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 2007

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Forest Certification

The 1997 Revision of the Land and Resource Management Plan (Forest Plan) 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 tenth season of implementing plan goals and objectives. Lessons learned from these ten years of monitoring and evaluation point how to better conduct interdisciplinary resource management and monitoring and evaluation of plan implementation by Forest and Grassland personnel. Monitoring and evaluation carried out by the Monitoring and Evaluation Team has resulted in no significant problems or reasons for change to the Revised Forest Management Plan at this time.

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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.

Ten 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 ten years, staffing was reduced and projects were not implemented. The Forest Plan was optimistic in its funding predictions and, therefore, predictions for program objectives (Chapter 1, Forest Plan) was also overly optimistic. Some programs, though under-funded, have benefited from other well-funded projects. For example, the Wildlife Program is typically under-funded and wildlife habitat improvement acreage would have only increased in small increments. Yet, due to the increased funding to treat hazardous fuels, more acreage of wildlife habitat improvement has occurred than funding would have allowed.

The Forest Plan was overly optimistic in predicting future Recreation budgets (Base, Experienced or Full) as shown in the S-Tables. Funding has come to the Forest that has gone to accomplishing other priorities than the Forest Plan stated objectives on pages 7 and 8. However, there are many accomplishments in the recreation program since the 1997 Revised Forest Plan was approved. In 2000 the National Visitor Use Monitoring survey conducted by the Forest Service resulted in the ARP being the second most visited National Forests and Grassland in the country at 6.2 million visits. Another survey was conducted in 2005 and when the data is available, nationally, the visitor use for the ARP will be updated.

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 program is providing more funding for our more heavily impacted recreation areas such as Mt. Evans and the Arapaho National Recreation Area. Through the fees our visitors pay to use these areas, we are able to maintain these facilities to a higher standard and expand interpretation and education programs. The Dos Chappell Nature Center has been built adjacent to the Mt. Evans Road and provides the public more information about the surrounding fragile environment. Construction for the Berthoud Pass Trailhead began in 2007. 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 for the Mitchell Lake and Long Lake Trailheads. A new recreation management/development plan for the Brainard Lake Recreation Area was completed. The Sulphur Ranger District completed their Motor Vehicle Use Map for visitors' use while driving on the district. Other districts are in progress to complete their maps. A Recreation Facility Analysis was completed enabling the ARP to align management of facilities with expected budget levels and to reduce costs by eliminating little-used recreation facilities.

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 2007 (Oct 1, 2006 - September 30, 2007) the ARP treated over 16,000 acres of hazardous fuels.

The timber program was able to offer and sell almost 1,500 acres of timber in FY 2007. There was a continuation of accelerated harvest on the Sulphur Ranger District to address mortality created by mountain pine beetles.

Approximately 235 acres of timber stand improvement have been accomplished annually for the past ten years. This is below the maximum Forest Plan objective of approximately 700 acres per year. However, thinning has occurred in many acres of older stands to reduce hazardous fuels. In many cases this activity improves the stand as well. Timber stand improvement activities have been limited by the acres of sapling stands on the forest. In stands of lodgepole and spruce fir thinning has been limited to some extent by the need to protect snowshoe hare habitat in an effort to recover the listed lynx. This will have an adverse affect on forest productivity in the future.

The lands program has exceeded most Forest Plan objectives. For (either at low (base) or high (full) yearly budgets or as described in the S-Tables of the Forest Plan); when in actuality over the 10 years the amount was 135 cases. This includes both back-logged and new submittals. For encroachment cases the Forest Plan projected that 378 cases on file would be resolved (at base budget levels) in the 10 year period to 2007. Over the past ten years 81 cases have been resolved, but some of these are newly discovered. On average 4-5 cases are discovered yearly. The Forest Plan projected that 10,050 acres of lands would be consolidated through ownership adjustment. In the 10-year period, 9631 acres were consolidated. The Forest Plan projected that for the first 10 years (1998-2007) of Plan implementation, that 64 special use applications which were on file would be processed. For Special Use Applications other than for access across ARP lands in the 10 year period the lands program averaged processing 35 applications (or 350 total) including some that were on file (backlog) and the reminder new applications.

The ARP is pockmarked with abandoned mines. In 2007 important progress was made in rehabilitating abandoned mines. Several projects were completed in 2007. The Golden Age Mine Removal Action was a cooperative project involving multiple Forest Service programs. The primary objectives of the project were a) to reduce erosion and metals loading from adit discharge into Castle Gulch; and b) restore upland habitats impacted by waste rock. The Golden Age Mine is located at the headwaters of Castle Gulch, a tributary to James Creek northeast of Jamestown, CO. The Lombard Mill and Mine project was a cooperative project between the Forest Service, National Forest Foundation, Coors Miller Brewing Company and the Clear Creek Watershed Foundation. The ARP Abandoned Mine Lands program has developed a strong working relationship with the Clear Creek Watershed Foundation, a non-profit organization promoting the cleanup of orphan mining sites in the Clear Creek Watershed. The objectives of the Lombard Mill and Mine project were to a) eliminate or reduce metals loading into Cumberland Gulch; and b) the restoration of impacted wetland, riparian, and stream habitats. The Lombard Mill and Mine are located at the headwaters of Cumberland Gulch, which flows into Fall River, a tributary to Clear Creek east of Alice, CO.

The Pawnee National Grassland has utilized prescribed fire to improve mountain plover habitat and reduce hazardous fuels. The Grassland has been diligently working with its range allotment permittees to improve range condition through better cattle distribution and improved grazing systems. The Grassland staff completed a decision on managing black-tailed prairie dogs on the grassland and is working with private landowners (ranchers/farmers), grazing permittees, the environmental community, and other agencies on implementation of the decision. 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. Overall in FY 2007, 1618 acres of noxious weeds were treated.

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 approximately 67,900 hours of volunteer work in 2007.

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 Travel 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 and trail system. Increasing motorized and mechanized recreation on the ARP and minimal 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.

In 2003 the Chief of the Forest Service identified unmanaged recreation, and specifically OHV use, as one of the 4 threats to sustainable forest health. As a result, on November 9, 2005 the "Travel Management: Designated Routes and Areas for Motor Vehicle Use Rule" (aka Travel Rule) was finalized in the Federal Register. This rule requires the Forest Service to designate a system of roads, trails, and areas open to

motor vehicle use by season and vehicle type. The public will have full review of preliminary inventory and maps. This designation is completed via a Motor Vehicle Use Map (MVUM), which will be printed annually. When printed, it is a violation of Forest Service regulations to use or possess a motor vehicle anywhere not designated on the MVUM.

Several of the ranger districts on the ARP began work on their road/trail inventory in FY07. Their projected completion dates are as follows:

Sulphur	September 2007 (completed)
Pawnee	December 2007 (completed)
Canyon Lakes	December 2008 (analysis initiated)
Boulder	December 2009
Clear Creek	December 2009

Current 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." Until the MVUM is in place this regulation is enforced on the ARP via Forest Closure Order.

Forest Closure Order No. UFC-01-06 (Urban Front Country Occupancy & Use, signed 1-1-07 by Acting Forest Supervisor, Jackie Parks) prohibits "using a motor vehicle off of National Forest system roads except snowmobiles operating on at least six inches of snow." and "using any type of vehicle on any National Forest system road or trail except those vehicles that are allowed by signing on that road and trail." The order also lists by Ranger District, specific roads and trails closed to motorized vehicle travel, year-round and seasonally. Districts are implementing the above closure order, as well as working on the MVUM and planning for any needed additional closures and opportunities for motorized travel.

Limited recreation management and law enforcement funding have maintained only minimal Forest Service employee presence in the Forests and on the Grassland. This puts an undue 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.

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 tenth year report, the narratives 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 2007, 6085 acres of natural regeneration have been certified as satisfactorily restocked and 175 acres have been planted.

An average of almost 475 acres per year has been certified as regenerated over the past 10 years. Over 96 percent of the regeneration was accomplished through natural seedlings reducing the cost of this program. The need for regeneration of forested stands has dropped since 2000. The primary reason for this is that reduced levels of timber harvest in the mid to late 1990s create reduced need for stand regeneration. It is anticipated that the current mountain pine beetle mortality will increase the need for regeneration activities in the future. Funding regeneration activities that require seedlings grown in nurseries, such as campgrounds, will be a challenge.

For timber (green/salvage) offered, see Appendix B, Graph 1.

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. The rationale for lands identified as not suited for timber production in the Forest Plan was considered and the rationale continues to be valid. There is no reason to revisit the determinations at this time.

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

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

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

This CFR requires a determination that destructive insect and disease organisms do not increase to potentially damaging levels following management activities. The most damaging insect and disease organisms currently occurring on the Forest are mountain pine beetle, *Dendroctonus ponderosa,* and dwarf mistletoe, *Arceuthobium spp.*

In the late 1990's an increase in mountain pine beetle (mpb) activity in lodgepole pine (lpp) stands was noted in the Williams Fork on the Sulphur Ranger District. In 2000-2001 the mpb began to expand rapidly in the Williams Fork and increased activity was noted on other areas of the District especially near Grand Lake. District personnel began analysis to try to improve the resistance of lpp stands to mpb, reduce hazardous fuels associated with the mpb killed trees and salvage mbp killed trees. In addition the District conducted spraying operations in campgrounds to limit mpb caused mortality of lpp. By 2007 the mpb epidemic had spread throughout lpp on the Sulphur Ranger District. All efforts to improve resistance to mpb had been unsuccessful. Spraying in campgrounds and other recreation facilities continued to protect most trees; however, it was becoming apparent that this may not be a long term solution. It is hypothesized that the length of the epidemic and the high mpb numbers were primarily responsible for the failure of mitigation techniques.

There are approximately 183,000 acres of lpp on the Sulphur Ranger District (SRD). As of 2007 the epidemic has affected approximately 156,000 of those acres. It is estimated that approximately 80 percent of the lpp over 4" in diameter have been killed by the mpb on those 156,000 acres. It is likely that at least 90% of the lpp over 4" in diameter on the District will eventually be killed by mpb.

Mountain pine beetle impacts on the Canyon Lake, Boulder and Clear Creek Ranger Districts east of the continental divide increased in 2007, but are not yet as extensive as west of the divide. It is estimated that only 5 percent of the lpp stands east of the divide have been affected. However, it appears that the mpb are spreading and over the next 5 years it is anticipated that tree mortality will occur in substantial areas of the lpp stands on these districts.

The mountain pine beetle can also affect limber pine, bristlecone pine and ponderosa pine. Mortality has been observed in these species and as the mpb epidemic moves east of the continental divide the acres affect is expected to increase. There has also been some mortality of spruce caused by the high mpb population density west of the divide. Although spruce is not a host for mpb it can be attacked and subsequently killed when no suitable lpp are available.

This mpb epidemic is resulting in an altered age structure of lpp stands on the SRD. Initially substantial numbers of lpp snags are created. These snags will slowly rot, generally at the base and the dead trees will fall over in the next 20+ years. The actual rate of snag fall can be influenced by several factors. The regeneration of the forest will also begin. Lodgepole have both serotinous and non-serotinous cones. For seed to be released from serotinous cones requires a heat source. This can either be from a wildland fire or once the trees fall the cones can be sufficiently heated by radiation from the sun on the ground. Therefore, without intervention, reforestation in areas with serotinous cones will occur over time as the tree fall. Lodgepole regenerates well after stand replacement events so it is anticipated that adequate regeneration will occur over time. Timber harvest of the dead trees can speed regeneration by placing the cones near the ground. Also, in areas with existing aspen clone stands, these aspen should be able to expand due to the lpp mortality.

Fire hazard may also be modified to some degree by the mortality caused by the mpb. The year after a tree is attacked by mpb the needles die and turn red. These dead needles do not contain the same level of moisture as do green needles and are more easily ignited by a heat source. The dead needles tend to persist on the trees for several years. Also, not all trees in a stand or watershed are attacked and die at the same time. This is a multi-year event. Therefore, the period of increased flammability can last for a number of years after the initial tree mortalities from mpb. It should be noted that lpp of the size and age being killed by mpb often experiences stand replacing wildland fire. So, it is not that there was not a fire risk prior to the mpb. However, the effect of the mpb epidemic initially will be to make it more likely that a stand replacing wildland fire could occur under more moderate conditions. Once the needles fall from a

majority of the trees the wildland fire hazard should be reduced for a few years. Then as a majority of the dead trees fall the fire hazard will increase again. Under this situation the type of wildland fire would more likely be a ground fire, which could result in increased damage to soils due to the heavy fuel concentration close to the ground.

Dwarf mistletoe is wide-spread throughout lodgepole pine and ponderosa pine stands on the Forest. Some removal of dwarf mistletoe infested lodgepole pine trees within timber sale contract areas has been done.

The occurrence of both of these organisms occurs naturally in forested area and has not been shown to be a result of management activities.

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

The Forest continues to experience a small isolated outbreak of *Ipps* beetle on hazardous fuels reduction projects on the Canyon Lakes Ranger District. The primary area of infestation appears to be adjacent to the Bobcat wildfire.

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

Using the Region 2 MIS selection process as a guide, a reevaluation indicated that revision of the 1997 MIS list was most appropriate to assure that all MIS were able to be monitored during the life of the Forest Plan, and were meaningful indicators of management effects to habitat condition or change (*Environmental Assessment for Forest Plan Amendment for Management Indicator Species*, 2005). The Forest Plan was subsequently amended to remove 13 species due to inability to monitor and 5 species as not being meaningful indicators of management actions. MIS population data through 2004 were available and used in the reevaluation and a Forest Plan amendment was approved in early 2005. The amended MIS list of May 3, 2005 follows.

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

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

Population Trends of MIS for ARP

As stated above, monitoring was done in cooperation with State fish and wildlife agencies, organizations, and universities to the extent possible. For PNG species, a combination of state, forest, university, and contract (Rocky Mountain Bird Observatory- RMBO) data was used. For ARNF/PNG big game species, estimates are based on Colorado Division of Wildlife (CDOW) post-hunt population estimates. Boreal toad population data was collected by a variety of agencies, all members of or accepted by the Boreal Toad Recovery Team. For MIS bird species, RMBO transect data were most commonly used over the past 10 years. RMBO has agreed to provide the ARP with a detailed analysis of the data collected and it should be available in 2009, making it a useful tool for analysis for future ARP Monitoring and Evaluation Reports. The tables containing the data from all the various efforts are located in Appendix **A** of this document.

MAMMALS

Elk

- ARNF population trend has varied from 1997-2007 with a population high of 20,770 in 2007 and a low of 18,823 in 2006. The 10 year average for herds in and near the ARNF is 20,032 animals.
- Colorado population estimates varied with a high of 305,500 in 2001 and a low of 218,500 in 1997. The state-wide 10 year average is 247,372.

