United States Department of Agriculture

Forest Service

Southwestern Region

Carson Forest Plan Monitoring and Evaluation Report

Fiscal Year 2014 and 2015

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 2014 and 2105.

Approved by: James Duran September 14, 2016

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Part 1 - Monitoring Activities and Evaluation

The Carson National Forest is currently in the process of revising its 1986 land and resource management plan (forest plan). During 2014 and 2015, the Forest Plan Revision Team and extended team members (specialists) prepared an Assessment Report of Ecological, Social, and Economic Conditions, Trends, and Sustainability, as part of the revision process. The assessment phase of forest plan revision (FPR) is designed to rapidly evaluate readily available existing information about relevant ecological, economic, and social conditions, trends, and sustainability and their relationship to the current forest plan, within the context of the broader landscape. The assessment report provides information on the "state of the forest". The assessment uses information that is currently available in a form useful for the planning process, without further data collection, modification, or validation. Some of the information used came from forest plan monitoring results that have been collected since 1986. Using the assessment, the forest's planning team analyzed what needs to change in order to create sustainable resources, goods, and services - Carson National Forest's Needs to Change Management Direction of Its Existing 1986 Forest Plan.

The assessment and needs to change documents substantially supplement the 2014-2015 forest plan monitoring report and summarize the effects of activities and management under the 1986 forest plan.

Summary of Monitoring Conducted and Evaluation of Program Areas

Biological Environment

Wildlife and 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 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 threatened and endangered species on the Carson National Forest for known nesting locations. The primary species monitored on the forest are southwestern willow flycatcher and Mexican spotted owl. Project level inventory provides biologists information on the potential occurrence of threatened and endangered 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 Carson National Forest has one Critical Habitat Unit 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 2014, all three critical habitat sections for the Southwestern Willow Flycatcher were surveyed. A complete report was submitted to USFWS on 29 July, 2014. A total of 4.7 linear km was surveyed across all three critical habitat areas. Willow flycatchers were only detected in the Tierra Azul survey area.

One male was detected during the first round of surveys in Tierra Azul. Two males and one female were detected on the second survey and two males were detected on the last survey. I concluded that there was one definite breeding pair (based on behavior and vocalizations) and two definite territories. It is possible the second male in the established territory had a female as a mate although she was never detected in any of the surveys.

Mexican spotted owl populations are very low with the last documented presence on the Jicarilla Ranger District in 1993. The district contains about 3,500 acres of highly fragmented habitat for the Mexican spotted owl, further degraded by severe drought in 2000 to 2002. It is likely that drought has made formerly occupied habitat unsuitable due to the lack of prey species. Additionally, mixed conifer habitat on the Jicarilla Ranger District is in a steep decline, with a significant amount of dead Douglas fir and aspen. The cause of this decline is suspected to be a combination of drought, climate change, and insects. Critical habitat for the Mexican spotted owl was designed in 2004 with two Critical Habitat Units established on the Jicarilla Ranger District. On the Jicarilla Ranger District, protocol surveys were conducted in 2009 and in 2010, with no detections either year. In 2014, protocol Mexican spotted owl surveys were conducted for the designated SRM-NM-11 Protected Activity Area (PAC) on the Jicarilla Ranger District. No inventories were conducted on the SRM-NM-12 PAC Additionally in 2014; numerous potential Mexican spotted owl habitat areas on the Jicarilla Ranger District were inventoried. All of these surveys yielded negative results. In 2015, protocol Mexican spotted owl surveys were conducted for the designated SRM-NM-11 Protected Activity Area (PAC) on the Jicarilla Ranger District. No inventories were conducted on the SRM-NM-12 PAC Additionally in 2015; numerous potential Mexican spotted owl habitat areas on the Jicarilla Ranger District were inventoried. All of these surveys yielded negative results. Furthermore, in 2015 protocol Mexican spotted owl surveys were conducted on the Camino Real Ranger District. Approximately 3,191 acres were surveyed and yielded results negative results.

Southwestern Region (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 Carson National 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 1. 2008-2015 Northern goshawk inventories and monitoring results

Ranger District	FY	Inventoried Acres	Results (sightings, nests)	Monitoring of Known Goshawk Nesting Areas
Canjilon	2015	3.325	0	2 nest sites monitored; 3 goshawks located
	2014	1.291	2	3 nest sites monitored; 5 fledglings
	2013	0	0	3 nest sites monitored; no goshawks located
	2012	0	0	3 nest sites monitored; no goshawks located
	2011	2,704	0	3 nest sites monitored; no goshawks located
	2010	800	0	3 nest sites no goshawks located
	2009	1,200	3 PFAs established: 1) 2 fledgings; 2) 1 fledging; 3) 0 young	0
	2008	400	0	0
El Rito	2015	3,325	0	1 nest site monitored; 1 chick did not survive to fledgling
	2014	6,266	0	3 nest sites monitored; 2 fledglings

Ranger District	FY	Inventoried Acres	Results (sightings, nests)	Monitoring of Known Goshawk Nesting Areas
	2013	0	0	0
	2012	0	0	0
	2011	5,100	0	0
	2010	5,100	0	0
	2009	100	1 PFA established; 1 fledging	0
	2008	0	0	0
Jicarilla	2015	0	0	0
	2014	0	0	0
	2013	0	0	0
	2012	160	One female adult sighted flying across FS Road 357 on 7/18/12.	2 historic nest sites – no birds or activity
	2011	850	1 adult in established Foraging Area	10 historic nest sites – no birds or activity
	2010	0	0	2 nest sites, no nesting goshawk located.
	2009	2,929	0	2 nest sites, no nesting goshawk located.
	2008	3,550	0	2 nest sites, no nesting goshawk located. Individual goshawk seen at one site.
Camino Real	2015	2,543	1	0
	2014	0	0	3 nest sites – no goshawks located

Ranger District	FY	Inventoried Acres	Results (sightings, nests)	Monitoring of Known Goshawk Nesting Areas
	2013	0	0[1]	4 nest sites – no goshawks located
	2012	6,252	One adult observed, breeding not confirmed	5 nest sites – no goshawks located
	2011	6,633	0	2 nest sites, no goshawks located
	2010	0	0	3 nest sites – no goshawks located
	2009	229	0	0
	2008	0	0	0
Tres Piedras	2015	8,148	2	2 nest sites – no goshawks located
	2014	8,148	0	2 nest sites – no goshawks located
	2013	900	0	2 nest sites – no goshawks located
	2012	4,800	One adult flying across a canyon within the Maquinita Analysis area.	2 nest sites – no goshawks located
	2011	2,327	0	No nest site monitorig
	2010	0	0	2 nest sites – no goshawks located
	2009	0	0	5 nest sites – no goshawks located
	2008	0	0	
Questa	2015	0	0	0
	2014	0	0	0

[1] Four historic places were monitored for Northern Goshawk: Picuris, Maestas, Cebadilla, and Tienditas. No goshawks were detected although photos of an adult goshawk were sent by a private landowner who lives approximately one mile from Tienditas. It is suspected there are goshawks in the area although a new nest site has not been located on FS land.

Ranger District	FY	Inventoried Acres	Results (sightings, nests)	Monitoring of Known Goshawk Nesting Areas
	2013	0	0	0
	2012	0	0	0
	2011	0	0	0
	2010	0	0	0
	2009	2,376	0	0
	2008	0	0	0

Peregrine Falcon

Peregrine falcon surveys are conducted by the New Mexico Department of Game and Fish. There are currently 11 known nest sites on the Carson National Forest. Survey information may be obtained from the New Mexico Department of Game and Fish.

In 2014, peregrine territories U-8 on the El Rito Ranger District and U-65 on the Tres Piedras Ranger District were monitored by Carson NF personnel. Breeding success was documented at U-65 and U-8. Two fledglings were reported at each nest site.

In 2015, peregrine territories U-8 on the El Rito Ranger District and U-65 on the Tres Piedras Ranger District were monitored by Carson NF personnel. Breeding success was documented at U-65. Two fledglings were reported at each this nest site. One chick was removed via State Falconry Permit holder. The other was left and later fledged. It was documented that the peregrine nest at U-8 failed in 2015.

Wild Trout Populations

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 Rio Costilla watershed beginning in 2007. At this time it is appropriate to consider the restoration effort in the Comanche drainage complete. In 2012, population surveys were conducted within the Comanche drainage; good populations of mixed age class trout were found. The amount of young fry found, also indicated that there is good natural reproduction taking place. This drainage is now open to fishing (See NM Fishing Regulations).

Additional treatments have been ongoing in the Rio Costilla watershed including 3.8 miles within Allen Creek. Allen creek has its headwaters within the Valle Vidal (3.8 miles) and crosses onto the Vermejo Park Ranch (1.2 miles) where it enters the Rio Costilla just above Costilla Reservoir. In 2012 Allen Creek was treated for the first time and is scheduled for follow up treatment in the summer of 2013.

The threat of whirling disease contaminating New Mexico's trout fisheries is a risk. 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 significant. The installation of fish barriers and restoration efforts for RGct, public education and the improved condition of water quality in many of the Carson's mountain streams may be factors in containing this disease.

