Carson National Forest
Southwestern Region

Carson Forest Plan Monitoring and Evaluation Report

Fiscal Year 2007

Forest Supervisor Certification of Forest Plan Sufficiency

The Carson Forest Plan is sufficient to guide management of the Forest over the next year. This document summarizes the monitoring efforts completed on the Forest through Fiscal Year 2007.

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5/20/08
Date

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Part 1

Monitoring Activities and Evaluation

Table 1

Program Area	Summary of Monitoring Conducted and Evaluation
Biological Environment	
Wildlife & Fish	**Goals:** To manage for healthy ecosystems, provide goods and services in an environmentally sound fashion, use new knowledge, develop an integrated inventory, cooperate with other agencies, and promote awareness and appreciation of species. • **Maintain habitat for viable populations** of all wildlife and fish species found on the Forest and improve habitat for selected species. This will be accomplished indirectly through intensive habitat management. • **Support New Mexico Game and Fish Department** in meeting its objectives of the New Mexico Comprehensive Wildlife Plan and in the reintroduction of native wildlife and fish species. Favor native species over new exotic species in stocking and introductions whenever possible. • **Maintain and/or improve habitat for presently listed threatened or endangered species** of animals and other species as they are classified as threatened or endangered. Work toward the eventual recovery and delisting of species. *Threatened and endangered species* populations and habitat will be protected and improved as necessary to aid in the recovery of the species. **Monitoring:** **THREATENED AND ENDANGERED SPECIES** Threatened and endangered (T&E) species are surveyed for project and program monitoring requirements (e.g., 1996 region-wide Amendment for Forest Plans), as well as to provide planning information during project analysis. Monitoring is ongoing for T&E species on the Forest for known nesting locations. The primary species monitored on the Carson are southwestern willow flycatcher and Mexican spotted owl. Project level inventory provides biologists information on the potential occurrence of T&E species, as well as, whether management activities (e.g., grazing, recreation, tree cutting, etc.) are a threat to a

species' habitat or existence. Supporting documentation for project level inventory is located at each of the ranger districts.

Threatened and endangered monitoring results do not indicate significant alterations in occupied or potential habitat that could result in a downward trend of habitat condition or populations.

In 2005, Critical Habitat was designated for the **southwestern willow flycatcher**. The Forest has one Critical Habitat Unit designated on the Camino Real Ranger District. The status of this population appears to be stable. Four breeding pairs with nesting sites have been regularly detected since monitoring began. In 2007, around 200 acres was inventoried. The monitoring data is forwarded to the US Fish and Wildlife Service.

Mexican spotted owl (MSO) populations are very low with some presence on the Jicarilla Ranger District. It appears drought has made the formerly occupied habitat on the district uninhabitable. There were no monitoring surveys done in 2007 for Mexican spotted owl populations on the Carson National Forest.

REGION 3 SENSITIVE SPECIES

The primary Region 3 sensitive species inventoried and monitored on the Carson are northern goshawk, American peregrine falcon, and Rio Grande cutthroat trout. This type of inventory and monitoring provide the biologists information on the occurrence of TE&S species on the Forest, as well as, whether management activities (e.g., grazing, recreation, tree cutting, etc.) are a threat to a species' habitat or existence. Sensitive species monitoring results do not indicate significant alterations in occupied or potential habitat that could result in a downward trend of habitat condition or populations.

Inventory and monitoring of known **northern goshawk** nesting areas produced the following information:

Table 2 2005-2007 Northern Goshawk inventory and monitoring results

District		Acres of inventory	Results (sightings, nests)	Monitoring of Known Goshawk Nesting areas
Canjilon	2007	0	0	0
	2006	0	0	0
	2005	0	0	0
El Rito	2007	0	0	1 nest site – no birds

	2006	0	0	1 nest site – no birds
	2005	0	0	1 nest site – no birds
District		Acres of inventory	Results (sightings, nests)	Monitoring of Known Goshawk Nesting areas
Jicarilla	2007	36,854	1 new pair, 2 add'l birds	1 nest site, no goshawks located
	2006	0	0	Single adult
	2005	0	0	Single adult
Camino Real	2007	645	0	5 nest sites – no goshawks located
	2006	0	0	5 nest sites – no goshawks located
	2005	381	0	5 nest sites – no goshawks located
Tres Piedras	2007	0	0	3 nest sites – no birds
	2006	1,500	0	2 nest sites – no birds
	2005	2000	0	2 nest sites – found 1 pair with 2 young
Questa	2007	0	0	0
	2006	4,000	1 single adult	0
	2005	1000	0	0

Peregrine falcon surveys are conducted by the New Mexico Game and Fish. There are currently six known nest sites on the Carson National Forest. Survey information may be obtained from the New Mexico Department of Game and Fish. There were no surveys done on the Carson National Forest in 2007.

Wild Trout Populations

Baseline inventory and monitoring of **Rio Grande cutthroat trout** (RGCT) populations are ongoing throughout the Carson NF. The surveys are performed using the three-pass regression method and population estimates are calculated from the regression. Samples

Program Area	Summary of Monitoring Conducted and Evaluation
	from populations are also collected for genetic analysis. These surveys are ongoing and help determine the level of management appropriate for the population. Supporting documentation is located at the Forest Supervisor's office. The Carson National Forest was a cooperating agency with the Fish and Wildlife Service and the New Mexico Department of Game and Fish on a native fish restoration within the Costilla watershed in 2007. The Comanche drainage from just below the confluence with Little Costilla Creek to the headwaters of Comanche and Vidal Creeks was electrofished, opened to angling harvest and treated with antimycin to remove all fish species. Native fish were relocated and pure Rio Grande cutthroat trout will be replaced in the stream system. Additional native fish to be restocked and/or reintroduced include the longnose dace, Rio Grande sucker and Rio Grande chub. The Comanche drainage project area is approximately 40 stream miles and the area treated with antimycin was approximately 20 stream miles. Monitoring subsequent to the treatment found approximately 6 juvenile Rio Grande cutthroat trout. A second treatment (planned for 2008) is generally used, especially in a large and complex drainage such as Comanche. Restocking is expected to follow within the same season as the second treatment. The threat of whirling disease contaminating New Mexico's trout fisheries is imminent. The RGCT is extremely susceptible to whirling disease. The disease has been detected in several hatcheries in the state and infected fish have been found in the San Juan River in the northwestern corner of the state. How the disease will affect the RGCT and other trout is not yet known, but the consequences could be catastrophic. The installation of fish barriers and the improved condition of water quality in many of the Carson's mountain streams may be factors in warding off this devastating disease. **MANAGEMENT INDICATOR SPECIES** A summary of status and habitat trends for 11 management indicator species (MIS) identified in the Carson Forest Plan was initiated in FY 1999. MIS species are elk, bighorn sheep, turkey, Abert's squirrel, red squirrel, hairy woodpecker, white-tailed ptarmigan, juniper (plain) titmouse, Brewer's sparrow, resident trout, and aquatic macroinvertebrates. The summary of population and habitat trends for the MIS identified in the Carson Forest Plan provides biologists with a forest-wide evaluation of MIS habitat to use when analyzing a project's site-specific effects. The original assessment was completed in 2003, but it is a living document with updates continued throughout 2007 as more information, published research, and habitat and population studies, became available. The 2007 MIS assessment has been posted on the Carson National Forest website: (http://www.fs.fed.us/r3/carson/plans/mis%20assessment/2007_mis_assessment.shtml). Portions of the text in this wildlife section were taken directly from the MIS assessment, therefore when seeking references for the information, refer to the MIS document. In cooperation with the New Mexico Department of Game and Fish, aerial surveys were conducted for **elk** in FY2007 to determine reproductive and adaptive success. Surveys were done in various locations on the Carson National Forest. Supporting documentation for elk aerial monitoring is located at the New Mexico Department of Game and Fish State Office in Santa Fe, New Mexico.

Program Area	Summary of Monitoring Conducted and Evaluation

Elk numbers had steadily increased over the past two decades; however, a decline in herds occurred a few years ago. This decline was believed to be due to drought and increased hunting permits. Monitoring in 2007 has indicated that the elk population on the on the Forest are stable. On the Jicarilla Ranger District, data shows a steady or increasing population from 1981-1993, and a slightly decreasing population since then. The trend for elk habitat from 1986 to 2005 is estimated to have increased from 1,362,760 to 1,424,074 acres or upward by almost four percent.

Annual counts of the reintroduced **Rock Mountain bighorn sheep** population in the Wheeler Peak, Latir and Pecos Wilderness Areas (majority of the Pecos herd is on the Santa Fe National Forest, with some use on the Carson) are conducted by the New Mexico Department of Game and Fish (NMGF). This monitoring is performed to determine the herd's reproductive and adaptive success. The Carson National Forest cooperates with the NMGF in this monitoring. Populations of bighorn sheep have shown a continual increase on the Carson National Forest, however, in the winter of 2006-2007 there was a die off of sheep due to overpopulation. The sheep present were over carrying capacity, but the population is now within expected carrying capacity. The habitat for the bighorn sheep is considered stable and in good condition. The data is held by the New Mexico Game and Fish Department.

The Management Areas referenced are as indicated in the Carson National Forest Plan. The following table lists the management areas:

Table 3 Forest Plan Management Area Descriptions

Management Area (MA)	Description
1	Spruce under 40% slope
2	Spruce over 40% slope
3	Mixed Conifer under 40% slope
4	Ponderosa Pine under 40% slope
5	Mixed Conifer and Ponderosa Pine over 40% slope
6	Aspen
7	Unsuitable Timber
8	Piñon/Juniper
9	High Elevation Grassland
10	Low Elevation Grassland
11	Revegetation Areas
12	Sagebrush
13	Oak
14	Riparian
15	Potential Recreation Sites
16	Recreation Sites

Program Area **Summary of Monitoring Conducted and Evaluation**

17	Wilderness
18	Wild and Scenic River
19	Special Areas
20	Semi-primitive
21	Valle Vidal

Point count transects for breeding birds, which include **hairy woodpecker, juniper titmouse and Brewers sparrow** are conducted on the Carson National Forest. These transects were monitored from 2003 -2006, but were not done in 2007. These counts provide trend data of NTMB migrations, as well as for MIS species trend information. Supporting documentation is located at the Forest Supervisor's office.

Hairy woodpecker is found in all forested habitats. Bark beetle outbreaks typically stimulate an increase in woodpecker populations. The bark beetle outbreaks in 2003, resulted in scattered pockets of dying trees (pinyon pine and Douglas-fir, for example) forest-wide providing habitat for woodpecker populations.

The attached map shows the Index of abundance for the hairy woodpecker on the Forest and other study areas. In 2006, 53 birds were found in five habitats and densities for hairy woodpecker were done for Ponderosa pine and pinyon juniper habitats. The population in ponderosa pine was calculated at .15 birds per hectare and in pinyon-juniper were 0.028 birds per hectare. In 2007, no surveys were done to monitor hairy woodpecker populations.

Rocky Mountain Bird Observatory (RMBO) has conducted surveys throughout the Southern Rocky Mountains and notes that populations of this species have shown dramatic increases after natural disasters, such as burns or major insect outbreaks. In 2004 they detected sufficient numbers of this species to provide a density estimate in the beetle infested pinyon-juniper habitat. Overall, the RMBO has detected the hairy woodpecker on all the RMBO point-count transect monitoring projects.

The forested habitats correspond to Carson Forest Plan Management areas, MA 1, MA 2, MA 3, MA 4, MA 5, MA 6 and MA 7. There were no harvest treatments from 2002 to 2007 that would have eliminated any areas from habitat. From 1986 to 2005, the estimated habitat trend for hairy woodpecker on the Carson National Forest is from 106,880 acres to 112,653 acres of habitat, or upward trend of five percent.

Program Area **Summary of Monitoring Conducted and Evaluation**

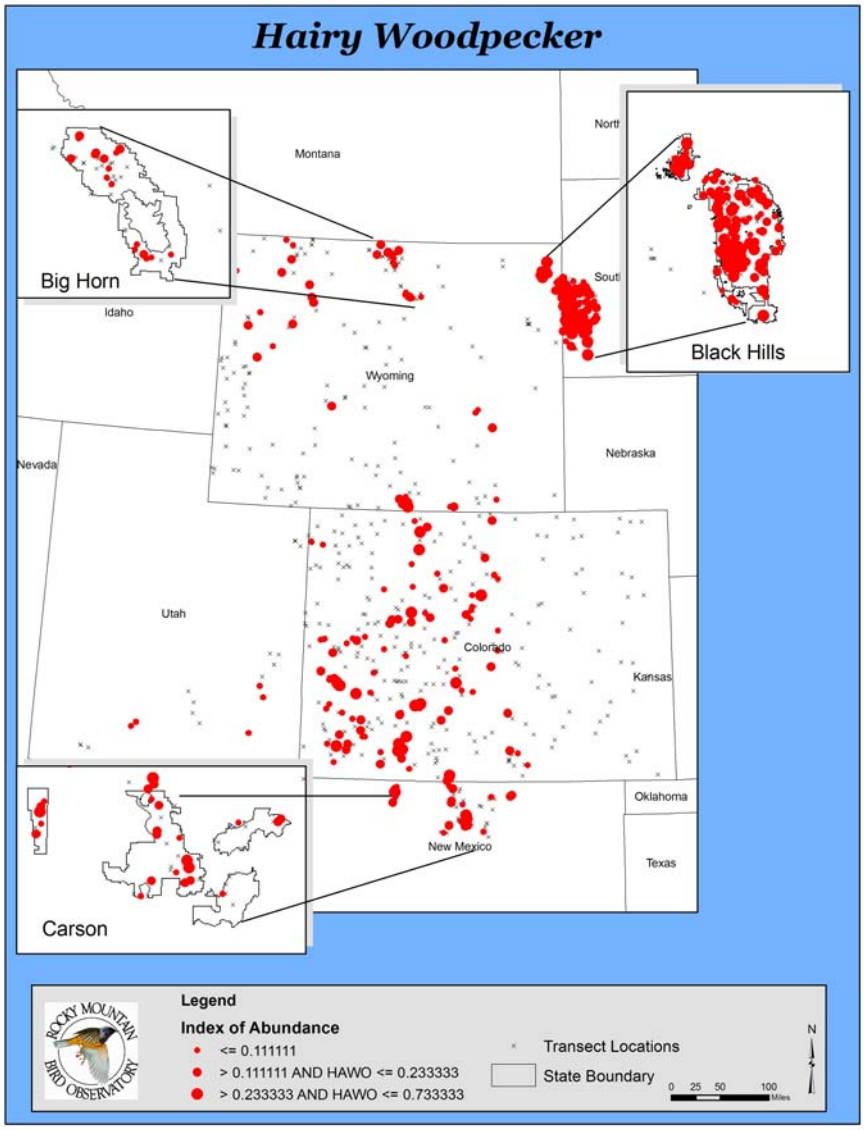


Figure 1 Hairy Woodpecker (Beason et al. 2005)

Program Area	Summary of Monitoring Conducted and Evaluation

Juniper titmouse (plain titmouse) had a population density of 0.22 birds/hectare, in 2006. The survey data seems to indicate the population on the forest at this time appears to be stable. The population of bark beetle was high up until 2005, when it became unmappable through 2007. Prior to 2005, there were over 33,000 acres of dead pinyon, however, even in the face of this loss of habitat by natural causes, the juniper titmouse seems to be persisting.