Mule Deer

- ARNF population trend has varied from 1997-2007 with a population high of 48,300 in 1998 and a low of 37,294 in 2006. The 10 year average for herds in and near the ARNF is 43,202 animals.
- PNG population trend has varied from 2000 to 2007 with a population high of 2,040 in 2007 and a low of 1,450 in 2004. Years 2001-2004 saw decreases while 2005 – 2007 experienced increases. The 7 year average for PNG animals is 1,739.
- Combined, the ARNF/PNG had an estimated population high of 45,430 in 2002 and a low of 39,144 in 2006. The 7 years average for the combined herds is 5,980
- For Colorado, population trend was generally upward 1997-2007, with an estimated population high of 602,700 in 2003 and a low of 516,500 in 1997. The ten year state-wide average is 564,921 animals.

Bighorn Sheep

- ARNF population trend has varied from 1997-2007 with an estimated population high of 1,480 in 1999 and a low of 1,105 in 2008. The 10 year average for herds in and near the ARNF is 1,255 animals.
- For Colorado, an estimated population high of 7,720 in 1997 and an estimated low of 7,040 animals in 2008 makes for a statewide ten year average of 7,409.

Black-Tailed Prairie Dog

- The highest acreage in 25 years occurred in 2005, totaling 3673 acres. Three plague events occurred after the towns were surveyed in 2005, resulting in a loss of about 1/3 or a year-end total of about 2460 acres.
- From 1981 to 2008, acres of towns have varied between a low of 179 acres in 1983 to a high of 3673 acres in 2005. The average acres of towns for that 27 year period are 956 acres. The number of prairie dog towns has varied with a high of 61 towns in 2007 and a low of 13 towns in 1984; the average is 23 towns; reductions were primarily caused by plague events.
- According to the Colorado Division of Wildlife et. al., the number and size of prairie dog towns present best indicate population levels.

BIRDS

Burrowing Owl
Estimates have generally been increasing between 1998 and 2007 with 1999 and 2007 being the only years to show a decrease. 2006 saw the highest estimate with 596 owls detected and 1998 was the lowest with 122 owls. The 10 year average is 247 owls.

Mountain Plover
Estimates have varied between 1990 and 2007 with an estimated high of 77 birds in 1990 and a low of zero birds in 2004. The 18 year average is 19 birds. The periods of 1994 to 1997 and 2001 to 2004 saw significant decreases.

Ferruginous Hawk
RMBO transect data indicates an estimated high of 3 birds detected in 2003 and a low of zero birds detected in multiple years. The ten year average is 0.9 birds and 0.7 transects with detections per year. The PNG has conducted surveys for active nests from 1981 to 2007 and has had a high of 15 in 1991 to a low of 3 in 2003. The average for this 27 year period is 9.2 active nests per year.

Golden-Crowned Kinglet
Estimates have varied between 1998 and 2007 with an estimated high of 25 birds in 2007 and a low of zero birds in 2003. The 10 year average is 11.7 birds and 5.3 transects with detections per year.

Hairy Woodpecker
Estimates have varied between 1998 and 2007 with an estimated high of 17 birds in 2007 and a low of zero birds in 2003. The 10 year average is 8.10 birds and 2.2 transects with detections per year.

Lark Bunting
Estimates have varied between 1998 and 2007 with an estimated high of 465 birds in 2007 and a low of 121birds in 2002. The 10 year average is 212 birds and 3.2 transects with detections per year. Note that no transects were read in 2006.

Mountain Bluebird
Estimates have varied between 1998 and 2007 with an estimated high of 24 birds in 2007 and a low of zero birds in 2000. The 10 year average is 8.5 birds and 3.2 transects with detections per year.

Pygmy Nuthatch
Estimates have varied between 1998 and 2007 with an estimated high of 39 birds in 2007 and a low of zero birds in 2003. The 10 year average is 11 birds and 2.6 transects with detections per year. Note that transects in typical habitat (ponderosa pine) were not read in 2003.

Warbling Vireo
Estimates have varied between 1998 and 2007 with an estimated high of 60 birds in 2000 and a low of 2 birds in 2003. The 10 year average is 41.3 birds and 6.8 transects with detections per year.

Wilson's Warbler
Estimates have varied between 1998 and 2007 with an estimated high of 74 birds in 2007 and a low of one bird in 1998. The 10 year average is 19 birds and 3.3 transects with detections per year.

AMPHIBIANS

Boreal Toad
Approximately 18 sites are monitored on the ARNF and approximately 6 are monitored in nearby Rocky Mountain National Park. Despite the discovery of new breeding sites in both locations, survey data indicate a downward trend in and near the ARNF.

FISH

Brook trout - trend appears to be stable or upward on ARNF

Brown trout - trend appears to be stable on ARNF

Greenback cutthroat trout - breeding populations are low but trends appear to be stable on ARNF

Colorado River cutthroat trout - breeding populations are low but trends appear to be stable on ARNF

Plains topminnow - trend appear to be stable on the PNG

Plains killifish - trend appear to be stable on the PNG

See Appendix A for tables 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.

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

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

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

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

There have been 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 decommissioned 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.

There are many large and small areas that have been designated and managed for off-highway vehicles (OHV's). On the Pawnee National Grassland the Main OHV Area serves as the OHV focal point on the grassland and receives use throughout the winter when other areas are snowed-in. On Sulphur Ranger District, there is the Stillwater OHV Trail System, which provides a variety of road and trail connector routes for a comprehensive and varied OHV experience. On the Canyon Lakes Ranger District there are some small and several large areas with well established and managed OHV routes. These include The Roach, Cherokee Park, Chicken Park, Deadman, Crown Point, Crystal Mountain, Pole Hill, Johnny Park, and Pierson Park areas. The Districts also have a high quality publication with maps of these areas titled "Canyon Lakes Ranger District, Roosevelt NF, OHV Routes."

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

WILDLIFE:

There is more off-road use or use of unauthorized roads (identified as "ways" in the Forest Plan, basically, user-created roads) than estimated in the Forest Plan. Accordingly, this may result in higher amounts of human disturbance to both wildlife and their habitats, than predicted in the Forest Plan. Forest-wide, measures have been taken to decrease the miles of open roads (authorized or not) and the amount of damage to habitats. For example, through the fuels reduction and timber salvage (due to mountain pine beetle epidemic) planning processes, interdisciplinary teams are using this opportunity to look at the transportation systems across large landscapes and identifying/ analyzing the actual needs. To implement rehabilitation projects, several disciplines are pooling resources (money/people/time) to accomplish several objectives and stretch limited funds. Although strides are being taken, the issue is far from manageable and as public use of the forest increases, it will be difficult to control unauthorized use.

WATERSHED AND FISHERIES:

Off-road vehicle use, of both roads and trails as well as unauthorized use off designated travel-ways,

continues to be a significant chronic source of erosion and sediment that degrades water quality throughout the Forest. Increased vegetation management has the potential to contribute to this as temporary roads and trails are used to access project areas. It is difficult to effectively close these roads from OHV use following treatment, and some can become additional unauthorized trails. Both authorized and unauthorized off-road vehicle use is expected to continue to increase, adding to watershed impacts.

Areas of particular concern are those areas such as the Left Hand Canyon and Bunce School areas on the Boulder Ranger District, where concentrated use has denuded much of the area of vegetation. Rehabilitation efforts have been and continue to be implemented in the Left Hand area to repair damaged areas. In 2007, two miles of routes within the Left Hand area were closed and rehabilitated. Post and cable was installed along open roads and trails to define the routes and limit road braiding. In addition, the 'Sandbox' OHV play area, in the Bunce School area, was fenced and rehabilitated.

Watershed improvement projects have been used to address effects of off-highway vehicle use in other areas. In 2007, 1.5 miles of roads were decommisioned in the Crimson project area, located in the Williams Fork drainage of the Sulphur Ranger District, as part of an ongoing project that has decommisioned nearly 30 miles of road.

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

RECREATION:

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

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

In 2003 the Chief of the Forest Service identified unmanaged recreation, and specifically OHV use, as one of the 4 threats to sustainable forest health. As a result, on November 9, 2005 the "Travel Management: Designated Routes and Areas for Motor Vehicle Use Rule" (aka Travel Rule) was finalized in the Federal Register. This rule requires the Forest Service to designate a system of roads, trails, and areas open to motor vehicle use by season and vehicle type. The public will have full review of preliminary inventory and maps. This designation is completed via a Motor Vehicle Use Map (MVUM), which will be printed annually. When printed, it is a violation of Forest Service regulations to use or possess a motor vehicle anywhere not designated on the MVUM.

Current 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." Until the MVUM is in place this regulation is enforced on the ARP via a Forest Closure Order.

Forest Closure Order No. UFC-01-06 (Urban Front Country Occupancy & Use, signed 1-1-07 by Acting Forest Supervisor, Jackie Parks) prohibits "using a motor vehicle off of National Forest system roads except snowmobiles operating on at least six inches of snow." and "using any type of vehicle on any National Forest system road or trail except those vehicles that are allowed by signing on that road and trail." The order also lists by Ranger District, specific roads and trails closed to motorized vehicle travel, year-round and seasonally.

Districts are implementing the above closure order, as well as working on the MVUM and planning for any needed additional closures and opportunities for motorized travel. This is an ongoing process.

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

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

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

The most obvious effects to communities occur during wildfire outbreaks. Over the first six years of Forest Plan implementation, the ARP was in drought conditions. These conditions led to numerous wildfires, which unfortunately consumed not only publicly owned resources but also private structures and property. To address this the Forest Service launched an effort to treat the hazardous fuels, which have built up over years of fire suppression and reduced vegetation management activities. 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 2007 hazardous fuel reduction planning has been completed on almost 80,000 acres. Between 2002 and 2007 over 39,000 acres had been treated to reduce hazardous fuels on the mountain districts, primarily in the wildland urban interface.

Insect outbreaks such as those around Lake Granby are changing the look of the forested lands from green live trees to orange or grey dead trees. Many private homes are located in or near these mountain pine beetle infested areas. All mountain districts on the ARP are implementing projects to treat beetle-infested trees. Through public involvement these homeowners and other interested publics and agencies helped to determine the best method to treat this infestation.

Recreation is the other obvious large impact on communities near or adjacent to the National Forests and Grassland. Communities reap many benefits, both economically and socially, from visitors to the ARP.

However, there are also impacts to these communities when excessive or inappropriate visitor use affects these communities' quality of life (crowding and 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.

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 2007 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. The 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 10 years, except in areas of the mbp epidemic. 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. Since 2002 an average of 6,000 acres of hazardous fuels has been treated. 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 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 achieved the expected 3 (minimum number of) annual projects per year.
- Expectations of riparian restoration, structural improvements and habitat protection have not been fully realized due to limited funding and other priority habitat treatments.
- Aspen regeneration and reduced conifer encroachment in openings have mostly been realized as expected through design of fuels/timber management projects.

FORESTED RESOURCE:
The Allowable Sale Quantity (ASQ) for the first decade is approximately 6.7 mmbf (135,000ccf). Timber sold in the first decade was approximately 135,000 ccf. Over 92,000 ccf was sold on the Sulphur Ranger District with over 75,000 ccf of salvage associated with the mountain pine beetle epidemic. Future timber

harvest on the Sulphur Ranger District is anticipated to primarily be salvage of lodgepole pine killed by mpb. Once the merchantability of the mpb killed lodgepole is reduced the volume sold on this district will diminish substantially.

Timber volume sold on the Front Range Districts, primarily the Canyon Lakes Ranger District has been at levels below the ASQ. This is primarily due to the low value of timber and current timber market conditions. From 2004 through 2007, sales with approximately 39,000 ccf of volume were offered, but received no bids on the Canyon Lakes Ranger District. At this time there is no reason to revisit the ASQ.

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. In addition, lack of accomplishments in these areas reflect other higher priorities.

- Recreation Special Uses, Heritage, Interpretation and VIS, Landscape/Scenery Mgt., and Accessibility programs are also subsets of the overall recreation program as are Developed Recreation, Wilderness and General Forest Areas.
- Maintenance activities were not recognized as high importance (no objectives) but new construction, reconstruction, and rehabilitation were. However, funds for new construction are very limited. A lot of the work of the Recreation program involves maintenance, yet it has no Forest Plan connection for tracking these accomplishments.
- Public contact for information, education, prevention and enforcement purposes is very important and a desired workload.
- Interpretation and education functions are also important but not part of our Forest Plan monitoring system.
- Volunteer coordination is a function that results in some kind of recognized reportable activity but is rarely viewed as an activity unto itself, yet much of our dollars and efforts are spent working with volunteers.
- The allotted budget for the Recreation program is below predictions shown in the Forest Plan. The program has been 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:
Some of the Forestwide goals and objectives have been met and others are not being met on an annual basis. See page 8 of the Forest Plan. Human Uses Objectives 6 and 9 need to be reevaluated for their continued appropriateness considering National trends and new transportation system management philosophies. Yearly budget allocation, competing priorities for the ARP as well as the long public process to bring polarized users into grudging agreement substantially lengthens the planning process.

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

WATERSHED:

Effects of management – Watershed conservation practices found in the 1997 Revised Forest Plan standards and guidelines have largely been effective in protecting water and riparian. In 2005 the regional Watershed Conservation Practices Handbook was updated for clarity and increased utility. Monitoring of the previous conservation practices has indicated protection or improvement of resource conditions for a variety of projects. Where conservation measures were found to be ineffective, it was typically because they were incorrectly or not applied, or because activities occurred during implementation that were not foreseen during project planning, so that appropriate conservation measures were not prescribed.

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.

LANDS:
Fuels funding has supplemented the boundary budget to enable some accomplishment to meet Forest Plan objectives for conflict free boundaries. In addition, the 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.

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

The mountain pine beetle epidemic, starting on the Sulphur Ranger District and moving to the other mountain ranger districts, has increased the amount of dead trees in developed recreation sites. This can pose a hazard to visitors. Prevention (spraying) and mitigation (tree removal) of these hazard trees is an ongoing process and is a substantial cost to the ARP recreation program.

AIR:
The long-term synoptic lake sampling program is in its thirteenth 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.

An ozone monitoring program was established in 2007. Five passive samplers and 1 active sampler are located within the Front Range Air-shed.

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.

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

There are no goals, objectives, standards or guidelines for the heritage resource. Much of what guides the work done in this area is guided by law. However, laws do not cover all aspects of the heritage resource program and it is left up to the individual line officer to decide what work will be done.
There is no funding for project monitoring, thus, it has not been determined how well mitigation direction is being followed as stated in the project NEPA documents.

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. 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.