Wild trout population surveys were conducted on the Rio San Antonio, Red River, Cabresto Creek, El Rito Creek, Comanche Creek, Vidal Creek, Little Costilla Creek, Rio Santa Barbra, Canada Tio Grande, Tanques Creek (Figure 1), Rio Pueblo, Rio Chiquito, Rio Tusas, Rito de los Pinos, and the Rito de la Olla (Pot Creek) with assistance from New Mexico Department of Game and Fish and New Mexico State University.

RGCT were captured for gamete collection from Powderhouse Creek, Alamitos Creek, South Fork Rio Hondo, Rio Santa Barbra, and El Rito Creeks. Theses collections were used to produce genetically pure RGCT for stocking and post-treatment population reestablishment.

Rio Grande Cutthroat Trout were stocked in Horseshoe Lake, Lost Lake, and Middle Fork Lakes within or near the Wheeler Peak Wilderness. Stocking also occurred at Trampas Lakes in the Pecos Wilderness.

To ensure the persistence of RGCT in Paloceinto Creek, Rio Frijoles, Tanques Creek, and Canada Tio Grande (Figure 2), non-native trout were removed from above the barrier using electrofishing techniques.

Figure 1. Carson National Forest biologists and Pathways student sampling El Rito Creek, El Rito Ranger District

Figure 2. Young-of-year Rio Grande cutthroat trout after being released into Allen Creek, Valle Vidal, Questa Ranger District

In 2014 and 2015 Boreal Toad surveys were conducted at Trout Lakes, Canjilon Ranger District, with the assistance from New Mexico Department of Game and Fish.

No aquatic macro invertebrate samples were collected during 2014 or 2015.

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 as more information, published research, and habitat and population studies, became available. The document was last updated in 2011. The 2011 MIS assessment has been posted on the Carson National Forest website: (http://www.fs.fed.us/r3/carson/plans/mis%20assessment/2011_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 FY2011 and 2012 to determine reproductive and adaptive success. Surveys were done in various locations on the Carson National Forest. It is not known whether surveys were conducted in 2015. Supporting documentation for elk aerial monitoring is located at the New Mexico Department of Game and Fish State Office in Santa Fe, New Mexico.

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 to meet state herd population objectives. Monitoring in 2009 indicated that the elk population on the on the Forest are stable. The newly estimated population ranges (2009-2010) for GMU's including all or portions of the Jicarilla, Camino Real, and Questa ranger districts either include or exceed virtually every population estimate previously developed using the Sightability Index Survey method. And, although estimates are no longer available for the separate GMU's that overlap with the Tres Piedras, Canjilon, and El Rito districts, the population estimate for the North-central Region (that includes all of these GMU's) shows a substantial population of elk in this area.

Taking into account the condition and trend of elk habitat on the Forest, existing data, and the continued increase in the number of hunting permits issued by the NM Department of Game and Fish, the Carson National Forest is sustaining stable populations of elk Overall, the habitat condition and trend for Rocky Mountain elk on the Carson National Forest is considered fair and stable.

Annual counts of the reintroduced Rocky 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 (NMDGF). Surveys have been conducted from 2009 to present. This monitoring is performed to determine the herd's reproductive and adaptive success. Populations within the Wheeler Peak and Latir herds for 2015 are at or slightly above carrying capacity. To address carrying capacity within the Wheeler Peak herd, the NMDGF planning a trap and translocation of 35-50 bighorn sheep from this herd in 2017. The Latir herd is experiencing an increase in ewes and lambs. The NMDGF has implemented of a ewe hunt in 2013 and are conducted another ewe hunt in 2015. The habitat for the all three populations of bighorn sheep is considered stable and in good condition.

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

Table 2. 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

Management Area (MA)	Description
12	Sagebrush
13	Oak
14	Riparian
15	Potential Recreation Sites
16	Recreation Sites
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. Three point count transects for breeding birds were conducted on the Jicarilla Ranger District in 2011. These were replicates of established transects conducted by the Rocky Mountain Bird Observatory (RMBO) Breeding Bird Survey Program (transects PJ-01, PJ-14, and PJ-32). Results were reported in Migratory Bird and Vegetation Survey Report Prepared for: Jicarilla Ranger District, Carson National Forest Sponsored by Williams Production RMT Company & Green River Energy Resources 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. No surveys were conducted on the Jicarilla Ranger District in 2015.

Hairy woodpecker (Figure 5) is found in all forested habitats. Bark beetle outbreaks typically stimulate an increase in woodpecker populations. The bark beetle outbreaks starting in 2003 and continuing through 2014 have resulted in a changing landscape of the piñon-juniper community on the Jicarilla Ranger District. The majority of the piñon-juniper community now contains only a small percentage of piñon pine. Similarly, die-off in the Douglas fir and ponderosa pine communities has altered those landscapes. Although all of the die-offs have slowed in recent years, the resulting vegetation communities have been altered. Some species have benefited from this alteration, like the hairy woodpecker, 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 piñon juniper habitats. The population in Ponderosa pine was calculated at 0.15 birds per hectare (0.37 birds per acre) and in piñon-juniper were 0.017 birds per hectare. (0.042 birds per acre)

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 (Figure 3). In 2004 they detected sufficient numbers of this species to provide a density estimate in the beetle infested piñon-juniper habitat. Overall, the RMBO has detected the hairy woodpecker on all the RMBO point-count transect monitoring projects. On the Jicarilla Ranger District, three additional surveys did

not yield any hairy woodpeckers. Additional surveys were conducted in 2015. The Integrated Monitoring in Bird Conservation Regions (IMBCR) report that includes the Carson NF monitoring is available at the Carson National Forest Supervisor's Office.

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 2010 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 112,444 acres of habitat, or upward trend of five percent.

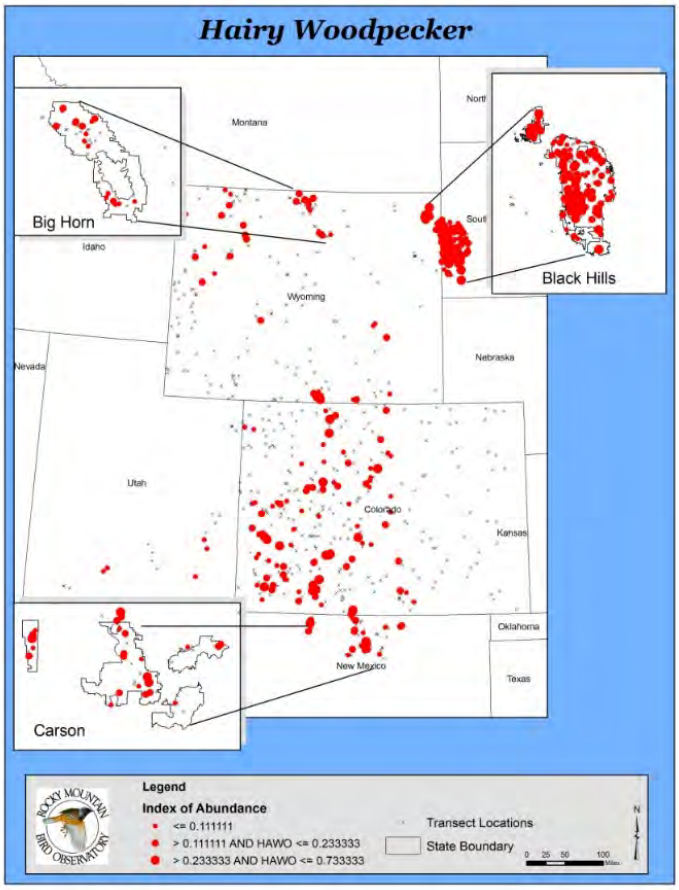

Figure 3. Distribution of hairy woodpecker (Beason et al. 2005)

Brewer's sparrow (Figure 5) was estimated to have a density in 2005 of 0.376 breeding birds per hectare (birds per acre) in the sagebrush type. The species was also detected in both the piñon-juniper and grassland habitats with a density of 0.049 birds per hectare (0.121 birds per acre). In 2006 the density was found to be 0.266 birds / hectare in sagebrush (0.653 birds per acre) and 0.02 birds / hectare (0.049 birds per acre) in the piñon-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 or 1.24 to 8.65 birds per acre). A site may be unoccupied in one year, then attain densities of 1.50 individuals/ha (birds per acre) the

next year. Because of high annual variation, estimates from small-scale or short-term studies must be handled with caution. 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 (Figure 4).

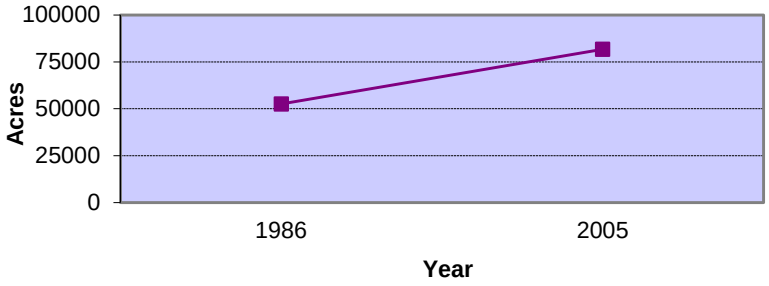

Figure 4. Changes in Brewer's sparrow habitat on the Carson National Forest, 1986-2005

Juniper titmouse (plain titmouse) (Figure 5) had a population density of 0.22 birds/hectare in 2006. The survey data seems to indicate the titmouse population on the forest at this time is on the low side, but holding at a stable level. Prior to 2005, there were over 33,000 acres of dead piñon mapped. Likely more acres of piñon were lost after that date, however, by 2008 the piñon bark beetle populations had returned to non-epidemic levels. It is expected that the titmouse population (numbers) will increase and the piñon recovers and repopulates suitable habitat numbers.