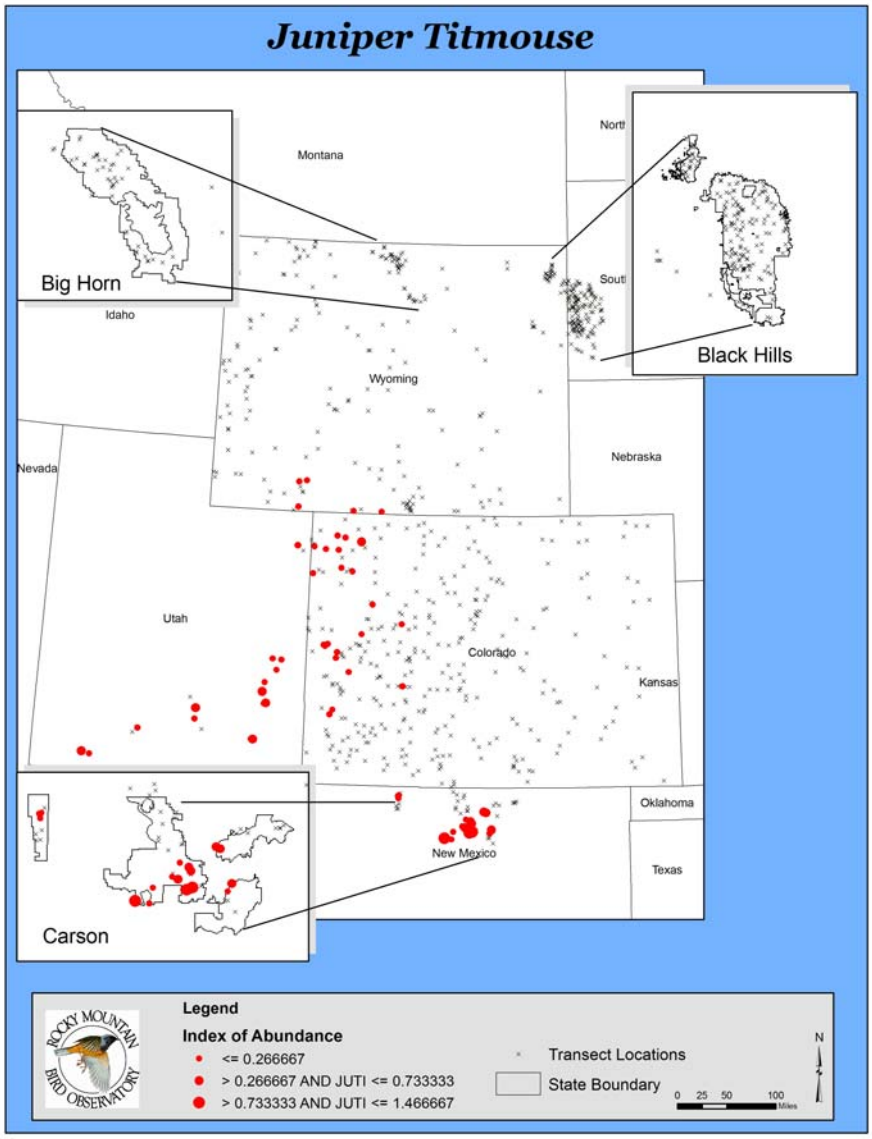
This species is dependent on large seeds such as those provided by juniper and pinyon pine, and acorns rather than insects. The die off of many pinyons may have increased the number of tree cavities available for breeding. The surviving pinyon in the infestation areas and uninfested adjacent areas experienced a moderate to heavy seed crop in 2006. This indicates an increase of available soil moisture in the infested areas as trees died in addition to the increased moisture levels.

The bird is found throughout the pinyon-juniper forest type which is Carson Forest Plan Management Area, MA 8. Forest management activities have maintained the habitat for this bird; natural causal organisms caused a loss of habitat is some areas. The trend in habitat acres shows a decrease from 355,409 to 348,239. This is a downward trend of an estimated 7,170 acres, or about two percent of available juniper titmouse habitat on the Carson National Forest since 1986.

Photos from left to right: Hairy Woodpecker, Juniper Titmouse, and Brewer's Sparrow.

Program Area **Summary of Monitoring Conducted and Evaluation**

Figure 2 Juniper Titmouse (Beason et al. 2005)



Program Area	Summary of Monitoring Conducted and Evaluation

Brewer's sparrow was estimated to have a density in 2005 of 0.376 breeding birds per hectare in the sagebrush type. The species was also detected in both the piñon-juniper and grassland habitats with a density of .049. In 2006 the density was found to be 0.266 birds/hectare in sagebrush and 0.02 birds per hectare in the pinyon-juniper.

Rotenberry (1999) states that Brewer's sparrow population numbers are "highly variable, depending on habitat and year." For example, one site in Oregon sampled for seven years varied from 50 to 350 individuals/km2 (0.5 to 3.50 individuals/ha). A site may be unoccupied in one year, then attain densities of 1.50 individuals/ha the next year. Because of high annual variation, estimates from small-scale or short-term studies must be handled with caution. No monitoring of Brewer's Sparrow population was done on the Carson National Forest in 2007. Although the numbers have fluctuated for the Forest, they appear to be within normal range for the species.

Forest management activities have maintained the amount of sagebrush lands available for this species. Sagebrush lands correspond to Management Area, MA 12, of the Carson Forest Plan. Habitat trend for Brewer's sparrow on the Carson National Forest is up by about 55 percent or 29,152 acres. Existing habitat for the Brewer's sparrow on the Carson National Forest is in good condition with an upward trend.

Table 4

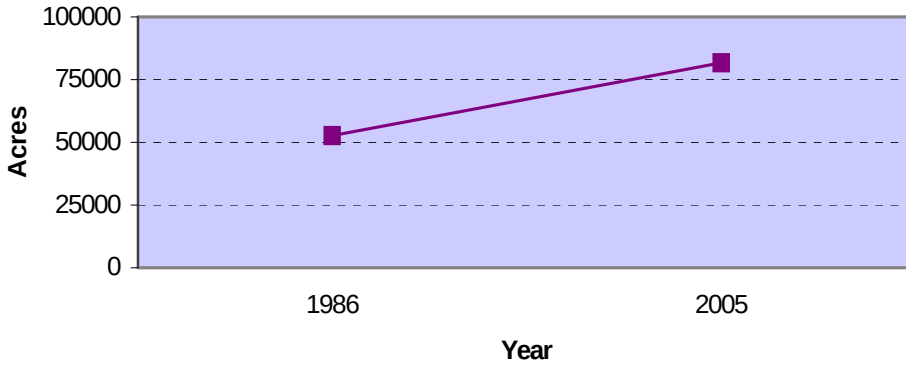
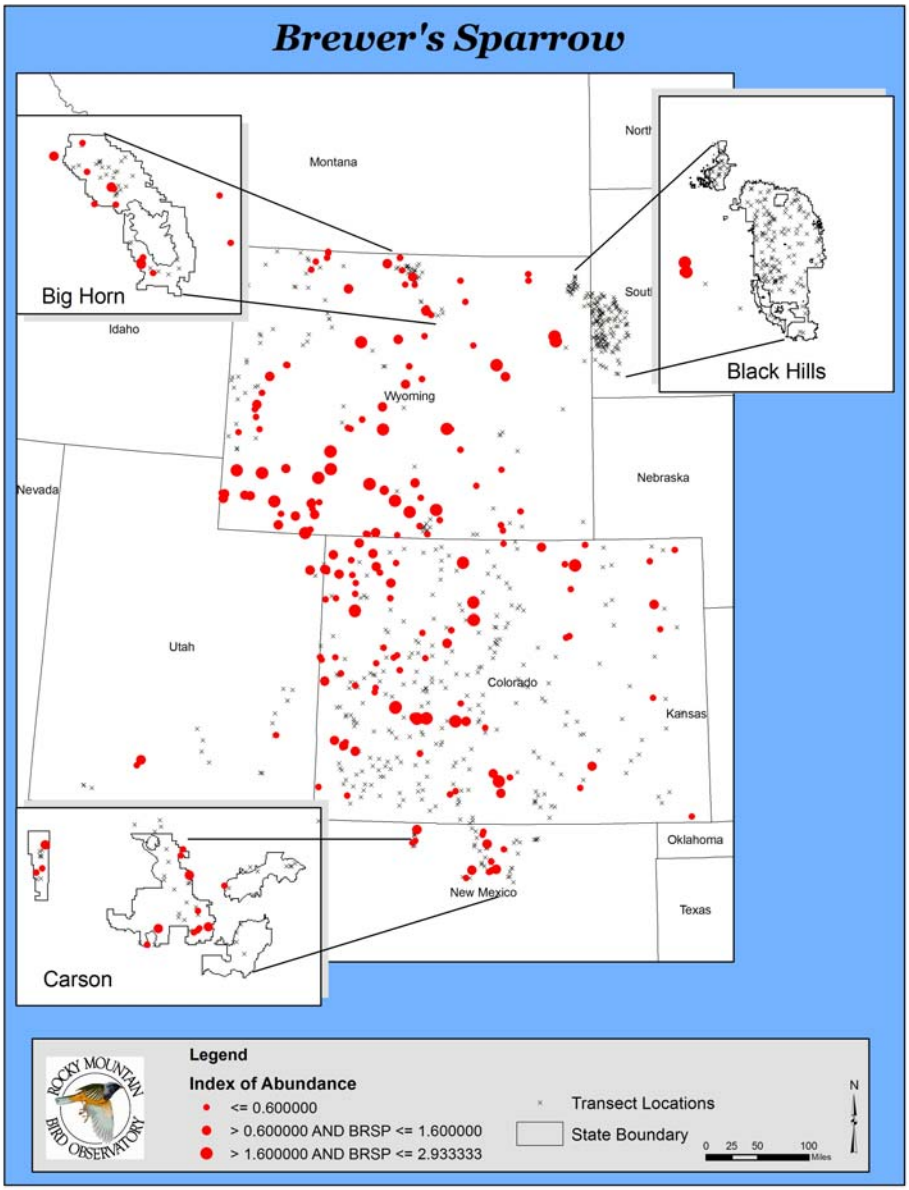


Figure 3 Changes in Brewer's Sparrow Habitat on the Carson National Forest, 1986-2005

Program Area	Summary of Monitoring Conducted and Evaluation

Figure 4 Brewer's Sparrow (Beason et al. 2005)



Program Area	Summary of Monitoring Conducted and Evaluation

Abert's squirrel surveys showed the density of 0.01 squirrels/ha; 1 squirrel/247 acres, in 2005 and 2006. No monitoring surveys of Abert's Squirrel population were done on the Carson National Forest in 2007. While the numbers are still low in comparison to other studies, they are similar numbers found in Utah in 2003 and in the San Juan National Forest in 2004 (Frey 2005). While comparing monitoring results on the Carson with other recent studies conducted in Arizona and Utah, two patterns are apparent to Dr. Frey (2005). First, it appears the entire region experienced declines in Abert's squirrel densities from 2001 to 2004. Second, the regional declines are probably attributable to drought conditions. In north-central New Mexico, drought conditions began in 2000 and extended into the beginning of 2004. In contrast with previous years, moisture was high during 2006; therefore, the increased density of Abert's on the Carson in 2006 is most likely due to increased moisture.

Abert's squirrel habitat corresponds to Carson Forest Plan Management Areas MA 4, MA 5, MA 7. Stand with a dense oak understory and the presence of pinyon and juniper had lower squirrel densities. The habitat trend for Abert's squirrel from 1986 to 2005 is estimated to have increased from 53,220 to 63,794 acres of interlocking canopies or an upward trend of almost 20 percent. From 2002 to 2007 there have been no treatments that would have reduced squirrel habitat.

Table 5

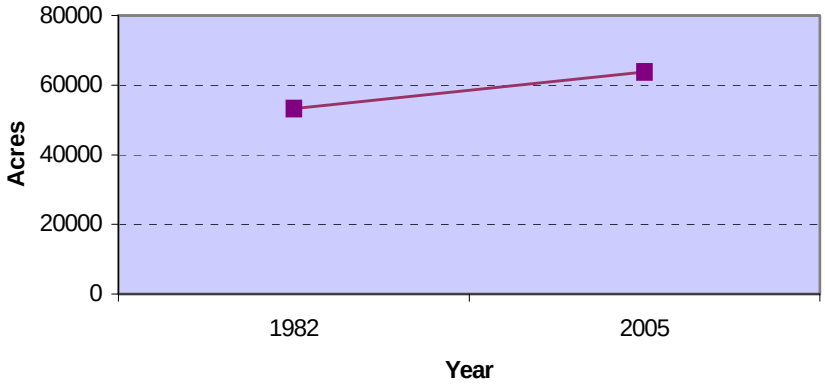


Figure 5 Changes in Abert's Squirrel Habitat on the Carson National Forest, 1986 to 2005

Red Squirrel is a huntable species as indicated by the 2006 Hunting Proclamation distributed by the New Mexico Department of Game and Fish. Nationwide densities vary from about 1 per 3.2 hectares to 1 per 0.2 hectare. In 2004 the overall mean density for the red squirrel was 1.04/ac (2.58/ha). Table 2 shows the density estimates by habitat type and year. The surveys have shown that the population levels are consistent with the rest of the state and the population appears to be stable throughout its range (Frey 2004). There were no surveys in 2005-2007 for Red Squirrel population on the Carson National Forest.

