	4435300	ARNF	C
1979		BOULDER	20	7500	466800	4438900	ARNF	C
1979		GRAND	18		400000	4448000	ARNF	B
1979		GRAND	38		441000	4419000	ARNF	C
1979		LARIMER	19		449000	4485000	ARNF	F
1980		CLREAR CK	39	10000	429100	4401100	ARNF	C
1980		GRAND	18	11000	419000	4465000	ARNF	C
1980		GRAND	18	11400	425700	4479000	PRIVATE	C
1980		LARIMER	9	6000	482000	4522000	PRIVATE	F
1980		LARIMER	20	10200	444000	4459800	RMNP	C
1980		GRAND	181		368000	4468000	ARNF	C
1981		BOULDER	20	11000	443800	4451000	RMNP	C
1981		GILPIN	38	10700	442500	4417000	ARNF	C
1981		CLREAR CK	39	12500	431000	4389000	ARNF	C
1981		GRAND	18	9000	421700	4470000	RMNP	C
1981		BOULDER	20	10600	444600	4452700	RMNP	C
1982		GRAND	18	9000	409000	4455000	ARNF	C
1982		GILPIN	38	9500	449000	4418000	ARNF	C
1982		BOULDER	20	7700	462400	4438800	ARNF	C
1982		LARIMER	7	8500	421000	4518000	ARNF	C
1982		GRAND	18	12400	433000	4469000	RMNP	B
1982		LARIMER	20	12000	433000	4470000	RMNP	C
1982		LARIMER	20	12100	436000	4475600	RMNP	C
1982		GRAND	18	8600	427000	4459000	RMNP	C
1983		GRAND	28	9500	396000	4418000	ARNF	C
1983		BOULDER	20	11000	448000	4446000	ARNF	C
1983		GRAND	18	9500	397000	4464000	ARNF	B
1984		LARIMER	8	10500	437000	4514000	ARNF	C
1984		LARIMER	20	11950	436500	4475000	RMNP	C
1984		GRAND	18	8720	430000	4457500	RMNP	C
1985		BOULDER	20	12500	441400	4429500	ARNF	C
1985		LARIMER	20	12100	436000	4475600	RMNP	C
1986		CLREAR CK	38	11000	444700	4409700	ARNF	C
1986		LARIMER	20	9600	459500	4485100	RMNP	C

Wolverine Sightings in and near ARNF (continued)

Yr Known	Yr Est	County	GMU	Elevation	UTMX	UTMY	Land Admin	Reliability Rating */
1987		GRAND	18	11100	432300	4469500	RMNP	C
	1987	LARIMER	8	3200	440400	4499000	ARNF	C
1988		LARIMER	20	12100	439000	4473500	RMNP	C
1988		LARIMER	20	12000	441300	4471600	RMNP	C
1988		GRAND	18		437400	4453600	RMNP	C
	1988	GRAND	28	8400	394530	4432520	BLM	C
1989		LARIMER	20	11600	437300	4477000	RMNP	B
1989		LARIMER	20	11800	436000	4476800	RMNP	C
1989		LARIMER	20	8400	449500	4465700	RMNP	C
1989		LARIMER	20	10400	451000	4458000	RMNP	C
1990		CLREAR CK	39	12300	434700	4383600	ARNF	C
1990		LARIMER	20	11200	445600	4480500	RMNP	C
1990		GRAND	18	11600	430000	4476200	RMNP	C
1990		GRAND	18	9400	425000	4464000	ARNF	C
1991		GRAND	28	9000	427000	4430000	ARNF	C
1991		CLREAR CK	39	10500	426400	4395600	ARNF	C
1992		GRAND	18	11100	430200	4474900	RMNP	B
1992		LARIMER	7	1000	408000	4523000	ARNF	C
1993		CLREAR CK	39	13100	429500	4396600	ARNF	C
1993		CLREAR CK	39	10500	459000	4386000	DOW	C
1993		GILPIN	38	10200	442700	4416500	ARNF NF	C
1994		GRAND	28	95000	406000	4410200	PRIVATE	C
1994		LARIMER	20	8500	446900	4466800	RMNP	C
1995		BOULDER	29	6000	466000	4431000	ARNF	C
1995		GRAND	27	9000	373300	4436300	PRIVATE	C
1996		CLREAR CK	38	10800	444600	4409600	ARNF	C
1996		JACKSON	171	10800	423500	4481900	CO ST FOR	C
	1996	BOULDER	20	6500	467600	4452000	ARNF NF	C
	1997	GRAND	18	10800	444970	4439350	ARNF	C
	?	GRAND	18	9000	430000	4443000	RMNP	C
	?	GRAND	18		428100	4477600	RMNP	C
	?	GILPIN	38	10000	445000	4418000	ARNF	C
	?	LARIMER	20	11500	439560	4471820	RMNP	F
2004		CLEAR CK		(Guanella Pass Area)			ARNF	?

*/ Reliability ratings: A = positive, B = probable, C = possible, F = negative, ? = not rated.

Lynx

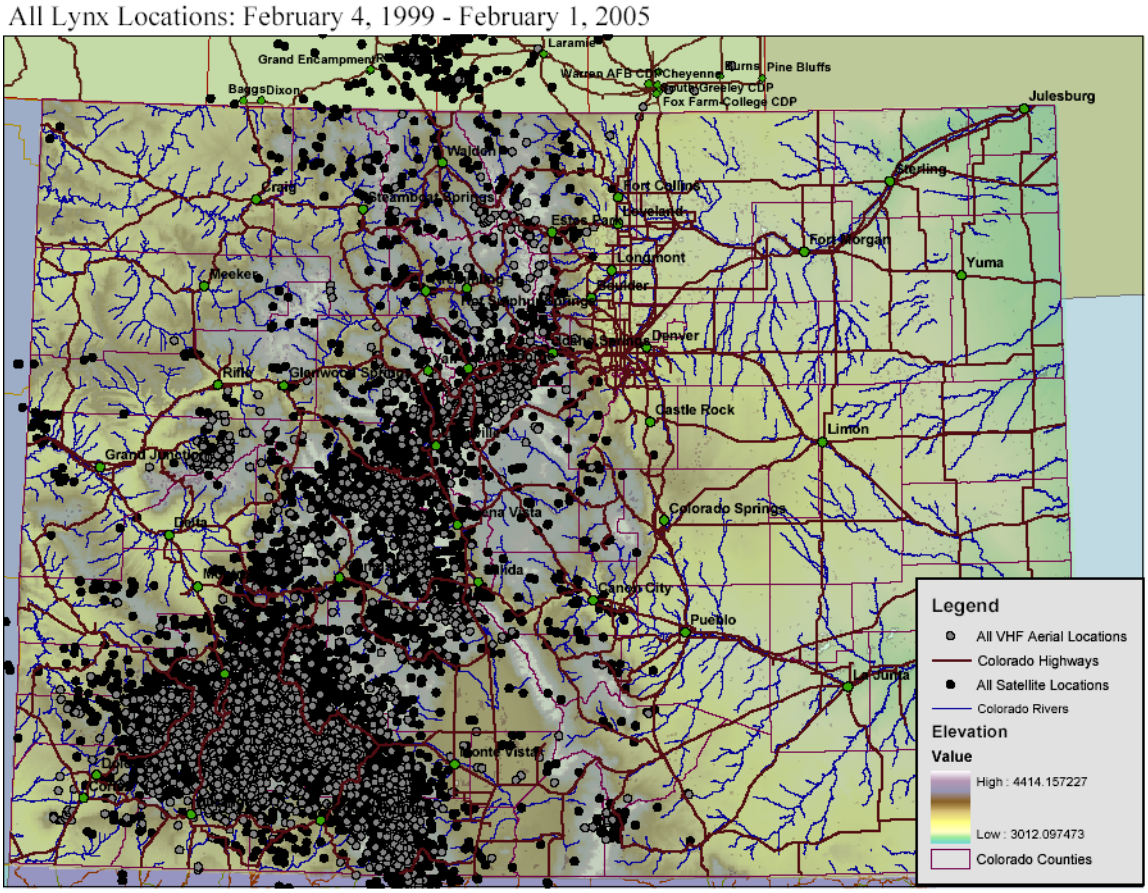
Colorado Division of Wildlife (CDOW) released a total of 166 adult lynx between 1999 and 2004 and is currently tracking 80 of the 105 lynx still possibly alive. Numbers of lynx released were 41, 55, 33 and 37 in 1999, 2000, 2003, and 2004, respectively. In 2003, 16 kittens born to six females were found. In 2004, 14 litters with a total of 39 kittens were documented. CDOW plans to release up to 50 lynx in 2005 and up to 15 in 2006-2008 (CDOW Lynx Update February 1, 2005).

Table 22. Current status of adult lynx reintroduced to Colorado (CDOW Lynx Update February 1, 2005)

	Females	Males	Unknown	Totals
Released	91	75		166
Known Dead	37	23	1	61
Possible Alive	54	52	11	105
Missing	9	15		23 (1 is unknown mortality)
Slipped Collar	1	1?		1-2
Tracking	44	36		80

The following figure shows lynx that have been tracked since reintroduction efforts began, which includes occurrences on ARNF (CDOW lynx data).

Figure 1.



Townsend's Big-eared Bat

Data contrasting recent counts and findings with prior information for Townsend's big-eared bat follows (data and citations in: CNHP 2002):

ARNF

The Colorado Division of Wildlife through the Bats/Inactive Mines Project (BIMP), in conjunction with the Division of Minerals and Geology, the Bureau of Land Management and the U.S. Forest Service has conducted evaluations of mines on public and private lands since 1991. The goal of this project is to evaluate mines for bat use before they are closed. If bats are found to use a particular mine, a bat-compatible closure will be recommended. A focal species of this effort is *C. townsendii*. On lands managed by or in close proximity to the Arapaho-Roosevelt National Forests, there have been over 400 mines evaluated for use by all bat species. These evaluations are organized by projects, and the results of these projects with regard to *C. townsendii* (COTO) are summarized below.

Table 23.

Year	No. of mines surveyed	Mines with COTO	Total no. of COTO
Fall River Project - Idaho Springs area			
1997	20	0	0
Soda Creek Project – Clear Creek County			
1997	32	2	?
Red Feather Project – Larimer County			
1997	4	0	0
Grand Project – Grand County			
1997	5	0	0
Dumont Project – Idaho Springs area			
1998	32	1	1
Manhattan Project – Larimer County			
1998-1999	32	10	19
2001	2	0	0
Lost Angel Project – Boulder area			
1998-1999	30	3	4
Mill Creek Project – Idaho Springs area			
1999	46	1	1
Freeland Project – Idaho Springs area			
1999	49	0	0
Lakewood/Tucker Project – Boulder, Jamestown, Eldora, Nederland and Ward areas			
1995	?	0	0
1996	?	2	3
2000	52	1	?
2001	6	1	6
Waldorf/Stevens Project – Georgetown area			
2000	28	0	0
Gold Dust Project – Gilpin County			
2000	5	1	?
Chicago Creek Project – Idaho Springs area			
2000-2001	32	0	0
Woodpecker Gulch Project – Idaho Springs area			
2000-2001	22	1	1

Table 24.
1992-1996 BIMP mines with *C. townsendii*

Year	County	Number of mines with COTO
1992	Clear Creek	1
1993	Larimer	1
1993	Boulder	2
1994	Boulder	4
1994	Larimer	1
1995	Boulder	4
1996	Boulder	4

Colorado

Pierson *et al.* (1999) provide the following summary for *C. townsendii* in Colorado.

There are about 350 historical records of individuals for *C. townsendii* in Colorado, 250 of which are from 1990 or later. About 170 mine roosts, and 15 cave roosts have been documented since 1990. All but one of these roosts has populations believed to be less than 30 individuals. Thirty hibernacula, most of which support only a few animals per site, have been documented. Twenty-six of the 30 have been discovered since 1990. A mine discovered in 1999 was found to support about 150 individuals. This is the largest known active roost for *C. townsendii* in Colorado.

C. townsendii is a frequently encountered species during cave and mine inventories, although large aggregations (>10 individuals) are uncommon. The Colorado Natural Heritage Program performed a survey of Colorado's caves for bats in the late summer of 2001 and the spring and early summer of 2002 (Siemers 2002). The focal species of this project was *C. townsendii*. A total of 99 caves were surveyed throughout Colorado, none of which were on the Arapaho-Roosevelt National Forests. Of the caves surveyed, 12 were used by *C. townsendii* (which was the most frequently encountered bat species). These caves range in elevation from 6122 feet to 9890 feet. The greatest number of *C. townsendii* observed at any one cave was 6 (data and citations in CNHP 2002).

Amphibians

Northern Leopard Frog

ARNF

Population estimates of newly metamorphosed *R. pipiens* in Larimer County. (Corn and Fogleman 1984 in: CNHP 2002).

Table 25.

Site	Year	Estimated Pop. size	Standard Error
Prairie Divide	1975	2103	304
Prairie Divide	1976	286	93
Creedmore Lake #1	1977	283	132
Creedmore Lake #1	1978	110	28
Creedmore Lake #1	1979	115	52

PNG

In 2002 there were at least seven populations of northern leopard frogs on PNG (CNHP 2002). Forest Service surveys found the following prior to 2002:

Table 26.