This species is dependent on large seeds such as those provided by juniper and piñon pine, and acorns rather than insects. The die off of many piñon pines may have increased the number of tree cavities available for breeding. The surviving piñon 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 juniper titmouse is found throughout the piñon-juniper forest type which is Carson Forest Plan Management Area, MA 8 (Figure 6). 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. Monitoring has shown that approximately 327,120 acres of piñon-juniper habitat has been affected by piñon bark beetle during its outbreak from 2000 to 2008 However, the data has is not detailed enough to determine how much of the area have been removed as juniper titmouse habitat. In 2011 on the Jicarilla Ranger District, survey transects located 2 juniper titmice.

Figure 5. From left to right: Hairy woodpecker, juniper titmouse, and Brewer's sparrow

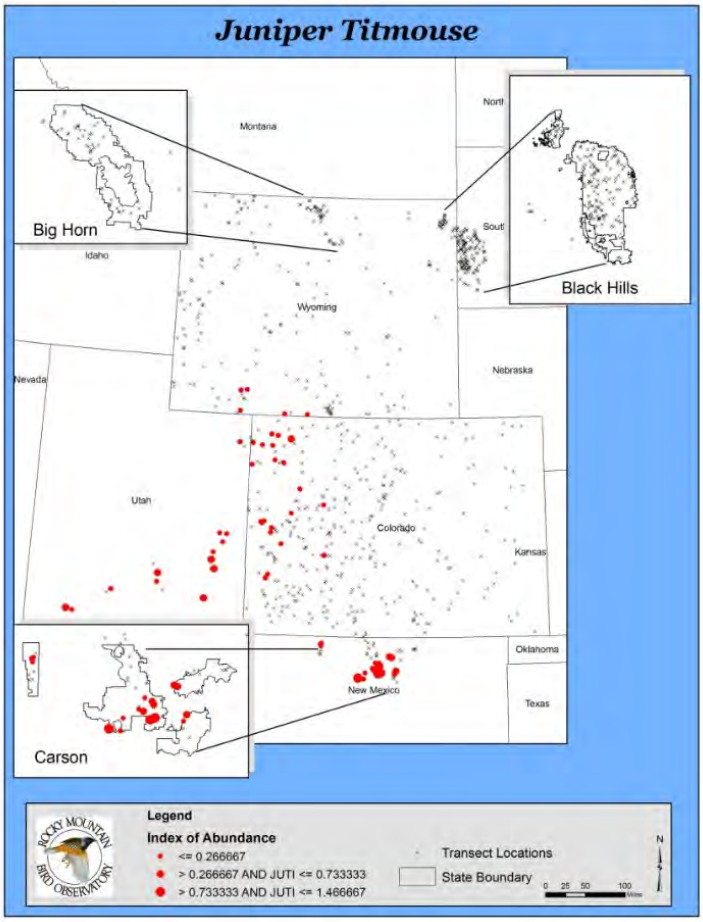

Figure 6. Juniper titmouse (Beason et al. 2005)

Figure 7. Abert's or tassel-eared squirrel

Abert's squirrel (Figure 7) surveys showed the density of 0.01 squirrels/ha; 1 squirrel/247 acres, in 2005 and 2006. Monitoring was conducted in 2008. On the 31 plots monitored since 2003 the overall mean density of 0.016 squirrels / ha; 1 squirrel/154 acres was recorded. When the six addition plots established in 2006 in the Valle Vidal was included, this changed the mean density to 0.019 squirrel/130 acres; 1 squirrel / 130 acres. 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, and MA 7. Stand with a dense oak understory and the presence of piñon 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 (Figure 8).

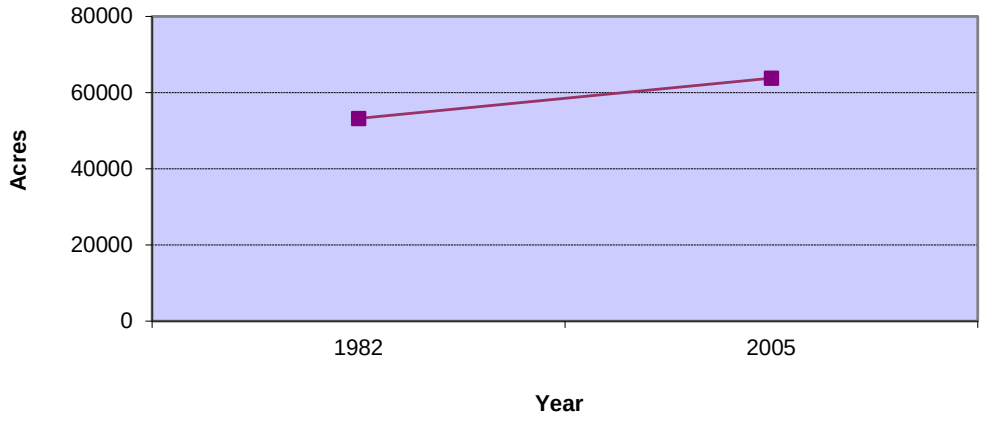

Figure 8. Changes in Abert's Squirrel Habitat on the Carson National Forest, 1986 to 2005

Figure 9. Red squirrel

Red Squirrel (Figure 9) is a huntable species as indicated by the 2014-2015 Hunting Proclamation distributed by the New Mexico Department of Game and Fish. In 2004 the overall mean density for the red squirrel was 1.04/ac (2.58/ha). Table 3 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 2014 for red squirrel where done on the Carson National Forest.

Table 3. Mean density per 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)

Year	Mixed Conifer	White Fir	Blue Spruce	Engelmann spruce	Spruce-fir
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)
2009	0.44 (1.09/ha)	0.53 (1.30/ha)	0.76 (1.89/ha)	0.54 (1.33/ha)	0.65 (1.60/ha)

The red squirrel is an indicator for 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 (Figure 10).

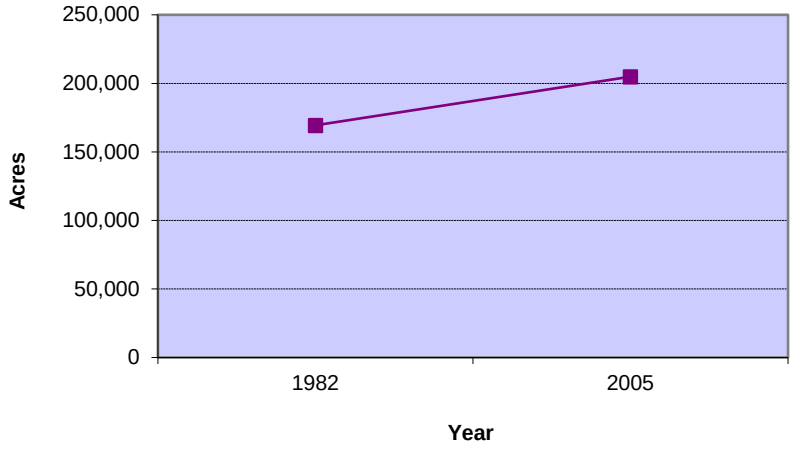

Figure 10. Changes in Red Squirrel Habitat on the Carson National Forest, 1986 to 2005

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, nationwide, 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).

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 (Figure 11). There were no vegetation treatments done in FY 2013 that affect old growth pine stands.

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.

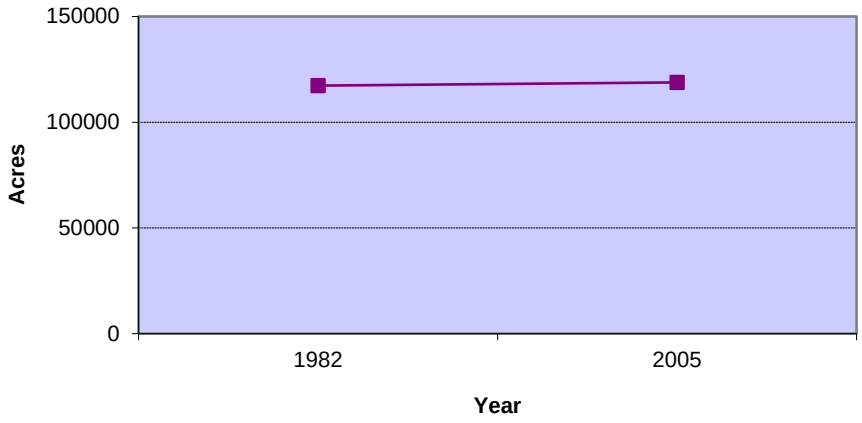

Figure 11. Changes in Suitable Habitat for Wild Turkey on the Carson National Forest, 1986 to 2005

Figure 12. White-tailed ptarmigan

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 and again in 2009, surveys were done on the Camino Real District, and the Forest can be contacted to obtain results. The New Mexico Department of Game and Fish conducted surveys for this species for 2012 on the Wheeler Peak, Questa Ranger District. Survey reports can be obtained from the New Mexico Department of Game and Fish. No surveys were conducted in 2015.