Table 6 Mean Density/ Acre for Red Squirrel (Frey 2003 and 2004)

YEAR	MIXED CONIFER	WHITE FIR	BLUE SPRUCE	ENGELMANN SPRUCE	SPRUCE-FIR
2003	0.17/AC (.42/HA)	0.15/AC (0.36/HA)	0.97/AC (2.40/HA)	0.43/AC (1.07/HA)	0.81/AC (2.00/HA)
2004	0.36/AC (0.90/HA)	0.56/AC (1.38/HA)	1.32/AC (3.26/HA)	1.04/AC (2.58/HA)	1.97/AC (4.87/HA)
2005	NO SURVEY				
2006	NO SURVEY				
2007	NO SURVEY				

The red squirrel prefers coniferous and mixed forests. These types of forests correspond to Carson Forest Plan management Areas MA 3, MA 5, MA 7. From 1986 to 2005, red squirrel habitat of interlocking canopies in mixed conifer and spruce-fir is estimated to have increased from 169,400 to 204,873 acres or an upward trend of about 20 percent. The following chart shows the habitat trend information since implementation of the Forest Plan in 1986.

Table 7

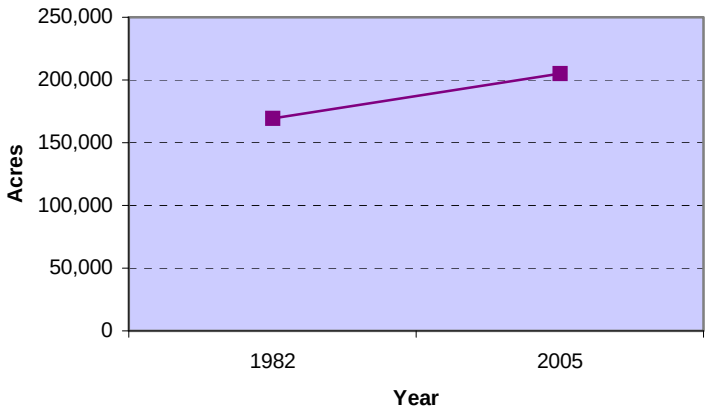


Figure 6 Changes in Red Squirrel Habitat on the Carson National Forest, 1986 to 2005

Wild turkey is an indicator species for the presence of old growth pine. With the increase of harvest (hunting) areas on the forest, it is reasonable to assume a population increase. Population trend can be determined based on increased areas where turkeys are found, increased hunting areas opened to the public, and by hunter success. Wild turkey populations, nation wide, are estimated to have increased by 3.7 to 4.2 million from 1990 to 1995 and from 1989 to 1995 there is an estimated 46% expansion of occupied range (Kennamer J.E. and M.C. Kennamer 1995).

Program Area	Summary of Monitoring Conducted and Evaluation

Turkey habitats are located in the following Management Areas of the Carson Forest Plan, MA 3, MA 4, MA 5, MA 6, and MA 1. Turkey habitat from 1986 to 2005 is estimated to have increased from 117,300 to 118,816 acres or a slight upward trend of about one percent. There have been no vegetation treatments from 2002 to 2005 that are considered such that would have removed acres from suitable habitat.

The shift in management practices to increased thinning and prescribed burning should improve conditions favorable to increasing populations over time. The urban-interface fuels reduction projects planned for the near future on the Carson will continue to improve conditions for the bird, although at a fairly slow rate. Thinning to create clumpy conditions interspersed with openings can reduce competition and create larger tree diversity for roosting and openings for foraging. Prescribed fire would control dense tree reproduction and provide understory forage. Continued development of small, protected water sources and implementation of effective road closures in turkey habitat will also improve conditions. Subsequently, these forest activities will contribute to maintaining turkey populations.

Table 7

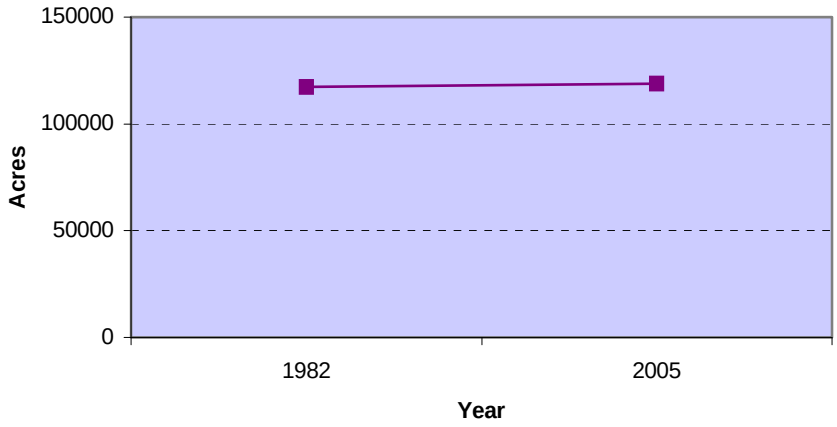


Figure 7 Changes in Suitable Habitat for Wild Turkey on the Carson National Forest , 1986 to 2005

White-tailed ptarmigan is an indicator species for the presence of alpine tundra and subalpine deciduous shrub. This corresponds to Management Area, MA 9, in the Carson National Forest Plan. The Carson Forest Plan EIS identifies 6,400 acres of occupied habitat (USDA 1986a). No management actions have changed since the time of the Forest Plan to cause a change in the number of acres of available habitat on the Carson National Forest.

The Terrestrial Ecosystem Survey data layer indicates there are 10,106 acres of alpine tundra on the Forest (USDA 1987). This does not mean there is any change in the trend

of available habitat, but is a result of a variation in habitat mapping. Incidental observations show that portions of these habitats are still occupied. The overall habitat trend for the white-tailed ptarmigan is stable on the forest. Domestic sheep grazing has been eliminated in ptarmigan habitat that should eventually contribute to willow recovery, and subsequently an improved trend over time. Other potential habitat areas, such as Little Costilla Peak in the Valle Vidal, were visited in 2006. Little Costilla Peak should be considered a possible resting location, but it lacks habitat requirements. Big Costilla Peak on private lands west of the Valle Vidal has been reported to have adequate habitat, and sightings have been recorded. In 2007, surveys were done on the Camino Real District and the Questa District, and the Forest can be contacted to obtain results. Determination of habitat on private lands and recording of sightings is under the New Mexico Department of Game and Fish and private landowners.

Resident trout species are used as indicator species for quality perennial streams and riparian vegetation. This corresponds to Management Area, MA 14. Resident populations reproduce and sustain themselves in the wild. Defined also as "resident trout" in the Carson Forest Plan, rainbow, brown and brook trout are non-native species that have been stocked extensively in northern New Mexico during the last 100 years. Rio Grande cutthroat trout is the only native of the resident trout management indicator species. Approximately 440 miles of perennial stream on the Carson National Forest are known habitat for resident trout. Rainbow, brown or brook trout occupy about 50 percent (~225 miles) of that habitat. Physical habitat conditions related to forest management activities and habitat trend for resident trout is stable.

Population surveys were conducted on two of six streams identified in the fisheries monitoring program for 2007. The first stream, Red River, was surveyed at four sites using multiple pass depletion surveys. The only notable change in populations was a significant decrease in brown trout abundance at the site just above the Red River hatchery. This decline is likely associated with heavy silt loads during the rainy season. During July and August a combination of heavy rains and naturally exposed soils in the upper Red River drainage caused large amounts of silt and clay to wash in to the river. New Mexico Department of Game and Fish received reports of dead fish on the lower Red River. It is likely that silt also filled in the habitat for macroinvertebrates although there is no survey data to substantiate this.

The second stream for population surveys in 2007, was the Rio Costilla, which was surveyed at four sites using multiple pass depletion surveys. Overall, there was an increase in wild trout population numbers at all sites. There continues to be a lack of larger fish represented in the Rio Costilla trout population. This is likely a result of very low to no water flows released from the Costilla reservoir during the winter months. This lack of flow limits the overwintering habitat for larger fish.

Aquatic macroinvertebrates or aquatic insects are found in lakes, streams, ponds, marshes and puddles and help maintain the health of the water ecosystem by eating bacteria and dead, decaying plants and animals. Local populations of certain aquatic macroinvertebrates are indicator species of high quality water. They are an indicator of overall aquatic conditions, quality of fisheries and associated riparian habitat. This habitat corresponds to Management Area, MA 14 of the Carson National Forest Plan. For the

Program Area	Summary of Monitoring Conducted and Evaluation
	requirement for aquatic macroinvertebrates is perennial water. Habitat conditions on the Carson National Forest vary by stream and by location within the stream. Overall, most habitats appear able to support diverse communities of aquatic macroinvertebrates. Stream habitat surveys, which are ongoing, will better qualify conditions in specific streams over time. Since the implementation of the Carson Forest Plan in most areas of the forest, physical condition of aquatic habitat appears to be stable or improved. Population trends for aquatic macroinvertebrates on the Carson National Forest appear to be stable. Funding for habitat and macroinvertibrate surveys was initially allocated, but subsequently withdrawn. Therefore the two streams that were scheduled for habitat surveys and six streams scheduled for macroinvertibrate surveys were not surveyed in 2007.
Riparian	**Goals:** To improve the condition of riparian areas through direct treatment and improved resource management, indirectly benefiting fish and wildlife habitat diversity, water quality, and water oriented dispersed recreation. **Monitoring:** (1) Determine the response in riparian condition resulting from the implementation of the standards and guidelines and; (2) Monitor the activities and uses to insure they are within the Standards and Guidelines. **Results**: Riparian health is a key to a sustainable, healthy forest ecosystem. Settlement activities (such as intensive grazing, and conversion to haying operations) in riparian areas significantly altered these systems in the late 1800's and early 1900's prior to presidential declarations making the public lands Forest Reserves. Although most of these systems have remarkably recovered, many still need improvement to regain their full natural function. One area of recovery is east of the Talpa, New Mexico community on the Rito de la Olla (Pot Creek). Until the late 1960's the riparian area was grazed and used for haying operations. The shifting of grazing to other pastures within the allotment, reductions in permitted livestock, cessation of the haying operations all contributed to recovery of the riparian area. This particular riparian area is now home to the occupied habitat for the Southwestern Willow Flycatcher. This particular area is within the Miranda allotment, however, it is excluded from grazing. Riparian condition surveys are being completed as a component of the fisheries surveys. These surveys also permit collection of information pertinent to the identification, location, and the condition of existing riparian areas. Properly functioning conditions are also being assessed. For key projects, baseline watershed quality information is being collected. Water quality information is being obtained and provided by the State of New Mexico.
Special Areas (Management Area 19)	**Goals:** The proposed Arellano Canyon Research Natural Area, the Tres Piedras *Haplopappus microcephalus* Botanical Area, the Middle Fork Lake/Sangre de Cristo Pea Clam Zoological Area and other potential research natural areas will be maintained and protected. **Monitoring:** NEPA analysis of site-specific proposed actions include the evaluation of effects on special areas, to insure that they are not adversely impacted. An interdisciplinary team evaluates a proposal through the NEPA process and recommends restrictions or corrective actions if inspections reveal adverse impacts on the potential

Program Area	Summary of Monitoring Conducted and Evaluation
	RNA or endangered plants or animals. **Results:** No uses or management activities on the Carson National Forest are causing adverse impacts to special areas. The continuing drought could possibly reduce the size of Middle Fork Lake which could cause a change in suitable habitat in the Pea Clam Zoological Area. The increased moisture levels in 2007 contributed to Middle Fork Lake maintaining near normal size. A range analysis done in 2007, on the Questa Ranger District, resulted in the identification of the need to increase residual forage guidelines to better protect the Pea Clam Zoological Area.
Protection 3 Insect and Disease	**Goals:** To meet Federal regulation, ensure destructive insect and disease organisms do not increase to potentially damaging levels following management activities. **Monitoring:** Determine growth reduction and mortality caused by insect and disease infestations. Diseases such as dwarf mistletoes and root disease causing organisms are found scattered about the forest. These diseases cause the death of individual trees and at times small pockets of trees. The scattered nature of these dead trees prevents an estimate of acreage of killed trees. Foliage diseases such as Ponderosa Pine Needle Cast are scattered over the Carson National Forest. New Mexico 518 between Taos and Questa has pockets of needle cast. These locations are expected to increase in size due to drought stress in trees and the increasing amount of inoculum present. Bark beetles —the primary tree killers in the region--tend to be host specific. Moreover, most conifers (excluding ponderosa pine) are normally attacked and killed by a single species of bark beetle. A group of Douglas-fir "faders," for example, is most often a result of attack by the Douglas-fir bark beetle, *Dentroctonus pseudotsugae.* In contrast, ponderosa pine are attacked and killed by several different bark beetles. Piñon pine mortality is primarily caused by *Ips confusus*, another bark beetle.

Table 8 Insect and disease conditions 2002 to 2007 by year by acres.

Insect/Disease	2002	2003	2004	2005	2006	2007
Western Spruce Budworm	114,680	62,700	114,990	80,265	54,077	156,450
Aspen Defoliation	2,645	680	7,570	8,525	1,524	10,430
Pinyon Bark Beetle	16,240	277,615	33,265	None mapped	None Mapped	None Mapped
Mountain Pine Beetle (investigation shows this to be Western Pine Beetle)	3,265	3,325	1,345	None mapped	271	None Mapped
Douglas-fir Beetle	90	6,235	15,815	11,885	4,826	340
Spruce Beetle (includes corkbark fire mortality)	1,675	5,840	3,905	6,605	2,223	None Mapped
Fir engraver Beetle	455	85	165	4,100	1,727	6800
Ips beetle in ponderosa pine	Not detected or recorded	Not detected or recorded	Not detected or recorded	Not detected or recorded	Not detected or recorded	3,310
Western balsam Bark Beetle	Not detected or recorded	Not detected or recorded	Not detected or recorded	3,540	6,590	11,180

Western Pine Beetle is not easily detected until a small clump of 3 to 5 trees or more are infested with the resultant browning of needles. This insect rarely infests trees less than 9 inches in diameter. Hence one beneficial effect of this insect is to create dead or dying trees suitable for cavity nesting wildlife species. Using the minimum number of trees needed to aerially detect this insect as 4 dead or dying trees a table was created to indicated the estimated number of snags over 9 inches in diameter created in the past 6 years by this insect alone. The table is based on one fader group equivalent to one acre infested.