PNG Aquatic Species and Habitat Identification Surveys (ARP unpublished data).

	Leopard Frogs	Notes
Eastman Creek	3	
2001	3	
Unnamed Tributary to Little Crow Creek		
1999	3	
2000	21	
2001	0	Bull frog tadpoles found
Little Owl Creek		
1998	4	

Wood Frog

Number of wood frog egg masses observed in 1986, 1987, and 1988 at localities in Colorado and Wyoming (Corn et al. 1989 in: RMBO 2002).

Table 27.

Location (in and near ARNF; N. Colorado – S. Wyoming)	**1986**	**1987**	**1988**
Chambers Lake area, Larimer Co., Colorado			
Matthews Pond	19	38	18
Upper Gravel Pit	3	8	17
Spruce Bog	-	28	-
Fox Park area, Albany Co., Wyoming			
Evans Creek West	0	5	1
Evans Creek East	-	24	6
Fox Park	3	3	-
Spur Ponds	0	9	4

Table 28.

Location (elsewhere in Wyoming)	**1986**	**1987**	**1988**
Long Lake area, Carbon Co., Wyoming			
Pond #1	9	-	-
Pond #2	4	-	-
Pond #3	-	5	-
Pond #4	-	8	-
Pond #5	-	5	-
Pond #6	-	8	-
Pond #7	-	22	-

Boreal Toad

Table 29

BO01 - Lost Lake (Middle Boulder Creek) - ARNF

Year	Males/ Females /Egg Masses*	Recruit-ment**	Age Classes ***	Comments
1996	0/1/0	No	2(M,A)	Toadlets introduced
1997	0/1/1	No	3(M,1,A)	Toadlets introduced
1998	0/2/0	No	None Seen	No breeding observed
1999	0/0/0	No	None Seen	Minimal surveys done
2000	0/0/0	No	None Seen	Monitoring adequate
2001	0/0/0	No	None Seen	Monitoring adequate
2002	0/0/0	Unk	None Seen	Monitoring adequate
2003	0/0/0	Unk	None Seen	Site visited 3 times

	Active Breed-ing	Minimum # Adults	# Yearlings	# Sub-adults	# Egg Masses	# Tad-poles	# Meta-morphs	Adequate Monitoring
2004	No	0	0	0	0	None	None	Yes

CC01 - Vintage site (Clear Creek West Fork) – ARNF

Year	Males/ Females /Egg Masses*	Recruit-ment**	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				Site not monitored
2003	0/0/0	Unk	None Seen	No breeding evidence

	Active Breed-ing	Minimum # Adults	# Yearlings	# Sub-adults	# Egg Masses	# Tad-poles	# Meta-morphs	Adequate Monitoring
2004	No	0	0	0	0	None	None	No

CC02 - Urad/Henderson (Clear Creek West Fork) – Henderson Mine

Year	Males/ Females /Egg Masses*	Recruit-ment**	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 dry sites
2003	15/15/18	Unk	1(A)	

	Active Breed-ing	Minimum # Adults	# Yearlings	# Sub-adults	# Egg Masses	# Tad-poles	# Meta-morphs	Adequate Monitoring
2004	Yes	15	2	0	16	>5000	>100	Yes

CCO3 - Herman Gulch (Clear Creek) – ARNF

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(A)	No evidence of breeding
2003	1/1/1	Unk	1(M)	<50 metamorphs

	Active Breed-ing	Minimum # Adults	# Yearlings	# Sub-adults	# Egg Masses	# Tad-poles	# Meta-morphs	Adequate Monitoring
2004	Yes	3	20	0	4	1000	None	Yes

CCO4 – Mount Bethel (Clear Creek) – ARNF

Year	Males/ Females /Egg Masses*	Recruit-ment**	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
2002	16/4/4	Yes	3(M,1,A)	Metamorphosis early
2003	7/7/7	Unk	3(M,1,A)	<50 metamorphs

	Active Breed-ing	Minimum # Adults	# Yearlings	# Sub-adults	# Egg Masses	# Tad-poles	# Meta-morphs	Adequate Monitoring
2004	Yes	68	--	1	8	7000	7	Yes

CCO5 – Bakerville (Clear Creek) – ARNF

Year	Males/ Females /Egg Masses*	Recruit-ment**	Age Classes ***	Comments
1994	1/1/1	Unk	2(M,A)	Limited data
1995		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

	Active Breed-ing	Minimum # Adults	# Yearlings	# Sub-adults	# Egg Masses	# Tad-poles	# Meta-morphs	Adequate Monitoring
2004	No	0	0	0	0	None	None	No

CC06 - Silverdale (Clear Creek South), ARNF

Year	Males/ Females /Egg Masses*	Recruit-ment**	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 Seen	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)	65 sub-adults/7 adults
2002				Site not monitored
2003				Site not monitored

	Active Breed-ing	Minimum # Adults	# Yearlings	# Sub-adults	# Egg Masses	# Tad-poles	# Meta-morphs	Adequate Monitoring
2004	No	0	0	0	0	None	None	No

GR01 - Jim Creek (Winter Park) – ARNF

Year	Males/ Females /Egg Masses*	Recruit-ment**	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 Seen	Monitoring inadequate
1998	0/0/0	Unk	None Seen	Monitoring inadequate
1999	0/0/0	Unk	None Seen	No night survey done
2000	0/0/0	Unk	None Seen	Monitoring adequate
2001	0/0/0	Unk	None Seen	No breeding observed
2002	0/0/0	Unk	None Seen	Site not monitored
2003	0/0/0	Unk	None Seen	Site visited 7 times

	Active Breed-ing	Minimum # Adults	# Yearlings	# Sub-adults	# Egg Masses	# Tad-poles	# Meta-morphs	Adequate Monitoring
2004	No	0	0	0	0	None	None	No

GR02 - Pole Creek - Pole Creek Golf Course

Year	Males/ Females /Egg Masses*	Recruit-ment**	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 metamophs
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)	Metamophs cytrid-positive
2003	7/2/2	Unk	4(M,1,S,A)	500+ metamorphs

	Active Breed-ing	Minimum # Adults	# Yearlings	# Sub-adults	# Egg Masses	# Tad-poles	# Meta-morphs	Adequate Monitoring
2004	Yes	9	0	5	2	500+	150+	yes

GR03 - Vasquez Creek – ARNF

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

	Active Breed-ing	Minimum # Adults	# Yearlings	# Sub-adults	# Egg Masses	# Tad-poles	# Meta-morphs	Adequate Monitoring
2004	No	0	0	0	0	none	none	No

GR04 - McQueary Lake – ARNF

Year	Males/ Females /Egg Masses*	Recruit-ment**	Age Classes ***	Comments
2001	2/3/3	Yes	2(1,A)	No metamorphs
2002	8/6/6	Unk	2(M,A)	<50 metamorphs
2003	2/2/2	Unk	2(S,A)	Desiccation & predation

	Active Breed-ing	Minimum # Adults	# Yearlings	# Sub-adults	# Egg Masses	# Tad-poles	# Meta-morphs	Adequate Monitoring
2004	No	0	0	0	0	none	none	Yes

GR05 - Upper Williams Fork – ARNF

Year	Males/ Females /Egg Masses*	Recruit-ment**	Age Classes ***	Comments
2001	2/2/2	Yes	3(M,1,A)	Metamorphs observed
2002	1/1/1	Yes	3(1,S,A)	No metamorphs seen
2003	1/2/1	Unk	2(S,A)	<50 metamorphs

	Active Breed-ing	Minimum # Adults	# Yearlings	# Sub-adults	# Egg Masses	# Tad-poles	# Meta-morphs	Adequate Monitoring
2004	Yes	5	22	11	0	3000+	<50	Yes

LR05 - Twin Lake (South Cache la Poudre) – ARNF

Year	Males/ Females /Egg Masses*	Recruit-ment**	Age Classes ***	Comments
1998	1/1/1	Unk	1(A)	Tadpoles observed
1999	0/0/0	Unk	None Seen	Site disturbed/dam work
2000	0/0/0	Yes	None Seen	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 Data Not Available

LR07 - Trout Creek - ARNF

	Active Breed-ing	Minimum # Adults	# Yearlings	# Sub-adults	# Egg Masses	# Tad-poles	# Meta-morphs	Adequate Monitoring
2004	Yes	2	0	0	2	<100	None	Yes
(new site)								

LR08 - Panhandle Creek - ARNF

2004	No	5	0	2	0	None	none	No
(new site)								

LR01 - Lost Lake (North Fork Big Thompson River, RMNP)

Year	Males/ Females /Egg Masses*	Recruit-ment**	Age Classes ***	Comments
1990	?/?/22	Unk	1(A)	Incomplete data
1991	206/28/15	Unk	1(A)	No data on sub-adults
1992	143/23/23	Unk	1(A)	No data on sub-adults
1993	77/10/?	Unk	1(A)	Incomplete data
1994	110/35/35	Unk	1(A)	No data on sub-adults
1995	122/32/32	Yes	1(A)	No data on sub-adults
1996	43/15/15	No	1(A)	No data on sub-adults
1997	112/15/15 +	No	3(M,2,A)	15 to 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)	Positive for chytrid
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 Seen	Surveys adequate

	Active Breed-ing	Minimum # Adults	# Yearlings	# Sub-adults	# Egg Masses	# Tad-poles	# Meta-morphs	Adequate Monitoring
2004	No	0	0	0	0	None	None	Yes

LR02 - Kettle Tarn (North Fork Big Thompson River, RMNP)

Year	Males/ Females /Egg Masses*	Recruit-ment**	Age Classes ***	Comments
1990	?/?/13	Unk	1(A)	Incomplete data
1991	21+/23/23	Unk	1(A)	No data on sub-adults
1992	63/18/18	Unk	1(A)	No data on sub-adults
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-yr old seen
2001	2/4/3	Yes	3(M,S,A)	Metamorphs observed
2002	2/2/2	Yes	3(M,1,A)	Tadpoles released at site
2003	3/3/3	Unk	3(M,1,A)	500+ metamorphs

	Active Breed-ing	Minimum # Adults	# Yearlings	# Sub-adults	# Egg Masses	# Tad-poles	# Meta-morphs	Adequate Monitoring
2004	Yes	1	1	1	2	None	None	Yes

LR03 - Spruce Lake (Big Thompson River, RMNP)

1996	Unk	Yes	Unk	Reproduction presumed
1997	3/1/?	Unk	3(1,S,A)	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-yr olds seen
2001	10/2/2	Unk	2(S,A)	Larvae observed
2002	15/3/3	Unk	1(A)	No metamorphs seen
2003	12/1/1	Unk	1(A)	No larvae observed

	Active Breed-ing	Minimum # Adults	# Yearlings	# Sub-adults	# Egg Masses	# Tad-poles	# Meta-morphs	Adequate Monitoring
2004	Yes	10	0	0	2	None	None	Yes

LR04 - Glacier Basin (Big Thompson River, RMNP)

Year	Males/ Females /Egg Masses*	Recruit-ment**	Age Classes ***	Comments
1995	1/1/0	Unk	1(A)	
1996	1/1/1	Yes	1(A)	Transplant site
1997	0/1/0	No	2(1,A)	
1998	3/0/0	Unk	1(A)	No breeding observed
1999	3/0/0	Unk	1(A)	No night survey done
2000	0/0/0	Unk	None Seen	Monitoring adequate
2001				Not monitored
2002				Not monitored
2003				Not monitored
				Translocation appears unsuccessful

*M/F/Egg Masses: This column shows the minimum number of breeding-age males (M), females (F), 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. Therefore, all sites will, at this time, show either a "Unk" (unknown) entry or a "No" entry for 2002, as success can not be determined until the Spring or Summer of 2003, or it is known that there were no metamorphosed toadlets produced at the site in 2002.

***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 = Metamprphs (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).