An exception to this is in lodgepole pine stands on the Sulphur Ranger District. As discussed previously mountain pine beetles (mpb) have killed large areas of mature lodgepole pine west of the continental divide including old growth lodgepole pine stands. The Forest Plan goals for age diversity in lodgepole pine can not be achieved due to the mpb epidemic. However, this is a natural process in lodgepole pine and will create large expanses of lodgepole pine and aspen seedlings.

Old growth of all conifer types has been largely retained over the past 10 years, even with recent wildfires except in areas of the mbp epidemic. 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 of high fire hazard acres 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 completed in FY03 to assure that locations are known, and to allow for planning and implementation according to Forest Plan direction. The 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. It appears that the mpb is moving east of the continental divide. If epidemic levels of mbp are reached in this area in the future there may be adverse affects to mature stands of ponderosa pine, limber pine, and bristlecone pine.

On the PNG increases have occurred in grassland mid-structure grasses especially due to several wet seasons. Revised grazing management plans for 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 in reducing these impacts. 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 so, a reduction in roaded area tends to benefit soil, water and aquatic resources. Roads that have the greatest impact to watershed resources are those that are located immediately adjacent to or in 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 13 miles of old timber sale roads were obliterated in the Crimson project area of the Sulphur Ranger District and 1.5 miles on the Canyon Lakes Ranger District. It should be noted that hundreds of miles of roads adversely impacting watersheds remain and that while the Forest has annually decommissioned roads, it has been unsuccessful in reaching the objective of decommissioning approximately 44 miles of road per year stated in the Forest Plan.

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 unauthorized 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 difficult. Numbers of unauthorized routes appears to be increasing every year. An average of 30% of the expected Forest Plan objective of 44 miles of closures per year (Forest Plan, p. 4) is being realized that improve habitat effectiveness.

However, some positive measures have been taken to improve the on-going issues of travel management and wildlife. Some examples include the extensive rehabilitation and law enforcement efforts in the Left-hand Canyon area of the Boulder Ranger District. In addition, the Sulphur Ranger District has incorporated hundreds of miles of road closures into their planning processes and has signed decisions that incorporate those closures. All across the forest and grasslands, specialists are pooling their time, personnel, volunteers, and money to accomplish projects that restore and protect a variety of important resources, including TES habitats. At the forest level, the on-going development of Motor Vehicle Use Maps for each district will direct forest users to authorized and legal roadways.

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 except in areas of mpb epidemic as previously discussed. In 2002 the ARP acquired approximately 2700 acres in the Evergreen, Colorado area from the City of Golden (Beaver Brook acquisition). This land serves as an important wildlife refuge and as one of the last remaining intact low-elevation, forested ecosystems along the Front Range of Colorado offers a high potential to develop into low-elevation old growth.

On the west side of the Forest, the Forest Service has acquired lodgepole pine old growth through the Wedge Parcel/Fahy Parcel land exchange. This property is located between the congressionally designated Bowen Gulch Protection Area and the western boundary of Rocky Mountain National Park. The acquisition of this property assures that important old growth will not be developed.

In addition to land exchanges/acquisitions, vegetation management has contributed to increased amounts of old growth. Development of future low-elevation old growth is occurring by reduction of forest fuels in fuels treatment areas along the Front Range. Implementation (of fuels reduction projects) is underway which will allow us to achieve the Forest Plan objective of treating about 7000 acres of high fire hazard per year. Due to increased awareness and survey efforts, 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 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 completed in FY03 to assure that locations are known, and to allow for planning and implementation according to Forest Plan direction. The 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.

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.
- As the mountain pine beetle epidemic progresses, the designation and management of existing and future old growth should be addressed.

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)

Habitat improvement projects have generally protected, restored and enhanced habitat for TES species. Examples of projects in both protection and enhancement are: installation of barriers and removal of non-native trout from cutthroat streams, enhancement of aspen and old growth stands, prescribed burning to benefit habitats, in particular mountain plover nesting and bighorn sheep habitats, rehabilitation of wetlands, monitoring of Preble's meadow jumping mouse Critical Habitat, and travel management to

protect the habitats of lynx, plover, native cutthroat trout, boreal toads, nesting raptors and numerous other TES species across the PNG and ARNF.

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. Annual accomplishments have been variable as funding fluctuates from year to year but the minimum level expected (3 projects per year) has always been accomplished.

Recommendation: Given the high emphasis for biological diversity committed to in the Forest Plan, increased effort and funding in this area is appropriate. Opportunities include working with partners; accomplishing required NEPA through other project goals and objectives (fuels reduction/timber/recreation), restoring riparian and OHV damaged 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/inclusive access management (see off-road and travel management discussions), especially 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)

The Air Quality Related Values (AQRVs) identified in the FEIS of the Forest Plan are: soil, flora, fauna, water quality, and visibility. Forest personnel have not taken any direct action to improve air quality related values. In general, the forest is a recipient of pollution from adjacent areas. With the exception of prescribed burning, forest activities do not produce large amounts of pollution.

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 2007.

Progress continues to be 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. Control of the Forest's emissions in connection with fuels management activities has been implemented in compliance with the State of Colorado.

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 sampled twice in 2007. Lake sampling was completed with the assistance of Bob Musselman and other staff of the Rocky Mountain Research Station (RMRS). Currently, the RMRS is compiling this data for future analysis and publication. Currently, lake water quality data is being used to help assess baseline levels as well as trends in lake chemistry on the forest and how they reflect impacts from off-forest air pollution.

In 2007, ozone monitoring was added to the Forest's air quality program, when five passive ozone monitors were installed throughout high elevation areas of the Forest. This monitoring is also being accomplished in cooperation with RMRS.

The ARP continued to work with Regional Office staff and adjacent land managers such as Rocky Mountain National Park to evaluate impacts from increases in ambient ozone concentrations and other pollution and to recommend mitigations to minimize those impacts. Baseline information on high elevation lake water quality, visibility data and other sources of air quality information continued to be used by the Regional Office to provide comment and review of Permits for Significant Deterioration (PSD).

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)

ARP personnel continue to model and estimate smoke emissions. Methods, including the use of the Simple Approach Smoke Estimation Model (SASEM), include measurements; smoke analysis, and impacts assessments for individual prescribed fire projects. These data are currently tracked (since 1997) and recorded in project files and annual spreadsheets and have also been compiled as part of the State of Colorado Smoke Permit process. Progress has not been made to develop an emissions budget for the Forest because the primary source of emissions of concern is smoke from prescribed burning. The Forest complies with regulation through the State air quality permitting process. Emission of other air pollutants generated by forest activities are well below National Ambient Air Quality Standards and development of an emission budget is not warranted.

Recommendation: This objective is unnecessary as described above and should be eliminated.

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)

Incremental progress continues to be made through watershed improvement projects, facilities improvement projects, and through changes in grazing management. One sixth-level watershed has been improved in condition enough to change its condition class from non-functional to functional-at-risk.

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

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.

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 mapping unit is not the scale where a determination of function is appropriate. This determination generally occurs at the activity area scale during project planning. Forest staffs are working on evaluation of soil conditions and improvement of the implementation of water and soil conservation practices during project activities at this scale.

Recommendation: This objective needs to be re-evaluated in the context of the updated Watershed Conservation Practices Handbook and changed to better address the issues of soil productivity, hydrologic function and watershed health described there.

Air, Soil, and Water: Stream Flows	Has the Forest made progress toward obtaining (through negotiation, trade or purchase) stream flows to sustain aquatic life and maintain stream processes on up to 5 reaches of stream channels? What were the most effective and cost efficient methods? (Biodiversity; Air, Soil & Water - Objective #8)

The Forest has minimally achieved this objective through the completion of an easement with the City of Boulder for the Lakewood pipeline in 2002. No facilities that have required streamflow protection have been authorized or re-authorized since 2002.

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

Progress has been made through the implementation of watershed improvement projects, road decommissioning, and abandoned mine reclamation, although the pace has been more moderate than the 49-160 acres annually listed in the Forest Plan objectives. Annual accomplishment in 2007 was 37 acres. Determining the effectiveness of improving State-listed streams is more problematic. The State lists stream segments that are not fully supporting State-designated uses on a list that is referred to as the 303(d) list. When the Plan revision was completed, there were 12 stream segments on the Forest that appeared on the list. On the most recent list, the 2006 303(d) list, only 6 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.

Various abandoned mine reclamation projects were completed in 2007. The Lombard Mine and Mill project, located east of Alice, CO, had two primary objectives, which were to a) eliminate or reduce metals loading into Cumberland Gulch; and b) the restoration of impacted wetland, riparian, and stream habitats. Cumberland Gulch flows into Fall River, which is a tributary to Clear Creek. The Golden Age Mine project objectives, where were a) to reduce erosion and metals loading from adit discharge into Castle Gulch; and b) restore upland habitats impacted by waste rock. Castle Gulch is a tributary to James Creek located northeast of Jamestown, CO.

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

Vegetation: High Fire Hazard	Has the Forest made progress toward reducing the number of high fire hazard, high value, and high and moderate risk acres? How was this accomplished? What was the most effective method? (Biodiversity; Vegetation - Objective #11)

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

The annual average accomplishment for the ten years of the Forest Plan is almost 4700 acres/year and falls within the Forest Plan stated 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. However, since 2003 with the development of the Front Range Fuels Treatment Partnership hazardous fuels reduction has averaged almost 7700 high fire hazard acres per year. In FY 2007 almost 11,400 acres were treated.

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

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

kiosk was installed on Mt. Evans and the Dos Chappell Interpretive Nature Center building was constructed and opened at the Mt. Goliath Natural Area along the Mt. Evans Scenic Byway. The Recreation Facility Analysis was completed in 2007.

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

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; Brainard Lake Recreation Area, Left Hand Canyon, Lefthand OHV Area, and South Saint Vrain Canyon of the Boulder Ranger District; and the Mt. Evans Road corridor, Barbour Forks area and the Fourth of July Road corridor on the Clear Creek Ranger District.

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

In addition, in 2005 the Boulder Ranger District completed the Brainard Lake Recreation Management Plan and Environmental Assessment for Brainard Lake Recreation Projects. Implementation design began in 2006 and continues.

The Front Range Sport Shooting Partnership was established in 2007. This Partnership with the ARP as a founding member, has a mission to develop and expand a framework of cooperation among federal, state, and local partners to enhance shooting sports opportunities in a safe and environmentally sound way along the Front Range of Colorado.

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

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

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

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

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

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

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

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

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

Travel Management	Have priorities been established and implemented for managing travel to best meet future travel and access needs of Forest users? How has this been accomplished? (Human Uses, Travel Management - Objectives #6, #7, #8, #9, #10, #11)

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

priorities, personnel downsizing, as well as the long public process to obtain informed consent among polarized users.

On November 9, 2005 the "Travel Management: Designated Routes and Areas for Motor Vehicle Use Rule" (aka Travel Rule) was finalized in the Federal Register. This rule requires the Forest Service to designate a system of roads, trails, and areas open to motor vehicle use by season and vehicle type. The public will have full review of preliminary inventory and maps. This designation is completed via a Motor Vehicle Use Map (MVUM), which will be printed annually. When printed, it is a violation of 36 CFR 261.13 and .14 to use or possess a motor vehicle anywhere not designated on the MVUM.

All the ranger districts on the ARP began work on their road/trail inventory in FY06. Their projected completion dates are as follows:

Sulphur	September 2007 (completed)
Pawnee	December 2007 (completed)
Canyon Lakes	December 2008 (work initiated)
Boulder	December 2009
Clear Creek	December 2009

As stated above, 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." Until the MVUM is in place this regulation is enforced on the ARP via a Forest Closure Order.

Forest Closure Order No. UFC-01-06 (Urban Front Country Occupancy & Use, signed 1-1-07 by Acting Forest Supervisor, Jackie Parks) prohibits "using a motor vehicle off of National Forest system roads except snowmobiles operating on at least six inches of snow." and "using any type of vehicle on any National Forest system road or trail except those vehicles that are allowed by signing on that road and trail." The order also lists by Ranger District, specific roads and trails closed to motorized vehicle travel, year-round and seasonally.

Districts are implementing the above closure order, as well as working on the MVUM and planning for any needed additional closures and opportunities for motorized travel.

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 ongoing travel management planning projects. 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 developed 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 (e.g., hazardous fuels analysis) such as

on the Sulphur and Canyon Lakes Ranger Districts, however, with the completion of planning in 2005 for the Left Hand area on the Boulder Ranger District a smaller scale travel management project was accomplished.

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

In 2005 the Travel Rule was issued which required the designation of roads, trails, and open areas to motor vehicle use by vehicle class and time of year. This rule provided for a national framework to complete the designation while allowing for local decisions. The ARP has established a 5-year timetable to complete the initial publication of the motor vehicle use map. A major portion of the work will be to establish the baseline transportation systems of roads, trails, and open areas. Most Districts have various travel management plans completed at the projects level and these decisions will form the baseline of the development and implementation of the Travel Rule.

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

Road closures are covered under multiple activities which include the soils program, wildlife program, fuels vegetation program, and the travel management program. The accomplishment and funding of these closures has varied each year based on the various program objectives. Most of the reason for not meeting a higher outcome is in the requirements of the RAP process, complexity/controversy involved in the public involvement, and the general decrease in funding across most program areas. In particular the roads program has seen a reduction in road maintenance funding for 5 of the past 6 years. Despite these challenges the ARP remains committed to the decommissioning of unnecessary authorized and unauthorized routes.

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

The ARP has not met Forest Plan objectives for new open system road construction. National emphasis has not been for new road construction, but is toward maintaining and/or improving the existing road

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

On-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. Inventorying and performing road deferred maintenance surveys of all Maintenance Level 3 to 5 continues with a goal of doing these surveys on a reoccurring five year cycle. The ARP personnel doing the on-going management activities are continually monitoring, evaluating and prioritizing the work for following years. The ARP has not met the Forest Plan objectives for maintaining system roads.

Land Uses and Ownership

Boundary Mgt., Access and Land Ownership Adjustments	Has the Forest made progress toward improving boundary management, access, and land ownership adjustments to protect and enhance Forest and Grassland resources and to increase management efficiencies? Which approaches have been effective? (Land Uses & Ownership, Boundary Mgt., etc. - Objective #1, #2)

Identification of boundary lines has averaged almost 28 miles per year in the ten years being reported. With the increased population and the demands for recreation, the ARP is experiencing dramatic increases in use which causes increasing problems of trespass, encroachment and loss of access by the public. However, the boundary line program emphasis has shifted to support the hazardous fuels reduction program. Boundary location work is now performed by a mix of service contracts, force account and through agreements with the Bureau of Land Management. The ARP program is managed by a Forest land surveyor who accomplished 24 miles of boundary line identified while maintaining 9 miles in 2007. This exceeds the maximum Forest Plan objective for identifying boundary line.

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. With the 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.

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)

More progress has been made to reduce the special uses backlog in 2007 than in previous years.

