

SOCIOECONOMIC ASSESSMENT OF THE GILA NATIONAL FOREST

**Submitted to the United States Forest Service
Region 3 Office**

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**University of New Mexico
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Economic Research**

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Abbreviations

AUM	Animal Unit Month
BLM	Bureau of Land Management
CFRP	Collaborative Forest Rehabilitation Program
DOD	Department of Defense
ESA	Endangered Species Act
FS	Forest Service
IRA	Inventoried Roadless Area
MSA	Metropolitan Statistical Area
NF	National Forest
NLCD	National Land Coverage Data
NMDOT	New Mexico Department of Transportation
NVUM	National Visitor Use Monitoring
OHV	Off-Highway Vehicle
RD	Ranger District
ROW	Right-of-Way
VMS	Visual Management System

Executive Summary

This report is an assessment of the socioeconomic and cultural relationships between the Gila National Forest (NF) and its neighboring communities. This assessment was commissioned by the Southwestern Regional Office of the United States Department of Agriculture Forest Service (FS), and serves as a source of information for the development of a revised plan for the Gila NF.

The assessment is based primarily on secondary data sources, including the United States Bureau of the Census, the Bureau of Land Management, the United States Geological Survey, the United States Federal Highway Administration, the New Mexico Department of Transportation, offices of wildlife management, and county governments. The most important source of data was FS records, including the FS infrastructure database (INFRA) and geographic information system (GIS) databases. In many cases, specific information was not available in a form appropriate to this analysis, requiring the Bureau of Business and Economic Research to make estimates, using the best available data. In other cases, data were not available at all and the analysis was limited. Information sources and analysis methods are thoroughly documented throughout the report.

Gila National Forest Overview

The Gila National Forest (NF) has 3.3 million acres of publicly-owned forest and range land and is the sixth largest national forest in the continental United States. The forest spans Catron, Grant, Hidalgo, and Sierra Counties in the southwestern quadrant of New Mexico. Although they vary in their socioeconomic characteristics, all the counties in the four-county assessment area are rural counties. In terms of population, the largest incorporated areas are Silver City, Bayard, and Hurley (10,545, 2,534, and 1,464, respectively, in 2000) in Grant County, Truth or Consequences (7,289) in Sierra County, and Lordsburg (3,379) in Hidalgo County. The one incorporated area in Catron County is Reserve, with a population of only 387 in 2000. Cities within 150 miles of the Gila NF include Las Cruces (74,267) and Deming (14,116) to the south in Dona Ana and Luna Counties, respectively, and Socorro (8,877) to the northeast in Socorro County. The Gila NF does not share boundaries with any present-day occupied Indian reservations, but the Ramah and Alamo Navajo and the Acoma Pueblo in New Mexico and the Warm Springs Apache in Oklahoma all have historical ties to the Gila NF, continue to use the Gila NF, and have on-going concerns about particular places and the disposition of various sites.

Unlike the four other national forests in New Mexico, all of the Gila NF except for the Burro Mountain Region near Silver City covers one contiguous area. The Gila NF is comprised of six ranger districts (Black Range, Glenwood, Quemado, Reserve, Silver City, and Wilderness) and includes three wilderness areas: the Aldo Leopold Wilderness (about 200,000 acres), the Gila Wilderness (about 560,000 acres), and portions of the Blue Range Wilderness (about 29,000 acres). The Gila Cliff Dwellings National Monument, which is jointly managed by the National Park Service and the FS under a memorandum of understanding, lies within the Wilderness Ranger District.

Demographics and the Economy of the Four-County Assessment Area

Once home to the Mogollon and Mimbrenos Indians and, later, the Warm Springs Apache, who consider the Gila their ancestral home, the area population took off when gold, silver, and copper were discovered; but the mining history has been one of boom and bust. In addition to mining, the

area's economy has been dependent on ranching, timber, and, more recently, tourism, with the NF providing critical resources in support of all these activities.

The four Gila NF assessment area counties generally follow the demographics of the U.S. as a whole – the population is aging, more racially diverse, with higher educational attainment and increasing per capita incomes. More households are headed by women and are single person households.

This is an area of changing economic fortunes, and many of the changes relate to the natural resources of the Gila NF. Over the past two decades, much of the logging industry in this part of New Mexico died, with the largest sawmill closing in Reserve in 1993. Prolonged drought conditions, adverse market conditions, and restrictions on grazing allotments designed to foster sustainable grazing have adversely impacted some ranching operations and may together have contributed to decisions to sell off land to other uses or to go out of business entirely. Falling copper prices on international markets were one major factor in the layoffs that occurred at the mines and also at the smelters of Grant and Hidalgo Counties. On the other hand, the Gila NF has attracted increasing recreational users. The local tourism industries expanded, as did amenity migration into the area by retirees and others, along with investments in vacation homes.

Access

While the Gila NF remains relatively remote, there are well-developed transportation links from major population centers. Growing populations in the Albuquerque Metropolitan Statistical Area (MSA) and in the Las Cruces, El Paso, and Tucson MSAs mean more people seeking out the diverse recreation opportunities offered by the Gila NF.

Forest roads provide access for both forest users and FS officials to areas of interest in the Gila NF. These roads are essential because they allow the only access to certain areas, permitting maintenance and rehabilitative activities. Access to the forest becomes critical in the event of a forest fire or other catastrophic event. The Gila NF features about 6,626 miles of roadways on NF-managed land. The Gila NF has 88 trailheads, and, according to the FS infrastructure database, almost 1,900 miles of trails.

The roads and trails catalogued above do not include all the roads and trails that have been created in the forest by people taking their motorized vehicles, typically their off-highway vehicles (OHVs), “off road.” These motorized vehicles provide an increasingly popular recreation alternative, but they can have many adverse effects, including causing damage to riparian and other areas of the forest, and degrading the experience of other forest users. In part to address the problem of OHVs, the FS has promulgated a new management directive, the Travel Management Rule, requiring each of the NFs to designate those roads, trails, and areas that are open to motor vehicle use.

A recent national trend is retirees and those not restricted to doing their job at a particular worksite (“lone eagles”) migrating or building or buying second homes in areas with considerable amenities. These newcomers to the land can create a number of challenges for forest management in terms of access when they willingly or unwillingly block previously used points-of-entry to the forest. Ranchers have also been known to prevent access to the forest to other users.

Land Cover and Wildlife

Overall, two thirds of the land in the Gila is evergreen forest, 22.6 percent is shrub land, 8.5 percent is herbaceous grasslands, and 1.7 percent is mixed forest. There are 121 thousand acres of privately-owned land on the Gila NF, making up about 3.6 percent of the entire forest. The private lands are disproportionately shrub and herbaceous grasslands – lands more suitable for grazing.

The Gila NF supports a vast variety of birds and other animals and is known for its hunting and wildlife viewing opportunities. The Gila NF is home to a number of endangered and threatened species, including the southwestern willow flycatcher, the Gila trout, the bald eagle, the Mexican spotted owl, the loach minnow, and the Spikedace. The Mexican gray wolf has been reintroduced into the areas surrounding the Gila NF, and its release in this area is very controversial.

The overgrowth of small diameter trees in the forest is endangering the health of the forest and creating conditions conducive to major fire disasters. The very great challenge is to restore the forest so that natural processes, including fire, will have a role in maintaining the health of the forest. While controlled burns may provide an answer, there are a number of promising projects around the Gila NF that involve harvesting small diameter trees to support wood products industries.

Users of the Gila National Forest

Recreation is a major use of the Gila NF. FS data indicate that over one million people visited the Gila NF in 1999-2000. Of these, almost 70 percent came for recreational activities such as hiking, picnicking, biking, and camping, while more than 30 percent came to go hunting or fishing or to view wildlife. Local visitors make up about 57 percent of the recreational visitors. OHV recreational use is increasing and can come into conflict with just about every other use, from traditional and cultural to grazing, ranching, and other recreational uses.

Grazing is a substantial commercial activity on the Gila NF and has a significant economic impact on surrounding rural communities. The data on farm receipts and income and on farm acreage attest to some problems in ranching. Ranchers face problems relating to the general drought conditions in the Southwest; they may face deteriorating market conditions and declining prices that threaten not only their short-term operations, but also the likelihood of their children being able to afford to take over their operations. In addition, the sustainable grazing practices mandated by the Rangeland Renewable Resources Act and the Multiple Use Sustained Yield Act and the protections of animal habitat and water quality required by the Endangered Species Act and the Clean Water Act have led to changes in FS management of the grazing program for the Gila and other national forests. For some allotments, these changes have meant lower limits on the number of animals that can be grazed; in some cases, ranchers have been required to move their herds and fence them in areas to prevent over-use and over-grazing. In other cases they have been forced to pipe in water, which requires additional investment and raises operating costs. The compounding of these circumstances can drive ranchers to the margin, with some deciding to quit entirely. Others may decide to sell off their rangelands, within or on the perimeter of the forest, taking advantage of the much higher prices paid for land used for residential development.

Timber has a long history of traditional uses in the Gila NF, and logging was once a very important activity. As noted above, there is growing interest in harvesting small diameter trees for wood products, and a number of public-private partnerships have formed. There are enterprises to take this input to market, but one of the problems in the Gila NF and elsewhere has been guaranteeing a long term supply of wood. Data from the Timber Information Manager database indicate that the most valuable forest product in the Gila NF in 2004 was fuel wood. Poles were a close second, while pinesaw timber was a distant third. In terms of special forest products, the major draw is Christmas trees.

Research for this report did not reveal any existing mining production or extractive activities occurring in the Gila today, but this does not rule out future mining activity. There are numerous mining claims on or near Inventoried Roadless Areas (IRAs) within the Gila NF.

Special use permits in the Gila NF have been granted most commonly for recreational and transportation uses. Among recreational uses permitted, the vast majority went for outfitters and guides.

In terms of illegal uses, the most common offense related to sanitation, typically leaving refuse, debris, or litter exposed. Other common violations relate to cutting or otherwise damaging timber or other forest trees, damaging a natural feature or other property of the U.S., or leaving a fire without completely extinguishing it.

Special Places

The Gila NF features 162 designated recreational sites. In addition to the developed recreation sites and dispersed recreation activities that take place on lakes and within the forest, there are a number of undeveloped sites of interest to recreational users. Major examples are the many hot springs and pools within the Gila NF.

Major attractions in the forest include the Gila Cliff Dwellings National Monument, the structures which comprise Fort Bayard in the Fort Bayard Historic District within the Silver City Ranger District (RD), the old mining town of Mogollon along Bursum Road in the Glenwood RD, and the mill ruins and catwalk up Whitewater Canyon, now part of the Catwalk National Recreation Area, also in the Glenwood RD. The Gila NF also has more than 6,700 sites of archeological or historical interest. These include everything from rock art and the ruins of pre-historic villages to Civilian Conservation Core (CCC) camps and lookouts. The forest has a list of Priority Heritage Assets that lists over 500 of these sites. The Gila NF also contains a number of properties that are listed on the National Register of Historic Places. In addition to these priority assets are historic and prehistoric structures and a great number of archeological sites. Finally, there are collections, such as historical archives and artifacts.