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	

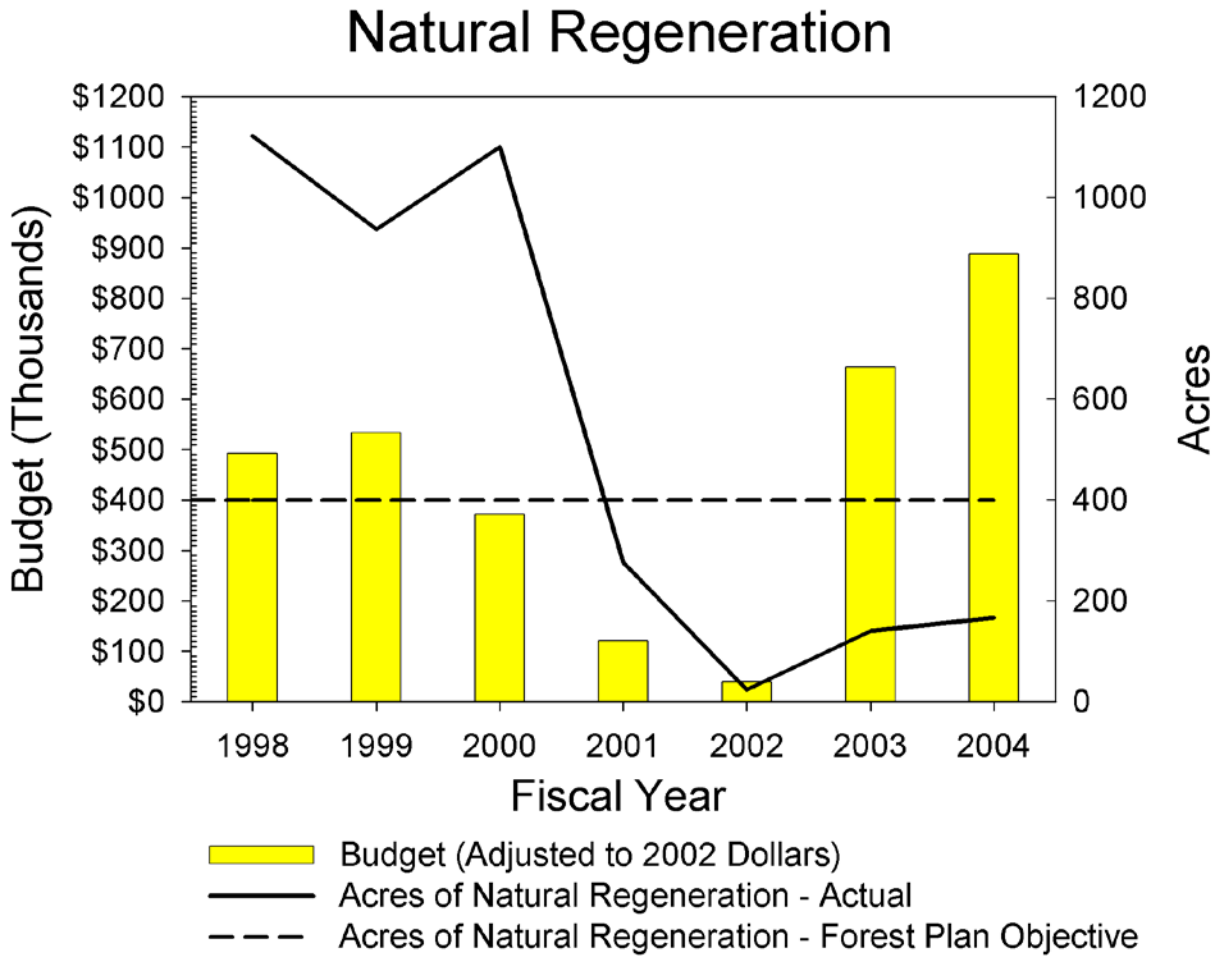
South Pawnee Crk	1998	1999	2001	2002
fish/pothole	n/a	68	25	819

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

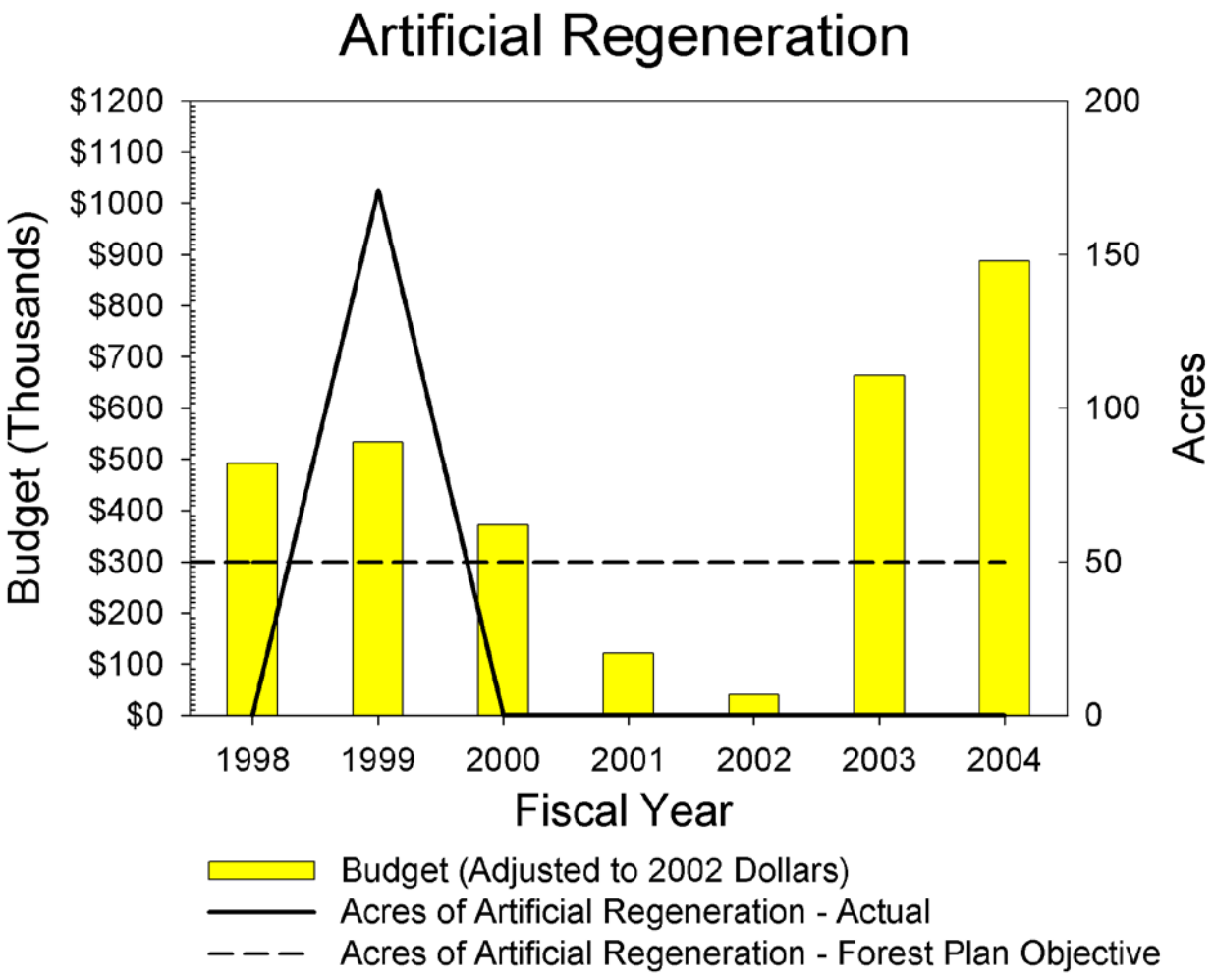
Stream Name	Years surveyed			
Little Crow Crk	**1998**	**1999**	**2000**	**2001**
fish/pothole	10	0	39	2
Little Owl Creek	**1998**	**1999**	**2001**	
fish/pothole	13	1	0	
South Pawnee Creek	**1998**	**1999**	**2001**	**2002**
fish/pothole	8	0	19	322

APPENDIX B: Graphs

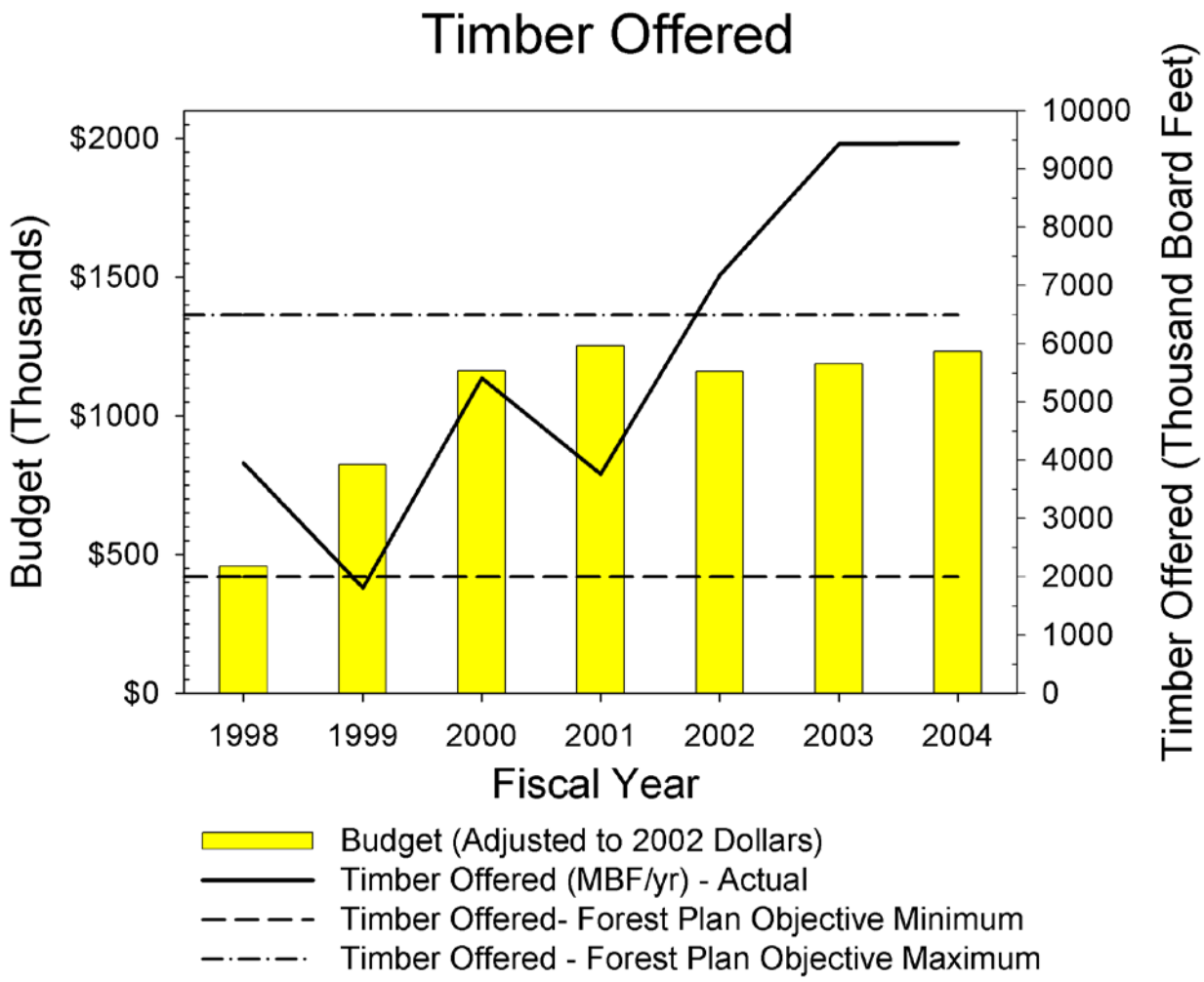
Graph 1



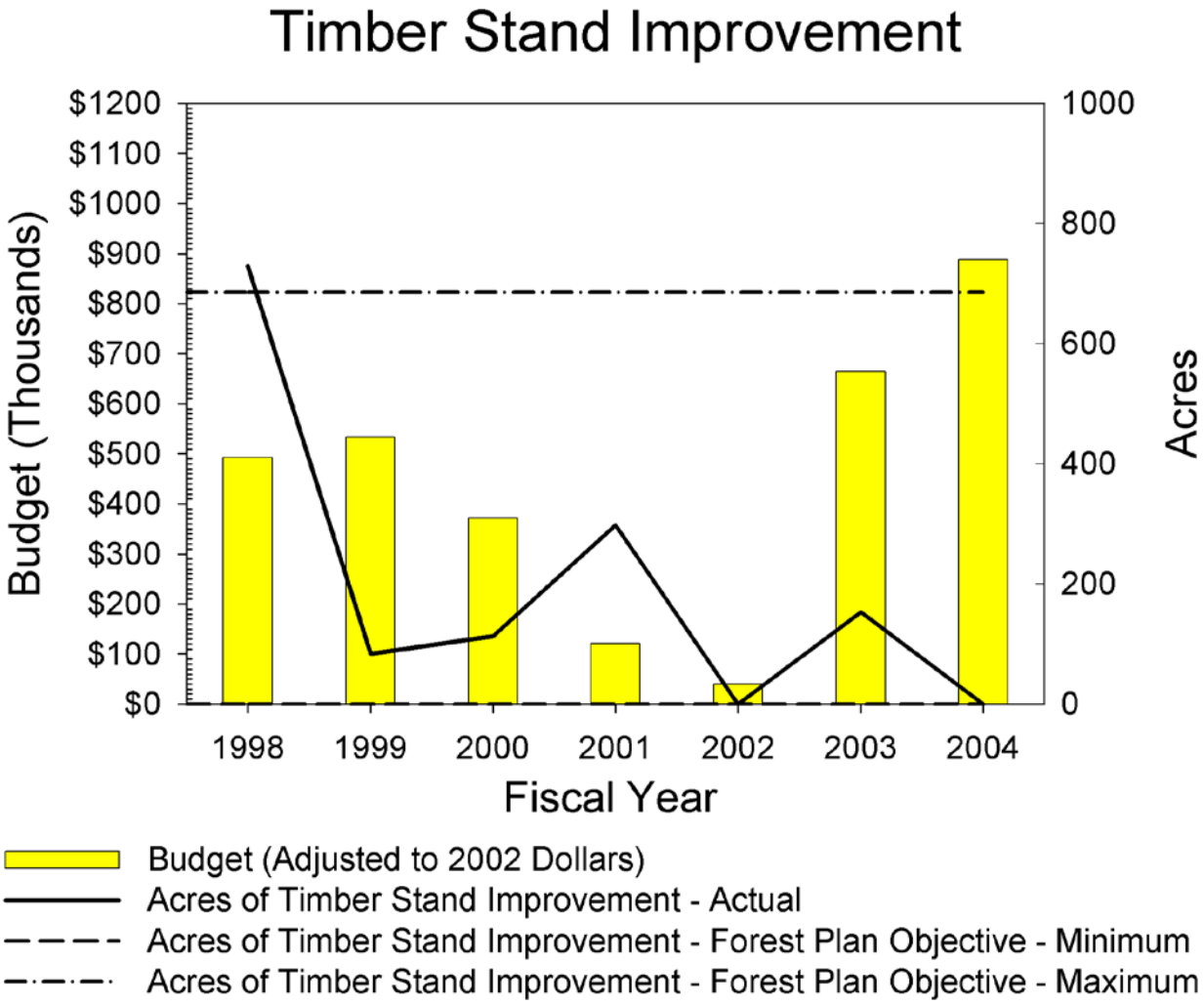
Graph 2


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
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Acres of Artificial Regeneration - Actual
Acres of Artificial Regeneration - Forest Plan Objective