Accomplishments in land ownership adjustments made in Fiscal Year 2007 (FY 07) included:

- Telluride Regional Airport Land Exchange (20 acres)

Ongoing work in land ownership adjustment for FY 07 included:

- Hahn Land Exchange
- Cervi Land Exchange
- Estes Park Administrative Site Conveyance
- York Small Tracts Act Project (includes 14 parcels)

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 was implemented nationally in FY 06. In FY 07, the ARP collected approximately $7000 in cost recovery fees, which are carried over into the next fiscal year.

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

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

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

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

RECREATION

Ongoing or Emerging Issues

- The "300 foot rule" currently allows motorized use 300 feet off any designated Forest Road for dispersed camping and other recreational purposes. Some forest visitors have been extending unauthorized roads beyond the 300-foot limit causing a cumulative creation of new unauthorized roads where none were planned. This has created sanitation and erosion problems, and also creates confusion resulting in users not knowing where the travel route legally ends. In addition, enforcement is currently based on adequate road and trail signing in the field and has not proven effective to stop motorized incursions into the forest because signs are easily damaged or entirely removed. The National Motor Vehicle Use Maps, as they are developed, will help to direct visitors to the legal system of motorized roads and trails.
- Renewed emphasis in inventory and data management (INFRA database) of Developed Recreation Sites, Trails, Wilderness Areas and General Forest Areas, as well as real property

inventories for all Recreation Facility assets has created a higher than expected workload and cost to the agency, both in terms of dollars and opportunity cost of not doing other necessary work.

- Prior to December 8, 2004, the Recreation Fee Demo (RFD) program brought some positive effects to the public but it also created some negative issues. Now with the Federal Lands Recreation Enhancement Act of 2004 (REA), a small but very vocal segment of the public has used the program as a poster child for protesting fees, government management authority over public lands, taxes, and general fairness issues.
- The Forest Service commitments made through Memorandum of Understanding (MOU) with groups like the Continental Divide Trail Alliance and the Colorado Fourteeners Initiative can establish partner expectations for funding, planning, and project implementation that the Forest or Districts may or may not be capable of upholding. Certain negotiation aspects are outside local control and we are faced with timing issues, funding issues and issues of other higher priority work which often conflict with partner expectations.
- Costs of providing safe drinking water that meets State standards and regulations are rising sharply. Microscopic Particulate Analysis testing for all water systems is now on a 3- year cycle and costs between $1,500 - $2,000 each test. Some campgrounds and picnic areas do not collect enough revenue to offset these costs.
- Carrying capacity for specified recreation areas that are undergoing planning processes are needed to help plan for existing and future human use.
- Recreation use in the urban front country is increasing rapidly, as are the corresponding impacts and conflicts between users. Urban front country areas need to be assessed for their capacity to provide specified recreational experiences and not to provide others. This assessment should then lead to management changes on the ground in the future.
- Epidemic conditions of the mountain pine beetle have created very dire conditions in many of our developed site campgrounds and picnic areas.

Recommendations

- The "300 foot rule" stated on the Forest Map has been incorporated into the 2005 Travel Rule, however, the ARP needs to do site-specific decisions in areas of concentrated dispersed use.
- Capacity issues, in some areas, need to be addressed.
- Travel management planning and decision-making needs to occur as the ARP is doing the Motorized Vehicle Use Map for lands in its jurisdiction.
- Additional Wilderness management elements need to be attained as well as additional Wilderness areas managed to standard.
- Special-use permits need to be administered to minimum standards, and more need to be administered fully.
- INFRA databases for Wilderness, Developed Recreation and Trails should be fully populated and operating at a functional level. INFRA for General Forest Areas will most likely be in some phase of implementation.
- More "field presence" is needed to educate the public and enforce regulations. The Forest Service "field presence" personnel should have training to be certified as Forest Protection Officers.
- James Peak Wilderness issues and obligations need to be met.
- Consider converting some small campgrounds and day-use areas to dry-sites (no developed water system) as circumstances allow.
- Plan to address carrying capacity as part of management planning and/or environmental analysis for recreation areas undergoing some kind of existing planning process or potential planning based on need or demand.

- Assess ARP urban front country areas for their capacity to provide specified recreational experiences and determine what experiences are better provided in other locations on the Forest or on other lands.
- We need to increase protection measures for existing stands of healthy trees in our developed sites and begin vegetation management planning for eventual stand vegetation replacement and in some cases, catastrophic vegetation loss replacement.

TRAVEL MANAGEMENT

Ongoing or Emerging Issues

- The cost and time to complete travel management planning is higher than expected. This is due to the high levels of public interest and opposing viewpoints on what type and how much of a travel system is needed to serve public and administrative needs. Concern is developing about meeting Forest Plan objectives due to higher planning costs and having to "re-close" previously closed roads and trails. The increasing cost of planning is diverting funding from on-the-ground transportation system improvement, maintenance and decommissioning.
- Many new travel routes are being established through "social" use and illegal travel activities. In some instances, users are constructing trails and then coming to the forest and asking that the forest add the new trails to our "system" and demanding that we maintain the trails. Many times, these requests are the first we know of the "new" facilities. Some liability issues could be associated with these new, illegal facilities.
- The Forest Service has declared itself a public road agency and is taking steps to identify previous non-public roads as public. The Public Forest Service Road program will have a significant affect on the management of the Forest and Grassland road transportation system.
- Upkeep of transportation system inventory information, including needed, planned and accomplished annual and deferred maintenance will require more time and effort.
- The Forest Service published the Travel Rule in November, 2005. This rule directs that OHVs will be allowed only on designated OHV routes (roads or trails) on all National Forest lands as shown on the Motor Vehicle Use Maps of each Ranger District.

Recommendations

- Continue to make the requirement of the Travel Rule a Forest priority.
- Continue to follow the Travel Analysis Process (TAP) for travel management recommendations.
- Continue to improve relationships with volunteer groups and aggressively seek out challenge cost share projects.
- Continue to sign roads and trails for the types of uses allowed.
- For roads that are decommissioned, an explanation of why this was necessary should be clearly displayed in the field to help deter future trespass.
- Minimize illegal use through expanded law enforcement and field presence. There is need for aggressive law enforcement and follow up on the districts where the transportation system is being actively signed and managed. The "closed unless designated open" regulation should be actively enforced.
- Work with the public and adjacent landowners to inform them of Arapaho and Roosevelt National Forests and Pawnee National Grassland travel regulations.
- Establish a method to more adequately plan and track accomplishments and utilization of funds allocated for "ongoing" activities.

- The Forest and Grassland should make a commitment to transportation planning and facilitate its completion. On a forest wide basis, prioritize the areas where the forest will address travel management in association with landscape analysis or on broad project areas. Incorporate travel management planning and the RAP process with other area or project level assessments and analyses for best efficiency. Proceed with planning and implementation based on those priorities.
- Evaluate Human Uses Goals #6 for applicability to present National Policy and the transportation needs of the Forest and Grassland. National policy leans more toward decommissioning unauthorized roads than converting them to authorized roads. Decisions should be based on sound RAP procedures.
- Evaluate Human Use Goal #9 for applicability to present National Policy and the transportation needs of the Forest and Grassland. National Policy leans more toward reconstructing and maintaining our existing transportation system. Most of the areas of the Forest and Grassland in need of open road access already have that access. Decisions should be based on sound TAP procedures.
- Revise Objective output measures to match those of Road Accomplishment Report and INFRA so reportable objective accomplishments and annual accomplishments are measuring the same thing. This will also make monitoring and evaluation reporting easier.

WILDFIRE/HAZARDOUS FUELS TREATMENT

Ongoing and Emerging Issues

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

Recommendations

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

WATERSHED

Ongoing and Emerging Issues

- Meeting the needs for instream flows on streams in the Forest continues to be an issue. Increased interest in additional water development in response to the expanding urban and intermix populations and the potential for drought, have the potential to push this issue to the forefront. There continues to be tension concerning State and Federal authorities with regard to water development on Forest lands. In 2005, the Forest completed a plan amendment to change two

standards and one guideline related to streamflow as directed by a discretionary review by the of Agriculture Deputy Under Secretary for Natural Resources and Environment.

- 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 and to treat mountain pine beetle killed trees 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.
- Focus implementation on identifying and completing sufficient watershed improvement within priority watersheds so that improvement in watershed condition can be demonstrated. Priority watersheds, and watershed improvement needs within the watersheds, have been identified for all Ranger Districts on the Forest, and development of a prioritization method suitable for the Pawnee National Grassland is continuing.

SOILS

Ongoing or Emerging Issues

- Detrimental soil compaction exists in some proposed project areas before treatment implementation and is likely associated with past harvesting activities (old skid trails, landings), non-system roads, and dispersed recreation. To meet activity area standards, the effects of new ground disturbing activities must be prevented, minimized, or mitigated. Past and project related detrimental impacts to soil resources must not exceed 15% of the activity area and all relevant Watershed Conservation Practices must be applied.
- Operations on finer-textured and wet soils are resulting in compaction; operations need to be discontinued when soils are wet. A wet weather operations field guide was developed 3 years ago for Forest Sale Administrator use to determine when equipment operations can result in soil damage. Consider using designated skid trails in certain soil types.
- It is recommended that decompaction and revegetation of landings, skid trails and ash piles be implemented during operations before timber sale contract close out.
- Monitoring indicates that a winged subsoiler is more effective at decompacting landings, skid trails, and obliterating roads on the Forest than conventional ripping. However, conventional ripping can decompact shallow compaction on shallow, rocky soils.
- The accumulation of burn-pile impacts is an issue. The burn severity effects of burning of small hand piles are lower than the burn severity effects of burning large piles. However, within an activity are, the footprint of many small piles is generally greater than the footprint of few large piles. Establishment and persistence of invasive weeds is common on burn-pile footprints.

- Using feller processors operating over slash and masticators minimize soil compaction.
- Harvest activities using skidders with non-designated trails are resulting in excessive detrimental soil impacts on whole tree harvesting units; Forest Plan activity area standards are not being met in some project areas.
- Although this activity is no longer common, harvest and site prep activities using feller-bunchers with non-designated skid trails and dozers for machine trampling and site prep would likely result in excessive detrimental soil impacts on fine textured soils. When this activity was common, Forest Plan activity area standards were not met in some project areas.
- Some design criteria and mitigations included in some Environmental Assessment Decision Notices and in some cases, Timber Sale Contracts are not being implemented.
- Chipping and masticating activities are creating heavy fuel loadings in some activity areas with unknown long-term ecological consequences.

Recommendations

- Continue to work with the Regional Office, the Forest Service Research Branch, and other Soil Scientists to develop more measurable goals for soil quality and at-risk soils.
- Continue to use/develop standard protocols for soil quality monitoring. Continue to work with regional office personnel to ensure protocols, standards and measures used are acceptable and applicable.
- Continue to work with marking crews, silviculturists, and engineers to educate them about soil/water resource issues and solutions.
- Continue to apply, and possibly incorporate, ongoing research projects of Rocky Mountain Research Station personnel and other forests/institutions with ongoing monitoring of management activities on the forest.

AIR

Ongoing or Emerging Issues

- Ambient ozone concentrations during the summers of 2003 and 2004 were exceedingly high at Rocky Mountain National Park and could potentially be affecting human well-being and ecosystems on the Arapaho-Roosevelt National Forest. Currently, parts of the Front Range Air-shed exceed public health standards for ozone.
- Nitrogen deposition due to off-forest, anthropogenic emissions might be detrimentally affecting higher elevation ecosystems.
- Increased smoke emissions from prescribed and wildfire 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.
- Implement ozone monitoring as recommended by the Regional Office in 2007.

WILDLIFE/BOTANY

Mountain Pine Beetle Epidemic Ongoing or Emerging Issues On Widlife And Habitats.

- Loss of mature habitat/old growth will affect wildlife that depend on this type of habitat
- Increased fire danger/wind damage could change wildlife habitat
- Increase in snags/early successional stages affects different wildlife and their hatibats. Some wildlife species will be benefited while others will be negatively affected.

Old Growth Ongoing or Emerging Issues

- Knowledge and use of Forest Plan old growth direction during the past 10 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

- 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.
- As the mountain pine beetle epidemic progresses, the designation and management of existing and future old growth should be addressed.

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 activity, structural stages, and roads/trails databases (as well as others) and GIS, are not totally reflecting existing condition, which makes quantifiable comparisons of habitat effects on wildlife difficult (if not impossible) to determine. In addition, methods of record-keeping are continually changing, making implementation and maintenance of databases difficult.

Databases Recommendation

Updating and maintenance of basic resource databases should be a priority. 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 various and concentrated areas of the ARP resulting in disturbance to wildlife and habitat.

Travel Management Recommendation

- Increase emphasis on travel management planning and implementation, which will enable better management/protection of wildlife and habitats, especially our TES species. This includes continuous updating of 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.
- Complete all Ranger District Motor Vehicle Use Maps as nationally directed.

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.
- One road access litigation case was filed in FY2007. This case is continuing in FY 08. Access across National Forest System land to private land will continue to be an issue.
- The implementation of cost recovery regulations will take time to get everyone familiar with the process and efficient in the new procedures. 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. The regulations are in place and the ARP did implement cost recovery in FY2007.
- 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.
- Boundary line surveying for fuels reduction projects has discovered encroachments on National Forest System (NFS) lands, which adds to the caseload in the Lands Program. A subdivision on the Canyon Lakes Ranger District was surveyed in FY 07 revealing12 lot encroachments.

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 on processing ANILCA access cases to avoid 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.
- Discrepancies between Forest 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 Forest Plan objectives and S-Tables to ensure that the proposed outputs recognize the complexity of land ownership on the front range, particularly BRD, CLRD, and CCRD.
- Continue to emphasize elimination of the special use and STA backlogs. The Forest did not meet the elimination of backlog by 2007 as stated in Table 1.7 (*Forest Plan*, p. 9).
- Use the new 36 CFR 251 regulations and cost recovery to eliminate inappropriate proposals.
- 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 as interest increases on the Grasslands.
- Sixty-three applications for uranium leases were submitted in FY07, but returned to the Bureau of Land Management for additional processing, however, the ARP anticipates these lease applications will be resubmitted.

- The Canyon Lakes District processed two mineral operations for exploratory diamond mining and anticipates additional plans of operations to be submitted.
- The Forest Service is requiring Mineral Administrator Certification for the locatable and leasable minerals. The certification requires training and approval by the Washington Office. This will require the Forest to change its administration and training opportunities in the minerals program.

Recommendations

- Mineral Administrator Certification: Have the Lands and Minerals Supervisor's Office and District Staffs discuss who should be certified and make a recommendation to the Engineering, Lands and Minerals Group Leader to implement.