It was expected the infestation incidence would be slightly reduced in 2005 due the reduced infested acreage in 2004. In actuality the population appears to have crashed with no

detection of this insect in 2005 - 2007. The indications are creation of at least 31,740 ponderosa pine snags 9 inches or greater in diameter in the last six years by this insect. The maps prepared after the aerial observation show the scattered nature of the insect infestations. It is highly likely the snags created are generally interior forest locations precluding removal, authorized or unauthorized, for firewood purposes. Issued permits preclude removal of ponderosa pine snags over 9 inches in diameter. Secondary cavity nesting birds preferred to nest in trees that had recently died. A significant number of nests are found in snags which had been dead less than 20 years with the most heavily used in the 5 to 20 year age since death range. (Balda, 1975)

Table 9 Western Pine Beetle conditions and snags created 2002 – 2007

Acres affected	3,265	3,325	1,345	None mapped	None mapped	None Mapped
Estimated Snags created	13,060	13,300	5,380	0	0	0

Douglas-fir beetle is similar to Western pine beetle in the number of trees (3-5), dead or dying, before aerial detection is effective. The larger trees, greater than 9 inches in diameter, are attacked and killed. A beneficial effect of this insect is to increase snag densities in infested stands. Using the minimum number of trees needed to aerially detect this insect as 4 dead or dying trees a table was created to indicate the estimated number of snags over 9 inches in diameter created in the past 6 years by this insect alone. The table is based on one fader group equivalent to one acre infested. The indications are creation of at least 151,938 Douglas-fir snags 9 inches or greater in diameter in the last six years. The maps prepared after the aerial observation shows the scattered nature of the insect infestations. It is highly likely the snags created are generally interior forest locations precluding removal, authorized or unauthorized, for firewood purposes. Secondary cavity nesting birds preferred to nest in trees that had recently died. A significant number of nests are found in snags which had been dead less than 20 years with the most heavily used in the 5 to 20 year age since death range. (Balda, 1975)

Douglas-fir beetle has increased its presence from 6,235 acres in 2003 to 15,815 in 2004. In 2005 a decline began with 11,885 acres, 4,826 acres in 2006, and 340 acres in 2007 affected. The number of infested acres appears to be declining. The precipitation increases over previous years may account for some of this reduction. An additional explanation is that the number of parasitic insects increased during 2005. This parasitism in 2005 helped reduce the population available for infestation of new trees. The populations, like many other insects, are somewhat cyclic around an endemic population.

Table10 Douglas-fir beetle conditions and snags created 2002 - 2007

Douglas-fir Beetle	2002	2003	2004	2005	2006	2007
Acres affected	90	6,235	15,815	11,885	4,826	340
Estimated Snags created	360	24,940	63,260	47,540	14,478	1,360

Fir Engraver beetle is similar to Western pine beetle in the number of trees (3-5), dead or dying, before aerial detection is effective. The larger trees, greater than 9 inches in diameter, are attacked and killed. A beneficial effect of this insect is to increase snag densities in infested stands. Using the minimum number of trees needed to aerially detect this insect as 4 dead or dying trees a table was created to indicated the estimated number of snags over 9 inches in diameter created in the past 6 years by this insect along.

The table is based on one fader group equivalent to one acre infested. The indications are creation of at least 51,561 Douglas-fir and white fir snags 9 inches or greater in diameter in the last six years. The maps prepared after the aerial observation shows the scattered nature of the insect infestations. It is highly likely the snags created are generally interior forest locations precluding removal, authorized or unauthorized, for firewood purposes. Secondary cavity nesting birds preferred to nest in trees that had recently died. A significant number of nests are found in snags which had been dead less than 20 years with the most heavily used in the 5 to 20 year age since death range. (Balda 1975)

Fir engraver beetle has increased its presence from 85 acres in 2003 to 4,100 acres in 2005 and then declined to 1,727 acres in 2006. In 2007 the population has again increased to 6,800 acres. The number of infested acres appears to be fluctuating. Available moisture may account for some of these changes. An additional explanation is the number of parasitic insects increased during 2004 but the conditions in 2005 were not conducive for increased parasitism. These populations like many other insects are somewhat cyclic around an endemic population.

Table 11 Fir Engraver Beetle conditions and snags created 2002- 2007

Fir engraver Beetle	2002	2003	2004	2005	2006	2007
Acres affected	455	85	165	4,100	1,727	6,800
Estimated Snags created	1,780	340	660	16,400	5,181	27,200

Spruce beetle is similar to Western pine beetle in the number of trees (3-5), dead or dying, before aerial detection is effective. The larger trees, greater than 9 inches in diameter, are attacked and killed. A beneficial effect of this insect is to increase snag densities in infested stands. This insect can build to high populations very quickly causing large areas of mortality in the higher elevations. Both spruce trees and corkbark/subalpine fir are attacked and killed. Using the minimum number of trees needed to aerially detect this insect as 4 dead or dying trees a table was created to indicate the estimated number of snags over 9 inches in diameter created in the past 6 years by this insect alone.

The table is based on one fader group equivalent to one acre infested. The indications are creation of at least 80,992 spruce and fir snags 9 inches or greater in diameter in the last six years. The maps prepared after the aerial observation shows the scattered nature of the insect infestations. It is highly likely the snags created are generally interior forest locations precluding removal, authorized or unauthorized, for firewood purposes. Secondary cavity nesting birds preferred to nest in trees that had recently died. A significant number of nests are found in snags which had been dead less than 20 years with the most heavily used in the 5 to 20 year age since death range. (Balda 1975)

Spruce beetle has reduced its presence from 5,840 acres in 2003 to 3,905 acres in 2004 and increased to 6,605 in 2005 and declined in 2006 to 2,223 acres. In 2007 there were no populations detected. The number of infested acres is fluctuating. The spruce beetle populations like many other insects are somewhat cyclic around a smaller endemic population.

Table 12 Spruce Beetle conditions and snags created 2002 - 2007

Spruce Beetle	2002	2003	2004	2005	2006	2007
Acres affected	1,675	5,840	3,905	6,605	2,223	None Mapped
Estimated Snags created	6,700	23,360	15,620	26,420	8,892	0

Western balsam bark beetle is similar to Western pine beetle in the number of trees (3-5), dead or dying, before aerial detection is effective. The larger trees, greater than 9 inches in diameter, are attacked and killed. A beneficial effect of this insect is to increase snag densities in infested stands. This insect attacks and kills trees in the true fir group, such as white fir and subalpine or corkbark fir. Using the minimum number of trees needed to aerially detect this insect as 4 dead or dying trees a table was created to indicate the estimated number of snags over 9 inches in diameter created in the past year by this insect alone.

The table is based on one fader group equivalent to one acre infested. The indications are creation of at least 85,240 fir snags 9 inches or greater in diameter in the last year. The maps prepared after the aerial observation shows the scattered nature of the insect infestations. It is highly likely the snags created are generally interior forest locations precluding removal, authorized or unauthorized, for firewood purposes. Secondary cavity nesting birds preferred to nest in trees that had recently died. A significant number of nests are found in snags which had been dead less than 20 years with the most heavily used in the 5 to 20 year age since death range. (Balda, 1975)

Western balsam bark beetle was undetected from 2002 to 2004. Populations appeared in 2005 and are up to 11,180 acres in 2007. The number of infested acres appears to be increasing. The populations like many other insects are somewhat cyclic around an endemic population.

Table 13 Western Balsam Bark Beetle conditions and snags created 2002 - 2007

Western Balsam Bark Beetle	2002	2003	2004	2005	2006	2007
Acres affected	Not detected or recorded	Not detected or recorded	Not detected or recorded	3,540	6,590	11,180
Estimated Snags created	0	0	0	14,160	26,360	44,720

The following chart summarizes the acres infested by insect, and the estimated number of snags greater than 9 inches in diameter created by insect infestation. The insects noted are native to the Carson National Forest. An endemic population of these insects fluctuates depending on year, moisture and temperature regimes, timing of temperature changes, parasitic insects and organism, bird and small mammal populations, and plant densities. Epidemic populations occur when some factor such as the moisture regime changes, drought, or plant densities become high causing intense competition for soil moisture and nutrients. The population of natural control agents generally lags one to two years behind the insect population increase. These general trends give rise to the cyclic population changes of insects.

Table 14 Insect, acres affected, and estimated snags created by year 2002 - 2007

Insect/data	2002	2003	2004	2005	2006	2007
Western Pine Beetle						
Acres affected	3,265	3,325	1,345	None mapped	None mapped	None mapped
Estimated Snags created	13,060	13,300	5,380	0	0	0
Douglas-fir Beetle						
Acres affected	90	6,235	15,815	11,885	4,826	340
Estimated Snags created	360	24,940	63,260	47,540	14,478	1,360
Fir engraver						
Acres affected	455	85	165	4,100	1,727	6,800
Estimated Snags created	1,780	340	660	16,400	5,181	27,200
Spruce Beetle						
Acres affected	1,675	5,840	3,905	6,605	2,223	None Mapped
Estimated Snags created	6,700	23,360	15,620	26,420	8,892	0

Insect/data	2002	2003	2004	2005	2006	2007
Western Balsam Bark Beetle						
Acres affected	Not detected or recorded	Not detected or recorded	Not detected or recorded	3,540	6,590	11,180
Estimated Snags created	0	0	0	14,160	26,360	44,720
Total estimated snags created	21,900	61,940	84,920	104,520	54,911	73,280

In the past six years an estimated 401,471 snags 9 inches in diameter or larger, have been created by the above insects, in the spruce, mixed conifer, and ponderosa pine cover types. These snags over time will fall to the forest floor providing large woody debris after their use by cavity nesting species.

The above table indicates an increasing amount of forested land affected by these insects. One insect population may be on a decline, while another may be increasing. The recent several years of drought are likely one of the causal factors increasing insect populations. Other natural causal factors are increased tree densities, reduced bird and small mammal populations due to drought, and reduced populations of parasitical insects.

Pinyon Bark Beetle generally infests the entire stand though an occasional pinyon will be attacked. Other tree species within the stand are not infested. The insect is host specific. The effect of this insect is to remove nearly all the pinyon pine in the infested stand. The number of acres infested decreased dramatically but still nearly 33,000 acres were attacked in 2004. From 2005-2007 there were no infested acres mapped aerially. It appears that the population of this insect collapsed and returned to an endemic level.

The immediate vegetative result of this beetle infestation is loss of tree cover. The longer-term result should be an increase in grass and forbs cover as the dead trees fall and break up, creating ground debris. This in turn provides micro sites (shade and moisture) for grass and other plant establishment. Other plants likely to invade the areas of tree canopy loss include big sagebrush and four wing saltbush.

Program Area	Summary of Monitoring Conducted and Evaluation
Protection 5 Fuels	**Goals:** Fuel treatment will follow the various timber activities as a means of reducing fire hazard and insect and disease potential. **Monitoring:** Maintain a fuel treatment atlas and record areas treated. Data is generated from field personnel who monitor and/or direct fuel treatment by Forest Service crews, logging companies, contractors, etc. **Results:** No large sale timber sales were implemented on the Forest in recent years. The majority of fuel treatments are occurring in the wildland urban interface adjacent to communities located in or adjacent to the National Forest. These projects are being prepared under the Healthy Forest Initiative or Healthy Forest Restoration Act or other authorities. The National Fire Plan has focused attention on at risk communities. Supporting documentation is located at the Forest Supervisor's office and the individual Ranger District offices. Forest-wide, the trend is toward increased fuel loadings, tree mortality, and increased tree density within stands of trees. Management options for dealing with these issues are somewhat limited. Tree mortality caused by insects or disease is difficult to address due to its widely scattered nature. Insect populations tend to by cyclic. Disease centers are difficult to treat if economically treatable. Fuel loadings increase as trees and other woody material die and fall to the forest floor. The trend has been toward more restrictions on use of active management, both through application of restrictive standards and guidelines related to threatened, endangered, and sensitive species and through limitations outlined in appeals and litigation.
Physical Environment	
Soil and Water 1 Watershed Conditions	**Goals:** To improve unsatisfactory watershed conditions on 25,000 acres by 2020. As a result of this change, productivity of the land is expected to improve. **Monitoring:** Improvement of watershed condition on the Forest is based on certain activities that will increase or enhance ground cover conditions. These activities include prescribed burning, converting sagebrush to native grasses and forbs, improving livestock distribution and utilization on grazing allotments, thinning densely stocked forested stands, installing sediment retention structures, and implementing proper grazing management through National Environmental Policy Act analysis for permit re-issuance. The Forest Plan monitoring plan identifies sampling of percent ground cover every three years as specified in *Terrestrial Ecosystem Survey Handbook*, Chapter 8 as the method for monitoring watershed conditions. Vegetative ground cover was extensively monitored using various methodologies, principally associated with grazing management and compliance with the annual operating instructions and permit terms and conditions (utilization monitoring, RAM, and pre and post season pasture evaluations). **Results:** Activities that improved Forest watershed conditions were accomplished on over 4,500 acres in 2007 (see Table 11). The trend in the types of projects proposed on the Forest is towards improving watershed conditions and completing treatments that are

involve primarily thinning and prescribed burning. Supporting documentation is located at the respective ranger districts. A detailed summary of district activities is included in this report.