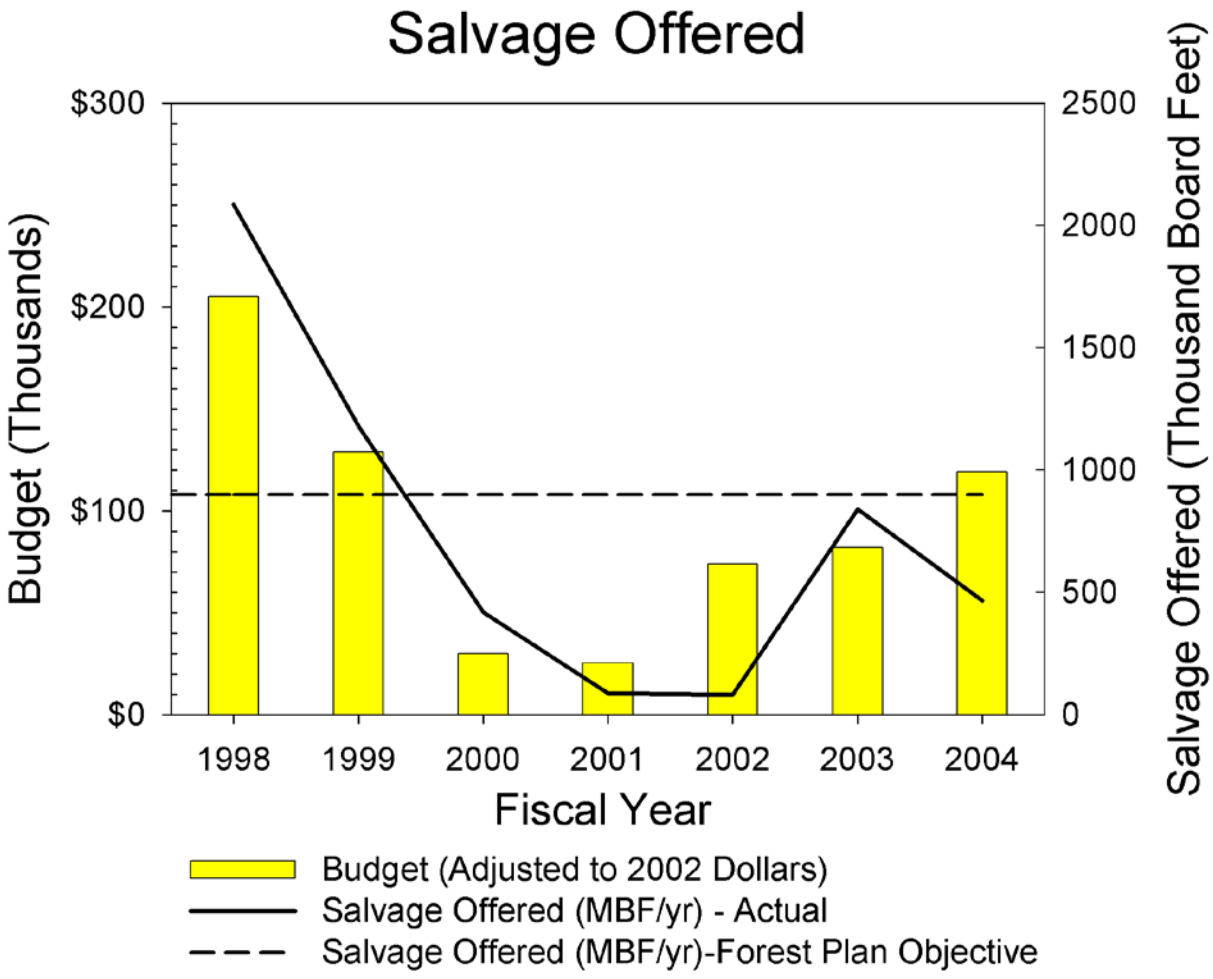
Graph 3


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
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Timber Offered (MBF/yr) - Actual
Timber Offered- Forest Plan Objective Minimum
Timber Offered - Forest Plan Objective Maximum

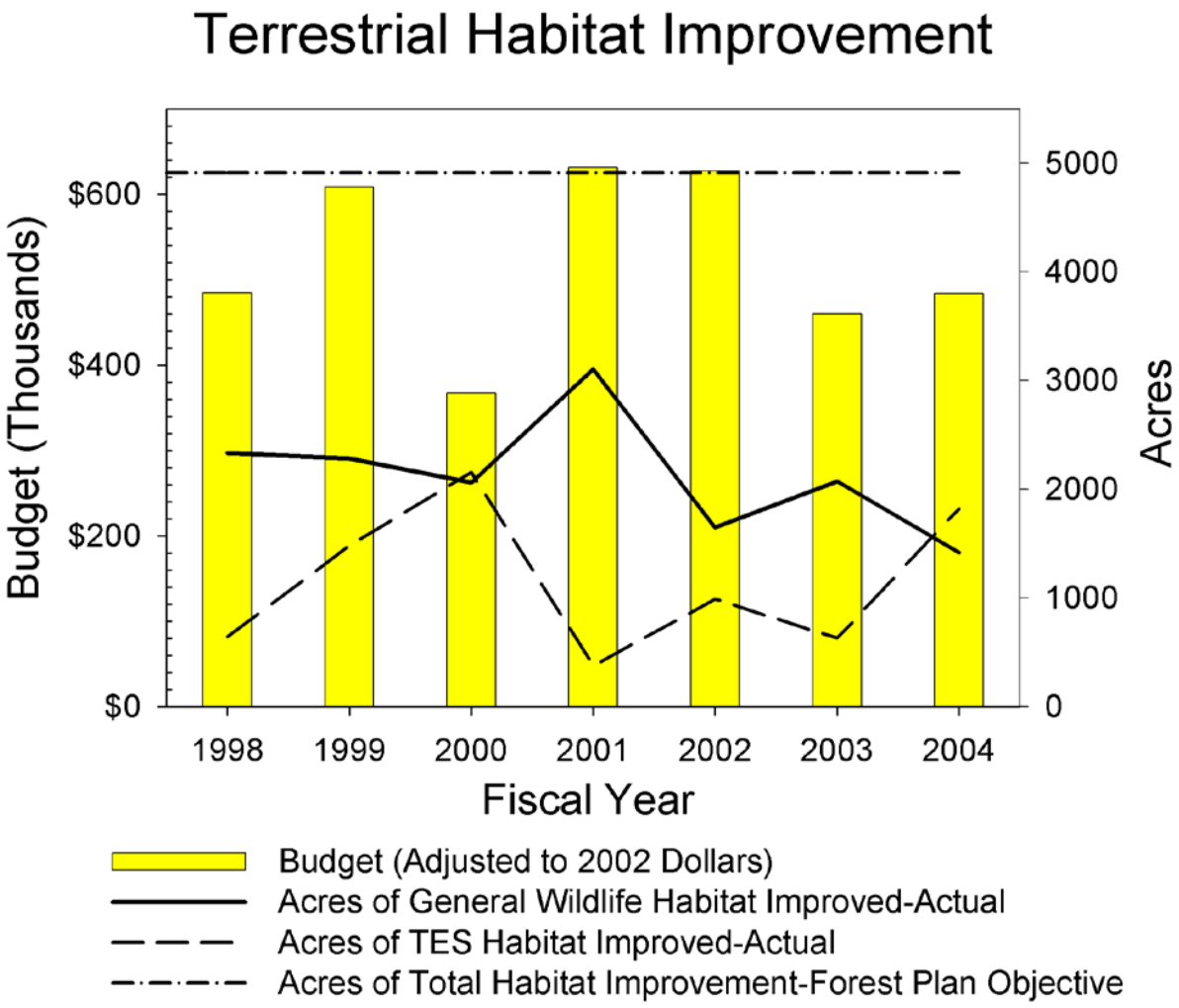
Graph 4


Timber Stand Improvement
Budget (Thousands)
$1200
$1100
$1000
$900
$800
$700
$600
$500
$400
$300
$200
$100
$0
1000
800
600
400
200
0
Acres
1998
1999
2000
2001
2002
2003
2004
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

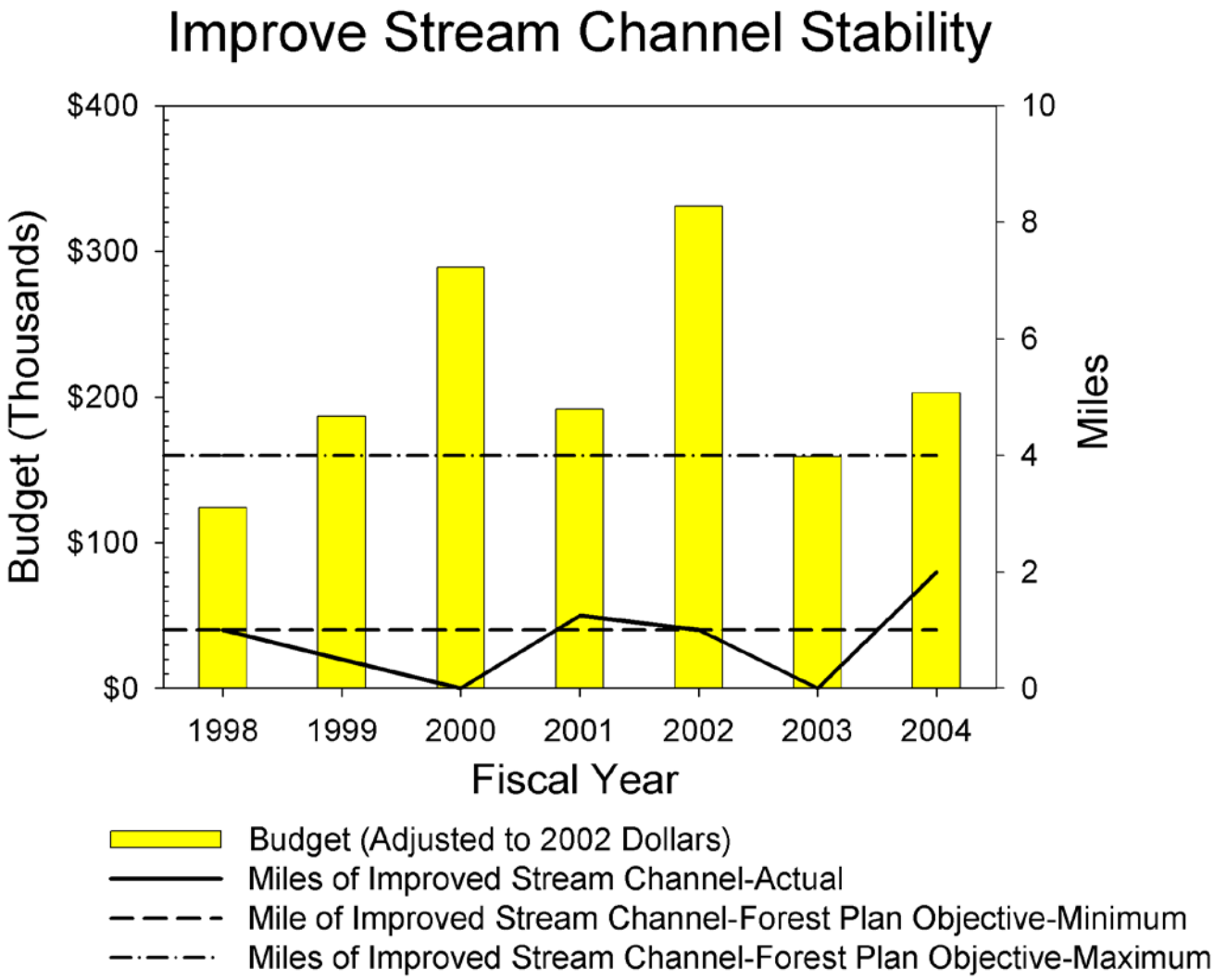
Graph 5


Salvage Offered
$300
$200
$100
$0
Budget (Thousands)
2500
2000
1500
1000
500
0
Salvage Offered (Thousand Board Feet)
1998
1999
2000
2001
2002
2003
2004
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Salvage Offered (MBF/yr) - Actual
Salvage Offered (MBF/yr)-Forest Plan Objective