HERITAGE RESOURCES

Ongoing or Emerging Issues:

- The changing needs for prescribe burning to reduce hazardous fuels has recently become an emerging issue. Due to the Bark Beetle infestation and mortality of mature tree stands across the Forest, there is an increased need for very large prescribed fires to reduce hazardous fuel loads. The timing of the development of burn plans and very early spring implementation of the burns does not meet the timing requirements for inventory, report writing and consultation requirements as outlined in Section 106 of the NHPA and 30 CFR Part 800. It is proving to be very challenging to meet the compliance requirements for these projects. In addition, with the extra workload, timing and priority of these projects, the compliance for other projects is not being completed, or not being completed in a timely fashion. The Forest Heritage Team is working on developing a Programmatic Agreement to address these timing issues, however it has not yet been completed.
- An important issue related to our heritage compliance continues to be the implementing regulations for the NHPA, 36 CFR Part 800. These 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 these 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. More Governmental entities are becoming CLGs, at this time CLGs associated with the Forest include the cities of Boulder, Central City, Fort Collins, Georgetown, Idaho Springs, Boulder, Gilpin, Clear Creek and Grand Counties. Because these Counties are CLG's all projects on the Boulder, Clear Creek and Sulphur Districts require additional consultation.
- Off-road vehicles present a major problem for cultural resource sites. The creation of social off-road trails and roads are not subjected to planning or cultural resource inventories before they are utilized and have the potential to adversely significant prehistoric and historic cultural resources. These detrimental effects are generally not reversible and are found only after they have occurred.
- There are no goals, objectives, standards or guidelines for the heritage resource program. Law dictates much of what guides the work done in this area. However, laws do not cover all aspects of the heritage resource program and it is left up to the individual line officer to decide what work will be done.
- Funding for project monitoring has not focused on heritage resources, thus, it has not been determined how well mitigation direction is being followed as stated in the NEPA documents.

- The Conveyance Project, Isolated Cabins, Hazardous Mine Safety Closures and Non-Recreation Special Use projects are emerging as a type for project with unavoidable adverse effects to historic properties. These types of projects are generally small in size so avoiding the effects by moving project boundaries is not possible. The Forest trend is to have more unavoidable adverse effects that require mitigation. This is an emerging issue due to the implementing regulations of NHPA, 36 CFR 900 Part 800. These regulations require additional consultation with the public and greater public involvement in the development of mitigations of adverse effects. Administrative site Conveyance, Isolated Cabin Removals, Mine Safety Closures and the permitting of Non-Recreation Special Uses typically do not require as extensive public comment in NEPA analyses, as do some of our larger projects. However, as the public becomes more aware of the changes in Section 106, the Forest will need to expend more effort in engaging the public in these projects for compliance with Section 106 of the NHPA.
- The Forest has made progress in maintaining baseline heritage data. However, the accuracy of some of the legacy 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 verify all Forest and Grassland heritage data for the heritage site and survey data information in the INFRA database and GIS layers.

Recommendations

- Compliance work is currently being accomplished on most projects in a timely and legal fashion. The heritage staff should be fully integrated into the NEPA process on large projects, and on smaller projects should be involved early in the planning stages.
- Continue to seek out new and effective ways (e. g., Challenge Cost Share Agreements, university partnerships, volunteers, grants) to fund heritage resource program activities in an era of flat and declining budgets.
- Provide adequate project funding to do full implementation monitoring.
- Continue to enter data into the GIS Heritage Layers and INFRA Heritage Database.

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

Ongoing or Emerging Issues

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

Recommendations

- Interdisciplinary Teams (IDTs) should have a meeting to discuss 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.

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LIST OF ACRONYMS

ADA: Americans with Disabilities Act
ANILCA: Alaska National Interest Lands Conservation
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
NGO: Non-Governmental Organization
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
SASEM: Simple Approach to Smoke Estimation Model
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

Elk Post-hunt population estimates (Big game statistics, Colorado Division of Wildlife, 2006) dlife 2007

Herd Name	Data Analysis Unit	Game Mgmt Units In and near ARNF	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Poudre River	E4	7,8,9,19,191	4490	4390	4540	4240	4280	4210	3920	3890	3810	3700	3830
Saint Vrain	E9	20	2670	2570	4140	4220	4370	3980	3810	4020	4100	3072	2360
Clear Creek	E38	29,38	1240	1230	1280	1250	1290	1300	1180	1150	1190	1211	1130
Mount Evans	E39	39,46,391,461	2460	2620	3000	3170	3140	3220	3020	4090	3850	4200	3320
Troublesome Cr	E8	18,181	3640	4700	3560	3340	3590	4020	3590	3820	3030	2862	4150
William's Fork	E13	28,37,371	4770	5200	4160	3880	3490	3340	4200	3800	3300	3778	5980
In and near ARNF Totals			**19270**	**20710**	**20680**	**20100**	**20160**	**20070**	**19720**	**20770**	**19280**	**18823**	**20770**
State-wide Totals		(rounded to 100)	218500	229400	264600	292600	305500	297500	278700	274900	258400	271800	291960

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

Herd Name	Data Analysis Unit	Game Mgmt Units In and near ARNF	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Redfeather	D4	7,8,9,19,191	12290	13810	11190	9730	9720	9070	8340	8650	8140	7300	5780
Big Thompson	D10	20	7960	8240	5830	6320	6470	6120	6470	6430	5880	5410	5090
Boulder	D27	29,38	7220	7400	8550	7890	7270	7080	7470	7000	7130	7366	7360
Bailey	D17	39,46,51, 391,461	8330	6890	6750	7070	7570	8410	8420	8010	7880	7800	8790
Middle Park	D9	18,181,27,28,37,371	10150	11960	14180	10900	12250	13150	13240	13250	12030	9418	12,800
In and near ARNF Totals			**45950**	**48300**	**46500**	**41910**	**43280**	**43830**	**43940**	**43340**	**41060**	**37294**	39,820
In and near PNG Totals													
Table Lands	D5	87,88,89,90,93,95	1/	1/	1/	2110	1880	1600	1480	1450	1500	1850	2040
In and near ARNF/PNG Totals						**44020**	**45160**	**45430**	**45420**	**44790**	**42560**	**39144**	**41,860**
State-wide Totals		(rounded to 100)	516500	526400	528700	551600	565300	563700	602700	593,610	614100	612760	

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

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

Herd Name	Game Mgmt Units In and near ARNF	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Poudre River	S1	150	120	120	120	115	105	95	95	50	55	50
Mount Evans	S3	240	200	200	200	200	160	125	125	175	100	90
Rawah	S18	**	40	40	40	30	30	45	45	20	15	15
Never Summer Range	S19	175	100	100	50	50	50	50	25	25	25	25
Georgetown	S32	350	350	450	450	450	400	250	300	300	400	400
St Vrain	S37	***	80	80	80	80	100	100	100	100	100	50
Big Thompson	S57	140	60	50	50	60	80	80	80	80	80	85
Lower Poudre	S58	60	40	40	40	30	30	30	30	25	25	15
Rocky Mtn National Park	N/A	130	130	400	350	350	350	450	450	375	375	375
In and near ARNF Totals		**1245**	**1120**	**1480**	**1380**	**1365**	**1305**	**1225**	**1250**	**1150**	**1175**	**1105**
State-wide Totals		7720	7245	7455	7535	7590	7495	7465	7370	7260	7330	7040

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

Birds

Monitoring Colorado Birds Data, RMBO 2007
Ferruginous Hawk (Also see ferruginous hawk active nest counts by PNG)
PNG Number/transect/year

Transect	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Avg/yr*
AS28	0	NR	0	NR	NR	NR	0	0	NR	NR	0
AT02	NR	NR	NR	NR	0	0	0	NR	NR	NR	0
AT03	NR	0	NR	0	0	0	NR	0	NR	NR	0
AT04	NR	0	NR	NR	0	0	0	0	NR	NR	0
AT05	NR	0	0	0	0	0	0	0	NR	NR	0
AT06	NR	0	0	0	0	0	0	0	NR	NR	0
GR01	NR	0	0	0	0	0	0	0	NR	0	0
GR02	NR	0	1	0	2	0	0	0	NR	0	0.4
GR03	NR	1	NR	0	1	1	0	1	NR	0	0.6
GR05-02	NR	NR	NR	NR	0	NR	NR	0	NR	2	0.6
GR15	NR	NR	0	NR	0	0	0	0	NR	0	0
HR05	NR	NR	0	0	NR	0	0	0	NR	NR	0
HR09	NR	0	0	0	0	NR	0	0	NR	NR	0
HR10	NR	NR	0	0	0	NR	0	NR	NR	NR	0
HR18	NR	0	NR	NR	0	0	0	0	NR	NR	0
HR25	NR	0	0	0	0	0	0	0	NR	NR	0
MC03	NR	0	0	0	0	0	0	0	NR	NR	0
MC27	NR	0	0	0	0	0	0	0	NR	NR	0
PP13	0	0	0	0	0	NR	NR	0	NR	NR	0
PP15	0	0	NR	0	0	NR	0	0	NR	NR	0
PP16	0	0	0	0	0	NR	0	0	NR	NR	0
PP21	0	0	0	0	0	NR	0	0	NR	NR	0
PP29	0	0	0	NR	0	NR	NR	NR	NR	NR	0
SF16	0	NR	0	0	NR	NR	0	NR	NR	NR	0
SF17	0	0	NR	0	0	NR	0	0	NR	NR	0
SF30	NR	0	0	NR	NR	NR	0	0	NR	NR	0
Total birds	**0**	**1**	**1**	**0**	**3**	**1**	**0**	**1**	**0**	**2**	**0.9**
# of transects w/ hits	**0**	**1**	**1**	**0**	**2**	**1**	**0**	**1**	**0**	**1**	**0.7**

Nr = Transect not onducted in ths year

*Avg/yr is calculated without NR years

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

Golden-crowned Kinglet

ARNF Number/transect/year

Transect	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Avg/yr*
AS28	0	NR	0	NR	NR	NR	0	0	NR	NR	0.00
AT02	NR	NR	NR	NR	0	0	0	NR	NR	0	0.00
AT03	NR	0	NR	0	0	0	NR	0	NR	NR	0.00
AT04	NR	0	NR	NR	0	0	0	0	NR	NR	0.00
AT05	NR	1	0	0	0	0	0	0	NR	0	0.00
AT06	NR	0	0	0	0	0	0	0	NR	0	0.00
GR01	NR	0	0	0	0	0	0	0	NR	NR	0.00
GR02	NR	0	0	0	0	0	0	0	NR	NR	0.00
GR03	NR	0	NR	0	0	0	0	0	NR	NR	0.00
GR05-02	NR	NR	NR	NR	0	NR	NR	0	NR	NR	0.00
GR15	NR	NR	0	NR	0	0	0	0	NR	NR	0.00
HR01**										0	0.00
HR05	NR	NR	17	0	NR	0	0	0	NR	NR	3.40
HR09	NR	4	0	0	0	NR	0	0	NR	0	0.60
HR10	NR	NR	0	0	0	NR	0	NR	NR	0	0.00
HR18	NR	0	NR	NR	0	0	0	1	NR	NR	0.20
HR25	NR	0	0	0	0	0	0	0	NR	0	0.00
MC03	NR	0	0	0	0	0	0	0	NR	NR	0.00
NO01**										2	2.00
MC27	NR	1	0	0	0	0	0	0	NR	NR	0.14
PP13	0	0	0	0	0	NR	NR	0	NR	NR	0.00
PP15	0	0	NR	0	0	NR	0	0	NR	NR	0.00
PP16	0	0	0	0	0	NR	0	0	NR	NR	0.00
PP21	0	0	0	0	0	NR	0	0	NR	NR	0.00
PP29	0	0	0	0	0	NR	NR	NR	NR	NR	0.00
SF01**										8	8.00
SF04	NR	NR	NR	NR	NR	NR	NR	NR	10	3	6.50
SF15	NR	NR	NR	NR	NR	NR	NR	NR	1	2	1.50
SF16	0	NR	0	NR	NR	NR	0	NR	1	0	0.25
SF17	10	2	NR	0	1	NR	0	2	1	2	2.25
SF30	NR	2	4	NR	NR	NR	1	5	NR	NR	3.00
Total birds	**10**	**10**	**21**	**0**	**1**	**0**	**1**	**8**	**13**	**17**	**8.10**
# of transects w/ hits	**1**	**5**	**2**	**0**	**1**	**0**	**1**	**3**	**4**	**5**	**2.20**

NR = Transect not conducted in this year

*Avg/yr is calculated without NR years

** Transects established 200[illegible]ed 2005

Hairy
Woodpecker
ARNF Number/transect/year

Transect	1998	1991	2000	2001	2002	2003	2004	2005	2006	2007	Avg/yr*
AS28	2	NR	1	NR	NR	NR	1	2	NR	NR	1.50
AT02	NR	NR	NR	NR	1	0	0	NR	NR	0	0.25
AT03	NR	0	NR	0	0	0	NR	0	NR	0	0.00
AT04	NR	0	NR	NR	0	0	0	0	NR	NR	0.00
AT05	NR	0	0	0	0	0	0	0	NR	1	0.13
AT06	NR	0	0	0	0	0	0	0	NR	0	0.00
GR01	NR	0	0	0	0	0	0	0	NR	NR	0.00
GR02	NR	0	0	0	0	0	0	0	NR	NR	0.00
GR03	NR	0	NR	0	0	0	0	0	NR	NR	0.00
GR05-02	NR	NR	NR	NR	0	NR	NR	0	NR	NR	0.00
GR15	NR	NR	0	NR	0	0	0	0	NR	NR	0.00
HR01	NR	NR	NR	NR	NR	NR	NR	NR	1	1	1.00
HR05	NR	NR	0	0	NR	0	0	0	2	0	0.29
HR09	NR	0	0	0	0	NR	1	0	NR	0	0.14
HR10	NR	NR	2	3	0	NR	0	NR	1	0	1.00
HR18	NR	0	NR	NR	0	0	0	0	NR	1	0.17
HR25	NR	0	0	0	0	0	0	0	NR	0	0.00
MC03	NR	1	0	0	1	0	1	0	NR	0	0.38
MC27	NR	0	0	0	0	0	1	0	NR	1	0.25
NO01-05	NR	NR	NR	NR	NR	NR	NR	NR	2	4	3.00
PP13	6	2	2	0	0	NR	NR	0	1	5	2.00
PP15	0	0	NR	0	0	NR	0	1	1	0	0.25
PP16	4	0	1	0	4	NR	2	13	NR	5	3.63
PP21	3	1	0	4	1	NR	5	2	4	1	2.33
PP29	0	1	1	NR	0	NR	NR	NR	NR	NR	0.50
SF01-05	NR	NR	NR	NR	NR	NR	NR	NR	2	1	1.50
SF04	NR	NR	NR	NR	NR	NR	NR	NR	1	3	2.00
SF15**										1	1.00
SF16	0	NR	0	0	NR	NR	0	NR	1	NR	0.20
SF17	0	0	NR	0	0	NR	0	1	1	1	0.38
SF30	NR	2	0	NR	NR	NR	2	0	NR	NR	1.00
Total birds	**15**	**7**	**7**	**7**	**7**	**0**	**13**	**19**	**17**	**25**	117.00
# of transects w/ h	**4**	**5**	**5**	**2**	**3**	**0**	**7**	**5**	**10**	**12**	53.00