In addition to formally designated areas, some areas are considered “special places,” especially to Native American communities. Where known, the identity and other information about these areas are kept secret out of respect for the privacy of tribal activities and uses. The fact that the locations of many of these sites are unknown complicates FS management of the Gila NF resources for multiple-use.

The Gila NF includes three wilderness areas, the Gila, Aldo Leopold, and Blue Range Wildernesses, and these make up about 24 percent of the total acreage of the Gila NF. Aside

from these areas, there are 685 thousand acres (20 percent of the total) that are IRAs on which there cannot be road construction or reconstruction under the Bush alternative to Clinton's Roadless Rule and 49,000 acres of IRAs on which roads can be built or rebuilt.

Economic Impact of the Gila National Forest

The principal economic activities on the Gila NF include ranching, timber harvesting, recreation and wildlife visits, and FS operations. The direct impacts indicate that visitor spending is by far the largest contributor to the economic activity in the assessment area, providing \$111 million in output and 2,122 jobs. FS operations account for a substantial number of jobs as well, and ranching operations on FS land produce \$11.6 million of output with an estimated 161 employees. The direct activities associated with the Gila NF create indirect and induced impacts, as businesses and workers make expenditures and purchases and these funds cycle through the local economy. In total, the Gila NF contributes directly or indirectly an estimated 3,376 jobs and \$63.9 million in income to the economies of the four counties included in this study. This is equivalent to about 17.5 percent of the 19,245 jobs in these areas in 2002. Visitor spending is by far the largest source of activity, contributing a total of 75 percent of the jobs and 80 percent of the labor income impacts. Ranching also contributes significantly, while the impacts of timber harvesting are negligible.

There are a number of special, high income activities that may not be satisfactorily captured in the above data. Those outfitters and guides that are located within the assessment area represent a significant amount of economic activity. For hunting outfitters, standard prices seem to range from \$600 to \$700 per day, often with a multiple day minimum. Customers of these companies are almost exclusively from outside the local region, so they represent an important flow of money into the assessment area. Another activity that may not be accurately counted in the data is the impact of wildfire suppression spending. The Bureau of Business and Economic Research estimates the additional economic activity generated by this spending to be \$3 million in output, 18 jobs, and \$459,000 of labor income.

Community Partnerships

The Gila NF has an extensive history of working with local communities on various projects ranging from economic development to forest health and sustainability. Partnerships are an indispensable method of managing operations, conducting business, and achieving goals that could not be met by the FS alone. One way the forest has been teaming up with community groups is through the Collaborative Forest Restoration Program (CFRP). The Community Forest Restoration Act of 2000 provides cost-share grants – up to \$5 million annually – to stakeholders for forest restoration projects on public land that are designed through a collaborative process. Projects must address specific issues such as wildfire threat reduction, ecosystem restoration, preservation of old and large trees, and utilization of small diameter wood products. CFRP projects in the Gila NF in 2005 included a biomass utilization project, a tree thinning project in the Little Walnut Picnic Area, and a project to hand over a small diameter wood operation to Lower Frisco Wood Products in Catron County.

According to data collected from the FS, the Gila NF benefited from 26,531 hours of work from 350 volunteers in 2005. The FS estimates the appraised value of these hours at over \$289,000 in

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2005, after accounting for the skill-level of volunteers and appraising on the government pay grade scale. The Gila NF benefits the most from volunteer efforts related to recreational activities and facilities (campground and trail maintenance), where volunteers provided more than \$234,000 worth of time and about 12 person-years worth of work. The amount and value of the time donated is quite large, particularly when one considers that only about 54,000 people lived in the four-county assessment area in 2000. This level of effort is testament to the value of the forest to local residents.

1 Introduction

1.1 Statement of Purpose

This report provides a socioeconomic assessment of the Gila National Forest (NF) and the surrounding counties and communities that comprise the assessment area. The report explores relationships and linkages between Forest Service-managed land, visitors, and surrounding communities. Specifically, this report contains information and analysis intended to help the Forest Service (FS) and the public do the following:

- Document and assess current contributions of the Gila NF to the socioeconomic and cultural vitality of the communities neighboring the public land;
- Identify opportunities and strategies to address land use conflicts brought about by growing multiple use concerns;
- Compile in one place information and analysis helpful in developing a forest management and planning framework.

1.2 Sources of Information and Analytical Methods

Information in this assessment is largely drawn from secondary data sources. Secondary data are often collected for different purposes, but may still be very useful in other inquiries or studies. Specifically, data for this report come from:

- Demographic and economic data sets, including those available from the United States Census Bureau and the Bureau of Economic Analysis;
- Administrative, land management, and resource data, mostly provided by the FS and the Bureau of Land Management; and
- Contextual and historical information obtained from archival sources, such as newspapers, internet sites, and trade journals.

1.3 Assessment Area and Level of Analysis

The Gila NF has 3.3 million acres of publicly-owned forest and range land and is the sixth largest national forest in the continental United States. The Gila NF is comprised of six ranger districts (Black Range, Glenwood, Quemado, Reserve, Silver City, and Wilderness) and includes three wilderness areas: the Aldo Leopold Wilderness (about 200,000 acres), the Gila Wilderness (about 560,000 acres), and portions of the Blue Range Wilderness (about 29,000 acres). The Gila Cliff Dwellings National Monument, which is jointly managed by the National Park Service and the FS under a memorandum of understanding, lies within the Wilderness Ranger District (RD).

The forest spans four counties in the southwestern quadrant of New Mexico – Catron to the north, Grant to the south, a piece of Hidalgo to the southwest, and Sierra to the east. These four counties comprise the assessment area for this report. **Figure 1.1** provides a map of the Gila NF and vicinity, showing county boundaries, urban areas, and Native American lands.

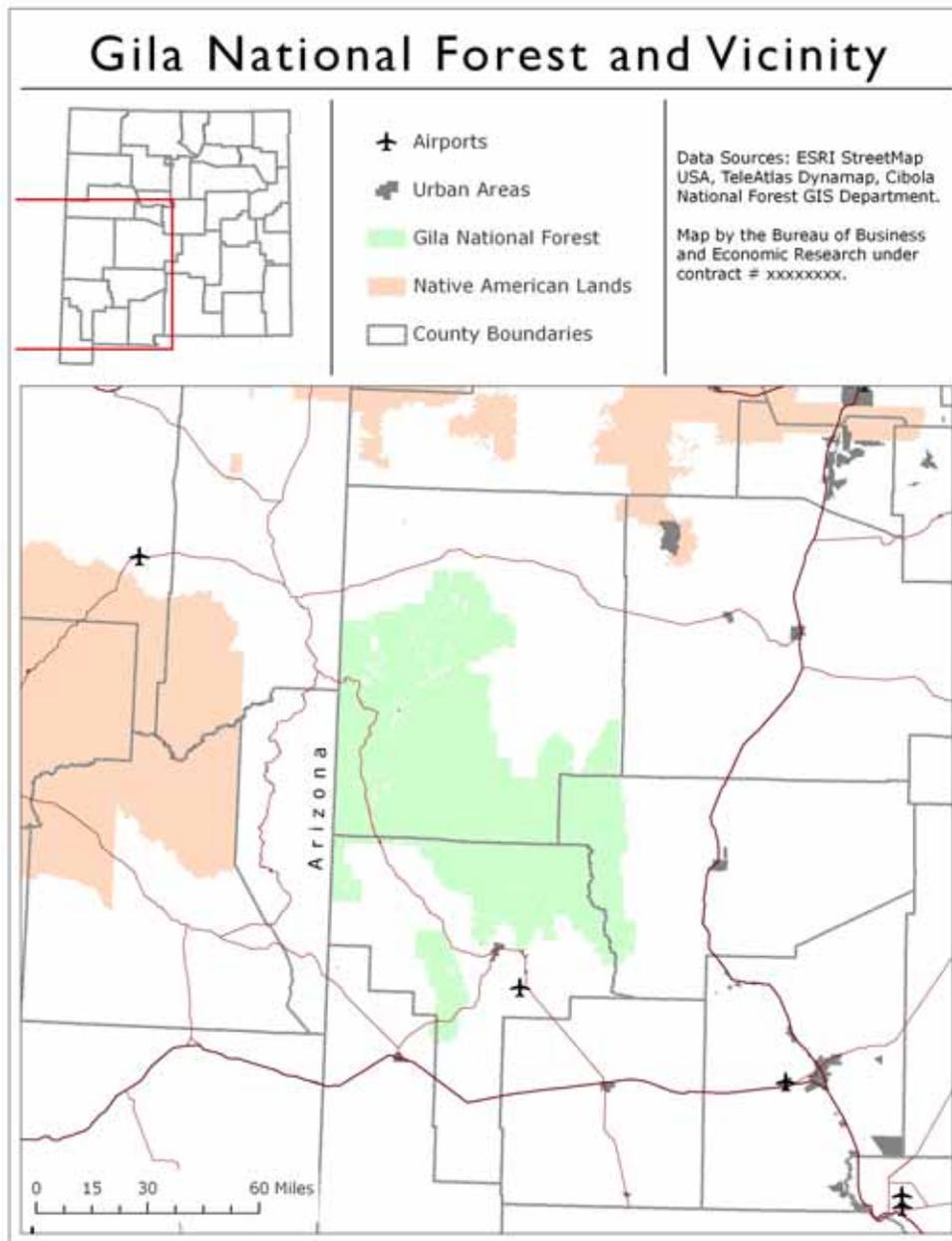


Figure 1.1: Gila NF Assessment Area

Although they vary in their socioeconomic characteristics, all the counties in the four-county assessment area are rural counties. The largest incorporated areas within the assessment area are Silver City (10,545 in 2000) in Grant County, Truth or Consequences (7,289) in Sierra County, Lordsburg (3,379) in Hidalgo County, and Bayard (2,534) and Hurley (1,464), both in Grant County. The one incorporated area in Catron County is Reserve, with a population of only 387 in 2000. Cities within 150 miles of the Gila NF include Las Cruces (74,267) and Deming (14,116) to the south in Dona Ana and Luna Counties, respectively, and Socorro (8,877) to the northeast in Socorro County.