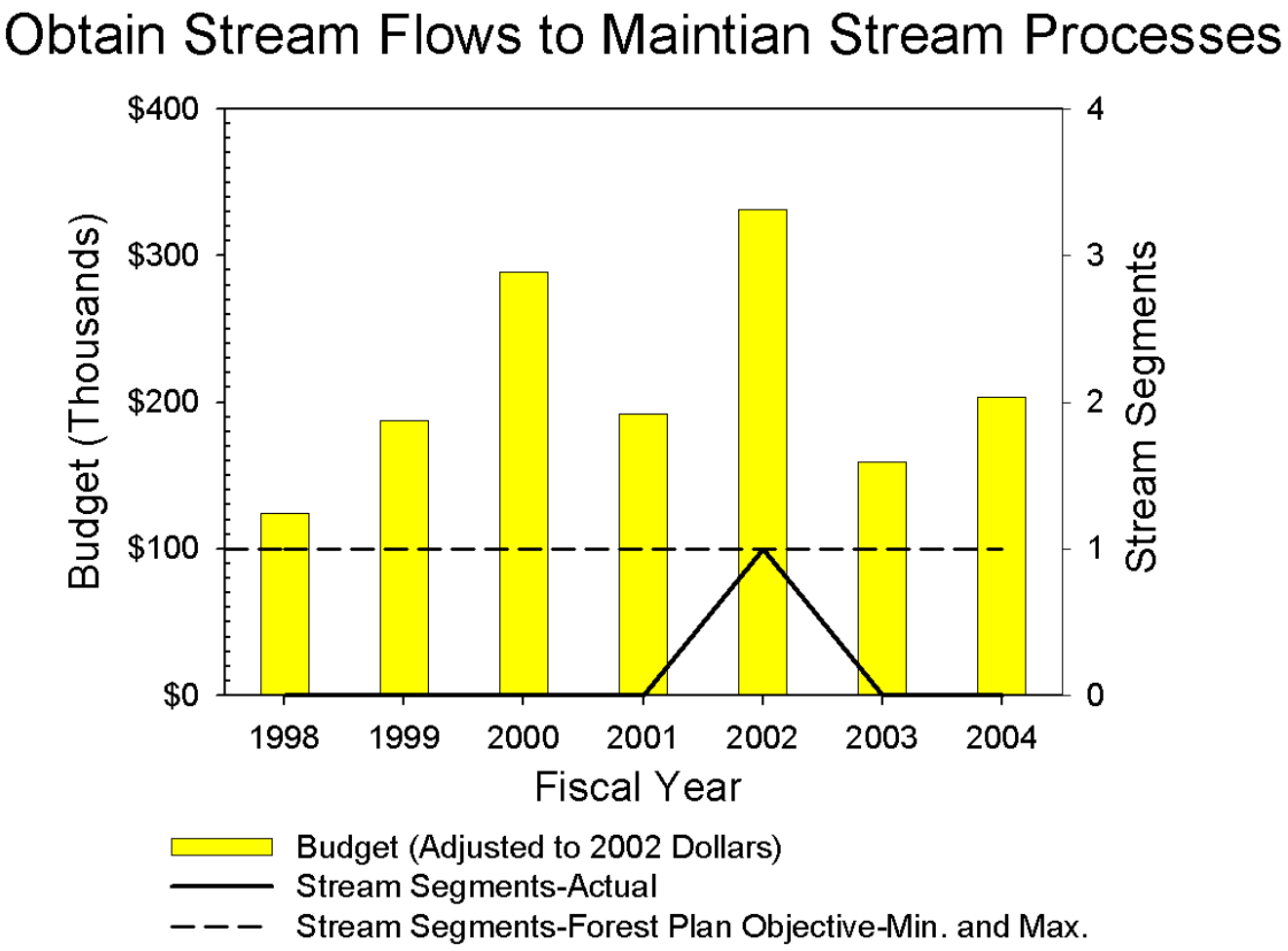
Graph 6


Terrestrial Habitat Improvement
Budget (Thousands)
$600
$400
$200
$0
5000
4000
3000
2000
1000
0
Acres
1998
1999
2000
2001
2002
2003
2004
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

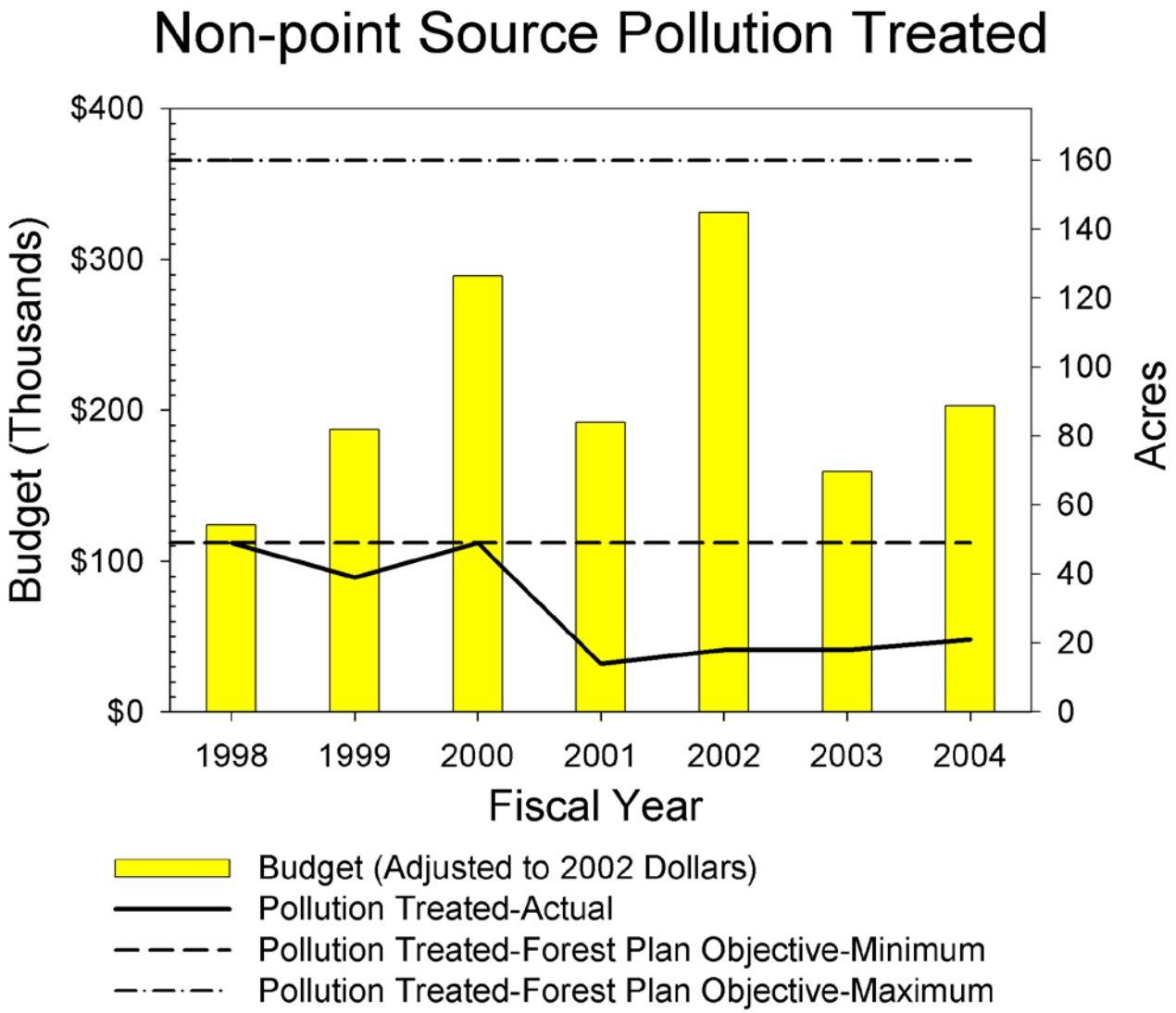
Graph 7


Improve Stream Channel Stability
Budget (Thousands)
$400
$300
$200
$100
$0
10
8
6
4
2
0
Miles
1998
1999
2000
2001
2002
2003
2004
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