NR = Transect not conducted in this year
*Avg/yr is calculated without NR years
**Transect established in 2005

Lark
Bunting
ARNF Number/transect/year

Transect	1999	2000	2001	2002	2003	2004	2005	2006	2007	Ave/yr*
AS28	NR	0	NR	NR	NR	0	0	NR	NR	0
AT02	NR	NR	NR	0	0	0	NR	NR	NR	0
AT03	0	NR	0	0	0	NR	0	NR	NR	0
AT04	0	NR	NR	0	0	0	0	NR	NR	0
AT05	0	0	0	0	0	0	0	NR	NR	0
AT06	0	0	0	0	0	0	0	NR	NR	0
GR01	75	85	68	66	112	77	75	NR	107	83
GR02	52	94	50	44	87	35	44	NR	78	61
GR03	43	NR	76	5	90	72	36	NR	86	58
GR05-02	NR	NR	NR	6	NR	NR	87	NR	80	58
GR15	NR	0	NR	0	0	0	64	NR	114	30
HR05	NR	0	0	NR	0	0	0	NR	NR	0
HR09	0	0	0	0	NR	0	0	NR	NR	0
HR10	NR	0	0	0	NR	0	NR	NR	NR	0
HR18	0	NR	NR	0	0	0	0	NR	NR	0
HR25	0	0	0	0	0	0	0	NR	NR	0
MC03	0	0	0	0	0	0	0	NR	NR	0
MC27	0	0	0	0	0	0	0	NR	NR	0
PP13	0	0	0	0	NR	NR	0	NR	NR	0
PP15	0	NR	0	0	NR	0	0	NR	NR	0
PP16	0	0	0	0	NR	0	0	NR	NR	0
PP21	0	0	0	0	NR	0	0	NR	NR	0
PP29	0	0	NR	0	NR	NR	NR	NR	NR	0
SF16	NR	0	0	NR	NR	0	NR	NR	NR	0
SF17	0	NR	0	0	NR	0	1	NR	NR	0
SF30	0	0	NR	NR	NR	0	0	NR	NR	0
Total birds	**170**	**179**	**194**	**121**	**289**	**184**	**307**	**0**	**465**	**212**
ts w/ hits	**3**	**2**	**3**	**4**	**3**	**3**	**6**	**0**	**5**	**3.2**

NR = Transect not conducted in this year

*Avg/yr is calculated without NR years

Mountain Bluebird

ARNF Number/transect/year

Transect	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Avg/yr*
AS28	0	NR	0	NR	NR	NR	0	0	NR	NR	0.00
AT02	NR	NR	NR	NR	1	1	2	NR	NR	0	1.00
AT03	NR	4	NR	3	0	0	NR	0	NR	0	1.17
AT04	NR	3	NR	NR	1	2	2	0	NR	NR	1.60
AT05	NR	2	0	0	0	0	1	0	NR	9	1.50
AT06	NR	0	0	1	0	0	0	0	NR	4	0.63
GR01	NR	0	0	0	0	0	NR	0	NR	NR	0.00
GR02	NR	0	0	0	0	0	0	0	NR	NR	0.00
GR03	NR	0	NR	0	0	0	0	0	NR	NR	0.00
GR05-02	NR	NR	NR	NR	0	NR	NR	0	NR	NR	0.00
GR15	NR	NR	0	NR	0	0	0	0	NR	NR	0.00
HR01**										0	0.00
HR05	NR	NR	0	0	NR	0	0	0	NR	2	0.33
HR09	NR	0	0	0	0	NR	0	0	NR	0	0.00
HR10	NR	NR	0	0	0	NR	0	NR	NR	0	0.00
HR18	NR	0	NR	NR	0	0	0	0	NR	0	0.00
HR25	NR	0	0	4	2	1	0	0	6	2	1.67
MC03	NR	0	0	0	0	0	0	0	NR	0	0.00
MC27	NR	0	0	0	0	0	0	0	NR	3	0.38
NO01**										0	0.00
PP13	0	0	0	0	0	NR	NR	0	NR	0	0.00
PP15	0	0	NR	0	6	NR	1	1	15	1	3.00
PP16	0	0	0	0	1	NR	1	6	16	3	3.00
PP21	3	0	0	0	0	NR	0	2	NR	0	0.63
PP29	0	0	0	NR	NR	NR	NR	NR	NR	NR	0.00
SF01-05	NR	NR	NR	NR	NR	NR	NR	NR	4	0	2.00
SF04**										0	0.00
SF15**										0	0.00
SF16	0	NR	0	0	NR	NR	0	NR	NR	0	0.00
SF17	0	0	NR	0	0	NR	0	0	NR	0	0.00
SF30	NR	0	0	NR	NR	NR	0	0	NR	NR	0.00
Total birds	**3**	**9**	**0**	**8**	**11**	**4**	**7**	**9**	**10**	**24**	**8.5**
# of transec	**1**	**3**	**0**	**3**	**5**	**3**	**5**	**3**	**2**	**7**	

NR = Transect not conducted in this year

*Avg/yr is calculated without NR years

**Transects established 2007

Pygmy Nuthatch

ARNF Number/transect/year

Transect	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Avg/yr*
AS28	0	NR	0	NR	NR	NR	0	0	NR	NR	0.00
AT02	NR	NR	NR	NR	0	0	0	NR	NR	NR	0.00
AT03	NR	0	NR	0	0	0	NR	0	NR	0	0.00
AT04	NR	0	NR	NR	0	0	0	0	NR	NR	0.00
AT05	NR	0	0	0	0	0	0	0	NR	NR	0.00
AT06	NR	0	0	0	0	0	0	0	NR	NR	0.00
GR01	NR	0	0	0	0	0	0	0	NR	NR	0.00
GR02	NR	0	0	0	0	0	0	0	NR	NR	0.00
GR03	NR	0	NR	0	0	0	0	0	NR	NR	0.00
GR05-02	NR	NR	NR	NR	0	NR	NR	0	NR	NR	0.00
GR15	NR	NR	0	NR	0	0	0	0	NR	NR	0.00
HR05	NR	NR	0	0	NR	0	0	0	NR	0	0.00
HR09	NR	0	0	0	1	NR	0	0	NR	NR	0.17
HR10	NR	NR	0	0	0	NR	0	NR	3	NR	0.60
HR18	NR	0	NR	NR	0	0	0	0	NR	0	0.00
HR25	NR	0	0	0	0	0	0	0	NR	NR	0.00
MC03	NR	0	0	0	0	0	4	0	NR	1	0.63
MC27	NR	0	0	0	0	0	4	0	NR	7	1.38
PP13	0	0	0	0	0	NR	NR	1	5	2	1.00
PP15	0	0	NR	3	10	NR	0	1	4	8	3.25
PP16	0	0	0	0	0	NR	5	3	1	9	2.00
PP21	1	2	0	0	4	NR	14	0	1	12	3.78
PP29	3	0	0	NR	0	NR	NR	NR	NR	NR	0.75
SF16	0	NR	0	0	NR	NR	0	NR	NR	NR	0.00
SF17	0	0	NR	0	0	NR	0	0	NR	NR	0.00
SF30	NR	0	2	NR	NR	NR	0	0	NR	NR	0.50
Total birds	**4**	**2**	**2**	**3**	**15**	**0**	**27**	**5**	**14**	**39**	**11.00**
# of transec	**2**	**1**	**1**	**1**	**3**	**0**	**4**	**3**	**5**	**6**	**2.60**

NR = Transect not conducted in this year

*Avg/yr is calculated without NR years

Warbling Vireo

ARNF 3

Transect	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Avg/yr*
AS28	21	NR	6	NR	NR	NR	1	8	NR	NR	9.00
AT02	NR	NR	NR	NR	0	0	0	NR	NR	0	0.00
AT03	NR	0	NR	0	0	0	NR	0	NR	0	0.00
AT04	NR	1	NR	NR	0	0	0	0	NR	NR	0.20
AT05	NR	0	0	0	0	0	0	0	NR	0	0.00
AT06	NR	0	0	0	0	0	0	0	NR	0	0.00
GR01	NR	0	0	0	0	0	0	0	NR	NR	0.00
GR02	NR	0	0	0	0	0	0	0	NR	NR	0.00
GR03	NR	0	NR	0	0	0	0	0	NR	NR	0.00
GR05-02	NR	NR	NR	NR	0	NR	NR	0	NR	NR	0.00
GR15	NR	NR	0	NR	0	0	0	0	NR	NR	0.00
HR01-05	NR	NR	NR	NR	NR	NR	NR	NR	4	10	7.00
HR05	NR	NR	2	0	NR	0	0	0	NR	0	0.33
HR09	NR	0	7	7	5	NR	1	5	8	3	4.50
HR10	NR	NR	7	14	0	NR	1	NR	NR	1	4.60
HR18	NR	0	NR	NR	0	0	0	0	NR	0	0.00
HR25	NR	7	19	6	3	0	0	0	3	0	4.22
MC03	NR	4	1	7	0	2	3	8	NR	7	4.00
MC27	NR	4	0	2	0	0	4	13	NR	6	3.63
NO01-05	NR	NR	NR	NR	NR	NR	NR	NR	4	7	5.50
PP13	15	4	7	14	4	NR	NR	0	12	10	8.25
PP15	2	0	NR	0	0	NR	0	0	NR	1	0.43
PP16	0	4	6	16	3	NR	5	4	5	6	5.44
PP21	0	0	0	3	6	NR	2	3	1	4	2.11
PP29	7	12	5	NR	5	NR	NR	NR	NR	NR	7.25
SF01-05	NR	NR	NR	NR	NR	NR	NR	NR	19	0	9.50
SF04**										0	0.00
SF15**										0	0.00
SF16	0	NR	0	0	NR	NR	0	NR	1	0	0.17
SF17	0	4	NR	1	0	NR	0	0	NR	0	0.71
SF30	NR	0	0	NR	NR	NR	0	0	NR	NR	0.00
Total birds	**45**	**40**	**60**	**70**	**26**	**2**	**17**	**41**	**57**	**55**	**41.3**
# of transec	**4**	**8**	**9**	**9**	**6**	**1**	**7**	**6**	**8**	**10**	**6.8**

NR = Transect not conducted in this year

*Avg/yr is calculated without NR years

**Transects established 2007

Wilson's Warbler

ARNF Number/transect/year

Transect	1998	1999	2000	2001	2002	2003	2005	2006	2007	Avg/.yr*
AS28	1	NR	0	NR	NR	NR	0	0	NR	0.25
AT02	NR	NR	NR	NR	0	0	0	NR	0	0.00
AT03	NR	0	NR	0	0	0	NR	0	0	0.00
AT04	NR	0	NR	NR	0	1	0	1	NR	0.40
AT05	NR	0	0	3	0	6	1	0	0	1.25
AT06	NR	0	0	0	0	0	0	0	1	0.13
GR01	NR	0	0	0	0	0	0	0	NR	0.00
GR02	NR	0	0	0	0	0	0	0	NR	0.00
GR03	NR	0	NR	0	0	0	0	0	NR	0.00
GR05-02	NR	NR	NR	NR	0	NR	NR	0	NR	0.00
GR15	NR	NR	0	NR	0	0	0	0	NR	0.00
HR01-05	NR	NR	NR	NR	NR	NR	NR	NR	5	5.00
HR05	NR	NR	4	13	NR	0	4	0	0	3.50
HR09	NR	6	7	16	3	NR	0	5	17	7.71
HR10	NR	NR	4	1	3	NR	6	NR	26	8.00
HR18	NR	0	NR	NR	0	0	0	8	19	4.50
HR25	NR	0	0	6	1	7	2	5	2	2.88
MC03	NR	0	0	0	0	1	0	0	0	0.13
MC27	NR	0	0	0	0	0	0	0	0	0.00
NO01**									0	0.00
PP13	0	1	0	0	0	NR	NR	0	0	0.14
PP15	0	0	NR	0	0	NR	0	0	0	0.00
PP16	0	0	0	0	0	NR	0	0	0	0.00
PP21	0	0	0	0	0	NR	0	0	0	0.00
PP29	0	0	0	NR	0	NR	NR	NR	NR	0.00
SA01-05	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.00
SF01**									3	3.00
SF04**									0	0.00
SF15**									1	1.00
SF16	0	NR	0	0	NR	NR	0	NR	0	0.00
SF17	0	0	NR	0	0	NR	0	0	0	0.00
SF30	NR	0	0	NR	NR	NR	0	0	NR	0
Total birds	**1**	**7**	**15**	**39**	**7**	**15**	**13**	**19**	**74**	19
# of transec	**1**	**2**	**3**	**4**	**3**	**4**	**4**	**4**	**8**	3.3

NR = Transect not conducted in this year

*Avg/yr is calculated without NR years

**Transects established 2007

Mammals on the Pawnee National Grassland

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

In and near PNG

Year	Towns	Acres	Year	Towns	Acres	Year	Towns	Acres
1981	14	**357**	**1994**	21	**329**	**2007**	61	2502
1982	15	**360**	**1995**	17	**338**			
1983	14	**179**	**1996**	19	**515**			
1984	13	**249**	**1997**	21	**701**			
1985	14	**323**	**1998**	20	**892**			
1986	17	**282**	**1999**	19	**703**			
1987	15	**384**	**2000**	25	**934**			
1988	16	**331**	**2001**	26	**1032**			
1989	13	**602**	**2002**	30	**1674**			
1990	20	**419**	**2003**	29	**2053**			
1991	23	**566**	**2004**	27	**2863**			
1992	17	**322**	**2005**	42	**3673**			
1993	28	**387**	**2006**	48	**2840**			

Birds on the Pawnee National Grassland

Burrowing Owl (PNG annual owl surveys)

In and near PNG Year	# Dog Towns Surveyed	Total # Acres	Adult Owls	Juvenile Owls	Unknown Owls	Total # Owls
1998	23	585	40	90	47	**177**
1999	26	1070	43	56	23	**122**
2000	28	987	48	58	32	**138**
2001	30	1216	68	43	32	**143**
2002	32	18790	83	57	45	**185**
2003	31	2295	67	79	71	**217**
2004	33	3411	70	133	69	**270**
2005	51	4202	85	128	91	**304**
2006	59	2840	166	352	78	**596**