Unlike the forests in the northern part of the state, there are no land grant communities adjacent to the Gila NF. While the Gila NF is the ancestral home of aboriginal groups (the Mimbrenos, the Mogollon) and of the Warm Springs Apache, the Gila does not share boundaries with any present-day occupied Native American tribal lands or reservations. The closest Native American lands are the White Mountain Apache and San Carlos Apache reservations to the west in Arizona, the Zuni Pueblo and the Ramah Navajo reservation, which lie further to the north, and the Acoma and Laguna Pueblos and the Alamo Navajo reservation, which lie to the northeast. While not adjacent to the forest, the Acoma Pueblos and the Ramah and Alamo Navajo all have historical ties to the Gila. They continue to use areas of the Gila NF and have ongoing concerns in regards to culturally significant places and the disposition of various sites.

Much of the data used for this report is available only on a county level. Thus, county boundaries define the parameters of much of the data and determine the assessment area – the area includes only New Mexico counties that are contained or touched by the six ranger districts of the Gila NF. The four New Mexico counties that comprise the assessment area total 11.9 million acres, or 18,606 square miles. **Table 1.2** lists the counties in the assessment area and shows the total Gila NF acres in the county, the amount of FS-managed land in each county, and the amount of land within the exterior boundaries of the Gila NF that is owned by other entities, referred to as “other owned” or “privately owned” in FS literature.¹ The last two columns provide data on the total acres in the county and the percent of these acres covered by the Gila NF.

Table 1.1: Gila NF Land by County (Acres)

	Total Gila NF Acres in County	Forest Service Managed Acres	Acres Under Other Ownership	Total Acres in County	Gila NF as a % of Total County Acres
Catron	2,127,869	2,036,793	91,076	4,442,089	47.9%
Grant	889,056	865,470	23,586	2,543,508	35.0%
Hidalgo	7,652	7,600	52	2,210,454	0.3%
Sierra	365,618	359,439	6,179	2,711,922	13.5%
All Counties	3,390,195	3,269,302	120,893	11,907,973	7.9%

Sources: Gila National Forest GIS Department and ESRI Arc GIS Street Map USA 2004

Calculations: Done by UNM-BBER.

The biggest portion of Gila NF-managed land (2.1 million acres) is in Catron County, where the Gila NF accounts for almost half of the total land area. The Gila NF comprises 35 percent of the land in Grant County and 13.5 percent of the land in Sierra County. FS lands account for less than 1 percent of the land in Hidalgo County.

1.4 Gila National Forest Ranger Districts

Unlike some national forests in New Mexico, almost all of the Gila NF is contained in one contiguous area. There is only one piece of the forest in the Silver City RD that is separate, but it

¹ USDA FS, “Land Areas Report Definition of Terms,” http://www.fs.fed.us/land/staff/lar/definitions_of_terms.htm.

is proximate - the Burro Mountain Region near Silver City. **Figure 1.2** depicts the geographical boundaries for the six ranger districts that make up the Gila NF.

Where it is possible and appropriate, information in this report is presented on a ranger district-level. However, it was often difficult, if not impossible, to reduce the level of analysis lower than the county level. Furthermore, some of the data provided by the FS is at the forest level, meaning data were reported at the aggregate level of the entire NF, and often could not be broken out by RD.

The following sections describe each of the RDs, including a discussion of historical land uses, using information from the Gila NF website and a variety of other sources.²

1.4.1 Black Range Ranger District

The Black Range RD, in the eastern-most portion of the Gila NF, covers 552,615 acres within parts of Catron and Sierra counties, and borders Grant County on the west. The Black Range Mountains are the dominant feature, with elevations ranging from 4,200 feet to just under 10,000 feet. A large portion of the Aldo Leopold Wilderness lies within the Black Range RD, as does a small portion of the Gila Wilderness. The Black Range RD encompasses a diversity of habitats, from desert and arid grasslands to Piñon and juniper woodlands and ponderosa pine. Higher up in the mountains above 9,000 feet is mixed conifer forest of spruce and fir.

Precipitation varies from 12 inches in the southern woodlands to over 20 inches in the higher elevations.³ The Continental Divide runs north-south through the northern part of the ranger district.

² USDA FS, "Gila National Forest," <http://www2.srs.fs.fed.us/r3/gila>.

³ USDA FS: Gila National Forest, "Black Range Ranger District," <http://www2.srs.fs.fed.us/r3/gila/about/distmain.asp?district=black>.

Gila National Forest Ranger Districts

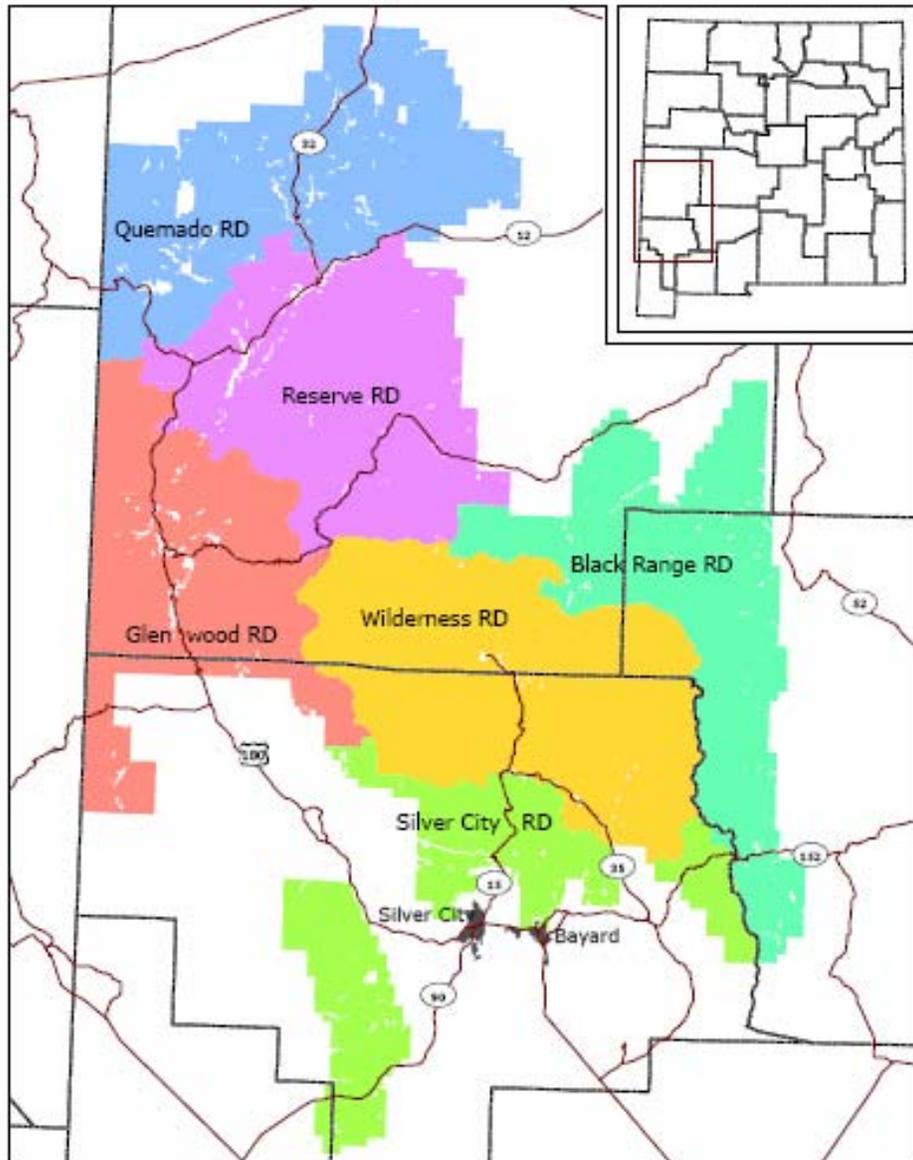


Figure 1.2: Gila NF Ranger Districts

State Highway 152 bisects the Black Range RD in the south, taking travelers through the historic town of Hillsboro (32 miles southwest of Truth or Consequences in Sierra County), which was founded in 1877 when gold was discovered at the nearby Opportunity and Ready Pay mines. Only a few hundred people live in Hillsboro today, but the town annually hosts an apple festival and has various tourist amenities in addition to its 120 year-old general store and the Black Range Museum.⁴ Nine miles west of Hillsboro is the small community of Kingston. Once the largest

⁴ Michael Cook, "Hillsboro: New Mexico Ghost Town," <http://www.ghosttowns.com/states/nm/hillsboro.html>.

town in the territory with over 7,000 residents, Kingston was founded after the discovery of a rich lode of silver ore at the Solitaire Mine in 1882.⁵

North of Elephant Butte, State Highway 52 provides another tour of the remnants of the Gila NF area's past. Cuchillo was established by ranchers and farmers in the 1850s and flourished as a stage stop and trade center from the 1880s to the 1930s, as it was mid-way between the mines at Chloride and Winston and the railroad at Engle.⁶ Chloride was founded in 1879 after silver ore was discovered nearby. Despite problems with the Indian population, the town grew to 2,000 people, with 12 mines and nearly 500 prospector holes, including the Silver Monument, the U.S. Treasury, and the St. Cloud, which is still in operation. The silver panic of 1893 wiped out the town and only about 20 people live there today.⁷ Winston was settled by miners from nearby Chloride in 1881. By 1884, it had 3,100 people, but it also declined as silver prices fell and only a few people live there today.⁸ Monticello was settled by ranchers and farmers in 1856. Once the headquarters for the Southern Apache Agency, Monticello was home to 500 Apaches in 1870. Placita was founded by the Sedillo family in the 1840s.⁹

1.4.2 Glenwood Ranger District

The Glenwood RD encompasses more than 523,000 acres on the west side of the Gila NF. The Glenwood RD includes the Blue Range Wilderness and the western portion of the Gila Wilderness and offers hikers more than 322 miles of varied trails.¹⁰

The Glenwood RD has many attractions, including the Catwalk National Recreation Area, which includes the Catwalk Trail in Whitewater Canyon. In 1893, a mill was built to serve the water needs of the town of Graham, which was located at the mouth of the canyon. Remains of the mill can still be seen today near the picnic area. Building the accompanying water pipeline was an engineering challenge, as the canyon is very narrow: the pipeline sometimes hung as much as 20 feet above the canyon bottom. Maintaining the pipeline was another challenge and "the workmen who walked the line to repair damage dubbed it the 'Catwalk'." The Catwalk Trail came into existence in the 1930s, when the Civilian Conservation Corps built a suspended walkway where the pipeline had been. In 1961, the FS rebuilt the trail, which was designated a National Recreation Trail in 1978. Today, the Catwalk Trail and picnic area are very popular visitor destinations in the Gila NF.¹¹

Other attractions include the Aldo Leopold Vista, Mogollon Historic Area, and Pueblo Park Campground. Bursum Road (NM 159), a primitive scenic byway, leads not only to varied recreational opportunities but also provides access to the historic mining town of Mogollon. The first log cabin was built in Mogollon and mines were developed in Silver Creek by 1889. Although the town was almost destroyed several times, the mines, including the newer additions of Little Fanny, Champion, McKinley, Pacific, and Deadwood, "extracted approximately one and a half million dollars of gold and silver in 1913, or about 40 per cent of New Mexico's precious

⁵ Percha Bank Museum, "A Brief History of Kingston, NM," <http://www.perchabank.com/history.html>.