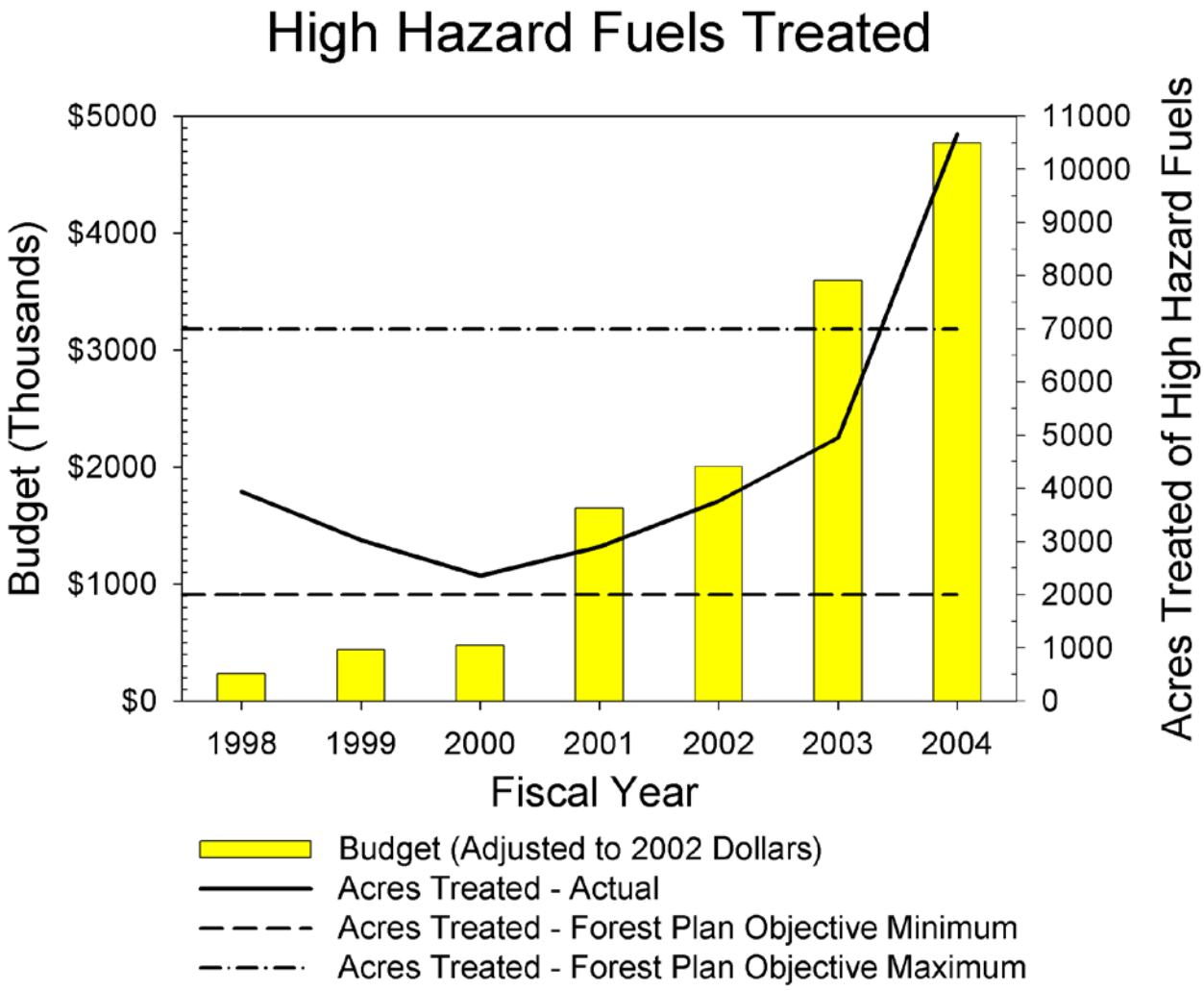
Graph 8


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

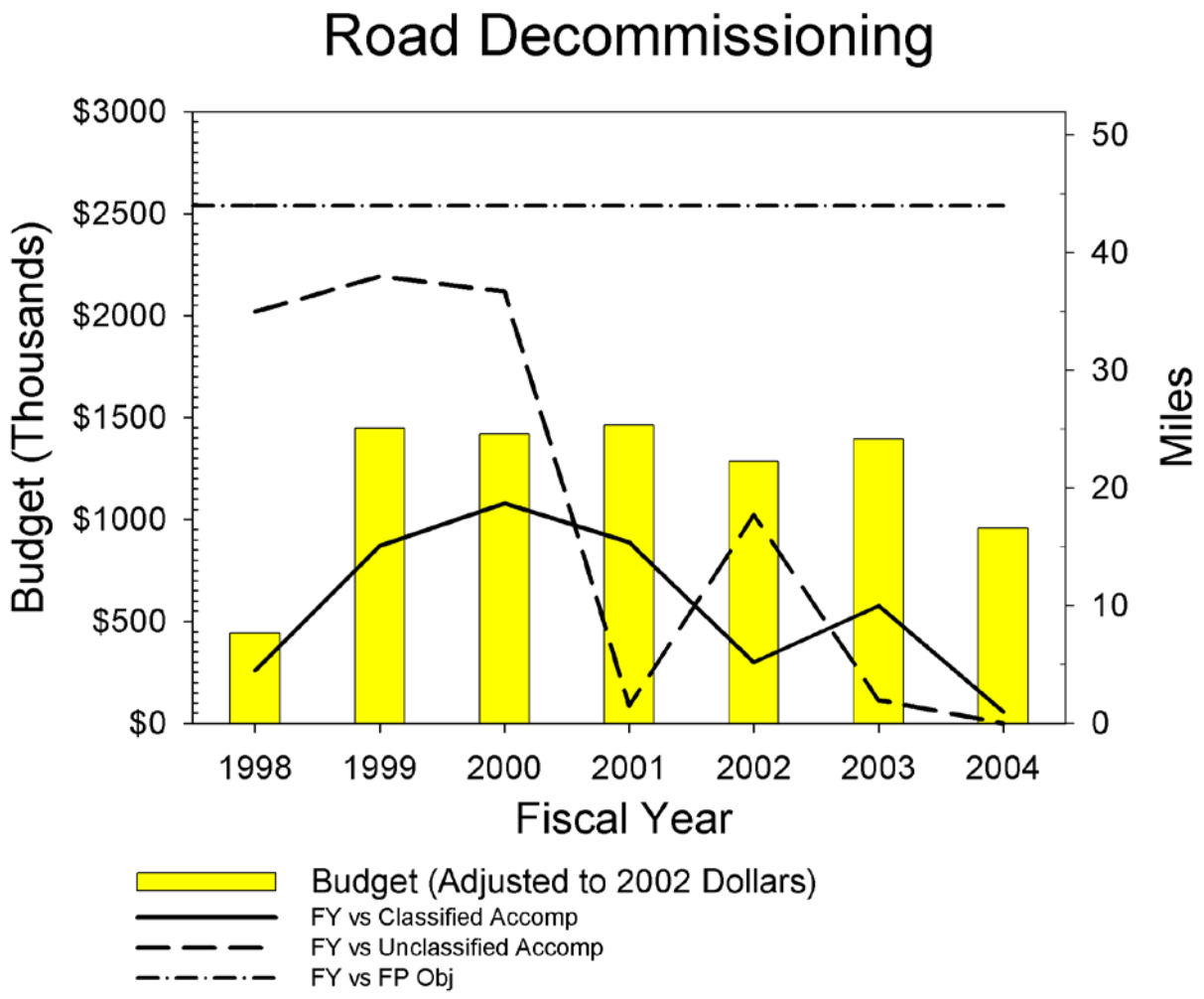
Graph 9


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
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Pollution Treated-Actual
Pollution Treated-Forest Plan Objective-Minimum
Pollution Treated-Forest Plan Objective-Maximum

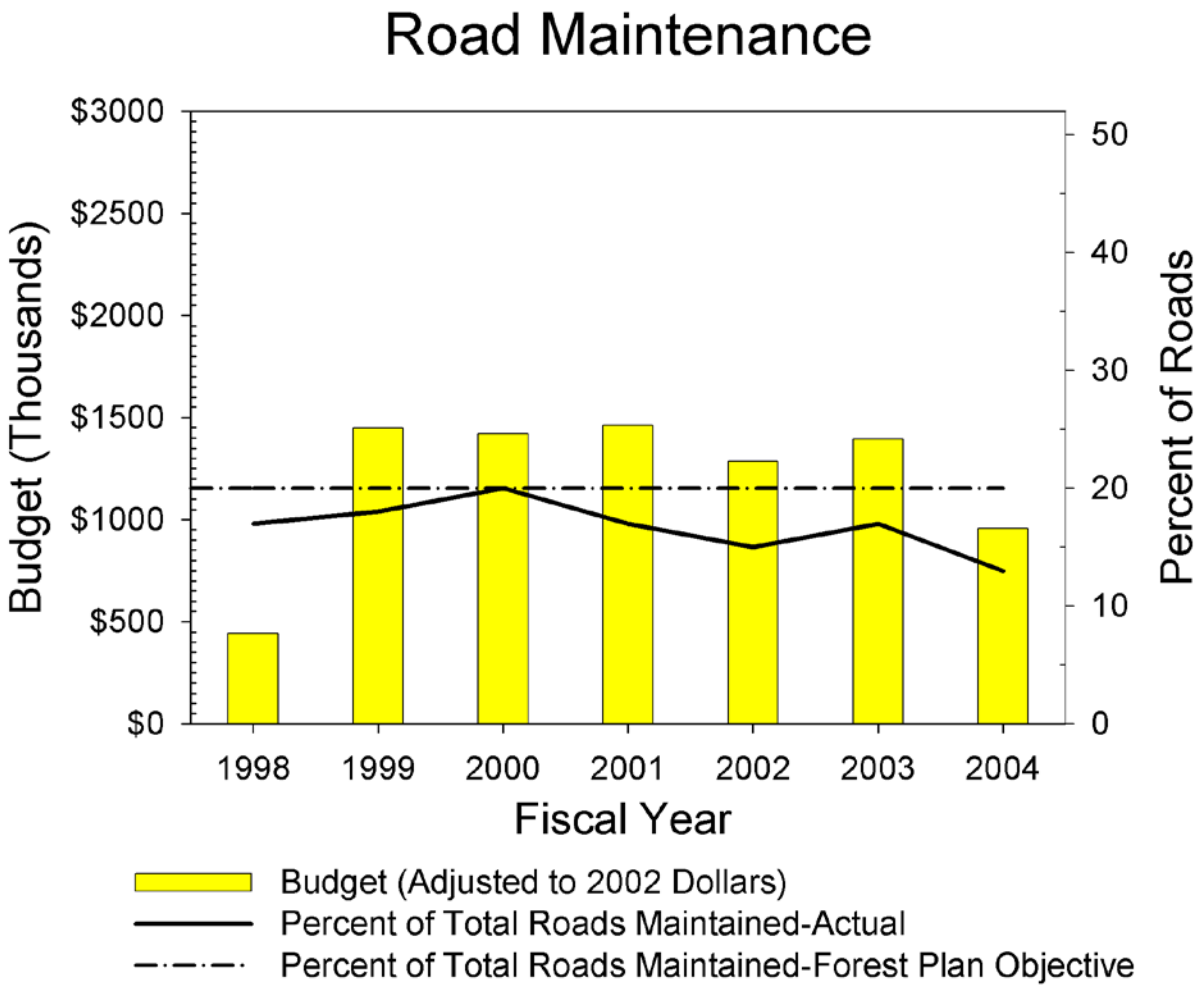
Graph 10


High Hazard Fuels Treated
Budget (Thousands)
$5000
$4000
$3000
$2000
$1000
$0
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Acres Treated of High Hazard Fuels
1998
1999
2000
2001
2002
2003
2004
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Acres Treated - Actual
Acres Treated - Forest Plan Objective Minimum
Acres Treated - Forest Plan Objective Maximum

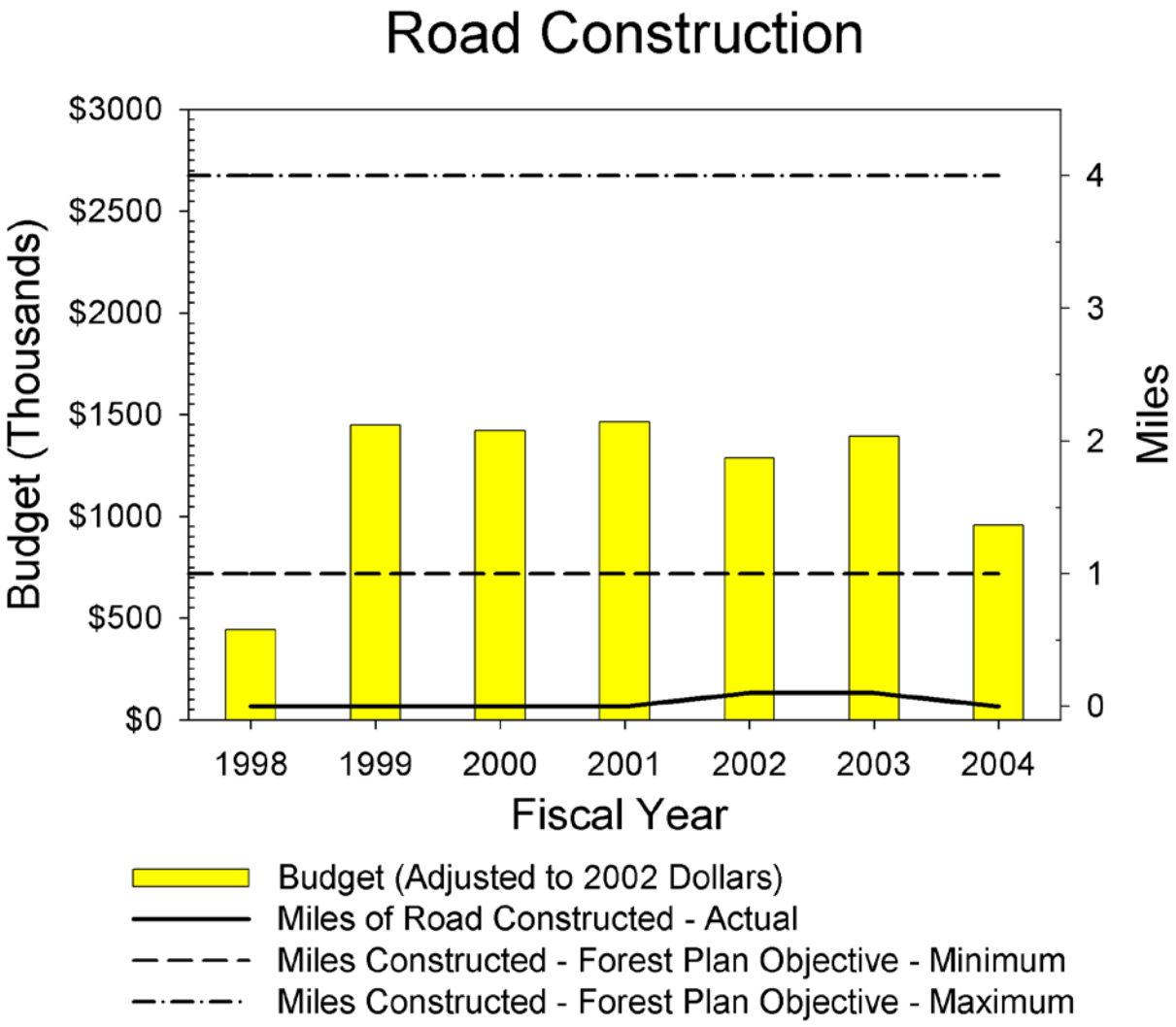
Graph 11


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
Fiscal Year
Budget (Adjusted to 2002 Dollars)
FY vs Classified Accomp
FY vs Unclassified Accomp
FY vs FP Obj