While the actual numbers of ptarmigan on the forest are uncertain but appear to be low, the species is still present and the population trend appears to be stable across the forest. This trend is based on the conclusion that the Pecos Wilderness population has been established and the fact there has been sightings of ptarmigan in all three areas over the years supporting the fact that the ptarmigan are remaining established on the forest in low numbers. It has never been expected that the Carson will achieve large breeding populations due to limitations of suitable habitat in the area.

Resident trout species are used as indicator species for quality perennial streams and riparian vegetation. This corresponds to management area 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 (approximately 225 miles) of that habitat. Physical habitat conditions related to forest management activities and habitat trend for resident trout is stable. See wild trout population monitoring in Southwestern Region’s Sensitive Species section.

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 14 of the Carson National Forest Plan. For the purpose of analyzing the effects of forest management activities, the primary habitat 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.

No aquatic macro invertebrate samples were collected during 2014 or 2015.

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. Table 4 displays the monitoring and inventories conducted in FY 2104 and 2015 on the Carson National Forest.

Table 4. Riparian-related inventory and monitoring conducted in FY 2014-2015

Monitoring Type	Location	What
BMP effectiveness monitoring	Valle Vidal Allotment	Comanche Creek bank stabilization (7 mi)
	Red River Restoration	Stream bank stabilization structures In-channel structural improvements
	Cabresto Dam	Wetland recovery (self mitigating expansion – 404 permit)

Monitoring Type	Location	What
	Rio Pueblo at Agua Piedra Day Use Area	Stream bank stabilization structures

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 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.

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 Carson National 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 12,471 acres in 2015 (Table 5). The lower accomplishment was due to a reduced window in the fall for prescribed burning. The Forest Service was not in operation for two weeks in October, when conditions can be optimal for burning.

The trend in the types of projects proposed on the Carson National Forest is towards improving watershed conditions and completing treatments that are light on the land. The wildland/urban interface projects proposed in the coming year involve primarily thinning and prescribed burning. Supporting documentation is located at the respective ranger districts.

Table 5. Some highlights of watershed improvement work 2009 - 2015

Fiscal Year	2009	2010	2011	2012	2013	2014	2015
Road maintenance (mi)2	768	580	430	454	478	345	352
Road obliteration (mi)	8.5	0	0	10	14	50	0

[2]Road Maintenance is done on a spot basis. These are miles of road where the maintenance was actually done. Many miles are driven over to arrive at the location where maintenance is needed. Miles not needing maintenance are not reflected in mileages in this table.

Fiscal Year	2009	2010	2011	2012	2013	2014	2015
Reseeding (ac)	100	200	473	417	350	0	2,077
Sagebrush conversion (ac)	839	200	567	400	350	0	2,077
Thinning (ac)	956	1,520	1,273	990	1,486	0	3,147
Prescribed burning	5,596	4,098	2,005	3,013	1,493	0	5,170

Drought conditions have caused authorized stocking levels on most allotments to be reduced (6). In 2014, the average authorized stocking levels were 30 percent less for cattle and 208 percent more for sheep than permitted. For 2015 it was 19 percent less for cattle and 225 percent more for sheep. Fifteen percent of the allotments were not stocked at all in 2014 and 14 percent in 2015.

Table 6. Percent of permitted stocking levels actually authorized by season for each allotment 2010-2015

-100 = no grazing of domestic livestock; 0 = permitted numbers of domestic livestock grazed

Allotment	2010	2011	2012	2013	2014	2015
Angostura	0	0	0	-8	-1	0
Black Lake	-44	-57	-65	-62	-21	-2
Capulin	0	0	0	-7	-29	-7
East Fernandez	-42	0	0	0	35	-8
Flechado	0	-7	-25	-43	-44	0
Knob	-20	0	0	0	2	0
Luna-Chacon	0	0	0	-19	-19	-75
Rio Chiquito	-1	-83	-62	-88	-91	-4
Rio Pueblo	0	-50	0	-25	-36	-1
Santa Barbara	0	0	0	-24	-40	-5
Tienditas	-8	-15	-36	-46	-54	-8
Trampas	-25	0	0	-21	-43	-5
Bateman	0	0	0	0	-54	-36
Canjilon	8	11	14	-27	-30	-21
Canjilon Creek	0	0	-60	-8	-15	0
Cebolla	-5	-5	-12	-30	28	5
English	6	0	0	0	-37	-7
Frenchy-Juaquin	0	0	0	0	0	0
Jarosa	0	0	0	-12	0	14
Mesa	0	0	0	-20	-50	0
Mogote	-5	-9	-29	-23	-21	0
Mogotito	6	0	0	-10	-30	0
Nutrias	0	0	0	-84	-13	0

Allotment	2010	2011	2012	2013	2014	2015
Oso	0	0	0	-31	0c/c 900e/l	0c/c 900 e/l
Alamosa	-7	-20	-15**	-20	-16	-8
Comanche	-100	-100	-85	-24	0	0
Cano	0	0	0	0	0	0
El Rito Lobato	-24	-30	-44	-55	-56	-46
Escondido	0	0	0	-84	-12	0
Jarita Mesa	-7	-4**	-22**	-90	-20	7
Jarosita	0	0	0	-81	0	0
Salvador Complex	-77 c/c -44 e/l	-77 c/c -55 e/l	-75 c/c -51 e/l	-75 c/c -59 e/l	-76 c/c 4 e/l	0 c/c 0 e/l
San Gabriel	-15	-11	-35	-92	100	0
Bancos	-100	-100	-100	-100	-100	-100
Cabresto	-54	-35	-58	-46	-63	-63
Carracas	-100	-100	-100	-100	-100	-100
Laguna Seca	-10	-61	0	-49	-12	-12
Valencia	-13	-100	-49	-53	0	0
Vaqueros	-50	-75	-53	-48	-25	-25
Apache Complex	-16	-4 c/c -70 e/l	-36 c/c -4 e/l	-10 c/c -72 e/l	-10 c/c -72 e/l	0 c/c 0 e/l
Carson Mojino	-47	-32	-32	-7	-16	0
Cerro Azul	-10	-7	-11	-20	28	60
East Piñon	-100	-100	-80	-63	0	0
Jawbone	-61	-11 c/c 0 e/l	-11 c/c -11 e/l	-13 c/c -10 e/l	-25 c/c 0 e/l	-78 c/c 0 e/l
Lagunitas	-7	-12	0	-10	-10	0
San Antone	0	-10	-12	-20	-25	0
San Antonio Mtn	-40	-34	-33	-33	0	0
Santos	+44	-20	-100	0	0	0
Servilleta	-87	-100	-100	-9 c/c 0 e/l	-100	0
Spring Creek	-25	-25	-26	-1	-25	0
Sublette	-6	-6	-6	-25	-25	34
TCLP	-23	-21	-21	-20	34	-15
Tio Gordito	-29	-46	-41	-41	-50	0
Tio Grande	-6	-10	-9	-20	-15	0

Allotment	2010	2011	2012	2013	2014	2015
Tres Orejas	-100	-100	-100	-9 c/c -0 e/l	-100	0
Tusas	-13	-38	-17	-30	-5	7
Arroyo Hondo	-30	-57	-57	-80	-83	0
Black Copper/RR	-100	0	0	0	0	-100
Bobcat	-100	-100	-100	-100	-100	-100
Columbine	-100	-100	-100	-100	-100	-100
Deer Creek	-24	-24	-24	-30	-6	-6
Goose Creek	-100	-100	-100	-100	-100	-100
La Cal	-100	-100	-100	-100	-100	-100
La Lama	-75	-75	-75	-75	0	0
Lake Fork Baldy	-100	-100	-100	-100	-100	-100
Main Fork	-100	-100	-100	-100	-100	-100
Midnight-Mallette	-35	-37	-28	-29	-29	-29
Rito Segundo	-100	-69	-69	-74	0	0
San Cristobal	-35	-19	-15	-91	-6	-6
Sawmill Park	-100	-100	-100	-100	-100	-100
Valle Vidal	0	-20	0	-11	0	0

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 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 Carson National Forest:

- Baseline and existing condition information are being collected in cooperation with the New Mexico Environment Department 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 National Forest 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 345 miles of forest roads forest wide in 2104 and 352 miles in 2015(except for the Jicarilla Ranger District.

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 188 miles of open roads are maintained on a timely basis to access gas well locations and minimize resource impacts from road use.

Human Environment

Facilities 2

Goals:

Travel management objectives will be developed for all forest development roads and travelways. This will further determine and verify which roads are needed and should be included or remain on the forest development roads 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:

The NEPA process to comply with the 2005 Travel Management Rule was completed for the Carson National Forest in September 2013. The Carson National Forest manages 2,253 miles of road open to motor vehicle use. 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. Facility, road, bridge and dam maintenance monitoring is ongoing, although minimal.

Results:

In fiscal years 2014 and 2015 there was no new road construction.

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 Carson National 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 2014 and 2015 have caused an analysis area’s ROS class to change.

Recreation 2

Goals:

The Carson National 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.

Results:

Customer satisfaction on how well we are managing the Carson National Forest 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.

The National Visitor Use Monitoring (NVUM) project for the Carson National Forest was completed and placed in the public domain in 2013. It is available electronically at: National NVUM Website.