Table 15 Some Highlights of Watershed Improvement Work 2002 -2007

Fiscal Year	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Road Maintenance (miles)	476	431	143	286	260	373
Road Obliteration (miles)	8	20	0	2.8	0	2
Re-seeding (Acres)	3,000 (Monto ya fire)	0	500	2,000	1,500	0
Sagebrush conversion (Acres)	200	0	1,200	0	0	0
Thinning (acres)	630	966	1,898	1,288	2,200	400
Prescribed burning	4,770	3,915	2,595	2,063	2,957	3,855

Summary for Year 2007

Camino Real Ranger District

- Maintained 10 miles of existing road
- 27 miles of trails were maintained. Maintenance included tree clearing, improved drainage structures, as well as tread maintenance.
- Several allotments were stocked under allowed capacity voluntarily. Grazing utilization guidelines of 40% in key areas and 4-6” stubble height in riparian zones continued to be implemented in all grazing allotments.
- Constructed 1 stock pond on the Rio Chiquito allotment to improve livestock distribution into uplands away from bottoms.
- Continued the implementation of vegetative treatments and fuel reduction activities in the following projects: Turkey Park II, La Joya, El Pato, Montes Borrego and North an South Shady Brook. A total of 400 acres were thinned.
- 405 acres of prescribed burning
- Improved trail damage and tread, reduced erosion and sedimentation by directing recreational use to established trails

Table 16 Stocking Level Reductions (percentages) for representative allotments for Camino Real Ranger District 2005 -2007

Allotment	Stocking level reduction 2005	Stocking level reduction 2006	Stocking level reduction 2007
Black Lake	0	45	50
Capulin	0	10	0
Flechado	n/a	n/a	22
Luna-Chacon	0	20	0
Rio Chiquito	0	31	20
Rio Pueblo	0	100	90
Santa Barbara	0	29	18
Trampas	0	33	30
Tienditas	0	39	30

Canjilon Ranger District:

- Reduced permitted stocking levels 7 percent district wide (reduced numbers or shortened grazing season)
- Monitored grazing levels on all allotments
- Reconstructed Jarosa and Mogote allotment boundary fence (3 miles) to improve livestock distribution

Table 17 Stocking Level Reductions (percentages) for representative allotments for Canjilon Ranger District 2006-2007

Allotment	Stocking level reduction 2006	Stocking level reduction 2007
Bateman	0	0
Canjilon	20	6
Canjilon Creek	20	20
Cebolla	2	2
English	9	0
Mesa	32	0
Mogote	25	0
Mogotito	14	15

Program Area	Summary of Monitoring Conducted and Evaluation

El Rito Ranger District:

- Accomplished 4 acres of mechanical noxious weed control
- Reseeded approximately 150 acres of Pine Canyon burn area
- Road Sediment Control
- Performed earthen dam construction, guzzler construction, spring reconstruction, and cattleguard installation as a part of 319 Project Implementation.
- Constructed and maintained 5 miles of allotment boundary fence.
- Gathered and removed approximately 70 head of wild horse stock from Jarita Mesa Territory.
- Prescribed burn 2,200 acres of Ponderosa pine, Pinon/juniper, and sagebrush to reduce stand density, reduce fuel loads, and improve ground vegetation conditions.
- Adjustments in entry dates and permitted cattle numbers were made in the following representative allotments, other allotments were also reduced, due to vegetative condition, management objectives and drought conditions:

Table 18 Stocking level reductions (percentages) for representative allotments on El Rito Ranger District 2005- 2007

Allotment Name	Stocking level reduction 2005	Stocking level reduction 2006	Stocking level reduction 2007
Comanche Sheep	20	25	10
El Rito Lobato East	35	45	26
El Rito Lobato West	44	43	33
Jarita Mesa	8	30/5	5/5
Alamosa	19	20	14
Salvador Complex	47	48 cattle 70sheep	51 cattle 64 sheep
Cano	NA	0	0
San Gabriel	NA	10	15

Jicarilla Ranger District

- 22 sediment traps constructed to catch sediment from disturbed areas to reduce water runoff from oil and gas development

Program Area	Summary of Monitoring Conducted and Evaluation

- Maintained roads by cleaning culverts, cattleguards, wing ditches and crown roads to standards to support oil and gas production.
- Removed 5 acres of Salt Cedar as invasive species treatment and installed protective fencing for cottonwoods and willows.
- Continued management of Wild Horse and Burro populations by removing 14 head from Jicarilla Wild Horse and Burro Territory.
- About 150 miles of lease roads are maintained on a timely basis to access gas well locations and minimize resource impacts from road use.
- Interagency agreement between BLM and FS for fire management continues to be beneficial for both agencies by saving money and increased suppression efficiency.

Table 19 Stocking level reductions (percentages) for representative allotments on Jicarilla Ranger District 2005-2007

Allotment Name	Stocking level reduction 2005	Stocking level reduction 2006	Stocking level reduction 2007
Cabresto	85	54	50
Bancos	100	100	100
Carracas	100	100	100
Vaqueros	92	92	72
Laguna Seca	48	34	17
Valencia	16	17	0

Tres Piedras Ranger District

- Prescribed burn over 800 acres in Dry Lakes II, of Ponderosa pine, Pinyon/juniper, and sagebrush to reduce stand density, reduce fuel loads, and improve ground vegetation conditions.
- Administered all allotments to standard through range readiness inspections, issuance of annual operating instruction in pre-season meetings with permittees, utilization monitoring during the grazing season and end-of-season-monitoring and feedback to permittees. This administration covers approximately 75,000 acres District-wide.
- In Stewart Meadows interior fencing was removed, fences were built along the northern rim to exclude access by cattle, and maintained the top rail fence.

Table 20 Stocking level reductions (percentages) for Tres Piedras Ranger District 2005-2007

Allotment Name	Stocking level reduction 2005	Stocking level reduction 2006	Stocking level reduction 2007
Apache	12	10	15
Sublette	20	25	10
Lagunitas	10	15	10
San Antone	15	25	14
Tio Grande	15	10	13
Tusas	10	20	21
Spring Creek	10	30	41

Questa Ranger District

- Maintained and restored function to erosion control structures (one rock dams) at the following locations in the Valle Vidal:
- 53 dams below Ring Ranch tributary to North Ponil Creek
- 60 dams along 1.5 mi of Seally Canyon Creek
- 30 dams adjacent to a 2.5 mile mountain bike trail in Whitman Vega
- Installed 18 erosion control structures (rock dams) along 0.5 miles of Middle Ponil drainage above Shuree Ponds for watershed protection, water quality improvement, and stabilization of associated riparian wetlands.
- Installed 37 wood post vanes along 2 miles of Comanche Creek to stabilize stream banks and reduce sediment input.
- Abandoned mine reclamation included removing 3,600 cubic yards of waster material from Pioneer Creek and 6,700 cubic yards from Placer Creek. This reduced or eliminated exposure of surface water to mine waste and tailings.
- Abandoned mine reclamation included improving riparian vegetation and habitat along 100 feet of Pioneer Creek and 200 feet of Placer Creek.
- Plant willow slips along 2 miles of Comanche Creek.
- Enhanced riparian vegetation restoration along Comanche Creek inside 29 existing enclosures.
- Watershed improvement on Comanche Creek included stabilizing wetland headcut with rock dam placement and support. Also created a raised inlet to a culvert to maintain flow of water and drainage.
- OHV improvement included steps to reduce runoff, erosion, and sediment delivery. Maintained vegetation integrity along OHV routes. Unauthorized road development was reduced by keeping OHVs on

designated routes.

- An OHV patrol officer was funded for the Red River area
- Public education continued for compliance with NM OHV laws and USFS regulations.
- Trail management and improvements were done to reduce runoff and trail surface erosion reducing sediment delivery to streams. 15 miles of trails were cleared and maintained.
- Trail surface hardening was done to 270 ft of trail for fisherman access at Goose Lake reducing erosion.
- Adjustments in entry dates and permitted cattle numbers we made in the following allotments due to vegetative condition, water availability and management objectives driven by on-going drought conditions:

Table 21 Stocking level reductions (percentages) for representative allotments on the Questa Ranger District 2005 - 2007

Allotment Name	Stocking Level Reduction 2005	Stocking Level Reduction 2006	Stocking Level Reduction 2007
Arroyo Hondo	37	47	50
Black Copper/Red River	100	100	100
Bobcat	100	100	100
Columbine	100	100	100
Deer Creek	50	50	30
Goose Creek	100	100	100
La Cal	100	100	100
La Lama	75	80	75
Lake Fork Baldy	100	100	100
Midnight	38	36	35
Rito Segundo	60	69	70
San Cristobal	24	67	36
Sawmill Park	100	100	100

Program Area	Summary of Monitoring Conducted and Evaluation

Valle Vidal	0	15 (ave)	0

SUPERVISORS OFFICE

- Supported efforts for Forest Land Management and Resource Plan amendment for the Valle Vidal, on hold.
- Supported the State of New Mexico Regional Water Planning efforts as a member of the Taos County Regional Water Planning Steering Committee in cooperation with Taos County and other stakeholders.
- Forest Staff and Leadership hosted several Congressional field trips and briefings regarding the Valle Vidal plan amendment.
- Forest Staff supported the abandoned mine remediation activities in the Red River Mining District through participation at public meetings (open house), on-site evaluation, development of best management practices, and review of design criteria for removal actions. Staff also assisted in selection of consolidation cell locations for mine waste repositories.
- Coordination with the New Mexico Department of Game and Fish continues. The agency reviews the majority of environmental analyses conducted for project level proposals. Forest biologists have been active in assisting in bighorn sheep transplants and Rio Grande cutthroat surveys of stream reaches that have not been recently inventoried. The Forest is also actively working the State on elk and livestock issues.
- Habitat Stamp Program projects, such as prescribed burning to improve the quality of habitat, are monitored after completion and continue over several years. The New Mexico Department of Game and Fish is a partner in Habitat Stamp Program project implementation monitoring and determining whether predicted results have been met. Supporting documentation is located at the District Ranger offices.
- Maintained approximately 363 miles of forest roads

Soil and Water 2 Best Management Practices	**Goals:** Production of water from forestlands will meet State water quality standards. **Monitoring:** Established designated qualified personnel to check Best Management Practices (BMP) (i.e., seeding disturbed areas, water barring roads, etc.) for implementation on the ground. Best management practices monitoring follows Regional evaluation guidelines and procedures. **Results:** The application of BMPs is standard procedure with any ground disturbing

Program Area	Summary of Monitoring Conducted and Evaluation
	activity undergoing environmental analysis. Implementation of BMPs is the responsibility of each district ranger. Field trips are taken to validate on-site BMP implementation. It is recommended that more emphasis be put on BMP training and the development of a BMP monitoring program to track actual implementation and effectiveness. Several water quality projects have been implemented on the Forest: • Baseline and existing condition information are being collected in cooperation with the New Mexico Environment Department (NMED) for several creeks within the Carson National Forest boundary. Collected information will help determine whether these reaches are in compliance with New Mexico water quality standards. Supporting documentation is located at the respective ranger station and the Supervisor's Office. • Identification of existing and potential non-point source water pollution on the Carson is ongoing and helps determine where watershed work would provide the most significant results.
Soil and Water 3 Roads	**Goals:** To assure that Best Management Practices (BMP) are implemented in all phases of road design, construction and maintenance. To minimize erosion and maintain on-site productivity and water quality, and to assure that road density for public use is not exceeded. **Monitoring:** Road design, construction, maintenance and density. **Results:** BMPs are standard mitigation measures when any road construction is proposed. Analysis of the proposal and alternatives are usually conducted with the assumption that BMPs are integrated into the activities. Much of the maintenance performed on Forest roads is structural measures (e.g., water bars, crowning, resurfacing, etc.) through inspection and maintenance activities in order to minimize erosion, maintain on-site productivity and water quality. Supporting documentation is located at the respective ranger districts **Supervisor's Office** • Maintained approximately 363 miles of forest roads forest wide. **Jicarilla Ranger District** • Road maintenance was performed through our continued partnership with the oil and gas companies via the Carson Roads Committee. In addition, about 150 miles of lease roads are maintained on a timely basis to access gas well locations and minimize resource impacts from road use. **Camino Real Ranger District** • Road maintenance was done on 10 miles of forest roads. One culvert was installed and 5 were cleaned.

Program Area	Summary of Monitoring Conducted and Evaluation
Human Environment	
Facilities 2	**Goals:** Travel management objectives will be developed for all Forest Development Roads (FDR) and travelways. This will further determine and verify which roads are needed and should be included or remain on the FDR System, which are needed only periodically and should be closed, and which should be added to the obliteration list. New construction of Forest Development Roads is primarily for timber sales and oil & gas development. Approximately 70% of these roads should be local terminal functional classification and should be closed promptly after resource management activities have ended. **Monitoring:** A revised transportation plan for the Carson will be completed in the next two years under the Travel Management process. In 2002, an inventory was performed on level 3, 4 and 5 roads. The result was a Forest-wide Road Analysis (RAP) for these arterial and collector roads. The RAP was completed in April 2003. In addition over 3,777 miles of road, levels 1 and 2, have been inventoried, documenting conditions of road surface, drainage, sight distance, and proper signing since 2001. The inventory was halted at the end of 2006 pending Travel Management decisions. Facility, road, bridge and dam maintenance monitoring is ongoing, although minimal. **Results:** In fiscal year 2007 there was no new road reconstruction.
Recreation 1	**Goals:** Provide the opportunity for the public to obtain a variety of recreation experiences by managing the natural resource setting and the activities that occur within it. Provide a spectrum of opportunities on the Forest from Semi-primitive to Urban, with emphasis on the less developed end of the spectrum. To offer a balanced level of developed and dispersed recreation experiences. Demand for dispersed recreation will be within capacity. Quality of experience will increase due to more intensive management. **Monitoring:** Effects on dispersed recreation are evaluated in the majority of environmental analyses for project proposals – whether or not they are recreation related. Changes to the Recreation Opportunity Spectrum (ROS) class are assessed and avoided if possible. **Results:** No decisions on site-specific projects in 2007 have caused an analysis area's ROS class to change**.**
Recreation 2	**Goals:** The Forest will offer a wide range of opportunities for developed sites in the public and private sector to support recreationists, to provide barrier-free access, and to implement recreational strategies. **Monitoring:** Assessment of goal achievement for the recreation program is based on professional judgment by recreation specialists, public comments and information from Regional, Forest and District recreation managers.

evaluation cards, newspaper articles and comments from recreation fee envelopes and walk-in visitors. Developed campgrounds and picnic areas are monitored at least on a weekly basis during the summer months by Forest Service law enforcement, district personnel, campground hosts and/or concessionaires, as well as through cooperative

agreements with state and county law enforcement. These comments provide input on the conditions of developed recreation sites, the presence of user conflicts and public safety problems. Supporting documentation is located at each ranger station or in the Forest Supervisor's office.