⁶ Michael Cook, "Cuchillo: New Mexico Ghost Town," <http://www.ghosttowns.com/states/nm/cuchillo.html>.

⁷ Ibid.

⁸ Michael Cook, "Winston: New Mexico Ghost Town," <http://www.ghosttowns.com/states/nm/winston.html>.

⁹ Michael Cook, "Monticello or Placita: New Mexico Ghost Town,"

<http://www.ghosttowns.com/states/nm/monticello.html>.

¹⁰ USDA FS, "Glenwood Ranger District," <http://www2.srs.fs.fed.us/r3/gila/about/distmain.asp?district=glenwood>.

¹¹ National Recreation Trails, "Catwalk Trail, Gila National Forest, New Mexico, National Recreation Trails," <http://www.americantrails.org/nationalrecreationtrails/trailNRT/Catwalk-NM.html>.

metals for that year.”¹² The community expanded to a population of fifteen hundred by 1915. During World War I, the demand for gold and silver dropped and many of Mogollon's mines shut down. A spike in the price of gold in 1934 saw a temporary rejuvenation, but by 1950 the Little Fanny was the only mine in operation.¹³

1.4.3 Quemado Ranger District

The Quemado RD is the northern-most district and the second largest district (600,600 acres) within the Gila NF. It also contains the largest amount of private land within the exterior boundaries of the Gila NF. The elevation of the Quemado RD varies from 6,600 feet to 9,700 feet. Vegetation and land cover consist of grassland in the lowlands, piñon-juniper woodland and ponderosa pine in the mid-range elevations, and mixed conifer with aspen and fir in the upper elevations. Cottonwood and willow are found in the riparian areas. Historically, logging and grazing were the primary industries in the Quemado RD, but since the mid-1990s, logging has died out.¹⁴

Recreational opportunities in the Quemado RD include “fishing, boating, camping, horseback riding, rock hounding, hiking, recreational vehicle use, hunting, and wildlife viewing.”¹⁵ Unique areas within the RD for recreating include the Quemado Lake Recreation Area in the northern part of the RD, portions of the Continental Divide National Scenic Trail in the eastern part of the district, the San Francisco Warm Springs in the western part of the district, and NM State Highway 32 between Quemado and Apache Creek.¹⁶

The area encompassed by the Quemado RD is rich in wildlife – elk, pronghorn antelope, and coyote are common, black bear and mule deer less so, and there are mountain lion. The Quemado Lake area is excellent for bird watching, with different varieties of water fowl and other birds taking advantage of the range of vegetation and the water supply.¹⁷

1.4.4 Wilderness Ranger District

The Wilderness RD is the largest district within the Gila NF, covering 900,000 acres. The Wilderness RD is the heart of the Gila and contains two designated wilderness areas, the Gila and the Aldo Leopold. The terrain of the Wilderness RD is varied and rugged. It is characterized by “deep canyons, flat mesas, large river channels and flood plains.”¹⁸ Vegetation and land cover vary by elevation. The lower elevations are comprised of semi-desert landcover and grasslands. Pine, spruce, and mixed conifers make up the landcover for the higher elevations, and ponderosa pine is extensive. Large areas of the Wilderness RD are also made up of piñon-juniper-oak woodlands.¹⁹

In addition to the two wilderness areas, the Wilderness RD offers visitors multiple recreation opportunities. The district manages the Gila Cliff Dwellings National Monument and associated

¹² James E. Sherman and Barbara H. Sherman, *Ghost Towns and Mining Camps of New Mexico* (Norman: University of Oklahoma Press), 155.

¹³ Ibid.

¹⁴ USDA FS, “Quemado Ranger District,” <http://www2.srs.fs.fed.us/r3/gila/about/distmain.asp?district=quemado>.

¹⁵ Ibid.

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ USDA FS, “Wilderness Ranger District,” <http://www2.srs.fs.fed.us/r3/gila/about/distmain.asp?district=wilderness>.

¹⁹ Ibid.

visitors center and the Lake Roberts Recreation Area with developed campgrounds and fishing opportunities.²⁰ The Wilderness RD and the Mimbres Valley are the ancient home of the Mogollon and the Mimbres people, whose civilization reached its peak sometime after 1000.²¹ The legacy of these pre-historic peoples consists of the remnants of their dwellings – the cliff houses that have become the favored attraction at the National Monument and the impressive but unexcavated TJ Ruin – and the examples of Mimbres pottery that have been found: some 10,000 bowls, by custom buried with the dead.²²

1.4.5 Reserve Ranger District

The Reserve RD website provides this description of the RD:

The Reserve Ranger District is one of the largest Districts in the northern portion of the Gila National Forest. Grass plains, chaparral, woodland, pine and mixed conifer habitats are found within the District's 573,537 acres that make up the District. Elevations . . . range from 5300 feet to 9786 feet. There are four developed campgrounds located in the District [and] 155 miles of trail including 55 miles on the Continental Divide. The District's southern border is the Gila Wilderness, providing several backcountry hiking opportunities. A large portion of the District is relatively untouched, providing the abundance of big game, small game, and fishing, making the area a 'hunter's paradise', known worldwide.²³

There are extensive grazing allotments on the Reserve RD. The timber industry went into decline around 1990, although there are currently efforts to revive the industry by harvesting and utilizing the small diameter trees that choke the forest and present a major fire hazard. A sawmill has recently been opened in Reserve. (See discussion in Chapter 8.)

1.4.6 Silver City Ranger District

The Silver City RD is the southern-most of the districts within the Gila NF and is comprised of three areas: the area adjacent to Silver City, the portion west of Emory Pass in the Black Range, and the separate Burro Mountain region to the southwest of Silver City. These areas, which are not contiguous, combine to form 402,972 acres and support a diversity of uses including recreation, scientific research, mining, grazing, and timber harvesting.²⁴

There are a multitude of recreation opportunities in the Silver City RD, including numerous developed and undeveloped campgrounds, picnic areas, and many miles of trails varying in length and difficulty to accommodate hikers, backpackers, mountain bikers, and horseback riders. Several recreation sites make this district unique: Little Walnut, Fort Bayard, which includes a

²⁰ Ibid.

²¹ Robert L. Cox, "The Mogollon Mimbres Culture," <http://www.mimbres.com/>.

²² J.E. Bradford and P.J. McKenna, "TJ Ruin, Gila Cliff Dwellings National Monument," National Park Service Southwest Cultural Resources Center Professional Papers No 21 (1989). According to McKenna & Bradford of the National Park Service, "the addition of the TJ unit, expanded [the Monument] to include all major architectural representations of the Mimbres Mogollon, including cave habitations, a large multi-component open site, pit house villages, and smaller limited activity sites." <http://www.mimbres.com/tjruin.htm>.

²³ USDA FS, "Reserve Ranger District," <http://www2.srs.fs.fed.us/r3/gila/about/distmain.asp?district=reserve>.

²⁴ USDA FS, "Silver City Ranger District," <http://www2.srs.fs.fed.us/r3/gila/about/distmain.asp?district=silver>.

wildlife refuge, and the Gila River Bird Area. The Trail of the Mountain Spirits Scenic Byway also travels through part of the Silver City RD.²⁵

The Silver City area has a long tradition of mining – gold, silver, and more recently, copper. Silver City derives its name and its fame as a mining town from a silver out-cropping that launched the local mining industry after 1870. Pinos Altos allegedly owes its fortunes as a gold mining town to three frustrated 49-ers who stopped to take a drink in Bear Creek and discovered gold. Santa Rita’s mining history goes back to the Mimbreno Indians (1100-1300), who collected low grade turquoise and chrysocolla and the Apache who later lived in the area and collected copper to be used for ceremonial and trade purposes. Mining of copper began in 1799. Today, the Phelps Dodge Santa Rita Chino Mine is an open pit mine almost 1,500 feet deep and 1-1/2 miles across that employs about 600 people.²⁶

The Red Paint or Warm Springs Apache consider the Gila their ancestral home. They were living in the area when gold and silver were discovered. Conflict over land and resources was perhaps inevitable as the Apache, headed by Mangas Coloradas, Victorio, and later Geronimo, tried to defend their lands and hunting areas from the encroachment of the mines and the boomtowns that often sprung up around them. Fort Bayard was established as an encampment in 1866 by Company B of the 125th U.S. Colored Infantry under the command of Lieutenant James Kerr, and was critical to the sustained campaign fought against the Apache.²⁷

1.5 Organization of the Report

The organization of this assessment is based on the collection and analysis of data pertinent to each of the assessment topics. Chapter 2 provides information on demographic trends and economic characteristics of the counties within the assessment area. Chapter 3 discusses access and travel patterns within the area. Chapter 4 examines the forest’s land cover and ownership, as well as forest health. Chapter 5 explores the different uses of the Gila NF and the policies impacting these different uses. Chapter 6 looks at specially designated areas in the forest, including recreational sites and heritage resources. Chapter 7 provides an assessment of the economic impacts the Gila NF has on surrounding communities. Chapter 8 discusses the relationships between the Gila NF and various communities at the local and regional levels and discusses partnerships on specific projects. Finally, Chapter 9 identifies key issues facing the FS lands and their management.

²⁵ Ibid.

²⁶ Silver City - Grant County Chamber of Commerce. “A History of the Santa Rita Mine” [Brochure] <http://www.silvercity.org/Reprints/mining>.

²⁷ Jeannette Geise, “A Brief History of Fort Bayard,” <http://www.southernnewmexico.com/Articles/Southwest/Grant/AbriefhistoryofFortBayard.html>.

2 Demographic Patterns and Trends

This chapter looks at the changing demographic characteristics of those living in the Gila National Forest (NF) assessment area. Data are generally presented at the county level, although population counts are provided for Census Designated Places and incorporated municipalities.²⁸

2.1 Population Density and Growth

Population density per square mile for the U.S. averaged 79.6 persons in 2000; that for New Mexico was 15.0 persons. By contrast, as shown in **Table 2.1**, population is relatively sparse in the assessment area counties. Catron County, which is largely covered by the Gila NF, has a population density of only 0.5 persons per square mile.

Table 2.1: 2000 Population Density (sq. mile)

Population Density	
Catron	0.5
Grant	7.8
Hidalgo	1.7
Sierra	3.2

Source: US Census Bureau, 2000 Decennial Census.

Note: Population Density calculated as per square mile of land area.