The forest also offers exceptional opportunities for dispersed recreation and for solitude. The east and west side of the forest both provide dispersed recreation; however, the west side (Tres Piedras, Canjilon, and El Rito RDs) is known for offering a wide variety of dispersed activities and is heavily used during the fall hunting season. The few developed recreation facilities on the west side are extremely popular, especially among local residents from nearby urban areas of the state (e.g., Albuquerque, Santa Fe, Los Alamos). Recreationists on the Carson NF have multiple opportunities to choose from any time of the year. Both summer and winter activities offer the outdoor enthusiast an array of settings, challenges if so desired, and occasions to enjoy spectacular views and wildlife throughout the forest. 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.

Table 7 provides the number of skier visits for the three downhill ski areas on the Carson National Forest since 2002. The Enchanted Forest continues to provide quality cross-country skiing opportunities. The area served 4,784 skier visits in 2013. Visitation per year is dependent on snow

conditions. Snow conditions or lack of snow also influences the number of skiers. Red River Ski Area, Sipapu Ski Area and Taos Ski Valley all permit snowboarding with the snowboarders reflected in the number of skier visits. Overall, skiers/snowboarders are satisfied with the conditions of the three ski areas on the Carson National Forest. Taos Ski Valley's Phase 1 projects of its Master Development Plan were approved in August 2012. A new ski lift was added on Kachina peak in 2015. Monitoring to assure projects and mitigation measures are implemented as authorized is ongoing.

Table 7. Skier visits to respective downhill ski areas 2003-2015 ski seasons

Ski Season	Taos Ski Valley	Red River Ski Area	Sipapu Ski Area
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	27,084
2007-2008	241,115	86, 619	30,151
2008-2009	241,115	89,619	38,732
2009-2010	256,879	91,975	37,453
2010-2011	193,716	83,690	38,374
2011-2012	210,237	88,596	37,442
2012-2013	220,579	82,730	41,265
2013-2014	215,181	88,098	39,115
2014-2015	241,182	87,246	51,004

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

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 Carson National Forest. The NM Department of Game and Fish regulates hunting and fishing on the National Forest System lands. The annual number of permits/licenses sold can be provided by the New Mexico Department of Game and Fish.

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. Wildlife based recreation in included in the NVUM. This information is available electronically at: National NVUM Website.

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.

Results:

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.

In 2014 and 2015 two projects were undertaken to restore the health of recreation sites. Eagle Rock Lake on the Questa RD was dredged and rebuilt to remove contaminated soils. The project was recently completed to wide acclaim. Canjilon Lakes campground suffered a severe drought and insect damage and had to be temporarily closed. The Carson involved communities in the restoration decisions of the campground and slowly the campground has been reopened for public use.

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 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 was completed and placed into the public domain in 2013. This information is available electronically at: National NVUM Website. The 2013 NVUM identified customer satisfaction on the forest at 98%.

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:

Hunters who do not rely on the use of ATV's continue to be concerned over the increasing use of ATVs on the forest during hunting season. The forest has been limited in its ability to enforce motorized use off of designated roads and trails. ATV use in unauthorized areas has become a significant problem on the forest for some districts where recreation use is moderate to high. However, the proactive travel management implementation plan, that uses tools such as effective signing and a collaborative approach to motorized vehicle use monitoring, may reverse this trend.

The NEPA process to comply with the 2005 Travel Management Rule was completed for the Carson National Forest in September 2013. The Carson National Forest manages 2,253 miles of road designated for motor vehicle use. In 2002, an inventory was performed on level 3, 4 and 5 roads. The result was a forest-wide 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. Facility, road, bridge and dam maintenance monitoring is ongoing, although minimal.

Segments of the Continental Divide National Scenic Trail (CDNST) are located on the Canjilon, El Rito, and Tres Piedras ranger districts. In 2013, volunteer and partnership efforts resulted in 2 miles of new trail construction and 24 miles of maintenance on existing portions of the trail. The Carson acquired Miranda Canyon, approximately 5,000 acres, located on the Canjilon RD. The forest has been working with partners to determine and develop recreation use for the area. The Carson completed and is implementing a sustainable recreation strategy in 2015 that looks at improvements to the recreation opportunities with support from many community partners. In addition, the following trails-related 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.

Table 8. Miles of forest trail activities 2007-2015

Activity	2007	2008	2009	2010	2011	2012	2013	2014	2015
Trail maintenance	42	31	72	140	128	120	112	112	138.6
Trail condition surveys	1	5	9	0	22	0	27	18.28	13.2
Trail reconstruction	0	6	0	0	0	10	3	3.6	5

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 Forest's 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 Rule was promulgated in 2000. The rule was a source of litigation since 2000. Court rulings in 2013 brought the litigation to an end. The Carson National Forest continues to maintain the integrity of the roadless areas on the forest pending the outcome of the rule making process (additional rules), other methods of congressional intent concerning the roadless issue, or designation by congress of its intent with individual roadless areas.

Results:

For the most part, the implementation of the Roadless Area Conservation proposal and/or its successor would duplicate protection for Management Area 20 already in place through Forest Plan standards and guidelines. Through the travel management process, corrections to the forest's corporate roads database are being made to eliminate any roads that are incorrectly shown as open on the forest's visitor map.

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 judgment of recreation specialists, public comments, review of recent environmental analyses that included recreation assessments and information from Regional, Forest and District recreation managers

Results:

There are approximately 684 miles of forest system trails (2015 forest corporate trails database query). Forest trails are used by both recreationists and grazing permittees. Depending on season of use and time of week, use levels can be moderate to heavy depending on the location of the trail and trailhead. For example, trails that originate out of areas such as Taos Ski Valley and the town of Red River receive more use than more remote trails. Forest-wide, only a small portion of trailheads provide adequate recreation opportunity, Leave No Trace, and interpretive information. 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. At this time, the use of volunteer efforts provides the ability for the forest to maintain and/or improve trail conditions. Volunteer and force account efforts allowed the forest to maintain 112 miles of trail to standard in 2014 and 138.6 in 2015 (Table 9 and Table 10).

On the Camino Real Ranger District, all trail work occurred in or near the Pecos Wilderness. Maintenance activities included tree/brush clearing, trail drainage, and tread maintenance. Trail maintenance efforts reduced erosion and sedimentation into adjacent streams by redirecting use to established trails.

On the Questa Ranger District, there was continued law enforcement activities and signing to address recreational ATV use and the resource damage that can result resource from this activity. Approximately 90 percent of areas that have been identified as having ATV-related resource damage have been identified, barriers installed and/or signed.

Table 9. Trail maintenance for 2014

District	Trail Name	Miles	Maintenance Type
Camino Real	Centennial (FT 100)	2.5	Logged out
	Hidden Lake (FT 45)	0.8	Logged out
	San Leonardo (FT 30)	5.2	Logged out, brushing
	Serpent Lake (FT19)	3.75	Logged out, treadwork
	Jicarita Creek (FT 38)	2.5	Logged out, treadwork
	West Fork (FT 25)	5	Logged out, treadwork
	Middle Fork (FT 24)	9.5	Logged out, treadwork
	East Fork (FT 26)	3.75	Logged out, cairns
	SBT (FT 2)	3	Logged out, treadwork

District	Trail Name	Miles	Maintenance Type
	Elliot Barker (FT 1)	2.5	Treadwork, brushing
	Indian Creek (FT 27)	1.5	Logged out
	Aqua Sarca (FT 16)	2	Logged out, treadwork
	Comales (FT 22)	2.5	Logged out, brushing
Canjilon	Canjilon Lookout	2.5	Logged out
	Rim Vista	1	Logged out
	Salazar	2.5	Logged out
Tres Piedras	Continental Divide	32.5	Logged out, signed, cairns
Questa	Italianos (FT 59)	3.7	Logged out, treadwork
	Yerba (FT 61)	3.9	Logged out, tread work
	Gavilan (FT 60)	1	Logged out
	Manzanita (FT 58)	2	treadwork, brushing
	Lost Lake (FR 91)	5.2	Logged out, brushing
	East Fork (FT 56)	4.7	Logged out, brushing
	Columbine (FR 71))	7	Logged out, treadwork
	Wheeler Peak (FT 67)	2.25	Logged out, brushing
	Williams Lake (FT 62)	2	Logged out, brushing
	Sawmill	4	Logged out
	TOTAL	118.75	

Table 10. Trail maintenance for 2015

District	Trail Name	Miles	Maintenance Type
Camino Real	S. Boundary	18	Logged out, signage
	Serpent Lake (FT19)	7.9	Logged out, treadwork
	Pot Creek Inter (FR 2)	.75	Edging, signage
	West Fork (FT 25)	3	Logged out, treadwork
	Middle Fork (FT 24)	11.7	Logged out, drainage, signage
	East Fork (FT 26)	.5	Cairns, signage
	SBT (FT 2)	3	Logged out, treadwork

District	Trail Name	Miles	Maintenance Type
	Elliot Barker (FT 1)	2	Treadwork, logging out, fence repair
	Angostura C. (FR 19A)	2	Logged out, treadwork
	Comales (FT 22)	2.5	Logged out, treadwork
Tres Piedras	Continental Divide	48	*Logged out, signed, cairns*
Questa	Italianos (FT 59)	3.7	Logged out, treadwork
	Yerba (FT 61)	3.6	Logged out, treadwork, drainage
	Gavilan (FT 60)	1.9	Logged out
	Manzanita (FT 58)	4.2	Logged out, treadwork, drainage
	Lost Lake (FR 91)	7.9	Brushing, treadwork, signage
	East Fork (FT 56)	5.3	Logged out
	Lobo Peak (FR 57)	3.6	Treadwork, brushing
	Bull Creek (FR 85)	2.1	Logged out, treadwork
	Midnight (FR 81)	3	Logged out
	Cebolla Mesa (FR 102)	1	Switchback/retaining wall repair
	Wheeler Peak (FT 67)	2.25	Treadwork, waste management
	Williams Lake (FT 62)	2	Logged out, treadwork
	Long Canyon (FR 63)	2.4	Logged out, brushing
	TOTAL	142.3	

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. Wilderness use is increasing slightly and is primarily concentrated along trails in the Wheeler Peak, Pecos, and Columbine-Hondo Wilderness wilderness areas. The use of the Latir Wilderness and the Cruces Basin Wilderness is increasing. Much of the use in these two wilderness areas is for fishing. Most trailheads provide information about recreational opportunities and wilderness resource conservation issues.