Taos Ski Valley (TSV) and Red River Ski Area (RRSA) operations are monitored at least once a week during the winter by the Questa snow ranger. Sipapu Ski Area operations are monitored at least once a month. Site inspections by Forest Service lift engineers are made at least once a season at each ski area. Supporting documentation for monitoring operations at TSV and RRSA is located at the Questa Ranger Station and at each ski area. Supporting documentation for monitoring operations at Sipapu is located at the Camino Real Ranger Station and at Sipapu Ski Area. Supporting documentation of lift inspections is located at the Southwestern Regional office in Albuquerque.

The National Visitor Use Monitoring Project for the Carson National Forest was completed and placed in the public domain in 2004. It is available electronically at http://www.fs.fed.us/recreation/programs/nvum/.

Results: Recreation use and demand appears to be experiencing a small, steady growth. Use is concentrated at developed sites, streams, rivers, lakes, wilderness and backcountry areas. Several nearly barrier-free recreational facilities have been provided in recent years at Santa Barbara Campground, Echo Amphitheater Picnic Area and Hopewell Lake Campground. Monitoring ski area operations has not exposed any noncompliance or safety violations.

Table 22 Skier visits to respective ski areas 2002 -2007 ski seasons

Ski Season	Taos Sky Valley	Red River Ski Area	Sipapu Ski Area
2001-2002	201,113	107,840	14,573
2002-2003	249,682	101,816	15,874
2003-2004	224,565	104,406	18,137
2004-2005	237,441	84,133*	19,791
2005-2006	155,003	76,140	17,751
2006-2007	208,187	83,246	23,167

* Lower number due to change in method of obtaining visitor count.

Program Area	Summary of Monitoring Conducted and Evaluation
	The Enchanted Forest continues to provide cross-country skiing opportunities for approximately 5,000 skiers per year depending on snow conditions. Snow conditions or lack of snow also influences the number of skiers. Red River Ski area and Sipapu Ski Area both permit snowboarding with the snowboarders reflected in the number of skiers. Overall, skiers are satisfied with the conditions of the three ski areas on the Carson, although a movement by the snowboarding community to open Taos Ski Valley to snowboarding surfaced in 1999. The snowboarding community through FY2007 continued to push for the allowance of snowboarding at Taos Ski Valley.
Recreation 3	**Goals:** Help the public enjoy their Forest visit and instill an understanding of the resources and uses of their National Forests. Wildlife recreation use will increase by 183 percent by the end of the planning period. This is within capacity for this type of use. **Monitoring:** No specific monitoring of wildlife recreation use has taken place on the Forest. The NM Department of Game and Fish regulates hunting and fishing on the National Forest System lands. **Results:** Inquiries and comments received at the ranger stations and the Forest Supervisor's Office verify that many visitors come to see wildlife through active bird watching, camping, hiking and cross-country skiing.
Recreation 4	**Goals:** All developments are high quality and well maintained. They fill the needs of the users. **Monitoring:** Assessment of goal achievement for the recreation program is based on professional judgment by recreation specialists, public comments and information from Regional, Forest and District recreation managers. Customer satisfaction on how well the forest is managed, is monitored through evaluation cards, newspaper articles and comments from recreation fee envelopes and walk-in visitors. Developed campgrounds and picnic areas are monitored at least on a weekly basis during the summer months by Forest Service law enforcement, district personnel, campground hosts and/or concessionaires, as well as through cooperative agreements with state and county law enforcement. These comments provide input on the conditions of developed recreation sites, the presence of user conflicts and public safety problems. Supporting documentation is located at each ranger station or in the Forest Supervisor's office. Recreation facility construction projects include reviews to ensure contract work meets specifications, environmental assessment requirements, and to monitor how well the design meets user needs. Such reviews have been performed at the Santa Barbara Campground, Echo Amphitheater Picnic Area and Hopewell Lake Campground. Supporting documentation is located at the Forest Supervisor's office. **Results:** Customer satisfaction on the condition of developed sites varies depending on the location and the age of the facility. The newest campgrounds, such as Agua Piedra and Hopewell Lake, are experiencing positive comments. On the other hand, Taos Canyon facilities are heavily used and sites closest to Taos are frequently vandalized. The

Program Area	Summary of Monitoring Conducted and Evaluation
	campgrounds near Red River are heavily used during the summer months. In response to visitor comments, the Red Rock Campground is being analyzed for upgrades. The National Visitor Use Monitoring Project for the Carson National Forest contains more information. The National Visitor Use Monitoring Project for the Carson National Forest was completed and placed into the public domain in 2004. This information is available electronically at http://www.fs.fed.us/recreation/programs/nvum.
Recreation 5	**Goals:** Establish a full spectrum of trail opportunities, considering all modes of travel, ranging from challenging and adventurous to opportunities for people with disabilities, and give special emphasis to the protection, development and management of specially designated areas and trails. **Monitoring:** Assessment of goal achievement for the recreation program is based on professional judgment by recreation specialists, public comments and information from Regional, Forest and District recreation managers. **Results:** Non-ATV hunters have been complaining over the increasing use of ATVs on the Forest during hunting season. There is little enforcement of ATV use off designated roads and trails. Hunters on the Jicarilla RD complain of the disturbance caused by an increase in gas drilling activity and traffic in their favorite hunting spots. ATV use in unauthorized areas is becoming a significant problem on the Forest. The development of a transportation plan that designates the type of use on roads and trails is in process. Involvement of the public to resolve issues and educate users is an integral part of designing a new transportation plan. The December 9, 2005 regulation concerning Travel Management, 36 CFR 212 as amended, will be used to determine designation of roads, trails, and areas open or closed to motor vehicles. Public involvement in this process took place in 2007, where desires were raised to expand motorized opportunities around the forest. The Carson National Forest expects to complete implementation of this rule by October 2009. The Continental Divide Trail system portion on the Carson National Forest has been designated. Much of the trail is along existing open and closed roads. Around 5.5 miles of the trail were relocated in 2007. More relocation of the trail is planned in the next 6 years. In addition, the following recreation projects were completed to provide a quality recreational experience on the Forest, while protecting natural resources. Supporting documentation is located at the Forest Supervisor's office.

Program Area	Summary of Monitoring Conducted and Evaluation

Table 23 Forest Trail Activities 2002 - 2007

Activity	2002	2003	2004	2005	2006	2007
Trail Maintenance (miles)	162	28	11	105	106	42
Trail Condition Surveys (miles)	50	10	0	0	7.6	1
Trail Reconstruction (miles)	6	1	0.5	0	4	0

Recreation 6

Goals: Potential wilderness characteristics will be maintained In Management Area 20, in order that the areas can be considered for multiple use or wilderness recommendation when a new plan is prepared in 10 -15 years.

Monitoring: In 1999, the President of the United States initiated the Roadless Area Conservation analysis for all National Forest System (NFS) lands. The Carson National Forests Management Area 20 includes all inventoried roadless areas identified in the Roadless Area Review and Evaluation II (RARE II), with the exception of a portion allocated for potential expansion of Sipapu Ski Area. The nation-wide Roadless Area Conservation Proposed Rule would prohibit any road building or timber harvesting in most RARE II inventoried roadless areas on NFS lands. The Roadless Area conservation Rules were promulgated in 2000. These rules have been a source of litigation since. Currently the Rules are not being implemented due to litigation. The 2000 Roadless Conservation Rule was overturned in the litigation process. The 2004 Roadless Conservation Rule is currently in the litigation process. The 2004 Roadless Conservation rule was overturned in the litigation process. The Carson National Forest continues to maintain the integrity of the roadless areas on the forest pending the outcome of the rule making process, other methods of congressional intent concerning the roadless issue, or resolution of the litigation.

Results: For the most part, the implementation of the Roadless Area Conservation proposal and its successor would duplicate protection for Management Area 20 already in place through Forest Plan standards and guidelines.

Recreation 7

Goals: Trails will be reconstructed and maintained at a level that provides public safety, travel and resource protection.

Monitoring: The assessment is based on professional judgement of recreation specialists, public comments, and information from Regional, Forest and District recreation managers.

Results: Trail use is primarily by recreationists and grazing permittees. Use levels

Program Area	Summary of Monitoring Conducted and Evaluation
	appear to be moderate to heavy with a slight increase depending on the location of the trail and trailhead. Some trailheads provide information about recreational opportunities. In 2007, 42 of the 639 miles of designated trail were maintained or reconstructed. **Camino Real Ranger District** • Maintained 27 miles of foot trail District-wide including 7 miles of Pecos Wilderness trails. Maintenance activities included tree clearing, trail drainage, and tread maintenance. The miles of trail maintained by watershed area are displayed in the following table • Windfall trees were removed on wilderness trails • Improved trail damage and tread, reduced erosion and sedimentation by directing recreational use to established trails **Questa Ranger District** • Continued barrier installation, law enforcement activities and signing to address recreational OHV use and resulting resource damage from this activity. Approximately 90% of OHV problem areas have now been identified, barriers installed and/or signed. • Continued Implementation of horse use regulations in campgrounds on Valle Vidal to minimize impacts. • Conducted trail maintenance on approximately 15 miles of trails. Table 24: Miles of trail maintenance by trail name for Questa District. Trail Maintained | Miles of maintenance Gavilan, Italianos, Manzanita, and Yerba canyons | 12 Bull of the Woods | 1 Lake Fork | 2 Many trails do not meet trail standards (clearing, logging out, tread maintenance, signing, nonexistent trail logs, etc.) due to budget/staff limitations. Management decisions regarding acceptable limits, zoning, and resource emphases are often made informally, frequently lacking the support of coordinated plans or professionally established analysis methods. Volunteer groups are aiding the Forest Service in trail maintenance.
Wilderness 1	**Goals:** Maintain an enduring high quality wilderness and provide a quality recreational experience. **Monitoring:** The assessment is based on professional judgment of recreation specialists, public comments, and information from Regional, Forest and District recreation managers. Volunteers and/or recreation specialists perform wilderness patrols several times during a summer. Patrols include inspections of trail conditions, dispersed camping areas and outfitter/guide permit use. Supporting documentation is located at each ranger station. **Results:** Wilderness use is primarily day-use by recreationists and grazing permittees.

Program Area	Summary of Monitoring Conducted and Evaluation
	Wilderness use is increasing slightly and is primarily concentrated along trails in the Wheeler Peak, Pecos wilderness areas, and Columbine-Hondo Wilderness Study Area. The use of the Latir Wilderness and the Cruces Basin Wilderness is also increasing slightly. Much of the use in these two wilderness areas is for fishing. Most trailheads provide information about recreational opportunities and wilderness resource conservation issues. Regular patrols are becoming more infrequent as the number of district employees is reduced. Public complaints about the presence/impacts of cattle grazing on aesthetics and ecosystems have occurred. Many trails do not meet trail standards (clearing, logging out, tread maintenance, signing, nonexistent trail logs, etc.) due to budget/staff limitations. Management decisions regarding acceptable limits, zoning and resource emphases are often made informally, frequently lacking the support of coordinated plans or professionally established analysis methods.
Wilderness 2	**Goals:** Maintain an enduring high quality wilderness trail system that is a source of minimal resource damage. **Monitoring:** The assessment is based on professional judgment of recreation specialists, public comments and information from Regional, Forest and District recreation managers. **Results:** Regular patrols are becoming more infrequent as the number of district employees is reduced each year. Wilderness use is primarily day-use by recreationists and grazing permittees, and is increasing slightly. Use is primarily concentrated along trails in the Wheeler Peak and Pecos wilderness areas and Columbine-Hondo Wilderness Study Area. The use of the Latir Wilderness and the Cruces Basin Wilderness is also increasing slightly. Much of the use in these two wilderness areas is for fishing. Public complaints about the presence/impacts of cattle grazing on aesthetics and ecosystems have occurred. The Cruces Basin Wilderness was established with the permitted use of grazing. Most trailheads provide information about recreational opportunities and wilderness resource conservation issues. Many trails do not meet trail standards (clearing, logging out, tread maintenance, signing, nonexistent trail logs, etc.) due to budget/staff limitations. Management decisions regarding acceptable limits, zoning and resource emphases are often made informally, frequently lacking the support of coordinated plans or professionally established analysis methods. Supporting documentation is located at each ranger station.
Wild and Scenic Rivers	**Goals:** Conduct a Wild and Scenic River eligibility assessment on all river and stream segments on the Carson National Forest. Maintain and enhance the outstandingly remarkable values and free-flowing conditions of eligible and designated Wild and Scenic Rivers. **Monitoring:** Eligibility and classification assessments have been conducted on all ranger districts. These assessments involved an analysis team of field personnel – such as a biologist, hydrologist/soil scientist, recreation specialist, archeologist, and technicians – familiar with the district. A representative from the NM Department of Game and Fish also

Program Area	Summary of Monitoring Conducted and Evaluation
	participated. Rivers were sectioned into logical segments for evaluation. Each member of the team reviewed each segment and determined whether it supported any outstandingly remarkable values. Discussions were generated when there were differences of opinion and final determinations were based on consensus. The Bureau of Land Management monitors the wild and scenic designated portions of Rio Grande and Rio Chama that are on National Forest System lands. **Results:** Sixty-five river segments have been identified as potentially eligible for Wild and Scenic designation. The outstandingly remarkable values, for which each segment deemed potentially eligible, will be protected until a suitability study has been completed or Congress designates it as a Wild and Scenic River. Supporting documentation is located at the Forest Supervisor's Office. All surface waters of the Valle Vidal Administrative Unit were classified as "Outstanding National Resource Waters" (ONRW) by the New Mexico Water Quality Control Commission in September of 2005[1]. Surface waters designated as ONRW are recognized as waters that possess outstanding ecological or recreational values. This designation assigns the highest level of water quality protection in order to maintain the quality of these waters into the future for the benefit of both humans and wildlife. There were changes in the designation of stream segments identified as potentially eligible for Wild and Scenic designation.The outstandingly remarkable values of the Rio Grande and Rio Chama are being maintained.
Lands	**Goals:** Successfully complete, process or administer planned land exchanges, title claims, purchases, donations, withdrawal reviews, property boundary locations, special uses, memorandums of understanding, and the acquisition of needed rights-of-ways, to meet other program output needs (timber sales, range projects, recreation operations etc.) and the needs of other agencies, private parties and corporations. **Monitoring:** Conditions to be monitored are dictated by individual projects, applications, annual programs, etc. **Results:** Approximately 659 Special Use Permits related to real estate are administered on the Carson National Forest. In 2007, 23 new permits were processed and 423 permits (approximately 60%) were administered to standard. Supporting documentation is located at the Forest Supervisor's Office.
Protection 1 Drinking Water	**Goals:** Comply with state health and sanitation codes to protect public health. AII public potable water supplies will be in compliance with the Safe Drinking Water Act and

[1] NMAC 20.6.4.8.A. (3) (e), Antidegradation Policy and Implementation Plan. August 2007. "Preexisting land-use activities allowed by federal or state laws prior to designation as ONRW, and controlled by best management practices (BMPs), shall be allowed to continue so long as there are no new or increased discharges resulting from the activity after designation of the ONRW.