As indicated in **Table 2.2**, by 2000, the assessment area counties had a population of nearly 54,000. Between 1980 and 2000, the population in the assessment area counties increased modestly by 10,300, or 24 percent, versus the 40 percent growth experienced by the state. Population growth in the four Gila NF counties was only 6 percent during the 1980s, when both Catron (-6 percent) and Hidalgo (-2 percent) experienced population declines. By contrast, the population in Sierra County grew by 17 percent between 1980 and 1990. With the exception of Hidalgo County, where population was flat, population grew in the assessment area counties during the 1990s, but growth over the decade (17 percent) still lagged behind the state's 20 percent. Catron County, with a 38 percent population gain over the decade, and Sierra, with a 34 percent increase, considerably outpaced the state as a whole, while Grant County logged in at 12 percent, well below the state but twice that county's rate of growth during the 1980s.

²⁸ According to the Census Bureau website Question and Answer Center, "A Census Designated Place (CDP) is a geographic entity that serves as the statistical counterpart of an incorporated place for the purpose of presenting census data for an area with a concentration of population, housing, and commercial structures that is identifiable by name, but is not within an incorporated place. CDPs usually are delineated cooperatively with state, Puerto Rico, Island Area, local, and tribal officials based on U.S. Census Bureau guidelines. For Census 2000, for the first time, CDPs did not need to meet a minimum population threshold to qualify for the tabulation of census data." www.census.gov/

Table 2.2: Historical & Projected County Population, 1980-2030

	Historical			Projected		
	1980	1990	2000	2010	2020	2030
Catron	2,720	2,563	3,543	4,063	4,459	4,752
Grant	26,204	27,676	31,002	33,769	35,886	37,657
Hidalgo	6,049	5,958	5,932	5,799	5,624	5,378
Sierra	8,454	9,912	13,270	16,723	19,857	22,672
TOTAL GILA COUNTIES	43,427	46,109	53,747	60,354	65,826	70,459
TOTAL NM	1,303,303	1,515,069	1,819,046	2,112,986	2,383,116	2,626,553

	Percent Change				
	1980-1990	1990-2000	2000-2010	2010-2020	2020-2030
Catron	-6%	38%	15%	10%	7%
Grant	6%	12%	9%	6%	5%
Hidalgo	-2%	0%	-2%	-3%	-4%
Sierra	17%	34%	26%	19%	14%
TOTAL GILA COUNTIES	6%	17%	12%	9%	7%
TOTAL NM	16%	20%	16%	13%	10%

Source: US Census Bureau, Decennial Census, 1980, 1990, 2000. UNM BBER projections, 2003. Calculations done by UNM BBER.

Grant County comprised almost two-thirds of the population in the area in 2000, after adding about 5,000 in population during the twenty-year period. Fast-growing Sierra County gained nearly the same number of new residents, many of them retirees attracted to Truth or Consequences or other communities near Elephant Butte. Catron County had a population of over 3,500 in 2000, after a decade of in-migration of people attracted by the county's scenic beauty and recreational opportunities.

A projected 70,000 residents will live in the assessment area by 2030, with the population increasing by 17,000, or 31 percent, between 2000 and 2030. Sierra County stands to gain the most in population between 2000 and 2010 – 26 percent growth is projected – while Catron and Grant Counties are expected to grow by a more modest 15 and 9 percent, respectively, and Hidalgo County is projected to lose 2 percent of its population in the same time period. Hidalgo County's population is projected to continue to decline in the following two decades, as well.²⁹ As is projected for the state as a whole, population growth in the assessment area counties should decelerate after 2010.

Table 2.3 displays the population for eleven incorporated municipalities and those unincorporated communities that meet the criteria to be Census Designated Places that reside in the Gila NF. Silver City, the largest community in the assessment area, has been faced with a decline in the copper mining industry, precipitated at least in part by a sharp drop in the price of

²⁹ U.S. Census Bureau. America Fact Finder, www.census.gov. There are developments across the Arizona border (e.g., the new Phelps Dodge copper mine in Morenci) that could provide job opportunities for Hidalgo and Grant County residents.

copper. The industry provided jobs in Grant and Hidalgo Counties, but also supported a large portion of the tax base in the area. Notice, too, that other mining towns in Grant County (Bayard and Hurley) declined during 1980-2000. Truth or Consequences, in growing Sierra County, saw population growth between 1980 and 2000 that matched the state's 40 percent growth rate. Lordsburg in Hidalgo County lost population in the 1980s but recovered and had gains in the 1990s. During the 1980s, Reserve in Catron County lost residents, as logging and sawmill activity declined. Taken together, these eleven places accounted for 55 percent of the total population in the assessment area in 2000.

Table 2.3: Population In Places, 1980-2000

Gila Places	County	Number			Percent Change	
		1980	1990	2000	1980-1990	1990-2000
Bayard city	Grant	3,036	2,598	2,534	-14	-2
Central village	Grant	1,968	1,835	NA	-7	NA
Elephant Butte city	Sierra	NA	NA	1,390	NA	NA
Hurley town	Grant	1,616	1,534	1,464	-5	-5
Lordsburg city	Hidalgo	3,195	2,951	3,379	-8	15
Reserve village	Catron	439	319	387	-27	21
Santa Clara village	Grant	NA	NA	1,944	NA	NA
Silver City town	Grant	9,887	10,683	10,545	8	-1
Truth or Consequences city	Sierra	5,219	6,221	7,289	19	17
Virден village	Hidalgo	246	108	143	-56	32
Williamsburg village	Sierra	433	456	527	5	16
TOTAL GILA PLACES		26,039	26,705	29,602	3	11

Source: US Census Bureau, Decennial Census, 1980, 1990, 2000. Calculations done by UNM - BBER.

2.2 Racial/Ethnic Composition

In 2000, New Mexico became a majority-minority state, with a total minority population exceeding that of the white non-Hispanic population. **Table 2.4** shows that all racial groups increased their numbers in the assessment area between 1990 and 2000. Non-Hispanics increased their numbers in all counties except for Hidalgo County, while the number of Hispanics increased in all counties except for Catron County. In terms of race, in Grant County there was a decline in those self-identifying as white alone and a large increase in the number of persons identified as "Other". While not shown in the table, the white Hispanic population fell by more than 4,000 people, while Hispanics in the "other" race category increased by almost 4,000.

Table 2.4: Race / Ethnicity by County, 1990 and 2000

	Ethnicity		Race					Total
	Non-Hispanic	Hispanic	White	African American	American Indian	Asian Pacific Islander	Other	
Year 1990								
Catron	1,835	728	2,508	7	21	2	25	2,563
Grant	13,615	14,061	25,745	137	229	69	1,496	27,676
Hidalgo	2,974	2,984	5,457	11	20	37	433	5,958
Sierra	7,533	2,379	9,254	39	77	12	530	9,912
Total Gila Counties	25,957	20,152	42,964	194	347	120	2,484	46,109
Year 2000								
Catron	2,864	679	3,109	10	78	26	320	3,543
Grant	15,876	15,126	23,459	162	419	99	6,863	31,002
Hidalgo	2,608	3,324	4,970	24	46	19	873	5,932
Sierra	9,782	3,488	11,541	64	197	34	1,434	13,270
Total Gila Counties	31,130	22,617	43,079	260	740	178	9,490	53,747

Source: US Census Bureau, Decennial Census, 1990 and 2000. Calculations done by UNM - BBER.

Note: Ethnicity can be of any race. The "Other" group includes two or more races.

Table 2.5 presents the percentages of the racial-ethnic groups represented in each county in the assessment area. From 1990 to 2000, while Hispanics increased their share of the total New Mexico population from 38 to 42 percent, their share of the total assessment area population fell from 44 to 42 percent. Those self-identified in terms of race as “white alone” fell from 93 percent to 80 percent of the assessment area population, with negligible changes for specific racial groups except those classified as “other” race. This latter group, which includes those who self-identify with more than one racial group, increased their share of the total population from 5 percent to 18 percent.

Table 2.5: Race / Ethnicity by County, Percentage, 1990 and 2000

	Ethnicity		Race					Total
	Non-Hispanic	Hispanic	White	African American	American Indian	Asian Pacific Islander	Other	
Year 1990								
Catron	72%	28%	98%	0%	1%	0%	1%	100%
Grant	49%	51%	93%	0%	1%	0%	5%	100%
Hidalgo	50%	50%	92%	0%	0%	1%	7%	100%
Sierra	76%	24%	93%	0%	1%	0%	5%	100%
Total Gila Counties	56%	44%	93%	0%	1%	0%	5%	100%
New Mexico	62%	38%	76%	2%	9%	1%	13%	100%
Year 2000								
Catron	81%	19%	88%	0%	2%	1%	9%	100%
Grant	51%	49%	76%	1%	1%	0%	22%	100%
Hidalgo	44%	56%	84%	0%	1%	0%	15%	100%
Sierra	74%	26%	87%	0%	1%	0%	11%	100%
Total Gila Counties	58%	42%	80%	0%	1%	0%	18%	100%
New Mexico	58%	42%	67%	2%	10%	1%	21%	100%

Source: US Census Bureau, Decennial Census, 1990 and 2000. Calculations done by UNM - BBER.

Note: Ethnicity can be of any race. The "Other" group includes two or more races.

2.3 Age of Population

Table 2.6 presents the age of the population by county in the assessment area. Shown are the percentages of those within each cohort, as derived from the 1990 and 2000 censuses, followed by projections of the percentages of each age cohort in 10-year increments until 2030. Between 1990 and 2000, the population 14 and younger decreased as a share of the total population in each of the assessment area counties, while the share of the population 65 and older increased in every county except Sierra County, which already had a very large retirement population in 1990.

As a group, the assessment area counties have an older population. While the median age was 34.6 years in New Mexico in 2000, the median age in the assessment area counties was generally significantly higher: 47.8 years in Catron, 38.8 in Grant, and 48.9 in Sierra, with only Hidalgo, with a median age of 34.8, near the state median.³⁰ The well-established retirement community in Sierra County has been mentioned. Over the past decade or so, Catron County has experienced in-migration from those of retirement age. As can be seen in the table, in each of the counties, and in the overall assessment area, the population projections anticipate further aging of the population. This corresponds with the national trend of Americans becoming older.³¹

³⁰ U.S. Census Bureau, American Factfinder, Fact Sheets for 2000, http://factfinder.census.gov/servlet/ACSSAFFacts?_submenuId=factsheet_1&_sse=on.

³¹ United Nations Department of Economic and Social Affairs, Population Division, "Report: World Population Ageing: 1950-2050," <http://www.un.org/esa/population/publications/worldageing19502050/>; and Julie Meyer, "Age: 2000, Census 2000 Brief," *U.S. Department of Commerce, Economics and Statistics Administration, U.S. Census Bureau* (October 2001). <http://www.census.gov/prod/2001pubs/c2kbr01-12.pdf>.