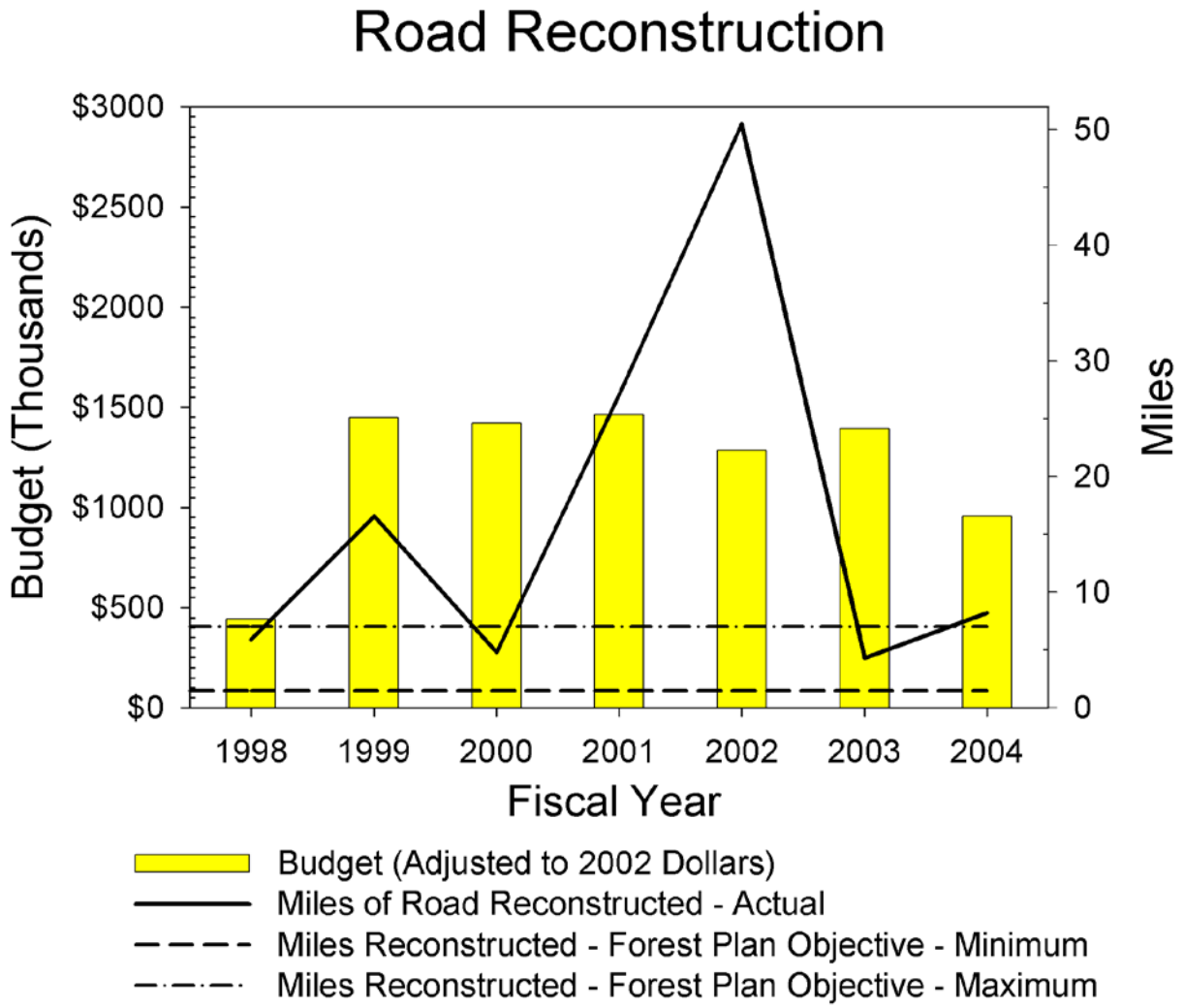
Graph 12


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

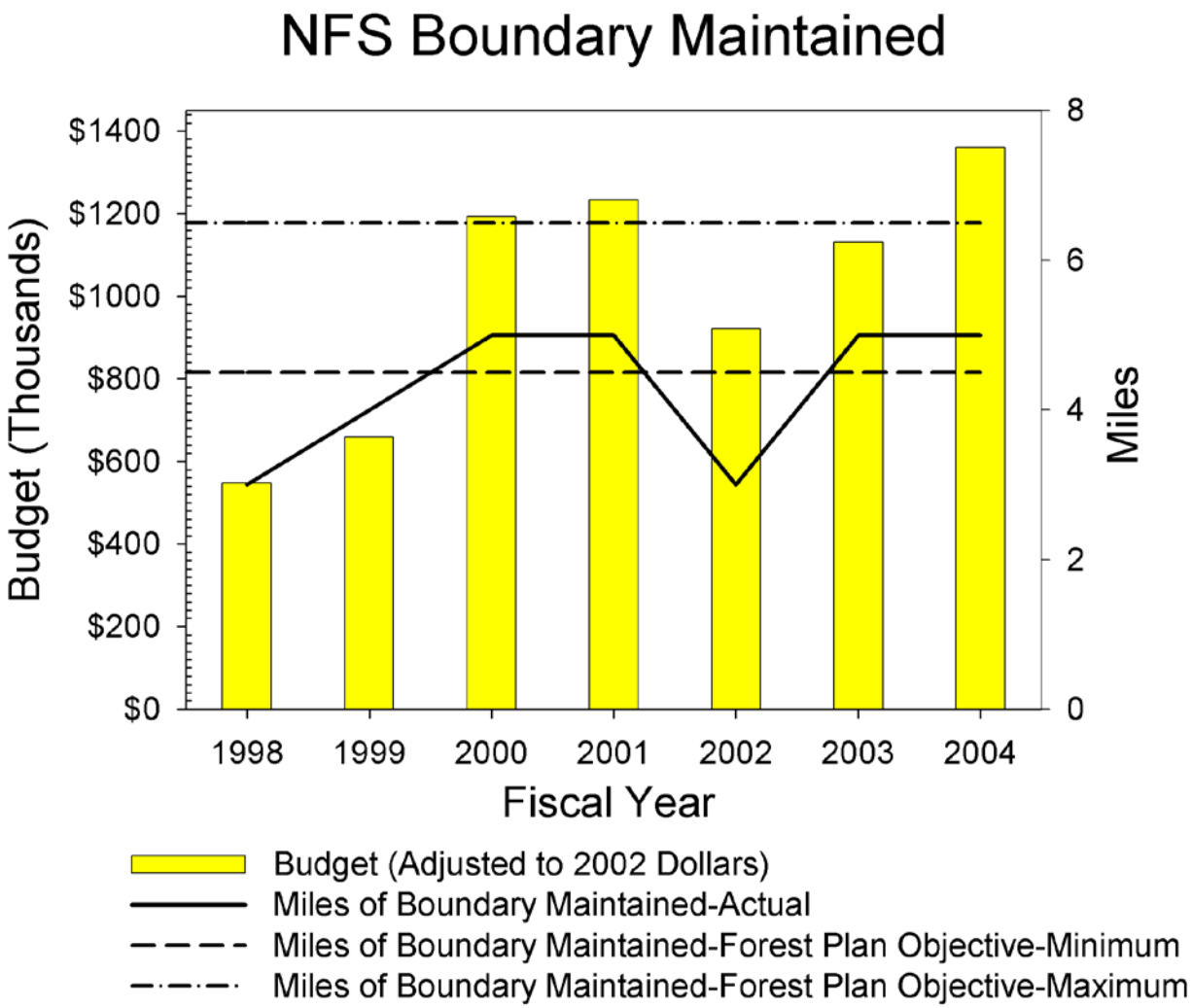
Graph 13


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

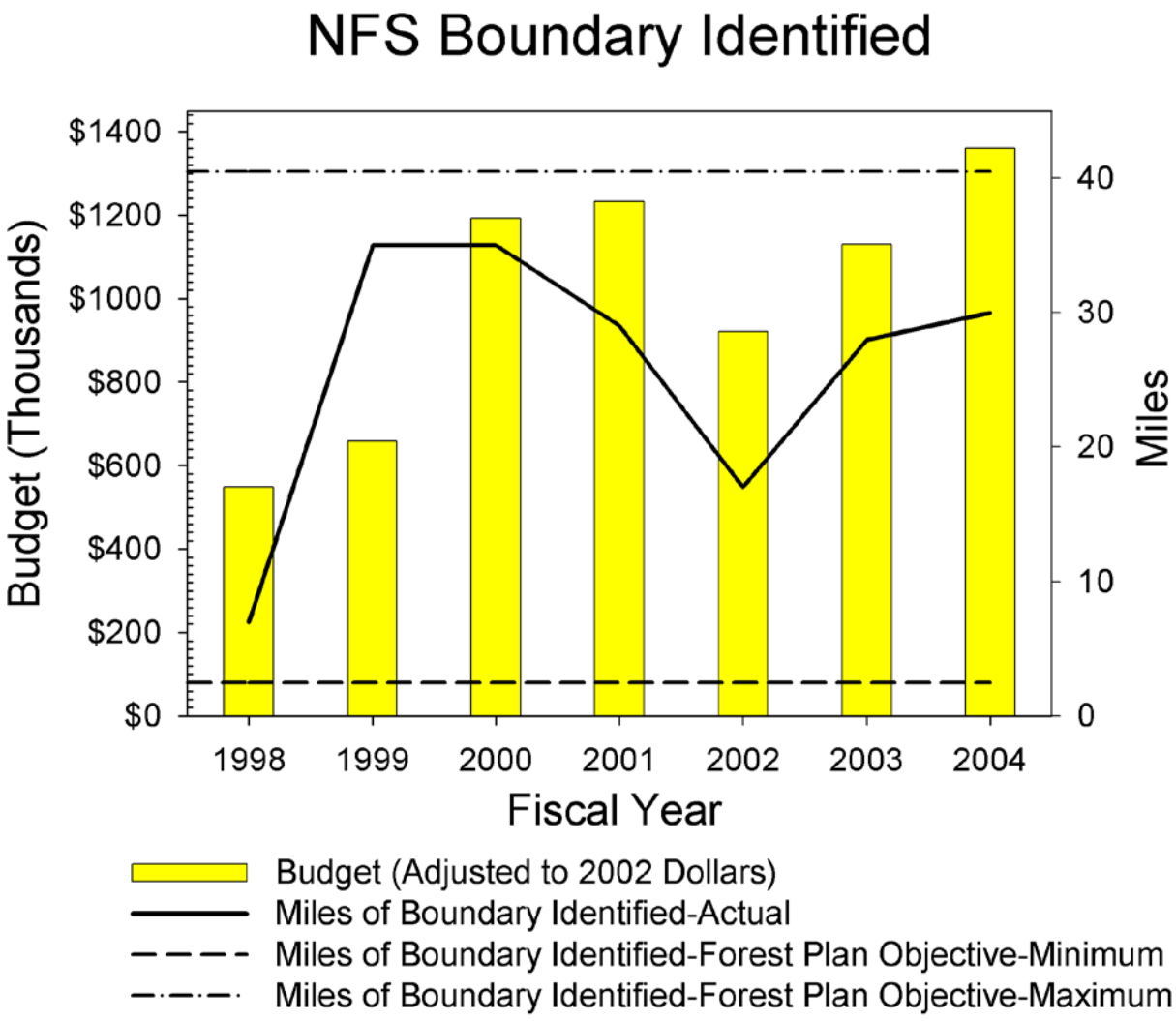
Graph 14


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
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Miles of Road Reconstructed - Actual
Miles Reconstructed - Forest Plan Objective - Minimum
Miles Reconstructed - Forest Plan Objective - Maximum

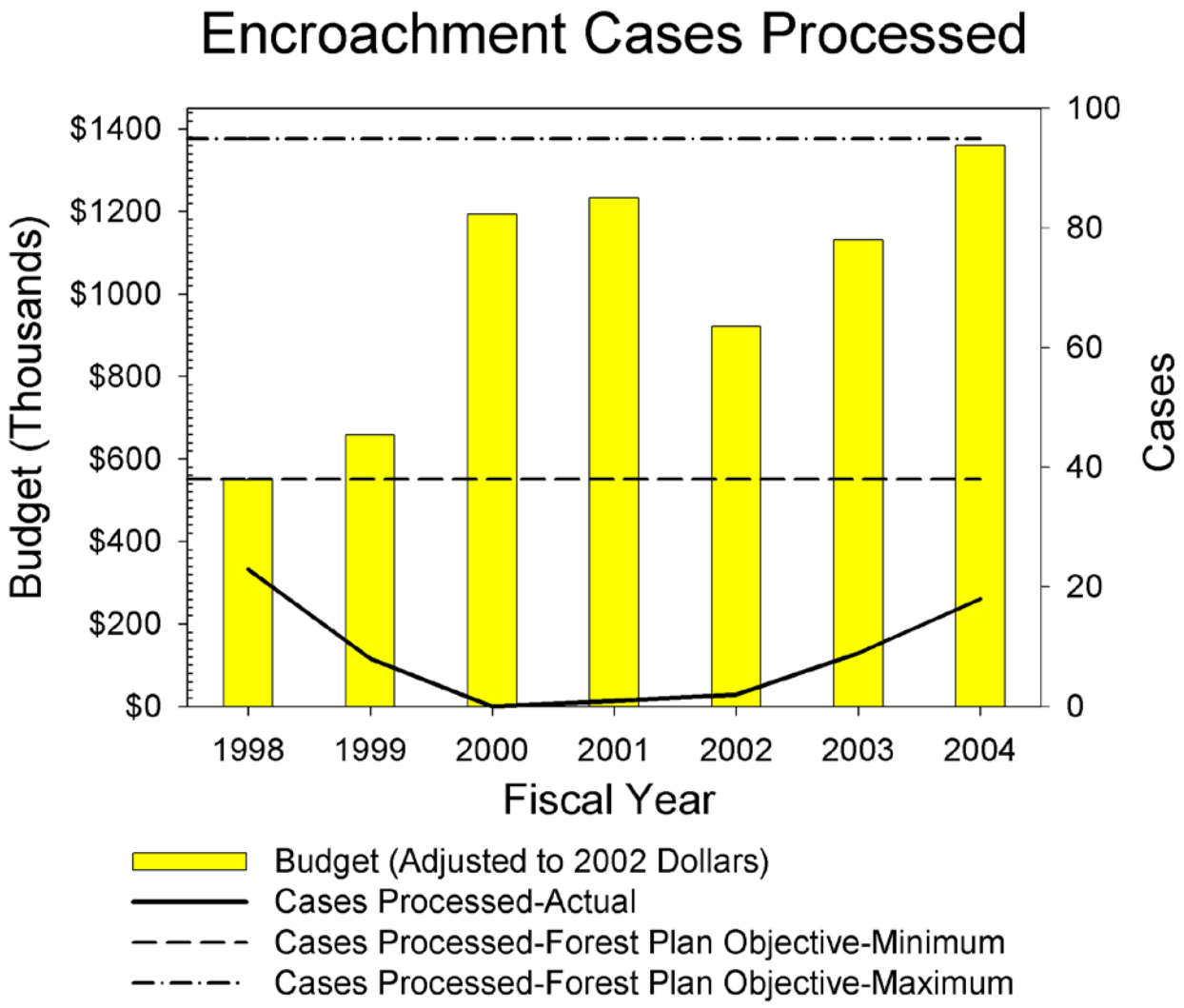
Graph 15


NFS Boundary Maintained
Budget (Thousands)
$1400
$1200
$1000
$800
$600
$400
$200
$0
8
6
4
2
0
Miles
1998
1999
2000
2001
2002
2003
2004
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