Program Area	Summary of Monitoring Conducted and Evaluation
	applicable state laws. Wastewater treatment will comply with state laws. **Monitoring:** Monitor all potable water systems open to public use. **Results:** Water samples are taken once a month from all campgrounds (when open) and Forest Service administrative buildings (year-round) not on municipal water systems. New Mexico requires a quarterly water sample; the Forest Service requires monthly samples. In 2007, all water samples met the minimum state requirements for public use water systems. Supporting documentation is located at the Forest Supervisor's office.
Protection 2 Fire Suppression	**Goals:** Provide effective fire suppression to reduce or minimize fire risk as the projected increase in population is realized. **Monitoring:** Determine the effectiveness of fire suppression by - 1. Periodic inspections and reviews by specialists to determine if fire control organization is effective in controlling fire losses within acceptable limits. 2. Fire reviews of selected fires. **Results:** For the 2007 fire season, the Carson National Forest received consistent moisture. Winter snows transitioned into spring rain maintaining high fuel moisture, which moderated the potential for an active fire season. The Carson had a total of 45 fires, which all remained Class A fires. The largest fire was only 5 acres and all suppression was successful. Safety remained the highest priority on all fires and none were utilized for resource benefit. The ratio of human caused fires to naturally ignited was unusually high. The Carson averages approximately 2% human caused, but in 2007, that jumped to 25%. Various treatments for fuels were utilized including prescribed fire and mechanical. In general, most treatments were achieved using force account prescribed fire. Table 25 Wildfires on the Carson National Forest 2002 - 2007

	2002	2003	2004	2005	2006	2007
Total Acres	31,238	232	84	4,771	147	31
Average Size (acres)	558	2.4	1.3	63.6	1.2	.68
Number of Fires	56	95	65	75	123	45
Largest fire (acres)	92,194 (Ponil)	85 (5,400 adjacent on Taos Pueblo lands)	25	3,922 (Pine Canyon)	52 (Quernos)	5 (Mesa)

Program Area	Summary of Monitoring Conducted and Evaluation
	Keeping the wildfires small permits better planning for prescribed burning when weather and fuel conditions allow. The total number of fire starts, 45, is smaller than the six year average of 77 fire starts per year. The last three years have seen about the same number of fire starts as the first three years of the six year cycle. The Healthy Forest Initiative has been used during 2007 to begin reducing fuel loadings in the vicinity of several communities across the Forest. Prescribed burns and other fuel reduction efforts were continued in 2007. Efforts to reduce fuel loading are expected to continue into the future.
Protection 4 Law Enforcement	**Goals:** Law enforcement efforts by the Forest Service, and aided by cooperative agreements with local sheriffs' departments, are adequate and commensurate with the goods and services produced on the Forest and Grasslands. **Monitoring:** Professionally evaluate trend in law enforcement effectiveness based on reviewing caseloads, solution rates and public compliance. The evaluation will be based specifically on a review of 1) protection of cultural resources; 2) changes in ORV damage; 3) changes in fuelwood theft; 4) changes in the dollar cost of vandalism; 5) trends in user protection; and 6) recurrent law enforcement problems at developed recreation sites. **Results:** • Maintained signing in areas north of Red River to address illegal ATV use. Law enforcement efforts were also increased to address this concern. • Over one half of violation notices issued were for -- dumping private trash on national forest, cutting forest products without a permit and off road vehicle violations. • A new area of concern is arson caused wildfire. At least 4 incidents of arson occur on the Carson National Forest annually. • Recurring law enforcement problems at both developed and dispersed recreation sites include exceeding the 14 day limit, leaving fires unattended, destruction of government property, and dogs not on a leash. • Carson National Forest Law Enforcement Officers monitor events such as the Red River Motorcycle Rally and the Rainbow Family Circle of Light gatherings on the Forest.
Air Quality Visibility – Class I Areas	**Goals:** Class I areas will retain good visibility to meet Class I standards. Visibility will be retained in form, line, texture and color of characteristic landscapes. **Monitoring:** Determine baseline condition of visibility and determine if any visibility degradation is occurring in the Class I areas. **Results:** After nearly 20 years of photo documentation of the Wheeler Peak Wilderness to detect changes in air quality of a Class I airshed, it has been determined that photo comparisons are qualitative data that do not provide substantive results in determining

Program Area	Summary of Monitoring Conducted and Evaluation
	whether quantitative standards for air quality have been exceeded. Late in 2000, a new air quality monitoring station was installed in the Taos Ski Valley to monitor air quality in the Wheeler Peak wilderness area using quantitative data, such as percent particulate matter. The photo monitoring has ceased. Data is collected using the installed monitoring station.
Timber 1	**Goals:** Achieve a more balanced age class distribution, appropriate growing stock levels, appropriate rotations and provide wildlife habitat and other resource needs. Ensure that – 1) Rotation age and CMAI assumptions are correct -- silvicultural prescriptions follow management areas standards; 2) Silvicultural prescriptions precede vegetative treatments; 3) Silvicultural prescriptions are practical and achieve desired results. **Monitoring:** Determine age class distribution, growing stock levels, rotations and wildlife/resource needs through stand database reports; Timber Management Information System; silvicultural prescriptions; Staff field reviews of 5% of treatment projects. **Results:** Forest Plan goals for forest health, especially treatment of mid-seral vegetation to improve diversity, have not been met, but the few small projects accomplished each year continue to move the Forest towards its desired condition. Mixed conifer and ponderosa pine forests on the Carson still contain large areas of small, densely growing trees. These conditions pose a threat of catastrophic wildfire over extensive landscapes. Stand examination was contracted late in 2006 and the field work was done in 2007 where 35,000 acres on the forest were inventoried. Vegetation treatments on the Camino Real, Tres Piedras, Jicarilla, Canjilon, Questa, and El Rito Ranger districts received post-treatment monitoring by the Forest silviculturist to assess their effectiveness. Over 500 acres were treated and monitored in 2007 for forest health and fuels reduction as a part of the Collaborative Forest Restoration Program (CFRP). Supporting documentation is located at the respective ranger stations. Periodic field visits to project areas by sale administrators, specialists and/or line officers usually result in informal monitoring and evaluation of the application of best management practices or actions needed. Documentation is captured through specialist notes, sale administration inspection reports and/or photo points located at the ranger stations.
Timber 2 Timber Assumptions	**Goals:** Timber plans and projections support a sustained yield of forest products and achievement of multiple-resource objectives. Validate timber assumptions: volume, productivity, Management Area descriptions and acres harvested.

Program Area	Summary of Monitoring Conducted and Evaluation
	Monitoring: Through sale review, EA's, cruise summaries, TMIS, compartment exams, stand database (use the same conversion ratios as used in Plan calculations), ensure that: • board foot/cubic foot ratios are correct; • volume/acre yield is correct; • management area descriptions are correct; • schedule of acres harvested is correct. **Results:** The Carson National Forest large sale timber program involved 3 ongoing timber sales that are regularly monitored when actively harvesting. Several small fuelwood, viga and ecosystem improvement sales have occurred. Other small sales made have been done for other than timber purposes vegetation management or wildlife habitat improvements. The schedule of sales outlined in the Forest Plan is no longer used based on many external factors such as litigation, which alter the timelines. The board foot/cubic foot ratio used is determined at the region level. The ratio is accurate at approximately 1 CCF (hundred cubic feet) the same as .5 MBF (thousand board feet) or stated differently 1 MBF equals 2 CCF. Other measures are not being used. Vigas and latillas are sold on a per foot basis. The amount sold of these two products is small.
Timber 3 Sawtimber and Products	**Goals:** Annual sale offerings will be made on a sustained yield basis. Meet Federal regulation, measure output; assure allowable sale quantity is not exceeded. **Monitoring:** PAMARs or other annual reporting systems and programmed harvest reports. **Results:** The large sale timber program of the Carson was implemented in 2007 with 3 ongoing saw timber sales. Four small sales, fuelwood, ecosystem improvement, timber, and viga, did occur. The amount harvested was below the minimum ingrowth on the Carson ensuring sustained yield. The allowable sale quantity was not exceeded. The Carson National Forest sold and harvested less than 5 MMBF out of an allowable sale quantity of 42 MMBF.
Timber 4 Fuelwood	**Goals:** Green wood sales will continue on a sustained yield basis. Dead/dry firewood will continue to be available through timber-sale residue and natural mortality. **Monitoring:** Review annual total of firewood sale reports, total firewood advertised but not sold, free use and administrative or other use. **Results:** The Carson continued to provide the necessary firewood, latillas, vigas and other small products to the local populace. The amount of woody material provided met the needs of the communities and local population. The number of permits for small products and fuelwood is shown in the following table.

Program Area	Summary of Monitoring Conducted and Evaluation

Table 26 Fuelwood and Small Products 2002- 2007

Fiscal Year	2002	2003	2004	2005	2006	2007
Latillas, and small products not convertible to volume						
Permits	649	816	Total included in fuelwood permits	2,042	2,960	2,392
Fuelwood						
Permits	3,775	3,750	3,550	4,964	5,384	3,500
Volume (cords)	18,377	17,885	20,536	24,345	13,533	12,992

Timber 5 Openings	**Goals:** Improve wildlife habitat through timber harvest by manipulation of stand sizes, methods of cut and juxtaposition of stands. **Monitoring:** Insure stand size of other harvest areas is appropriate through environmental analysis, presale and administrative reviews, and post sale reviews/project area. **Results:** Harvest prescriptions are geared toward the manipulation of wildlife habitat improvement. Guidelines for the Northern Goshawk are used to insure adequate opening size and number, retention of overstory trees. These guidelines are melded with the requirements of Mexican spotted owl recovery plans. The end result is harvest areas meeting wildlife habitat needs with any timber harvest the tool used to provide for wildlife habitat improvement.
Timber 6 Practices and Assumptions	**Goals:** All lands harvested for timber production as part of the allowable sale quantity are adequately restocked within 5 years after final harvest. **Monitoring:** Assure that regeneration is obtained within 5 years after -- final harvest cut, and scheduled planting is accomplished through Annual Reforestation/TSI needs report, plantation survival surveys, silvicultural prescriptions, post sale administrative review, Timber Management Information System (TMIS), Stand Data Base/Acres.

Program Area	Summary of Monitoring Conducted and Evaluation
	Results: Emphasis is on wildlife habitat improvement, fuels reduction, and to supply local small businesses. Regeneration on harvests for other than timber production emphasis are not required to meet the 5 year time period. No lands were harvested for timber production reasons in 2007.

Table 27 Regeneration Surveys 2004 - 2007

Activity	Acres 2004	Acres 2005	Acres 2006	Acres 2007
TOTAL Acres Regeneration Survey	508	0	1,212	620
Total natural Regeneration Survey	0	0	0	0
Total natural Plantation Survival	222	0	1,212	620
Natural Regeneration without site preperation	38	0	0	0

Timber 7 Unsuitable Timberlands	**Goals:** Meet Federal regulations to periodically re-examine lands identified as not suited for timber production to determine if they have become suited and could be returned to timber production. **Monitoring:** Evaluate the accuracy of suitable timberlands classification through -- 1) Review new or updated soil survey data. 2) Review development of better technology for regeneration establishment. 3) Stand exams. 4) Timber Inventory and planning results. The data monitored will be used as the basis for an evaluation to determine which lands are suited to timber production. **Results:** The soil information, stand examination data, timber inventory, and regeneration establishment technology has not changed since implementation of the Forest Plan. No stands identified as unsuitable were placed in timber production category.
Minerals	**Goals:** To meet the requirements of the law, regulations, contract obligations, fiscal accountability, protection of surface resources and successful reclamation. The expected future conditions should be specified in the documentation of the approval of the activity, project, lease, sale, etc.