In and near PNG Year	# Dog Towns Surveyed	Total # Acres	Adult Owls
2007	63	2347	112

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

PNG

Year	# Birds	Birds/ km² ± SE
1990	**77**	4.7 ± 1.2
1991	**33**	2.0 ± 0.5
1992	**67**	4.1 ± 0.8
1993	**44**	2.7 ± 0.6
1994	**59**	3.6 ± 0.4
1995	**2**	NA
1996	**9**	0.6 ± 0.1
1997	**5**	NA

Year	# Birds	Birds/ km² ± SE
1998	**24**	1.5 ± 0.1
1999	**0**	NA
2000	**8**	NA
2001	**2**	NA
2002	**1**	NA
2003	**1**	NA
2004	**0**	NA
2005	**12**	NA

Year	# Birds	Birds/ km² ± SE
2006	**2**	NA
2007	**3**	NA

(Also see ferruginous hawk transect counts by RMBO)

Ferruginous Hawk (Active nests; PNG annual raptor surveys)

PNG

Year	total # sites surveyed	# active nests	Year	total # sites surveyed	# active nests	Year	total # sites surveyed	# active nests
1981	45	**13**	**1993**	73	**13**	**2005**	81	**5**
1982	42	**14**	**1994**	73	**9**	**2006**	81	**8**
1983	53	**10**	**1995**	73	**7**	**2007**	91	**9**
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**			

MIS TABLES FOR FISHERIES ON THE ARAPAHO-ROOSEVELT NATIONAL FORESTS AND PAWNEE NG

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	1998	2003				
fish/mile	84	984	784				
Black Hollow Creek	1984	1985	1988	1989	2003	2006	
fish/mile	475	457	352	369	484	123	
George Creek	1985	1988	1991	1997	2003	2006	
fish/mile	388	440	41	52	72	143	
West Fork Sheep Creek	1984	1987	1988	1991	1998	2003	2006
fish/mile	387	598	651	258	563	365	528

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

Stream Name	Years Surveyed				
Jim Creek	1992	2000	2003	2008	
fish/mile	5.3	36	21.1	0	
Little Vasquez Creek	1985	1992	1998	2001	2008
fish/mile	185	181	20	25.2	
Hamilton Creek	1992	2000	2003	2007	
fish/mile	109	352	176	165	
Kinney Creek	1992	1997	2000	2003	
fish/mile	91	422	29	123	
Cabin Creek	1992	2000	2003	2007	
fish/mile	704	380	174	418	
Steelman Creek	2000	2003	2004		
fish/mile	25	90	231		

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

Stream Name	Years surveyed						
Fraser River	1979	1993	1998	2000	2003		
fish/mile	106	211	437	425	299		
Vasquez Crk	1990	1992	2001	2004			
fish/mile	0	8	414	258			
St Louis Crk	1978	1986	1987	1988	2000	2003	2005
fish/mile	317	612	201	1647	1973	3408	531
Kinney Crk	1992	1997	2000				
fish/mile	239	387	143				
Little Muddy Crk	1979	1992	2000	2006			
fish/mile	0	352	1083	1175			
Deadman Creek	1981	2000	2004*	2008			
fish/mile	211	1503	105	1557			
WFK Clear Crk	1973	1994	1995	1999	2000	2001	
fish/mile	0	198	271	860	798	883	

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	2006	2008
fish/mile	106	1475	97	90	2250	2270
Cache la Poudre River	1994	2000	2001	2002		
fish/mile	817	1790	1199	258		

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

Stream Name	Year of surveys							
Willow Creek	1998	1999	2000	2001	2002	2005	2006	
fish/pothole	370	258	195	40	5	80	2717	
Howard Creek	1998	1999	2000	2001	2002	2005	2006	2008
fish/pothole	n/a	36	902	268	602	357	480	0
South Pawnee Crk	1998	1999	2000	2001	2002	2005	2006	2008
fish/pothole	n/a	68	n/a	25	819	563	468	~

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

Stream Name	Years surveyed					
Little Crow Crk	1998	1999	2000	2001	2005	2006
fish/pothole	10	0	39	2	dry creek	n/a
Little Owl Creek	1998	1999	2001	2005	2006	
fish/pothole	13	1	0	0	n/a	
South Pawnee Creek	1998	1999	2001	2002	2005	2006
fish/pothole	8	0	19	322	22	4*

* not an adequate sample due to sampling difficulty

Amphibians

Boreal toad population trend data in and near Arapaho Roosevelt National Forests (Boreal Toad Recovery Team 2008).

Column headers in the following tables are defined as follows.

Males/Females/Egg Masses: This column shows the minimum number of breeding age males and females and number of viable egg masses at the locality in each year.

Recruitment: A 'yes' entry means that one-year-old toadlets were observed at the site in the spring of the following year, or two-year-old toads were seen the second year.

Age Classes: The first number in the entry indicates the minimum number of age classes observed/reported at a specific site. Numbers within parentheses indicate which age classes were observed: M=metamorphs (young of the year), 1=one year olds (new 'recruits'), S=subadults (generally two or three year old toads), 2 or 3=subadults which were specifically identified as either two or three year old toads, A=adult toads (generally 4 years old and older).

Boulder County

BO01 – Lost Lake (Middle Boulder Creek) – ARNF
Bd: Negative (2001)

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
1996	0/1/0	No	2(M,A)	Toadlets introduced
1997	0/1/0	No	3(M,1,A)	Toadlets introduced*
1998	0/2/0	No	3(1,2,A)	No breeding observed
1999	0/0/0	No	None	Minimal surveys done
2000	0/0/0	No	None	Adequate monitoring
2001	0/0/0	No	None	Adequate monitoring**
2002	0/0/0	No	None	Adequate monitoring
2003	0/0/0	No	None	3 visits
2004	0/0/0	No	None	2 visits
2005	0/0/0	No	None seen	Site visited 2 times
2006	0/0/0	No	None seen	Site visited once
2007	0/0/0	Unk	None	Site visited once

*Tadpoles observed, possibly from mating of a resident female and a translocated male toad.
**PCR test results were negative for samples from 5 groups of sentinel tadpoles placed at Lost Lake in 2001.

Clear Creek County

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

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
1994	?/?/?	Unk	Multiple	Little data available
1995	3/2/2	Unk	2(M,A)	Probably few metamorphs
1996	1/1/1	No	1(A)	No production
1997	1/1/1	No	1(A)	Eggs froze
1998	3/0/0	No	1(A)	No breeding observed
1999	3/0/0	No	1(A)	No breeding observed
2000	0/0/0	No	None seen	Minimal monitoring
2001	0/0/0	No	None seen	No breeding observed*
2002		No		Not monitored
2003	0/0/0	Unk	None Seen	No evidence of breeding
2004		No		Not monitored
2005	0/0/0	No	None seen	No evidence of breeding
2006	0/0/0	No	None seen	Site is drying
2007	0/0/0	Unk	None seen	Site was dry at only visit

*All site visits in 2001, including night surveys, conducted in May.

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

Bd: Positive (2004)

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
1995	131/19/19	Yes	4(M,1,S,A)	
1996	142/18/18	Yes	4(M,1,S,A)	Few metamorphs
1997	167/33/23	Yes	4+(M,1,S,A)	
1998	203/107/55	Yes	4(M,1,S,A)	Many metamorphs
1999	141/60/60	Unk	4(M,1,S,A)	Bd mortality
2000	34/34/34	Yes	2(M,A)	
2001	14/14/14	Unk	3(M,1,A)	Some egg mortality*
2002	25/22/22	Unk	2(M,A)	Several sites dry
2003	15/15/15	Yes	1(A)	
2004	10/16/16	Yes	3(M,A,1)	Several sites dried up
2005	2/12/12	Yes	2(M,A)	Poor hatching success
2006	2/1/4	Yes	4(M,1,S,A)	Some water level issues
2007	2/2/0	Unk	3(M,A,1)	

*Egg mass mortality due to a water fungus observed at the hesbo site; other sites had good egg mass survival.

CC03 – Herman Gulch (Clear Creek) – ARNF

Bd: Positive (2004)

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
1993	?/?/?	Unk	2(M,A)	Breeding observed
1994	11/11/11	Unk	2(M,A)	
1995	52/12/12	Unk	3(M,S,A)	Good production
1996	20/12/12	No	1(A)	Poor larvae survival
1997	19/10/10	Unk	3(M,S,A)	Many metamorphs
1998	10/10/10	Unk	2(M,A)	Few metamorphs seen
1999	11/11/11	Yes	1(A)	High egg mortality
2000	9/5/5	Unk	3(1,S,A)	No metamorphs seen
2001	2/2/4	Unk	3(M,S,A)	<50 metamorphs
2002	0/1/0	Unk	1(A)	No evidence of breeding
2003	1/1/1	Yes	1(M)	<50 metamorphs
2004	4/4/4	No	2(1,A)	
2005	0/0/0	No	None seen	
2006	0/0/0	No	None seen	Site visited once
2007	0/0/0	Unk	None seen	Site visited twice

CC04 – Mount Bethel (Clear Creek) – ARNF

Bd: Positive (2005/2006)

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
1993	Yes	Unk	2(M,A)	Many metamorphs
1994	Yes	Unk	2(M,A)	
1995	4/1/1	No	2(S,A)	Few, if any metamorphs
1996	3/3/3	Unk	2(M,A)	Few metamorphs
1997	9/1/1	Unk	2(M,A)	
1998	11/3/3	Unk	2(M,A)	36 + metamorphs seen
1999	23/1/1	Yes	2(M,A)	500 + metamorphs
2000	29/3/3	Yes	4(M,1,S,A)	Many metamorphs seen
2001	28/6/5	Yes	4(M,1,S,A)	500+ metamorphs seen
2002	16/4/4	Yes	3(M,1,A)	Early metamorphosis
2003	7/7/7	Unk	3(M,1,A)	<50 metamorphs
2004	68/8/8	Unk	3(M,S,A)	<50 metamorphs
2005	33/6/6	Unk	2(M,A)	Tested Bd positive
2006	5/0/7	Unk	2(M,A)	Early breeding
2007	1/1/2	Unk	2(M,A)	4 site visits

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

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
1994	1/1/1	Unk	2(M,A)	Limited data
1995	Unk.	No	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	No	1(A)	Inadequate monitoring
2000	0/0/0	No	None seen	Monitoring adequate
2001	3/0/0	Unk	1(A)	Inadequate monitoring
2002				Site not monitored
2003	1/1/1	No	1(A)	Few tadpoles found
2004	0/0/0	No	None seen	
2005	0/0/0	No	None seen	
2006	0/0/0	No	None seen	Site visited once
2007	0/0/0	Unk	None seen	Visited twice

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

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
1993	?/?/0	Unk	Multiple	First survey of site
1994	?/?/0	Unk	Multiple	No metamorphs
1995	2/0/0	Unk	2(S,A)	No breeding observed
1996	5/0/0	No	1(A)	No breeding observed
1997	0/0/0	No	None	Inadequate monitoring
1998	1/1/0	Unk	2(S,A)	Monitoring marginal
1999	0/0/0	Yes	1(S)	41 sub-adults seen
2000	0/0/0	Unk	2(1,S)	Many sub-adults seen
2001	0/0/0	Unk	2(S,A)	65 subadults, 7 adults*
2002				Site not monitored
2003				Site not monitored
2004	0/0/0	No	None Seen	
2005	0/0/0	No	1(A)	9 unsexed adults seen
2006	0/0/0	No	None seen	Site visited twice
2007	0/0/0	Unk	None seen	Visited once – poor visibility

*Breeding site used in 1990s apparently not being used at present, and location of current breeding site unknown. .

CC07 – Otter Mountain (Clear Creek South), ARNF
Bd: Negative (2003/2006)

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
2003	1/1/1	No		200 tadpoles seen
2004	2/2/2	No	1(A)	50 tadpoles seen
2005	0/0/0	No	1(A)	1 adult seen
2006	2/2/2	No	1(A)	5 adults seen
2007	0/0/0	Unk	None	Sed fences may be barriers

Grand County

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

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
1995	5/1/?	Unk	3+(S,A)	Substantial population
1996	?/?/0	Unk	3+(S,A)	Substantial population
1997	0/0/0	Unk	None	Monitoring inadequate
1998	0/0/0	Unk	None	Monitoring inadequate
1999	0/0/0	Unk	None	No night survey done
2000	0/0/0	Unk	None	Monitoring adequate
2001	0/0/0	Unk	None	No night survey done
2002	0/0/0	Unk	None	Not monitored
2003	0/0/0	Unk	None	Site visited 7 times*
2004	0/0/0	Unk	None	
2005				Not monitored
2006				Monitoring report not received
2007	0/0/0	Unk	None	Visited twice

*Breeding site constructed just downstream from original breeding area in 2003: this is the site that will be monitored in subsequent years.

GR02 – Pole Creek – (Pole Creek)
Bd: Positive (2002/2003)

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
1995	5/3/3	Unk	2(M,A)	Numerous metamorphs
1996	3/3/3	Yes	2(M,A)	Few metamorphs
1997	10/4/2	No	2(1,A)	Few, if any, metamorphs
1998	5/2/2	Yes*	2(M,A)	Monitoring marginal
1999	5/5/5	Unk	2(M,A)	Metamorphs at #4
2000	6/2/2	Yes	3(M,S,A)	One clutch desiccated
2001	9/7/7	Yes	4(M,1,S,A)	>500 metamorphs
2002	14/6/6	Yes	4(M,1,S,A)	Metamorphs present**
2003	7/2/2	Yes	4(M,1,S,A)	>500 metamorphs
2004	2/2/2	Yes	3(M,S,A)	>150 metamorphs
2005	34/8/8	Yes	4(M,1,S,A)	>3000 metamorphs
2006	5/5/5	Yes	3(M,1,A)	35 adults seen
2007	12/4/0	Unk	3(A,1,S)	16 adults seen

This locality is on Pole Creek Golf Course, near holes 4 and 15
*Recruitment from 1998 production based on observations of sub-adult toads in 2000.
**Metamorphs sampled on 9/23/02 Bd positive

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

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
1999	1/1/1	Yes*	1(A)	Found late in the season
2000	0/0/0	No	None	Monitoring adequate
2001	0/0/0	No	1(S)	1 sub-adult seen*
2002	0/0/0	Unk	None	1 site visit
2003				Site not monitored
2004	0/0/0	No	None	
2005	0/0/0	No	1(A)	1 adult seen
2006	0/0/0	No	None seen	
2007	0/0/0	Unk	None seen	Potential habitat searched throughout drainage

*16 toadlets from 1999 clutch were captive reared and released in Vasquez Creek drainage in 2000; the sub-adult observed in 2001 was observed at the release site. No toads were observed then or since at the 1999 breeding site (tire rut): both sites continue to monitored.