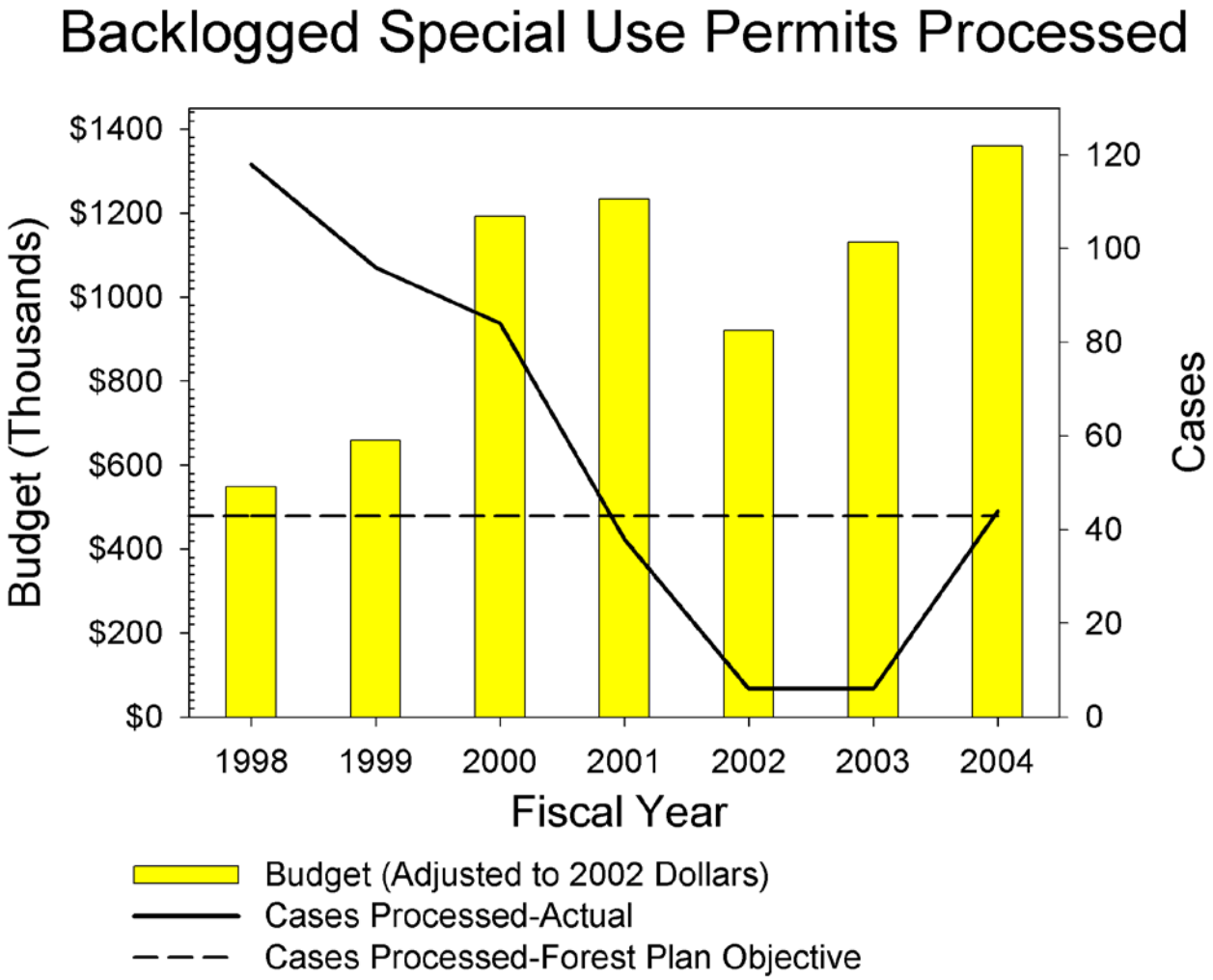
Graph 16


NFS Boundary Identified
Budget (Thousands)
$1400
$1200
$1000
$800
$600
$400
$200
$0
Miles
40
30
20
10
0
1998
1999
2000
2001
2002
2003
2004
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

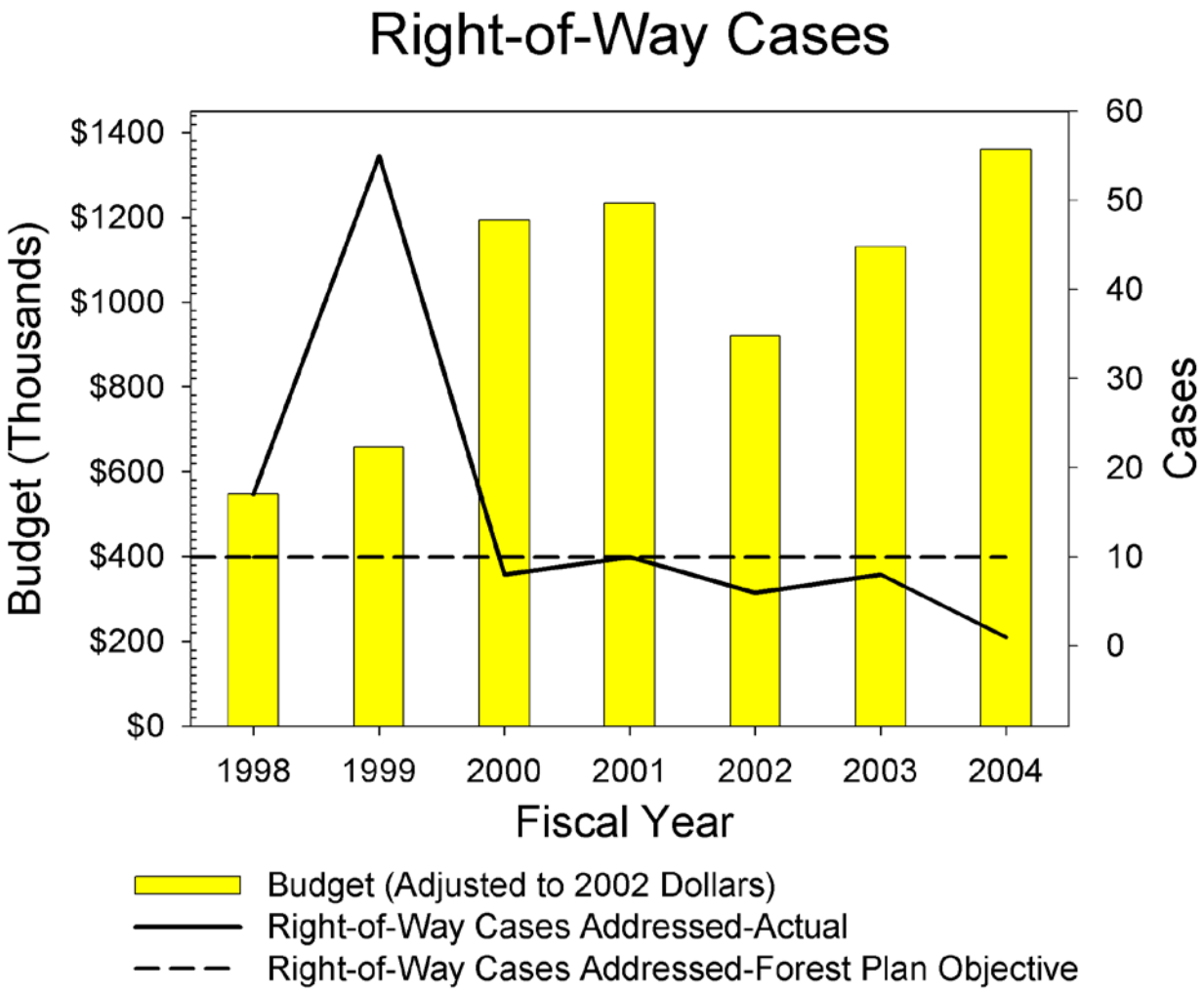
Graph 17


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
Fiscal Year
Budget (Adjusted to 2002 Dollars)
Cases Processed-Actual
Cases Processed-Forest Plan Objective-Minimum
Cases Processed-Forest Plan Objective-Maximum

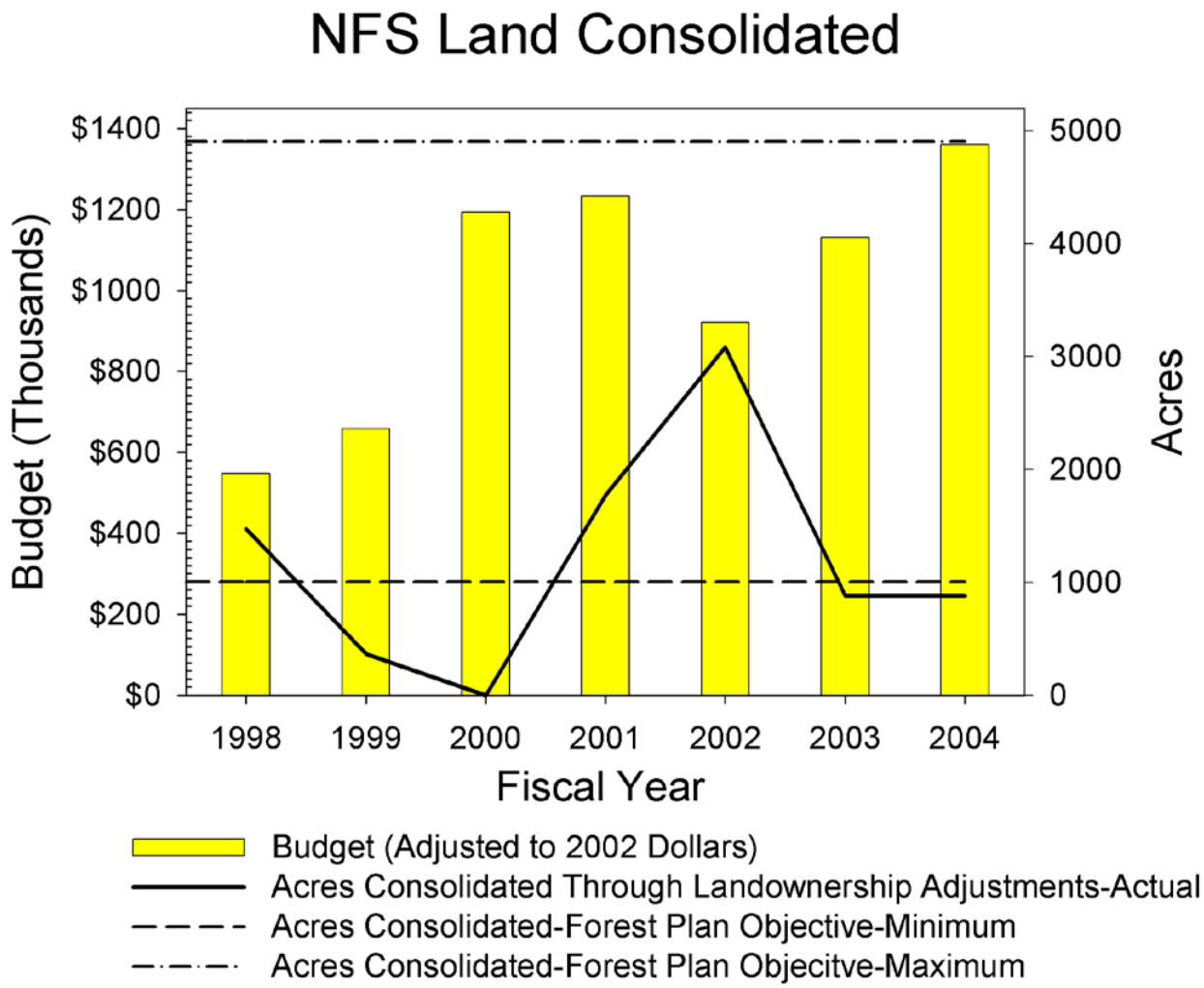
Graph 18


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
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
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
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