Program Area	Summary of Monitoring Conducted and Evaluation
	Monitoring: The mineral program will be monitored through a combination of the MAR data reporting system, systems designed for project quality control, field examinations by Forest Staff and the activity review system. Management of the minerals activities: Environmental Assessments, bonds, bond justifications, response times for applications and plans of operations, quality of resource coordination, field checks for compliance of the terms of the operating plans, reasonableness of resource protection requirements, mineral sales program, pit plans, accountability, documentation, and reclamation. **Results:** The San Juan Basin (Jicarilla Ranger District) has experienced an upturn in Applications for Permit to Drill (APD). These APD's are on lands leased prior to 1970. An environmental assessment, or categorical exclusion following the Energy Policy Act, is made for each APD or grouped APDs. An environmental impact study was released for comment in 2005 concerning unleased lands and surface occupancy on the unleased lands or lands having leases lapse on this ranger district. The EIS is expected to be completed in 2008.
Range 1 Unsatisfactory Range	**Goals:** Bring unsatisfactory ranges to satisfactory condition through increasing management intensity levels, constructing structural range improvements, adding nonstructural range improvements. **Monitoring:** Use allotment analysis data to update Grazing Statistical Report. **Results:** The drought over the last few years continued in 2007. This temporary change in the weather has brought many hardships to cattle producers. Late entry dates and early removal continued to be use as intensive management options to reduce impacts to unsatisfactory ranges to aid in moving these ranges toward a satisfactory condition. See discussion under watershed improvement for details pertaining to range condition monitoring and actions to improve conditions.
Range 2 Range Condition and Trend	**Goals:** Range conditions will be improved at 2030 by decreasing unsatisfactory range to 68,883 acres; and increasing satisfactory range to 753,244 acres. **Monitoring:** Conduct range analysis per Regional standards by qualified Range Conservationists. **Results:** Improved range conditions have resulted from implementation of structural and nonstructural improvements, and more intensive management developed in allotment management plans. Continued NEPA analysis on all of the Forest's allotments will help sustain this type of improvement. Drought conditions have slowed the progress of improving range conditions. Non-Native invasive plants are found in scattered locations across the Carson National Forest. These plants have the potential to impact the native plants through replacement by competition, root exudates, and aggressive growth behavior. An Environmental Impact Statement addressing treatment of these plants was approved in 2005. The EIS was appealed and remanded to the forest. A revised non-native invasive plant is anticipated in

Program Area	Summary of Monitoring Conducted and Evaluation
	2008.
Range 3 Management Plans	**Goals:** Prepare or update grazing allotment or unit management plans on 75 percent of the National Forest allotments. **Monitoring:** Track allotment management plans through PAMARS. **Results:** The Forest completed 8 allotment management plans in FY2007. The Forest strove to complete the analysis and documentation phase on additional numerous allotment environmental analyses. These allotment environmental analyses are expected to be completed in FY2008 and 2009.
Range 4 Range Development	**Goals:** To move toward balancing range use with capacity, the structural and nonstructural improvements will be added or reconstructed based on the allotment management plans and funding levels. **Monitoring:** Track data on completed range improvements (fences, waters, revegetation, etc.) through the existing RAMIS system and the annual grazing statistical report. **Results:** The needed data was reviewed, verified and entered in the Infra database by District personnel. The Range Infra Deferred Maintenance database has replaced the RAMIS database.
Range 5 Permitted Use	**Goals:** Through increased management and additional structural and nonstructural range improvements, range capacity is expected to increase from the present 119,000 AUM's to 136,000 AUM's in the fifth decade. **Monitoring:** Track through data generated from grazing permits and displayed in Grazing Statistical Report. **Results:** All permitted Use data for stocked allotments was verified/updated in the Range Infra database by Forest Personnel in 2007.
Range 6 Grazing Capacity	**Goals:** Grazing capacity is expected to exceed permitted use through the fifth decade. **Monitoring:** New analysis data updates Annual Grazing Statistical Report. **Results:** The grazing capacity was verified for the 8 allotments on the Carson National Forest through the NEPA process. Four of the allotment analyses were upheld on appeal.
Visual Quality 1	**Goals:** Prevent acres with visual quality objectives of Retention or Partial Retention from being reduced more than 20%. **Monitoring:** The Visual Resource Management System will be used as a basis of the monitoring activity. **Results:** There was no activity that would reduce the visual quality objectives of retention or partial retention in 2007. On the Jicarilla Ranger District in 2007, a gas well was constructed in Vaqueros Canyon. Visual Quality Objectives mitigation was performed

Program Area	Summary of Monitoring Conducted and Evaluation
	including tree plantings, creation of a large revegetated berm and low profile equipment. The oil and gas lease predate the Forest Plan and designation of Vaqueros Canyon. The Valle Vidal unit is the planned Forest Plan amendment, which will use the updated Visual Quality Objectives (VQO) system known as the Scenery Management System (SMS). A cross walk between VQO and SMS will permit the use of the newer designation.
Visual Quality 2	**Goals:** Visual Quality levels will be maintained or enhanced. **Monitoring:** Projects involving vegetative treatment or manipulation, road or trail construction and major development will be evaluated through the NEPA process to enhance or maintain visual quality levels. **Results:** Two powerline project analyses have been completed. Visual resource management is an integral part of both projects. Neither project will reduce the visual quality levels below current levels or not follow the standards and guidelines in the Forest Plan.
Forest Plan Implementation	**Goals:** Assure compliance with and implementation of the Carson Forest Plan in accordance with its stated mission, goals, objectives and standards and guidelines. **Monitoring:** This will be done in light of funding or any other constraints **Results:** Each project implemented in 2007 was evaluated to insure compliance with the Forest Plan. There were no Forest Plan amendments in 2007.

Baseline Inventory Monitoring

- Contracts for annual wildlife population monitoring have been ongoing since 2003. These annual monitoring contracts are expected to continue into the future.
- Vegetation data are being collected on each ranger district. This information is being used to determine existing conditions for wildland urban interface and forest health projects, salvage sales, Mexican spotted owl thresholds and old growth at the landscape level, and Forest Plan Revision preparation. Vegetation conditions are recorded on maps and tracked in the RMRIS database and GIS. Photo history is also used to document changes in vegetation composition, structure and health. Much of this data determines where management activities are needed on the Forest to help reach a desired condition. Supporting documentation is located at the ranger stations and the Forest Supervisor's office.
- The Forest archeologist provides program oversight and quality control by reviewing all heritage resource clearances. The purpose of this type of monitoring is to gain overall knowledge of new sites found on the Forest and the course of action taken to protect them. Supporting documentation is located at either the ranger stations or the Forest Supervisor's office.

- The National Visitor Use Monitoring Project for the Carson National Forest was completed and placed into the public domain in June 2004 and will be updated in 2008. This information is available electronically at http://www.fs.fed.us/recreation/programs/nvum.

Implementation Monitoring

- Fuelwood monitoring includes field checking for "leave" trees and assessing how the public is harvesting. Monitoring information is considered when determining cleanup efforts needed for fuelwood areas. Cleanup efforts are also monitored. Recommendations and actions are normally documented and are located at the ranger stations.
- Precommercial thinning and salvage sale activities include post-sale inspections. Areas are examined to ensure contract requirements are met and results are documented in the RMRIS/NRIS database. Supporting documentation is located at each of the ranger stations.
- Forage utilization is monitored periodically in grazing allotment pastures to determine whether over utilization is occurring. Supporting documentation is located at each of the ranger stations.
- Range readiness is monitored on an annual basis to determine the time livestock can be released onto an allotment pasture. Current drought conditions have resulted in later than normal turnouts. Supporting documentation is located at each of the ranger stations.
- Archeological and heritage surveys are completed prior to the implementation of ground disturbing proposals to assure protection or mitigation of cultural and/or historic sites. Supporting documentation is located at the Forest Supervisor's office. 6,785 acres were surveyed in 2007 with 120 new heritage sites located. In addition, 80 additional sites were monitored for disturbance and current condition.

Effectiveness Monitoring

- Prescribed fire treatments are monitored through on-site visits. Usually "before and after" photos are taken for burn projects to determine whether the anticipated objectives have been attained (i.e., has the palatability of the oak browse noticeably improved?). Recommendations and follow-up actions are determined. Supporting documentation is located at each of the ranger stations.
- Numerous public field trips are taken each year on the Carson to areas where projects have been implemented. These trips result in informal monitoring of the effectiveness of actions taken and provide excellent opportunities for the public to express their opinions about a type of project. Line officers are also involved in these trips. Supporting documentation is located in the NEPA project documentation at each of the ranger stations.
- Damage, erosion and changed conditions of prerecorded heritage resource sites are documented. Project areas are inspected upon project completion to verify that flagged archaeological sites have been avoided. Site monitoring forms are kept on file in the Forest Supervisor's office. One damage assessment was completed in 2007.

Certain assumptions made in the Carson Forest Plan are continually being validated by many of the monitoring activities listed above. Amendments, such as the 1996 region-wide amendment for the Mexican spotted owl, northern goshawk and old growth, can significantly change how we meet our goals and objectives, but not necessarily the assumptions or desired conditions made in the Forest Plan. Since the Forest Plan primarily

Part 2

focuses on desired condition, we can be flexible in finding and determining better ways of moving toward our desired condition.

Upon reviewing Chapter 5 (Monitoring Plan) of the Carson Forest Plan, much of the Carson's monitoring activities are closely linked to the items listed in Chapter 5. Formal evaluation and documentation of these monitoring activities is limited, given the emphasis and budget constraints put on the specialists. The information generated from these monitoring efforts achieves the intent of the majority of monitoring items found in Chapter 5 of the Forest Plan.

Monitoring Results

Introduction

Specifically this year, what has happened on the forest/grassland or externally that has affected the forest/grassland such as natural changes, social and economic changes, and management actions?

Drought

Historical evidence and tree ring evidence indicate droughts in the southwest often last for 50 or more years. Within the long term drought short periods of near normal or normal precipitation do occur. The drought began about 1996 and has continued with periods of near normal moisture such as occurred in 2005. The grasslands have been affected with little growth. The mature plants were often times less than 6 inches in height. Grazing was curtailed with some permittees not allowed to graze cattle. The act of not permitting cattle to graze many allotments aided in maintaining grasslands at their current levels.

Forested lands were also affected by the lack of moisture. The moisture stress is beginning to show with increased bark beetle and other insect populations. Small spots of dead, dying, or damaged trees are evident across the forest and are well scattered. These population centers could be a forbearer of increased insect attack and mortality across the forest.

Table 28 Precipitation, Taos, New Mexico 2002 - 2007

Precipitation, Taos New Mexico 2002-2007 (inches)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
2002	0.85	0.04	0.22	0	0	1.02	0.95	0.59	2.7	1.32	0.77	0.32	8.78
2003	0	1.1	1.11	0.5	0.52	0.72	0.69	1.83	1.73	0.62	0	0.81	9.63
2004	0.1	0.65	0.49	1.84	0	1.29	1.1	0.54	1.76	1.28	0.58	0.8	10.43
2005	1.65	0	1.07	1.71	0.67	0.89	1.14	3.77	2.58	2.02	0	0	15.5
2006	0.12	0.1	0.14	0.56	0.45	0.33	0.75	2.54	0.73	0.8	0.18	0.2	6.9

2007	0.31	0.31	0.31	0.57	1.16	0.75	1.17	2.22	0.66	0.81	0.30	0	8.57
6- yr avg	0.51	0.37	0.56	0.86	0.47	0.83	0.97	1.92	1.69	1.14	0.31	0.36	10.0

Fire season

For the 2007 fire season, the Carson National Forest received consistent moisture. Winter snows transitioned into spring rain maintaining high fuel moisture, which moderated the potential for an active fire season. The Carson had a total of 45 fires, which all remained Class A fires. The largest fire was only 5 acres and all suppression was successful. Safety remained the highest priority on all fires and none were utilized for resource benefit. The ratio of human caused fires to naturally ignited was unusually high. The Carson averages approximately 2% human caused, but in 2007, that jumped to 25%.

Social and Economic Changes

The communities adjacent and within the forest boundaries are experiencing a continued influx of people. Many visitors return becoming residents. The attitudes brought by the newer residents conflict with many traditional land uses and at time the cultures of current residents. There were continuing comments concerning cessation of grazing activities to protect the land. Yet many long-term residents have used or have family members who use the forestlands to supplement or provide incomes to sustain their families. The newer residents may conflict with the long-term residents causing tension with the Forest Service in the middle.

The economic changes have been in the seasonal business sector, and lodging and food establishments. Many of these jobs are on the lower end of the income level. Businesses capable of using forest products and paying higher wages have not moved into the area.

Ecosystem Health

Insect populations in combination with continued drought are a potential change agent. Insects have increased their population causing mortality in all the forest cover types on the Carson National Forest. This natural phenomenon provides many wildlife benefits such as snags and insect larva for food. An estimated 401,471 snags greater than 9 inches in diameter have been created by insects in the last 6 calendar years. Insect populations are expected to continue in their cyclic pattern with epidemics not expected. However, an epidemic population can build up in less than one years time if climatic conditions coincide with other natural factors.

Multiple Benefits to People

In 2007, fuelwood was provided to individuals. Northern New Mexico has a high proportion of residents who use fuelwood for heating and cooking. The Carson provided fuelwood supplies to local communities as is typified by the Camino Real Ranger District's stewardship blocks. Communities are both obtaining fuelwood and creating thinned areas to aid in providing increased fire protection to their homes.

The Carson National Forest has a long-standing tradition and desire to provide for the local communities while providing for national needs. The fuelwood program provides for both of these needs.

Scientific and Technical Assistance

Management activities were designed to improve the productivity of the natural resources while providing for people. The grazing program while delaying entry dates was designed to provide for the natural resources. Early and constant contact with livestock owners permitted the owners to reduce numbers or find other sources of feed. The range program continued to monitor the conditions of the allotments with the intent of providing the permittees an opportunity to graze the land.

The planned accomplishment of 8 out of 10 allotment management plans was met. The two allotment management plans not met will be completed in 2008. This will leave 26 range allotment decisions and allotment management plans to complete in 2008 and 2009.

The Carson National Forest participated in many activities with school and local groups. These contacts permit students and parents to ask questions, learn about the forest, grasslands, and waters, and discuss their feelings regarding the national forest. These activities enable the information possessed by Carson employees to be passed on to students and their families. Communities are strengthened by the information transfer as well as the Forest Service. The following are a sampling of the technology transfer activities Carson employees were involved in.

- Visited with elementary children in numerous communities, Taos, Questa, El Rito, Peñasco,and Red River in school and field settings discussing fire prevention education.
- Participated in Fire Prevention and Career Fair programs throughout the Carson National Forest influence area.
- District personnel visited schools for the purpose of educating youth about fire prevention, the dangers of wildfires and how fire can be used as a management tool, 5 events and 600 adults/children.
- District personnel from Tres Piedras RD, El Rito RD and Canjilon RD along with Carson NF Supervisors Office staff planned and coordinated the 2007 Hopewell Lake Fish Fiesta in July.
- District personnel from Questa RD, Camino Real RD, along with Carson NF Supervisors Office staff planned and coordinated the 2007 Eagle Rock Lake Fish Fiesta in July.
- Offered winter environmental education tours at Taos Ski Valley through our “Ski with the Ranger” program annually since 1996.

Barriers to Effective Monitoring

The predominant barriers overriding effective monitoring and evaluation have been higher priority work and lack of funding. Congressional and budget intent comes to us functionally, and is still tied to targets. In addition, user groups want us to produce a "product" (wilderness experience, firewood, forage, clean campgrounds, etc.) for them. Few are asking for monitoring results. In order to show responsiveness toward the public and accomplishments to Congress, we maintain focus on products and targets. Often any internal or external interest there may be in monitoring is focused on the "gotcha" versus the adaptive management of learning. People or special interest groups are more interested in using our deficient documentation of monitoring activities as a way of demonstrating that we are not following regulations.