In 2014 Congress officially designated the Columbine Hondo Wilderness Area.

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. Use is primarily concentrated along trails in the Wheeler Peak and Pecos and Columbine-Hondo Wilderness Areas. Overall, use has slightly increased, with the exception of the new Wheeler Peak Trail (FT 90), which takes off near Williams Lake. Use of this trail, constructed several years ago, has significantly increased daily visitation to Wheeler Peak. 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.

In 2014 and 2015 the forest has worked with the Rocky Mountain Youth Corps to do work in the Pecos wilderness area, on trails that experience high visitor use.

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 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-seven 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, Rio Santa Barbara, and within wilderness areas were classified as “Outstanding National Resource Waters” (ONRW) by the New Mexico Water Quality Control Commission. 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.

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:

In 2015 the Carson NF completed the Miranda Canyon acquisition. The forest is conducting surveys of the lands and working with partners on how best to manage the lands.

Protection 1 - Drinking Water

Goals:

Comply with state health and sanitation codes to protect public health. All public potable water supplies will be in compliance with the Safe Drinking Water Act and applicable state laws. Wastewater treatment will comply with state laws.

Monitoring:

Monitor all potable water systems open to public use.

Results:

Potable Water samples for Nitrate are taken once a year for all public water systems owned by the Forest Service, as required by the Environmental Protection Agency's Drinking Water Act. This includes all campgrounds and administrative sites, as well as permittees who manage water systems located on NFS lands. All water samples are taken by a sampler certified by the New Mexico Environment Department, which oversees the administration and enforcement of the Drinking Water Act. The certified sampler, in most cases, is a private consultant hired either by the Forest Service or a campground concessionaire who has a contract with the Forest Service. No violations of drinking water standards occurred in 2014 and 2015.

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 2014 fire season, the Carson National Forest received consistent moisture. Significant winter snows and then a long period of spring rains. Fuel moisture levels were at or near record highs. The Carson National Forest had a total of 47 fires, which nearly all remained Class A fires, with one Class B. The largest fire was only 10 acres and all suppression was successful. Safety remained the highest priority on all fires and none were utilized for resource benefit. The Carson National Forest averages approximately 35 percent human caused fires with most of those being abandoned campfires. Various treatments for fuels were utilized including prescribed fire and mechanical. In general, most treatments were achieved using force account prescribed fire.

For the 2015 fire season, the Carson National Forest received consistent moisture. Significant winter snows and then a long period of spring rains. Fuel moisture levels were at or near record highs. The Carson National Forest had a total of 38 fires, which all remained Class A fires. The largest fire was only 0.8 acres and all suppression was successful. Safety remained the highest priority on all fires and none were utilized for resource benefit. The Carson National Forest averages approximately 35 percent human caused fires with most of those being abandoned campfires. Various treatments for fuels were utilized including prescribed fire and mechanical. In general, most treatments were achieved using force account prescribed fire.

Table 11. Wildfires on the Carson National Forest 2009-2015

	2009	2010	2011	2012	2013	2014	2015
Total acres	113.7	306.7	1,063.1	425	41	19.9	15.2
Avg size (ac)	2.0	3.3	7.8	2	0.6	0.4	0.4
Number fires	57	92	55	99	72	47	38
Largest fire (ac)	87 Cabresto Mesa	270 Ojito	720 Osha	363 Midnight	19 Chino	10 La Jara Canyon	0.86 Negro

Keeping the wildfires small allows better planning for later prescribed burning, when weather and fuel conditions allow. The total number of fire starts in have continued to lower (Table 11). Efforts to reduce fuel loading are expected to continue into the future. The Forest needs to increase the prescribed burning program to at least 10,000 acres per year, and manage more naturally ignited fires for multiple objectives.

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.

Results:

Insect and disease information for Region 3 is currently available on for FY2014.

Bark beetle-caused mortality increased considerably in 2014 across all forest types on the Carson National Forest. Douglas-fir mortality nearly decreased minimally since last year's survey, going from 8,500 acres in 2013 to 7,850 in 2014. Corkbark fir mortality was observed on over 7,710 acres, an increase in the number of acres as last year. Fir engraver increase again in 2014 to 3,520 acres. Ponderosa pine mortality occurred in higher numbers across the Questa and Camino Real RD', affecting 470 acres. No piñon pine mortality was recorded on the Carson NF in 2014.

Spruce beetle activity was mapped on 4,220 acres this year, up from 2,000 acres in 2013. Most of the spruce mortality was concentrated around the Santa Barbara Divide. A continued increase in spruce beetle activity is expected in the next few years. The aerial "signature" of spruce beetle-infested spruce is not as striking or long-lasting as that of bark beetles in other trees; therefore, aerial detection of spruce beetle activity is extremely difficult.

In 2014, only 27,000 acres with aspen decline were mapped on the Carson National Forest, which was an exponential increase from 2013. The areas mapped were new areas of decline or areas where the aspen decline has progressed from light to heavy. The area affected by western spruce budworm stabilized from 98,200 acres in 2013 to 92,690 acres this year, but continues to be the most widespread activity on the Carson National Forest. Aspen defoliation decreased from to 68,500 acre in 2013 to 27,000 acres, with the majority of it observed on the Canjilon and Tres Piedras RDs. Table 12. summarizes insect and disease conditions from 2009 through 2014.

Table 12. Summary of insect and disease conditions (acres) on the Carson National Forest 2009-2014

Insect/Disease	2009	2010	2011	2012	2013	2014
Western spruce budworm	214,510	98,750	172,060	166,810	98,250	92,690
Aspen defoliation	21,760	11,890	41,610	65,370	68,530	27,000
Aspen decline[3]		1,500	1,440	830	710[4]	
Piñon bark beetle			<5		<5	
Douglas-fir beetle	400	100	2,830	3,000	8,490	7,850
Spruce beetle (includes corkbark fir mortality)		30	870	850	2,020	4,220
Fir engraver beetle	120	<5	50	530	1,590	3,520
Western balsam bark beetle	12,380	11,620	3,660	2,810	6,630	4,290
Ponderosa pine bark beetles	120	10	30	10	340	470

[3] Aspen decline first was noted in 2010.

[4] Areas with new or previously unmapped aspen decline/mortality

Table 12. 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 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.

Western pine beetle, *Dendroctonus brevicomis*, primarily affects ponderosa pine. This insect rarely infests trees less than 9 inches in diameter. One beneficial effect of this insect is to create dead or dying trees suitable for cavity nesting wildlife species.

There was little to no detection of this insect in 2006-2007 and an increase in affected acres in 2008-2009 with a decrease in 2010. The acres affected increased in 2011 but are still at a low level. The indications are creation of at least 700 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 existing snags in interior forest locations generally preclude removal, authorized or unauthorized, for firewood purposes. Issued permits prohibit removal of ponderosa pine snags. 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. The drought in 2010 and into 2011 may be a causal agent if the beetles involved increase the acres affected in 2013. Mortality and estimated snags increased in 2014, 470 acres and 940 respectfully.

Table 13. Ponderosa mortality and estimated snags created 2009-2014

	2009	2010	2011	2012	2013	2014
Acres affected	120		30		340	470
Est snags created	480	0	60	0	680	940

Douglas-fir beetle**,** *Dendroctonus pseudotsugae*, affects Douglas-fir. 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. The indications are a creation of at least 33,000 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 existing snags in interior forest locations generally preclude removal, authorized or unauthorized, for firewood purposes. Secondary cavity nesting birds prefer to nest in trees that recently died and a significant number of nests are found in snags that have been dead less than 20 years, with the most heavily used in the 5 to 20 year age.

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, 340 acres in 2007. In 2011, the beetle was observed (aerially) affecting 2,830 acres, a significant increase from previous years (Table 14.). This could be the result of drought stress or other biological conditions. Insect parasitism in 2005 to 2010 helped reduce the population available for infestation of new trees. These populations, like many other insects, are somewhat cyclic around an endemic population. The declining numbers of infested trees from 2008 to 2010 could have reduced the insect parasites. The decline in parasites and continued drought stress are two causal agents for the increase in the number of infected acres.