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

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
2001	2/3/3	Yes	2(1,A)	No metamorphs observed
2002	8/6/6	Unk	2(M,A)	<50 metamorphs
2003	2/2/2	No	2(S,A)	Desiccation and predation
2004	0/0/0	No	None	
2005	0/0/0	No	None seen	
2006	0/0/0	No	None seen	Possible adult sighting
2007	0/0/0	Unk	None	Also searched above lake to upper ponds

GR05 – Upper Williams Fork (Upper Williams Fork) – ARNF
Bd: Positive (2006)

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
2001	2/2/2	Yes	3(A,M,1)	Metamorphs observed
2002	1/1/1	Yes	3(A,S,1)	No metamorphs seen
2003	1/2/1	Yes	4(M,1,S,A)	<50 metamorphs
2004	2/2/2	Yes	4(M,1,S,A)	Cold water temps
2005	2/1/1	Unk	2(1,S,A)	Metamorphs possible
2006	2/0/1	Yes	2(M,A)	
2007	2/1/0	Unk	3(M,A,1)	

GR06 – Big Meadow (Big Meadow) – RMNP
Bd: Positive (2004/2005)

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
2004	1/1/0	Yes	3(M,1,A)	
2005	2/2/2	Unk	2(1,A)	
2006	0/0/2	Unk	1(S)	Pond dried
2007	1/1/0	Unk	2(A,S)	

GR07 – South Fork (South Fork Williams Fork) – ARNF
Bd: Unk

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
2007	?/?/?	Unk	?	Found by DOW in Sept- only tadpoles seen

Larimer County

LR01 – Lost Lake (North Fork Big Thompson) – Rocky Mountain NP
Bd: Positive (2000/2005)

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
1990	?/?/22	Unk	1(A)	Incomplete data
1991	206/28/15	Unk	1(A)	No data on subadults
1992	143/23/23	Unk	1(A)	No data on subadults
1993	77/10/?	Unk	1(A)	Incomplete data
1994	110/35/35	Unk	Unk	No data on subadults
1995	122/32/32	Yes*	1(A)	No data on subadults
1996	43/15/152	No	1(A)	No data on subadults
1997	112/15/15+	No	3(M,2*,A)	15-20 egg masses
1998	106/12/12	Unk	2(M,A)	150+ metamorphs seen
1999	10/10/10	Unk	1(A)	Metamorphs possible
2000	3/3/3	Unk	1(A)	Bd positive
2001	0/3/0	Unk	1(A)	Only females observed
2002	0/1/0	Unk	1(A)	One female observed
2003	0/0/0	Unk	None	Surveys adequate
2004	0/0/0	Unk	None seen	Juveniles found along trail
2005	3/3/3	Unk	1(A)	Larvae seen
2006	0/0/0	Unk		Larvae seen
2007	0/2/2	Unk	2(A,S)	No breeding observed

*Recruitment in 1995 based on observation of 2 year old toads in 1997.

LR02 – Kettle Tarn (North Fork Big Thompson) – RMNP
Bd: Positive (2001/2005); Negative (2006)

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
1990	?/?/13	Unk	1(A)	Incomplete data
1991	21+/23/23	Unk	1(A)	No data on subadults
1992	63/18/18	Unk	1(A)	No data on subadults
1993	54/25/25	Unk	2(M,A)	
1994	120/21/21	Unk	2(M,A)	
1995	210/24/24	Unk	2(M,A)	
1996	29/13/8	Unk	3(M,2,A)	
1997	15/11/0	No	1(A)	
1998	18/13/10	Unk	1(A)	
1999	15/8/2	Yes*	1(A)	No metamorphs seen
2000	13/5/3	Unk	2(1,A)	One 1 year old seen*
2001	2/4/3	Yes	3(M,S,A)	Metamorphs observed*
2002	2/2/2	Yes	3(M,1,A)	NASRF tadpoles released**
2003	3/3/3	Yes	3(M,1,A)	500+ metamorphs
2004	2/2/2	Unk	3(1,S,A)	Site dry by late July
2005	0/1/0	Unk	1(A)	Good water levels
2006	0/3/1	Unk	1(A)	Desiccation loss
2007	1/0/0	Unk	1(A)	No breeding observed

*Metamorphs observed but not estimated on monitoring form.
**Tadpoles from NASRF released at site; it is unknown whether metamorphs observed in 2002 derived from naturally produced clutches or from these released tadpoles.

LR03 – Spruce Lake (Big Thompson) – RMNP
Bd: Negative (2003/2005/2006)

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
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-year old seen
2001	10/2/2	Unk	2(S,A)	Larvae observed*
2002	15/3/3	Unk	1(A)	No metamorphs observed
2003	12/1/1	Unk	1(A)	No larvae observed
2004	10/2/2	Unk	1(A)	No larvae observed
2005	7/5/5	Unk	1(A)	Larvae observed
2006	7/1/3	Unk	2(M,A)	Eggs collected from site
2007	0/8/2	Unk	1(A)	15 egg masses and 100 tadpoles observed

*Last site visit June 20, prior to time of metamorphosis

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

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

*This site will no longer be regularly monitored after 2000. Translocation appears unsuccessful (Muths et. al. 2001).

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

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
1998	1/1/1	Unk	1(A)	Tadpoles observed
1999	0/0/0	Unk	None	Site disturbed/dam work*
2000	0/0/0	Yes	None	Low water
2001	3/2/2	Yes	3(1,S,A)	No metamorphs seen
2002	1/1/1	Unk	2(S,A)	No metamorphs seen
2003	0/0/0	Unk	0	Site disturbed
2004				Not monitored
2005				Not monitored
2006				Not monitored
2007				Not monitored

*In 1999 there was temporary disturbance at this site due to testing of reconstructed dam.

LR06 – Trout Creek (Trout Creek) – ARNF
Bd: Negative (2004/2006)

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
2004	2/2/2	Yes	1(A)	Site found 6/22/04
2005	0/0/0	Yes	None seen	
2006	0/0/3	Unk	3(1,S,M)	Good year at site
2007				Monitoring data not yet received

LR07 – Panhandle Creek (Panhandle Creek) – ARNF
Bd: Negative (2006)

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
2004	3/2/0	Yes	2(S,A)	Exact site not found
2005	0/0/0	Yes	None seen	
2006	5/0/1	Unk	4(M,1,S,A)	Exact site located
2007				Monitoring data not yet received

LR08 – Faye Lakes (Faye Lakes) – RMNP
Bd: Negative (2005/2006)

Year	Males/Females /Egg Masses	Recruitment	Age Classes	Comments
2004	4/4/0	Yes	2(M,A)	
2005	2/2/2	Yes	2(1,A)	
2006	3/2/0	Yes	3(M,1,A)	
2007	6/2/2	Unk	3(A,1,S)	

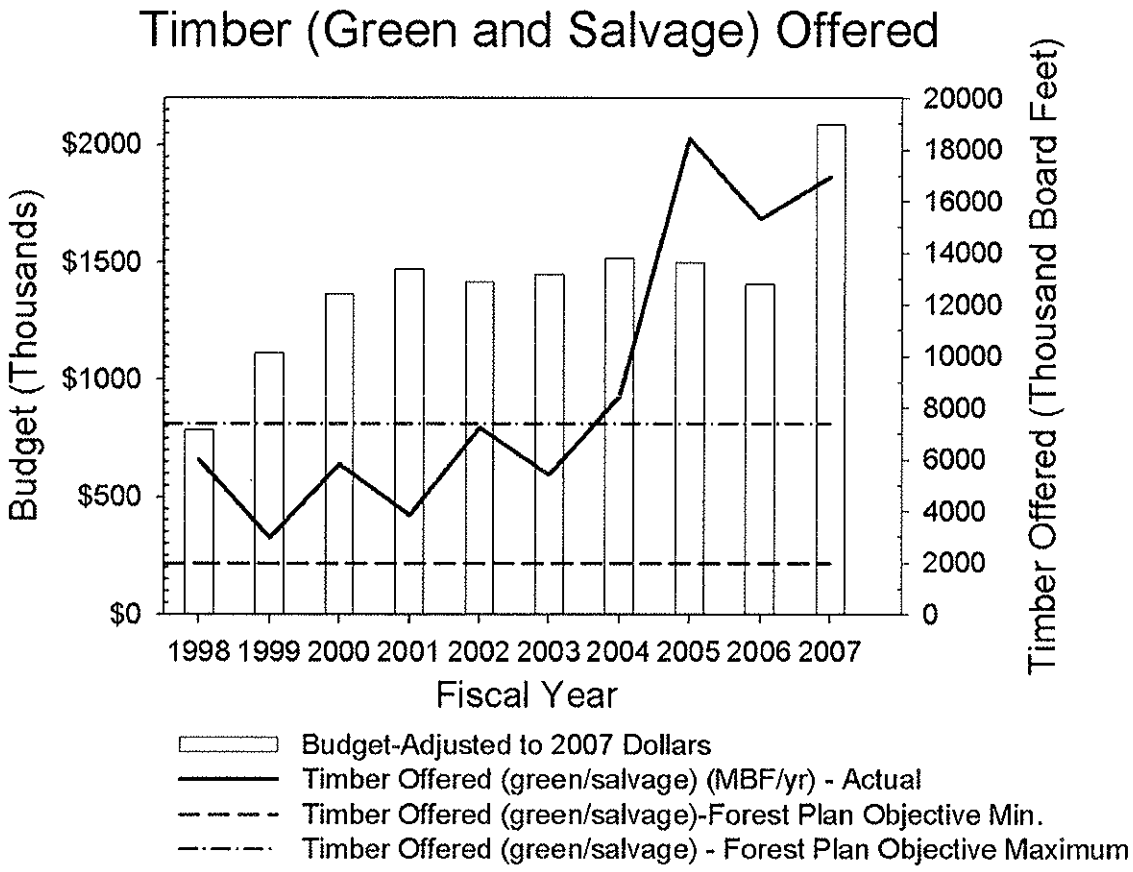
As of 2007 there are 23 breeding sites on the Planning Area (see following table). Although not part of the historic database, discovery of 'new' breeding areas is probably just the first confirmation of boreal toad presence in areas not previously surveyed for boreal toads, but where they have been present for years. Of all 23 sites, 9 are Bd positive, 5 are Bd negative, and 9 have not yet been tested.

# Sites	Boulder County	Clear Creek County	Grand County	Larimer County
ARNF	1	6	5	3
RMNP	0	0	1	5
Private	0	1	1	0
Bd+	0	3 (2 neg: 2 unk.)	4 (3 unk.)	2 (5 neg:1 unk.)

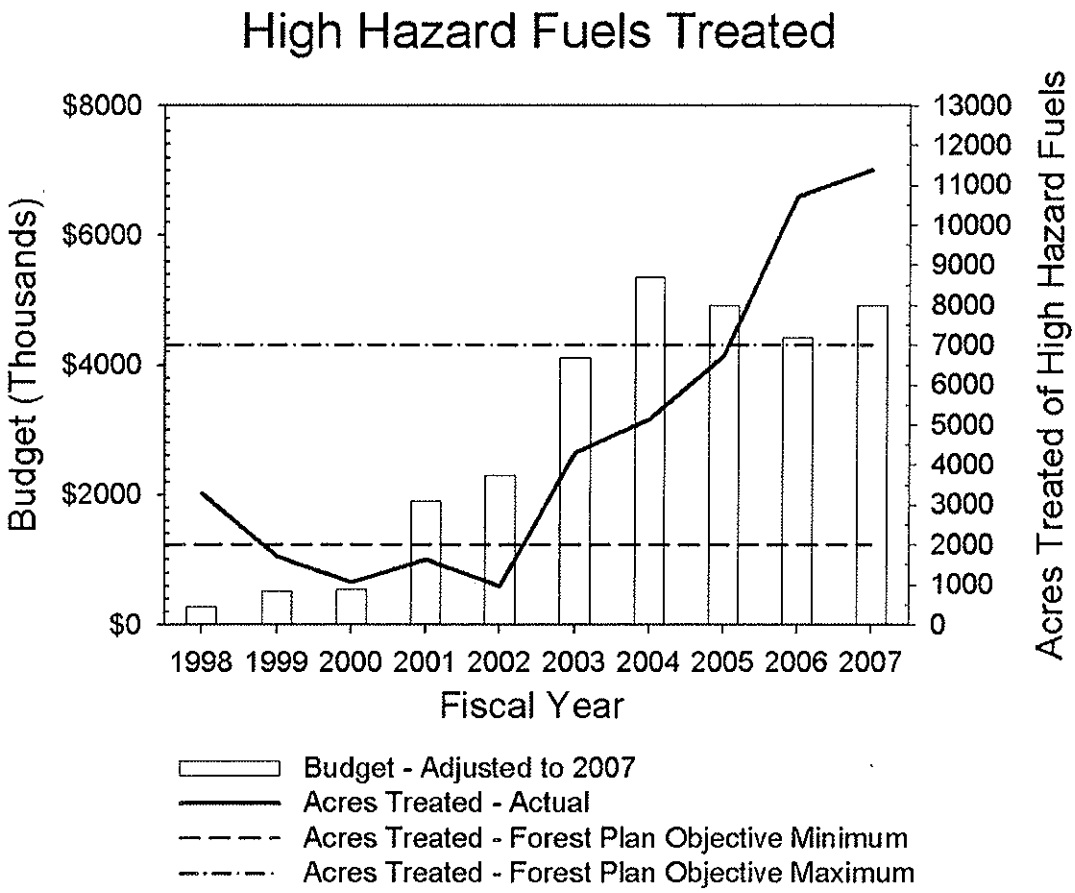
Despite the discovery of new sites (previously undetected sites) on the Planning Area, predominantly in Larimer County, and several others statewide, CNHP and other data clearly indicates a downward trend for boreal toad numbers at occupied sites in Colorado and on the Planning Area.

APPENDIX B: Graphs

Graph 1


Timber (Green and Salvage) Offered
Budget (Thousands)
$2000
$1500
$1000
$500
$0
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Timber Offered (Thousand Board Feet)
1998 1999 2000 2001 2002 2003 2004 2005 2006 2007
Fiscal Year
Budget-Adjusted to 2007 Dollars
Timber Offered (green/salvage) (MBF/yr) - Actual
Timber Offered (green/salvage)-Forest Plan Objective Min.
Timber Offered (green/salvage) - Forest Plan Objective Maximum

Graph 2


High Hazard Fuels Treated
Budget (Thousands)
$8000
$6000
$4000
$2000
$0
13000
12000
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 2005 2006 2007
Fiscal Year
Budget - Adjusted to 2007
Acres Treated - Actual
Acres Treated - Forest Plan Objective Minimum
Acres Treated - Forest Plan Objective Maximum