Table 2.6: Age of Population by Broad Cohort and County

County	Age	Percent Distribution				
		Actual		Projections		
		1990	2000	2010	2020	2030
Catron	0 - 14	22.0	16.3	13.2	14.5	14.7
	15 - 64	62.6	64.9	57.8	48.9	46.3
	65 yrs. & over	15.4	18.8	29.0	36.6	39.1
Grant	0 - 14	25.4	21.3	20.6	20.0	18.5
	15 - 64	60.6	62.2	60.4	57.3	56.5
	65 yrs. & over	14.0	16.5	19.0	22.6	25.0
Hidalgo	0 - 14	27.3	25.7	22.1	21.5	21.1
	15 - 64	61.3	60.7	61.0	56.1	50.0
	65 yrs. & over	11.4	13.6	16.9	22.4	28.9
Sierra	0 - 14	16.7	16.4	12.7	13.0	12.5
	15 - 64	51.6	55.9	56.6	53.3	50.8
	65 yrs. & over	31.7	27.7	30.7	33.7	36.8
GILA NF COUNTIES	0 - 14	23.6	20.2	18.1	17.7	16.5
	15 - 64	58.9	60.7	59.2	55.4	53.5
	65 yrs. & over	17.5	19.1	22.7	26.9	30.0
NEW MEXICO	0 - 14	25.1	23.0	20.0	19.2	17.9
	15 - 64	64.2	65.3	66.1	62.6	59.7
	65 yrs. & over	10.7	11.7	13.9	18.2	22.4

Source: New Mexico County Population Projections: July 1, 2000 to July 1, 2030; UNM-BBER, April 2004.

The 15 to 64 age cohort encompasses those of working age. This cohort's share is projected to shrink in all of the assessment area counties, but the decline will be more rapid in Catron and Hidalgo counties. Catron and Hidalgo are small, rural counties with limited economic activity. Facing limited opportunities for employment, younger people migrate to larger communities, accelerating the aging of the population. As mentioned above, Catron County is also attracting in-migration and many of those attracted are older.

The 65 and older cohort will rise from 19 percent to 30 percent in the assessment area between 2000 and 2030. In Catron and Hidalgo Counties, this cohort's share will more than double. The in-migration of retirees, and particularly those who take up residence in the wildland-urban interface, will place new demands on the Forest Service (FS) as well as new constraints. (See discussion in Chapter 4.) The aging of the population in the assessment area counties may be expected to place new demands on the Gila NF, since the recreational uses and interests may change; on the other hand, retirees may have the leisure time to volunteer their services or to become involved in partnerships with the FS.³² Aging populations present new challenges for

³² The relationship between age and pursuit of outdoor recreational activities is generally found to be an inverse relationship, with younger people more active in their pursuit of outdoor recreational activities. However, the importance of age varies depending upon the type of activity. See H. Ken Cordell, Gary T. Green, and Carter J. Betz, "Recreation and the Environment as Cultural Dimensions in Contemporary American Society," *Leisure Sciences* 24, no. 1 (January 01, 2002): 13-41. See also John C. Bergstrom and H. Ken Cordell, "An Analysis of the Demand for and Value of Outdoor Recreation in the United States," *Journal of Leisure Research* 23, no. 1 (1991): 67-86.

governments, as those retiring from the workforce expect to receive services funded by revenues from a workforce that is shrinking as a percent of the total population.³³ These retirees will compete for federal and state funds as they seek services such as Medicaid and Social Security. The consequence for federal agencies like the FS may be increased competition for funding as revenue growth slows.

2.4 Income and Poverty

Table 2.7 depicts per capita income in 1999 dollars by county in the assessment area for 1989 and 1999. Real per capita income (Census Bureau income definition) increased in all the counties except Hidalgo between 1989 and 1999.³⁴ Real per capita income in the assessment area was \$14,421 in 1999, well below the New Mexico average of \$17,261. Real per capita income for the state grew by more than 18 percent over the decade and by just under 16 percent in the four assessment area counties. The sharp reductions in copper mining and smelting activities in Grant and Hidalgo Counties undoubtedly played a role in holding back income growth for the area.

Table 2.7 also shows the number and percent of persons living below the federal poverty level for each county. The poverty rate in the assessment area counties was the same as that statewide in 1989 – 20.6 percent. However, while the state poverty rate fell to 18.4 percent in 1999, there was little improvement overall in the assessment area, where the poverty rate averaged 20.2 percent. About 10,800 persons in the assessment area counties were below the official poverty level in 1999, up from about 9,500 persons in 1989. In all four of the counties with the exception of Grant County, the poverty rate was above the New Mexico average of 18.4 percent in 1999. Poverty rates declined in Catron and Grant Counties but increased in Sierra and Hidalgo Counties, with the poverty rate in the latter increasing nearly 7 percentage points.

³³ Wan He, Manisha Sengupta, Victoria A. Velkoff, and Kimberly A. DeBarros, “65+ in the United States 2005,” U.S. Census Bureau, Current Population Reports, *U.S. Government Printing Office* P23-209 (2005): 25, <http://www.census.gov/prod/2006pubs/p23-209.pdf>.

³⁴ The income figures reported in this chapter are self-reported income from the 1990 decennial census. Census income definitions differ from those used by the U.S. Bureau of Economic Analysis. The per capita figures are therefore not comparable to those reported in Chapter 7. The Census definition is closer to a “cash received” concept. According to the Census Bureau website (factfinder.census.gov), “Total income” is the sum of the amounts reported separately for wages, salary, commissions, bonuses, or tips; self-employment income from own nonfarm or farm businesses, including proprietorships and partnerships; interest, dividends, net rental income, royalty income, or income from estates and trusts; Social Security or Railroad Retirement income; Supplemental Security Income (SSI); any public assistance or welfare payments from the state or local welfare office; retirement, survivor, or disability pensions; and any other sources of income received regularly such as Veterans’ (VA) payments, unemployment compensation, child support, or alimony.

Table 2.7: Per Capita Income and Persons in Poverty, 1989 & 1999

	1989			1999		
	Per Capita Income	Persons Below Poverty Line	% of Persons Below Poverty Line	Per Capita Income	Persons Below Poverty Line	% of Persons Below Poverty Line
Catron	11,080	657	25.6%	13,951	860	24.3%
Grant	12,175	5,731	20.7%	14,597	5,676	18.3%
Hidalgo	13,098	1,212	20.3%	12,431	1,591	26.8%
Sierra	13,140	1,882	19.0%	15,023	2,706	20.4%
TOTAL GILA COUNTIES	12,441	9,482	20.6%	14,421	10,833	20.2%
TOTAL NM	14,596	305,934	20.6%	17,261	328,933	18.4%

Source: US Census Bureau, Decennial Census, 1990 and 2000. Calculations done by UNM - BBER.

Note: The poverty line is the federally established poverty level. Per capita income is in 1990 dollars.

The 1989 per capita income figures were adjusted for the effects of inflation using the Consumer Price Index (CPI-U-RS)

Poverty in the assessment area (20.2 percent) is high and generally tracks with race and ethnicity. **Table 2.8** indicates that poverty percentages by race in the assessment area are: white (19 percent), African American (19 percent), American Indian (31 percent), Asian (33 percent), and "other" (28 percent). White Non-Hispanics (not shown but at 16 percent) have the lowest poverty rate among those listed, except in Catron County, but their rate of poverty exceeds their counterparts across New Mexico, 14 percent of whom are in poverty. The overall poverty rate for Hispanics in the assessment area is 27 percent, which is also above the statewide average of 24 percent.

Table 2.8: Poverty by Race and Ethnicity, 2000

	Ethnicity		Racial Group				
	NON-HISPANIC	HISPANIC	WHITE	AFRICAN AMERICAN	AMERICAN INDIAN	ASIAN	OTHER
Catron	663	127	728	0	70	0	62
Grant	2,083	3,538	3,758	30	55	43	1,790
Hidalgo	343	1,233	1,213	0	15	5	358
Sierra	1,633	1,007	2,249	10	66	0	381
GILA NF COUNTIES	4,722	5,905	7,948	40	206	48	2,591
Percent of Total Group							
Catron	23%	20%	23%	0%	67%	0%	22%
Grant	13%	24%	16%	19%	17%	39%	26%
Hidalgo	13%	37%	25%	0%	42%	100%	42%
Sierra	17%	30%	20%	32%	35%	0%	27%
GILA NF COUNTIES	15%	27%	19%	19%	31%	33%	28%
NEW MEXICO	15%	24%	14%	23%	36%	14%	24%

Source: US Census Bureau, Decennial Census, 2000. Calculations done by UNM - BBER.

Note: Hispanic can be of any race. The "Other" group includes two or more races. The poverty line is federally established.

2.5 Household Composition

Total households in the assessment area grew by about 4,500, numbering almost 22,000 in 2000. **Table 2.9** presents household composition by type of household for 1990 and 2000. Households in the assessment area are exhibiting the same trend as seen in the U.S., as there are proportionately more single households and more female-headed households.³⁵ For example, in 2000, Catron County had 1,587 total households, of which 471 (30 percent) were single households and 140 (9 percent) were households with a female head.

Female-headed households are becoming an increasingly important market nationally, as they continue to become an important part of the demographic landscape. All the counties in the assessment area had increases in the share of female-headed households between 1990 and 2000, when the number of these households increased by nearly 900, to total nearly 2,600. In 2000, female-headed households accounted for 12 percent of all households, slightly less than the 13 percent for the state as a whole. It may be recalled that the assessment area counties as a whole have an older population, with a higher percentage of persons 65 and older than in the state.

Similarly, households of people who live by themselves have become increasingly common. Single households continue to grow in part because of a national trend of marrying at later ages. However, roughly one-third of the residents in single person households in New Mexico are over 65 years of age. Within the assessment area counties, single households increased by 2,200, totaling over 6,300 in 2000. In 2000, the percent of single households in the assessment area (29 percent) was higher than in the state (25 percent). Single households increased by about 5 percentage points in each of the counties during 1990-2000.

³⁵ Single households are non-family households headed by a single person. Female-headed family households are households that are headed by a female with children or other dependents and no husband present.

Table 2.9: Type of Household, 1990 & 2000

	Number of Households			Percent of Total Households	
	Total	Single	Female Headed, Family	Single	Female Headed, Family
Year 1990					
Catron	1,063	269	69	25%	6%
Grant	9,874	2,077	1,143	21%	12%
Hidalgo	2,095	417	179	20%	9%
Sierra	4,431	1,425	324	32%	7%
TOTAL GILA COUNTIES	17,463	4,188	1,715	24%	10%
Year 2000					
Catron	1,587	471	140	30%	9%
Grant	12,138	3,130	1,629	26%	13%
Hidalgo	2,152	548	309	25%	14%
Sierra	6,103	2,194	506	36%	8%
TOTAL GILA COUNTIES	21,980	6,343	2,584	29%	12%

Source: US Census Bureau, Decennial Census, 1990 and 2000. Calculations done by UNMBBER.