Table 14. Douglas-fir beetle conditions and estimated snags created 2009-2014

	2009	2010	2011	2012	2013	2014
Acres affected	400	100	2,830	3,000	8,490	7,850
Est snags created	1,600	400	11,320	12,000	33,960	31,400

Fir engraver beetle**,** *Scolytus ventralis*, affects true fir trees. 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. The indications are a creation of at least 16,900 white fir and corkbark 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 existing snags in interior forest locations generally preclude removal, authorized or unauthorized, for firewood purposes. Secondary cavity nesting birds prefer to nest in trees that recently died and a significant number of nests are found in snags that have been dead less than 20 years, with the most heavily used in the 5 to 20 year age.

Fir engraver beetle has increased its presence from 85 acres in 2003 to 4,100 acres in 2005, a decline in 2006 to 1,727 acres, and another increase to 6,800 acres in 2007. In 2008 the population has significantly decreased to 5 acres; then increase to 120 acres in 2009 and a decrease to less than 5 acres in 2010.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 2006 and 2007. These conditions were again seen in 2008 to 2009 with increased number of parasitic insects. These populations like many other insects are somewhat cyclic around an endemic population. The declining numbers of infested trees from 2007 to 2010 could have reduced the insect parasites. The decline in parasites and continued drought stress are two causal agents for the increase in the number of infected acres. Infected acres 2013 tripled from 2012 to 1,590 acres. Infected doubled in 2014 to 3,520 from 2013.

Table 15. Fir engraver beetle conditions and estimated snags created 2009-2014

	2009	2010	2011	2012	2013	2014
Acres affected	120	<5	50	530	1,590	3,520
Est snags created	480	20	200	2,120	6,360	14,080

Spruce beetle**,** *Dendroctonus rufipennis*, affects spruce trees. 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. The indications are a creation of at least 2,020 spruce 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 (Figure 13). It is highly likely existing snags in interior forest locations generally preclude removal, authorized or unauthorized, for firewood purposes. Secondary cavity nesting birds prefer to nest in trees that recently died and a significant number of nests are found in snags that have been dead less than 20 years, with the most heavily used in the 5 to 20 year age.

Figure 13. Spruce beetle-caused mortality near Santa Barbara Divide (Camino Real Ranger District)

Spruce beetle presence decreased from 5,840 acres in 2003 to 3,905 acres in 2004, and then increased to 6,605 acres in 2005, with a subsequent decline in 2006 to 2,223 acres. In 2007 to 2009 there were no populations detected. In 2010, detection on about 30 acres showed the insect present in the forest. The increase in 2011 (870 ac), 2013 (2,020 ac), and 2014 (4,220 ac) could be a result of drought stress and the low number of parasitic insects attacking the beetles. A large spruce beetle outbreak is in southern Colorado near the Carson National Forest. The number of infested acres is fluctuating. The spruce beetle populations like many other insects are somewhat cyclic around a smaller endemic population. However, the continuing drought could be one agent predisposing spruce trees to attack by the spruce beetle.

Table 16. Spruce beetle conditions and estimated snags created 2009-2014

	2009	2010	2011	2012	2013	2014
Acres affected		30	870	850	2,020	4,220
Est snags created	0	120	3,480	3,400	8,080	16,880

Western balsam bark beetle, *Dryocoetes confusus*, attacks and kills trees in the true fir group, such as white fir and subalpine or corkbark fir. 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. The indications are a creation of at least 26,520 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 existing snags in interior forest locations generally preclude removal, authorized or unauthorized, for firewood purposes. Secondary cavity nesting birds prefer to nest in trees that recently died and a significant number of nests are found in snags that have been dead less than 20 years, with the most heavily used in the 5 to 20 year age.

Western balsam bark beetle was undetected from 2003 to 2004. Populations appeared in 2005 in 3,540 acres, increased to 17,850 acres in 2008 and declined to 2,810 acres in 2012. In 2013, 6,630 of infested acres were detected, over twice as many infected acres as 2012. The populations of both the host insect and parasitic insects like many other insects are somewhat cyclic around an endemic population. Insect parasitism in 2009 to 2011 helped reduce the population available for infestation of new trees. The possible increase in parasites could be an agent in further reducing the acres of infested trees. However, continued drought stress could be an agent for the increase in the number of infected acres in 2013. 2014 saw a decrease in affected areas.

Table 17. Western balsam bark beetle conditions and estimated snags created 2009-2014

	2009	2010	2011	2012	2013	2014
Acres affected	12,380	11,620	3,660	2,810	6,630	4,290
Est snags created	46,520	46,480	14,640	11,240	26,520	17,160

Piñon bark beetle generally infests the entire stand, though an occasional piñon 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 piñon pine in the infested stand. The number of acres infested decreased dramatically but still nearly 33,000 acres were attacked in 2004. In 2014 no new piñon pine mortality was detected aerially. It appears that the population of this insect subsided 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 microsites (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.

Diseases such as dwarf mistletoes and root disease causing organisms are found scattered about the forest. These diseases can cause the death of individual trees and at times small pockets of trees. Foliage diseases such as Ponderosa Pine Needle Cast are scattered over the Carson National Forest. New Mexico State Highway 522 between Taos and Questa has several pockets of needle cast alongside the road. These locations are expected to increase in size due to drought stress in trees and the increasing amount of inoculum present in the dead needles on the ground. The scattered nature of these dead trees prevents an accurate estimate of the total acreage of dead or dying trees.

Bark beetles are the primary cause of tree mortality in the region and tend to be host specific. They are monitored and detected aerially by the browning discoloration of needles in affected trees called “faders”. Generally the smallest clump of “faders” that can be detected is 3 to 5 trees. 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 the result of an attack by the Douglas-fir bark beetle, *Dentroctonus pseudotsugae*. Piñon pine mortality is primarily caused by the bark beetle, *Ips confusus*. In contrast, ponderosa pine are attacked and killed by several different bark beetles. Aspen decline has several causal agents including drought stress, attack by two or more species of small beetles, and fungal attacks in combination.

The insects noted in the previous tables 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.

In the past six years an estimated 303,240 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.

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 Carson National Forest.

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 System lands, cutting forest products without a permit, and illegally driving a motor vehicle off a designated road.
- 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 other scheduled event on the forest.
- The forest currently has I law enforcement officer which challenges in serving the public.

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:

One timber sale was implemented in 2014 and 2015, for the purpose of reducing fuels hazard. Approximately 1,378 acres were treated and monitored in 2014 and 2015 for forest health and fuels reduction as a part of 7 Collaborative Forest Restoration Program (CFRP) grants (Table 17).

The majority of fuel treatments are occurring in the wildland urban interface surrounding 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.

Table 18. Summary of fuels reduction activities on the Carson National Forest in 2014 and 2015

Project Name	Description	Acres Treated
Agua Caballos Green Fuelwood	Group and individual tree selection	189
Borrego Mesa Green Fuelwood	Group and individual tree selection	146
Canjilon WUI Green Fuelwood	Group and individual tree selection	71
Gordito Timber Sale	Group and individual tree selection	172
Mica Green Fuelwood	Group and individual tree selection	68
Ruedas Green Fuelwood	Group and individual tree selection	70
Capulin Pile Burn	Pile burning of activity fuels	51
Ensenada Pile Burn	Pile burning of activity fuels	78
Red Mesa Pile Burn	Pile burning of activity fuels	225
Highway 115 Pile Burn	Pile burning of activity fuels	163

Project Name	Description	Acres Treated
Alamosa Prep	Thinning for hazardous fuel reduction	124
Chacon CFRP	Thinning for hazardous fuel reduction	188
Baca Canyon Thinning	Thinning for hazardous fuel reduction	225
Blake Lake Forest Restoration CFRP	Thinning for hazardous fuel reduction	150
Agua Caballos Thinning	Thinning for hazardous fuel reduction	230
Canjilon WUI	Thinning for hazardous fuel reduction	216
CCC CFRP	Thinning for hazardous fuel reduction	114
Guajalote TSI	Thinning for hazardous fuel reduction	138
Kuykendall CFRP	Thinning for hazardous fuel reduction	155
La Alba CFRP	Thinning for hazardous fuel reduction	124
Maquinita Thinning	Thinning for hazardous fuel reduction	310
Rio Trampas CFRP	Thinning for hazardous fuel reduction	350
Bighorn Mountain/Stateline Thinning	Thinning for hazardous fuel reduction	58
Rocky Mountain Youth Corp CFRP	Thinning for hazardous fuel reduction	297
Cuchilla Big Game Enhancement Thinning	Thinning to improve wildlife habitat	202
Maquinita Big Game Enhancement Thinning	Thinning to improve wildlife habitat	657
Red Mesa Big Game Enhancement Thinning	Thinning to improve wildlife habitat	114
Trick Tank Thinning	Thinning to improve wildlife habitat	10
Alamosa Prescribed Burn	Understory burn	4,544
Borrego Mesa Prescribed Burn	Understory burn	190
Box Tank Prescribed Burn	Understory burn	176

Project Name	Description	Acres Treated
Francisco Prescribed Burn	Understory burn	323
Lost Lakes Prescribed Burn	Understory burn	448
Red Mesa Prescribed Burn	Understory burn	136

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 and endangered, and Forest Service sensitive species and through limitations outlined in litigation.

Air Quality - Visibility in 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. Determine baseline condition of visibility and determine if any visibility degradation is occurring in the Class I areas.