Note: Single households are non-family households headed by a single person. Female headed family households include children.

2.6 Educational Attainment

Table 2.10 presents educational attainment for the 25-years and older population in 1990 and 2000, while **Table 2.11** looks at the percentage of educational attainment in 1990 and 2000 and offers a comparison with the state as a whole. Compared to a decade earlier, attainment levels in the assessment area counties were generally higher in 2000: the share of the population with at least some college education increased from 38 percent to 47 percent, while those with less than a high school education (or GED) declined from 31 percent to 23 percent.

The area as a whole evidenced considerable improvement over the decade, but still lagged behind the state in 2000. Among the Gila NF counties, Hidalgo County has by far the lowest educational attainment, and showed the smallest gains over the decade. In 2000, the percentage of those with at least some college varied by county, ranging from 32 percent in Hidalgo County to 50 percent in Grant County. The higher share for Grant County may be partly related to access to education, as Western New Mexico University is located in Silver City.

Table 2.10: Educational Attainment by County, 25 Years and Older

	Less than 9th Grade	9th to 12th Grade	HS Grad or GED	Some College; No Degree	Assoc., BA. Or More	Total
Year 1990						
Catron County	197	262	536	324	398	1,717
Grant County	2,586	2,370	4,728	3,716	3,411	16,811
Hidalgo County	523	461	1,323	582	573	3,462
Sierra County	1,286	1,428	2,603	1,275	890	7,482
TOTAL GILA COUNTIES	4,592	4,521	9,190	5,897	5,272	29,472
Year 2000						
Catron County	195	380	770	649	663	2,657
Grant County	1,868	2,321	5,922	4,947	5,292	20,350
Hidalgo County	642	480	1,328	696	450	3,596
Sierra County	891	1,480	3,106	2,565	1,864	9,906
TOTAL GILA COUNTIES	3,596	4,661	11,126	8,857	8,269	36,509

Source: US Census Bureau, Decennial Census, 1990 and 2000. Calculations done by UNM-BBER.

Table 2.11: Educational Attainment Percentage by County, 25 Years and Older

	Less than 9th Grade	9th to 12th Grade	HS Grad or GED	Some College; No Degree	Assoc., BA. Or More	Total
Year 1990						
Catron County	11%	15%	31%	19%	23%	100%
Grant County	15%	14%	28%	22%	20%	100%
Hidalgo County	15%	13%	38%	17%	17%	100%
Sierra County	17%	19%	35%	17%	12%	100%
TOTAL GILA COUNTIES	16%	15%	31%	20%	18%	100%
TOTAL NM	11%	14%	29%	21%	25%	100%
Year 2000						
Catron County	7%	14%	29%	24%	25%	100%
Grant County	9%	11%	29%	24%	26%	100%
Hidalgo County	18%	13%	37%	19%	13%	100%
Sierra County	9%	15%	31%	26%	19%	100%
TOTAL GILA COUNTIES	10%	13%	30%	24%	23%	100%
TOTAL NM	9%	12%	27%	23%	29%	100%

Source: US Census Bureau, Decennial Census, 1990 and 2000. Calculations done by UNM-BBER.

Educational attainment is closely tied to one's ability to generate income. The average earnings of a person with a bachelor's degree in 2005 were 80 percent more than those of someone with a high school diploma.³⁶ As educational attainment increases, the likelihood of poverty decreases.

³⁶ According to the press release for the Current Population Survey 2005 data on education and earnings, "Adults age 18 and older with a bachelor's degree earned an average of \$51,554 in 2004, while those with a high school diploma earned \$28,645... Those without a high school diploma earned an average of \$19,169..." <http://www.census.gov/Press-Release/www/releases/archives/education/007660.html>.

This correlation is evident in the assessment area when one compares the counties with a high percentage of persons with less than a high school education to the counties with high percentages of poverty shown previously in **Table 2.7**.

Increasing incomes and education levels in the assessment area counties are likely to place additional demands on the Gila NF in terms of recreation.³⁷ Reducing poverty could make communities somewhat less dependent on forest products for subsistence and for household cash income.

2.7 Housing

Table 2.12 provides data on the number of housing units and the occupied status of these units in each county in the assessment area. As would be expected, the number of dwellings in all counties increased as the population grew.

The housing stock expanded by about 6,500 units, or about one-third, from 1990 to 2000. Note the relatively high numbers of vacant houses in Catron (38 percent) and Sierra (30 percent) counties in 2000. As is indicated in **Table 2.13** and **Table 2.14**, the majority of these vacant homes were for seasonal or recreational use.

Table 2.12: Housing Units and Occupation of Housing

	1990			2000		
	Housing Units: Total	Housing Units: Occupied	Housing Units: Vacant	Housing Units: Total	Housing Units: Occupied	Housing Units: Vacant
Catron County	1,552	1,010	542	2,548	1,584	964
Grant County	11,349	9,773	1,576	14,066	12,146	1,920
Hidalgo County	2,413	2,004	409	2,848	2,152	696
Sierra County	6,457	4,428	2,029	8,727	6,113	2,614
TOTAL GILA COUNTIES	21,771	17,215	4,556	28,189	21,995	6,194

Source: US Census Bureau, Decennial Census, 1990 and 2000. Calculations done by UNM-BBER.

³⁷ J.M. Bowker, et al, "Wilderness and Primitive Area Recreation Participation and Consumption: An Examination of Demographic and Spatial Factors," *Journal of Agricultural and Applied Economics* (August 2006), http://findarticles.com/p/articles/mi_qa4051/is_200608/ai_n17176784/print.

Table 2.13: Vacant Housing by Type Of Vacancy

	For rent	For sale only	Rented or sold, not occupied	Seasonal or rec use	For migrant workers	Other vacant	Total vacant
Year 1990							
Catron	53	35	13	258	20	163	542
Grant	404	219	96	281	17	559	1,576
Hidalgo	111	38	15	21	17	207	409
Sierra	330	191	38	997	32	441	2,029
TOTAL GILA COUNTIES	898	483	162	1,557	86	1,370	4,556
Year 2000							
Catron	17	56	14	638	5	234	964
Grant	535	245	137	460	6	537	1,920
Hidalgo	167	50	24	85	17	353	696
Sierra	323	265	78	1,543	21	384	2,614
TOTAL GILA COUNTIES	1,042	616	253	2,726	49	1,508	6,194

Source: US Census Bureau, Decennial Census, 1990 and 2000. Calculations by UNM-BBER

Table 2.14: Percent of Total Vacant Housing

	For rent	For sale only	Rented or sold, not occupied	Seasonal or rec use	For migrant workers	Other vacant	Total vacant
Year 1990							
Catron	10%	6%	2%	48%	4%	30%	100%
Grant	26%	14%	6%	18%	1%	35%	100%
Hidalgo	27%	9%	4%	5%	4%	51%	100%
Sierra	16%	9%	2%	49%	2%	22%	100%
TOTAL GILA COUNTIES	20%	11%	4%	34%	2%	30%	100%
Year 2000							
Catron	2%	6%	1%	66%	1%	24%	100%
Grant	28%	13%	7%	24%	0%	28%	100%
Hidalgo	24%	7%	3%	12%	2%	51%	100%
Sierra	12%	10%	3%	59%	1%	15%	100%
TOTAL GILA COUNTIES	17%	10%	4%	44%	1%	24%	100%

Source: 2000 US Census Bureau, Decennial Census, 1990 and 2000. Calculations by UNM-BBER

According to the information presented in **Table 2.15**, the housing stock in the assessment area was about 30 years old in 2000, with only small variances among counties. Also shown is the percentage of households that lack complete plumbing.³⁸ The number of houses in the assessment area that lacked plumbing facilities increased from 2 percent to 3 percent between 1990 and 2000. In contrast, the state average age of housing rose from 22 to 27 years and the proportion of households without plumbing stayed level at 3 percent. There is a correlation between high

³⁸ According to the U.S. Census Bureau, *Census 2000*, B-59, in both the 1990 and 2000 censuses, "Complete plumbing facilities include: (1) hot and cold piped water, (2) a flush toilet, and (3) a bathtub or shower. All three facilities must be located inside...but not necessarily within the same room." www.census.gov/prod/cen2000/doc/sf4.pdf.

poverty levels and the lack of plumbing in a dwelling; Catron County had the highest percent of dwellings without complete plumbing (11 percent) and the second-highest poverty rate of the assessment area counties (24 percent).

Table 2.15: Age of Housing Stock and Plumbing Availability

	Average Age of Housing Stock		Lacking Complete Plumbing Facilities	
	1990	2000	1990	2000
Catron County	28.7	28.9	10%	11%
Grant County	28.9	31.6	2%	2%
Hidalgo County	26.4	32.9	0%	3%
Sierra County	24.7	28.8	1%	3%
TOTAL GILA COUNTIES	27.2	30.5	2%	3%
TOTAL NM	22.2	27.0	3%	3%

Source: US Census Bureau, Decennial Census, 1990 and 2000. Calculations by UNM BBER.

2.8 Net Migration

Table 2.16 illustrates the net migration into the assessment area at the county level. In each decennial census, respondents are asked about their county and state of residence five years previous. Shown in **Table 2.16**, then, are only those in New Mexico who were five years of age or older at the time of the 2000 census. Thus, for the assessment area in 2000, 43 percent of those in the area were movers (had changed addresses in the past five years). Of these 21,633 movers, 10,287, or nearly half, had moved from a house in the county of residence to another house within the same county. In the assessment area, 7,048 persons, or one of three movers, came to the area from other states. And of those who moved from other states, the region of origin was Northeast (6 percent), Midwest (13 percent), South (27 percent), and West (54 percent). (It is notable that Texas is in the South region and that California dominates the West region.) Minimal differences in these percentages occurred in the assessment area between the 1990 and 2000 census data. Of note are the figures for Catron County, which show that 22 percent of the population in 1990 and 23 percent of the population in 2000 had lived in a different state five years earlier. In both years, the vast majority of the new residents came from the West region.