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 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.

Generally, the visibility on the clearest days is improving towards natural conditions over the last ten years, but visibility under hazy conditions has not improved over the same time period. It is still hazier than it was in the past. As far as the pollutants, under both clear and haze days, visibility is most affected by sulfates (burning fossil fuels) and organic carbon (from vehicle emissions, industrial facilities, fires) when compared to natural conditions.

In 2014 and 2015 Air Quality and values dependent on air quality on the Carson NF are generally in good condition or are improving as most pollutants are decreasing.

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 Information Management System (TIMS); 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 Carson National Forest towards its desired condition. Mixed conifer and ponderosa pine forests on the forest still contain large areas of small, densely growing trees. These conditions pose a threat of high severity wildfire over extensive landscapes.

Approximately 1,378 acres were treated and monitored in 2014/2015 for forest health and fuels reduction as a part of the Collaborative Forest Restoration Program. Supporting documentation is located at the respective ranger stations. In addition, 4,378 acres of commercial and pre-commercial thinning were cut in 2014/2015.

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.

Monitoring:

Through sale review, EA's, cruise summaries, TIMS, 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:

There was one active timber sale on the Carson National Forest in 2014/2015 that reduced fire hazards. Approximately 1,378 acres were treated and monitored in 2014/2015 for forest health and fuels reduction as a part of seven Collaborative Forest Restoration Program grants. 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 0.5 MBF (thousand board feet) or stated differently 1 MBF equals 2 CCF. Other measures are not being used. Vigas and latillas were sold on a per foot basis. The amount sold of these two products is small.

The Carson National Forest large sale timber program involved 4 ongoing timber sales that are regularly monitored when actively harvesting.

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 National Forest was implemented in 2013 with 2 ongoing sawtimber sales. There were numerous small commercial sales, primarily fuelwood, and a few involving special forest products such as vigas and latillas. Several of the small commercial sales are associated with grants (i.e., Collaborative Forest Restoration Project), which means part of the grant includes removal of forest products.

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 harvested less than 11.9 MMBF in and 2014 and 11.3 MMBF in 2015 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 **Error! Reference source not found.**.

Table 19. Fuelwood and small products 2009-2015

Fiscal Year	2009	2010	2011	2012	2013	2014	2015
Latillas and small products not convertible to volume							
Permits	2,223	560	400	429	467	2,181	2,511
Fuelwood							
Permits	5,305	5,231	4,872	4,590	3,931	4,498	5,217
Volume (cords)	27,386	23,044	24,727	23,913	20,475	29,928	29,320

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, TIMS, Stand Data Base/Acres.

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 2013.

Table 20. Regeneration surveys 2009-2015

Activity	2010	2011	2012	2013	2014	2015
Total acres regeneration survey	604	415	485	230	891	0
Total natural regeneration survey	0	0	0	0	0	0
Total natural plantation survival	604	415	485	230	891	0
Natural regeneration without site preperation	0	0	0	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.

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) continued to experience a downturn in applications for permit to drill (APDs) in 2014 and 2015. These APD’s are on NFS lands were leased prior to 1970.

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 several years continued in 2014 and 2015 with abnormally dry conditions on much of the Carson National Forest. In general, drought brings many hardships to cattle producers. Herd adjustments (lower numbers) and entry and exit date adjustments continued to be used as intensive management options to reduce impacts to unsatisfactory ranges where necessary to aid in moving these ranges toward a satisfactory condition. See Table 6 under Soil and Water 1- Watershed Conditions 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. Ongoing 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.

In 2014, 278 acres of invasive plants were removed, 280 acres were monitored for invasive plants, and 181 acres were restored on the Carson National Forest. In 2015, 94 acres of invasive plants were removed, 102 acres were monitored for invasive plants, and 47 acres were restored on the Carson National Forest. An environmental impact statement addressing treatment of invasive plants on both the Carson and Santa Fe National Forests was prepared and a decision made in 2005, but the decision was reversed on appeal. A supplemental invasive plant control decision is still pending.

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 Carson National Forest completed one allotment management plan and signed one grazing allotment decision in FY2014 and none in 2015. The 2014 NEPA decision covered three grazing allotments – Laguna Seca, Valencia, and Vaqueros.

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 and updated in the Range Infra database by forest personnel in 2014 and 2015.

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:

In 2014 and 2015, grazing capacity was not verified for any allotments on the Carson National Forest through the NEPA process.

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 were no activities in 2014 and 2015 that reduced the visual quality objectives of Retention or Partial Retention.

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:

There were no activities in 2014 and 2015 that reduced the visual quality objectives.

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:

In FY 2014 and 2015, 10 NEPA each site-specific decisions were made on the Carson National Forest. Each project implemented was evaluated to insure consistency with the Forest Plan.

A forest plan amendment to include standards and guidelines for Valle Vidal (Management Area (MA) 21) was scheduled to be completed in FY2013. Since the Carson National Forest is scheduled and funded to begin forest plan revision under the 2012 planning regulations in FY2014, it was decided that any specific standards and guidelines for MA 21 would be included in the revised plan. Valle Vidal is currently managed under the forest-wide prescriptions of the 1986 Carson Forest Plan

The Camino Real Ranger District travel management decision was made in September 2013 and completed the process for complying with the 2005 Travel Management Rule. This resulted in Forest Plan Amendment 16, which prohibits motor vehicle use off the designated system of roads, trails, and areas, except as identified on the motor vehicle use map or unless specifically authorized under a written authorization issued under Federal law or regulations by an authorized officer.

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 Carson National 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 Carson National 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.
- A National Visitor Use Monitoring (NVUM) Project was completed and placed into the public domain in June 2012. Data for this project was collected from FY 2008 through FY 2012. This information is available electronically at National NVUM Website. An NVUM was conducted on the Carson National Forest in 2013; however the results have not yet been published.

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. 2,267 acres were surveyed in 2013 resulting in the recording or updating of 384 heritage sites.
- On the Jicarilla Ranger District, survey work primarily focused on district projects rather than oil and gas development. Just over 600 acres were surveyed for district projects, resulting in the recording or updating of information for 54 archeological sites, one of which was a new Navajo pueblito site (Figure 14).

Figure 14. New Navajo pueblito site on Jicarilla Ranger District (Note: rubble on top of boulder across middle of photo)

An unusual rock art panel was one of the highlights of the survey work. What appears to be a chupacabra was found painted on a talus boulder during survey of the project area for a proposed sagebrush mowing project (Figure 15).

Figure 15. Chupacabra pictograph with archeologist for scale

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 National Forest 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 (Figure 16). 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. No damage assessments were completed in 2014 and 2015, since none were needed. A Site Steward Program continued to monitor sites throughout the forest by private volunteers.

Figure 16. The San Antonio Guard Station and Lookout sits on top of San Antonio Mountain. Photo taken September 2013, during a condition assessment

- The Carson National Forest manages two wild horse territories – Jarita Mesa (El Rito Ranger District) and Jicarilla. Annual monitoring is conducted on both, to determine whether herds are within appropriate management levels (AML). Horse gathering is performed, when numbers exceed the AML. In 2015, the Jicarilla had between 342 and 502 horses.. The 2015 population of the Jarita Mesa Wild Horse Territory. The Carson National Forest is on the

forefront in conducting low impact gathers and working with contraception protocols to reduce reproduction.

Figure 17. Wild horses on the Jarita Mesa Wild Horse Territory

- 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 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.

Part 2 - 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. Moisture increased in 2014 and 2015 as the forest received consistent levels throughout each year.

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 times 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 periods of 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 313,182 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 year's time if climatic conditions coincide with other natural factors.

Multiple Benefits to People

In 2014/2015, fuelwood was provided to approximately 9,715 households in northern New Mexico which 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 the needs of people. The range program continued to monitor the conditions of the allotments with the intent of providing permittees an opportunity to graze the land. Regular contact with permitted livestock owners allows for timely adjustments in management, as monitoring deems necessary for resource conditions.

The Carson National Forest completed 20 individual project level documentation processes under the National Environmental Policy Act (NEPA) in 2014/2015. Of those NEPA decisions the forest completed and signed, one grazing allotment management decision was made in FY2014. In addition, the forest completed 2 documents related to mineral management, 4 for species habitat improvement and 11 for special use management. Each of these processes necessitated research for the latest scientific information and at times required technical assistance from specialists not residing on the forest.

The Carson National Forest Fire Prevention Program participated in numerous community events to share forest service, fire prevention and defensible space information. Our fire prevention school program focuses on children in all the school systems surrounding the forest. Our emphasis is teaching the importance of wildfire prevention, the principles of fire behavior, healthy forests and the concept of interdependence in forest ecosystems. Community events that included public meetings, visits to schools included over 2,000 children, parents and teachers, parades reached approximately 10,000 people.

The Carson National Forest Fire Prevention Program participated in numerous community events to share forest service, fire prevention and defensible space information. Our fire prevention school program focuses on children in all the school systems surrounding the forest. Our emphasis is teaching the importance of wildfire prevention, the principles of fire behavior, healthy forests and the concept of interdependence in forest ecosystems

Other events included participation in local community festivals, parades fishing derbies and health fairs. Many of these events included participation from our interagency cooperators.

Many community events and meetings included the sharing of information on creating defensible space around homes in our wildland urban interface areas.