Table 2.16: Net Migration by County

	CATRON COUNTY				GRANT COUNTY			
	1990	2000	Percent of Total	Percent of Total	1990	2000	Percent of Total	Percent of Total
			1990	2000			1990	2000
TOTAL	2,403	3,394	100%	100%	25,604	28,911	100%	100%
Same House	1,237	1,960	51%	58%	14,177	16,916	55%	59%
Different House	1,166	1,434	49%	42%	11,427	11,995	45%	41%
in the United States	1,166	1,430	49%	42%	11,319	11,763	44%	41%
Same County	388	307	16%	9%	6,430	6,913	25%	24%
Different County	778	1,123	32%	33%	4,889	4,850	19%	17%
Same State	258	344	11%	10%	1,693	1,528	7%	5%
Different State	520	779	22%	23%	3,196	3,322	12%	11%
Northeast	73	17	3%	1%	60	263	0%	1%
Midwest	29	48	1%	1%	376	444	1%	2%
South	13	85	1%	3%	900	924	4%	3%
West	405	629	17%	19%	1,860	1,691	7%	6%
Puerto Rico	0	0	0%	0%	0	0	0%	0%
Elsewhere	0	4	0%	0%	108	232	0%	1%

	HIDALGO COUNTY				SIERRA COUNTY			
	1990	2000	Percent of Total	Percent of Total	1990	2000	Percent of Total	Percent of Total
			1990	2000			1990	2000
TOTAL	5,409	5,473	100%	100%	9,359	12,668	100%	100%
Same House	2,863	3,526	53%	64%	4,818	6,411	51%	51%
Different House	2,546	1,947	47%	36%	4,541	6,257	49%	49%
in the United States	2,546	1,834	47%	34%	4,467	6,107	48%	48%
Same County	1,375	982	25%	18%	1,846	2,085	20%	16%
Different County	1,171	852	22%	16%	2,621	4,022	28%	32%
Same State	613	233	11%	4%	1,186	1,694	13%	13%
Different State	558	619	10%	11%	1,435	2,328	15%	18%
Northeast	13	14	0%	0%	82	159	1%	1%
Midwest	47	26	1%	0%	273	392	3%	3%
South	93	183	2%	3%	457	699	5%	6%
West	405	396	7%	7%	623	1,078	7%	9%
Puerto Rico	0	0	0%	0%	0	0	0%	0%
Elsewhere	41	113	1%	2%	74	150	1%	1%

	TOTAL GILA COUNTIES				NEW MEXICO			
	1990	2000	Percent of Total	Percent of Total	1990	2000	Percent of Total	Percent of Total
			1990	2000			1990	2000
TOTAL	42,775	50,446	100%	100%	1,390,048	1,689,911	100%	100%
Same House	23,095	28,813	54%	57%	719,628	919,717	52%	54%
Different House	19,680	21,633	46%	43%	670,420	770,194	48%	46%
in the United States	19,498	21,134	46%	42%	645,519	731,488	46%	43%
Same County	10,039	10,287	23%	20%	345,469	400,128	25%	24%
Different County	9,459	10,847	22%	22%	300,050	331,360	22%	20%
Same State	3,750	3,799	9%	8%	107,289	126,093	8%	7%
Different State	5,709	7,048	13%	14%	192,761	205,267	14%	12%
Northeast	228	453	1%	1%	14,311	15,329	1%	1%
Midwest	725	910	2%	2%	28,270	29,457	2%	2%
South	1,463	1,891	3%	4%	73,548	72,497	5%	4%
West	3,293	3,794	8%	8%	76,632	87,984	6%	5%
Puerto Rico	0	0	0%	0%	110	398	0%	0%
Elsewhere	223	499	1%	1%	24,791	38,308	2%	2%

Source: US Census Bureau, Decennial Census, 1990 and 2000. Calculations by UNM BBER.

2.9 Challenges and Opportunities for Forest Management

The demographic data developed in this chapter for the four Gila NF assessment area counties generally follow the demographics of the U.S. as a whole – the population is aging, more racially diverse, with higher educational attainment, and increasing per capita incomes. More households are headed by women and are single person households.

To focus on the similarities between the U.S. and the Gila NF counties, however, would be to miss some very important developments over the past two decades. This is an area of changing economic fortunes, and many of the changes relate to the use of natural resources from the Gila NF and other public lands. Over the past two decades, much of the logging industry in this part of New Mexico shut down, with the largest sawmill closing in Reserve in 1993.³⁹ Policies regarding grazing on public lands have moved toward encouraging sustainable grazing practices. Restrictions on grazing, where they occur, can compound the adverse economic impacts of drought and unfavorable market conditions. Any of these reasons could prompt some ranchers to sell off some of their land or shut down entirely. Falling copper prices on international markets were one major factor in the layoffs that occurred at the mines and also at the smelters of Grant and Hidalgo Counties.⁴⁰

On the other hand, the Gila NF has attracted increasing recreational uses. The local tourism industries expanded, as did amenity migration into the area by retirees and others and investments in vacation and second homes. Twenty-two percent of the population in Catron County in 1990 had lived in another state 5 years before and 23 percent of the population in 2000 was in this situation. The housing stock in the assessment area expanded by about 6,500 units during 1990-2000 – an increase of about one-third. The 2000 census found a very large number of vacant houses in Catron (38 percent) and Sierra (30 percent) Counties. Sixty-six percent of the vacant houses in Catron County and 59 percent of those in Sierra were seasonal or vacation homes. Sierra County has other attractions like Elephant Butte. The major attraction in Catron County, however, is the Gila NF.

It is also important to recognize the differences in experience among the four assessment area counties. For example, the population increased in the assessment area and in three of the assessment area counties between 1980 and 2000, but declined in Hidalgo County. Hidalgo County was also alone in experiencing a fall in real per capita income between 1990 and 2000, and there was a sharp rise in the county's poverty rate. Hidalgo County also had the smallest gains in terms of educational attainment. By contrast, Grant County realized a healthy gain in real per capita income and a two and one half percentage point drop in the poverty rate.

More people with more education and more income in the assessment area may be expected to translate to more use of the forest for recreation purposes.⁴¹ Increasing incomes and lower poverty rates may make at least some households less dependent on the forest for subsistence and household cash generation. However, agriculture and other natural resource industries are likely to be important in the rural way of life, even as their economic importance diminishes, and the

³⁹ USDA Forest Service State & Private Forestry Forest Products Laboratory, Adele Olstad and John Zerbe, ed's., *The Forest Products Conservation & Recycling Review* 13, no. 5/6 (May/June 2001), http://www.fpl.fs.fed.us/tmu/documents/nltr/nltr05_06_01.htm.

⁴⁰ Kent Paterson, "Earth's Bounty – Mining Sector in New Mexico," *New Mexico Business Journal* (July 2000), http://findarticles.com/p/articles/mi_m5092/is_6_24/ai_64059458.

⁴¹ Bowker, op. cit.

forest may continue to be critical to some households' subsistence activities and as a source of cash income.

On a national level, America is aging and life spans are increasing. With the leading edge of the Baby Boomers reaching age 60 in 2006, this massive cohort could begin to spend more of that leisure time in the vicinity of the Gila NF. There is already evidence of retirees choosing to live within or near the Gila NF. The aging of the U.S. population and of the population in the assessment area counties can be expected to place new demands on the Gila NF for recreation as well as for more cultural and heritage displays and interpretive events. Serving this population may require investments in infrastructure to make areas of the forest more accessible to those with limited mobility. Yet Boomers have indicated that they will seek alternatives to retirement that include volunteering, from which the Gila NF could benefit. Aging Boomers will place a heavy demand on federal benefits and entitlements, such as Medicare, Medicaid, and Social Security, and therefore intensify competition for federal dollars.⁴² This could mean flat or reduced funding levels for federal agencies, including the FS.

Finally, those seeking to live or retire in more peaceful forest surroundings are increasingly choosing to buy land and build houses within or adjacent to the national forests. This is clearly happening in the Gila NF, particularly in the Quemado and Silver City RDs. Housing at the wildland-urban interface also impacts the Gila NF policies about fire and the reduction of fuel loads. Strategies for fighting fires when there are dwellings in the forest require that additional resources be devoted to the protection of those houses and the lives of their residents.⁴³ Residents at the forest edge may also oppose thinning and thinning methods, particularly those involving controlled burns. Housing in the forest also can alter access and impact forest use. New roads built to developments can impact forest health by creating runoff and air pollution problems, and by providing access to new areas where unmanaged recreation can occur.

⁴² Wan He, Manisha Sengupta, Victoria A. Velkoff, and Kimberly A. DeBarros, "65+ in the United States 2005," U.S. Census Bureau, Current Population Reports, *U.S. Government Printing Office* P23-209 (2005): 25, <http://www.census.gov/prod/2006pubs/p23-209.pdf>.

⁴³ Jesse McKinley and Kirk Johnson, "At Your Peril: On Fringe of Forests, Homes and Fires Meet," *The New York Times* (June 26, 2007).

3 Access and Travel Patterns

This chapter discusses current and potential access issues in each of the Gila National Forest's (Gila NF) ranger districts (RDs). The analysis considers the existing transportation networks that serve the Gila NF, current traffic patterns along major routes, and planned investments that may improve access to the NF. The analysis also looks at the existing roads and trails within the various RDs and discusses developments impacting forest access. The analysis is based primarily on secondary data, including information from the New Mexico Department of Transportation (NMDOT).

3.1 Location of Major Transportation Routes

The purpose of this section is to describe the transportation networks that serve the Gila NF, providing visitor access to and from the forest. Examining transportation and traffic patterns can offer insight into where visitors may be coming from and identify any major access obstacles.

Figure 3.1 presents the three major highways that serve as the major thoroughfares for the state and that encircle the Gila NF. Interstate 40 (I-40) is a major cross-national shipping route, supporting high levels of heavy truck traffic. I-40 runs east-west some 100 plus miles from the northern boundaries of the Gila. There are few paved roads that run south from I-40 that are near the Gila NF. One option is a secondary state road, NM 117 / NM36, which runs just west of Acoma down to the town of Quemado. Another option, which is on the Arizona side of the border, is federal highway 491 down to Springerville, where one can pick up U.S. 60 for access to Quemado or U.S. 180 for access to the Reserve, Glenwood, and Silver City RDs.

Interstate 25 (I-25) runs north-south, connecting I-10 in Las Cruces to the Colorado border. I-25 does not provide direct access to any of the Gila NF RDs, but Quemado RD, Reserve RD, and Glenwood RD are accessible from I-25 via U.S. highway 60 and NM state highways 32 and 12. I-25 also provides access to the Black Range RD via NM 152 through Hillsboro, and to the Silver City and Wilderness RDs either via Hillsboro and NM 152 through the Black Range or by taking NM 26 from Hatch to Deming and then heading up U.S. 180 north to Silver City. I-10 from Tucson to Las Cruces provides access to Silver City via NM 90 from Lordsburg or U.S. 180 from Deming. **Table 3.1** is a list of roadways that provide access to the six ranger districts.⁴⁴

⁴⁴ Geographical data on national roads is obtained from ESRI® Streetmaps™ USA 2004.

Regional Transportation

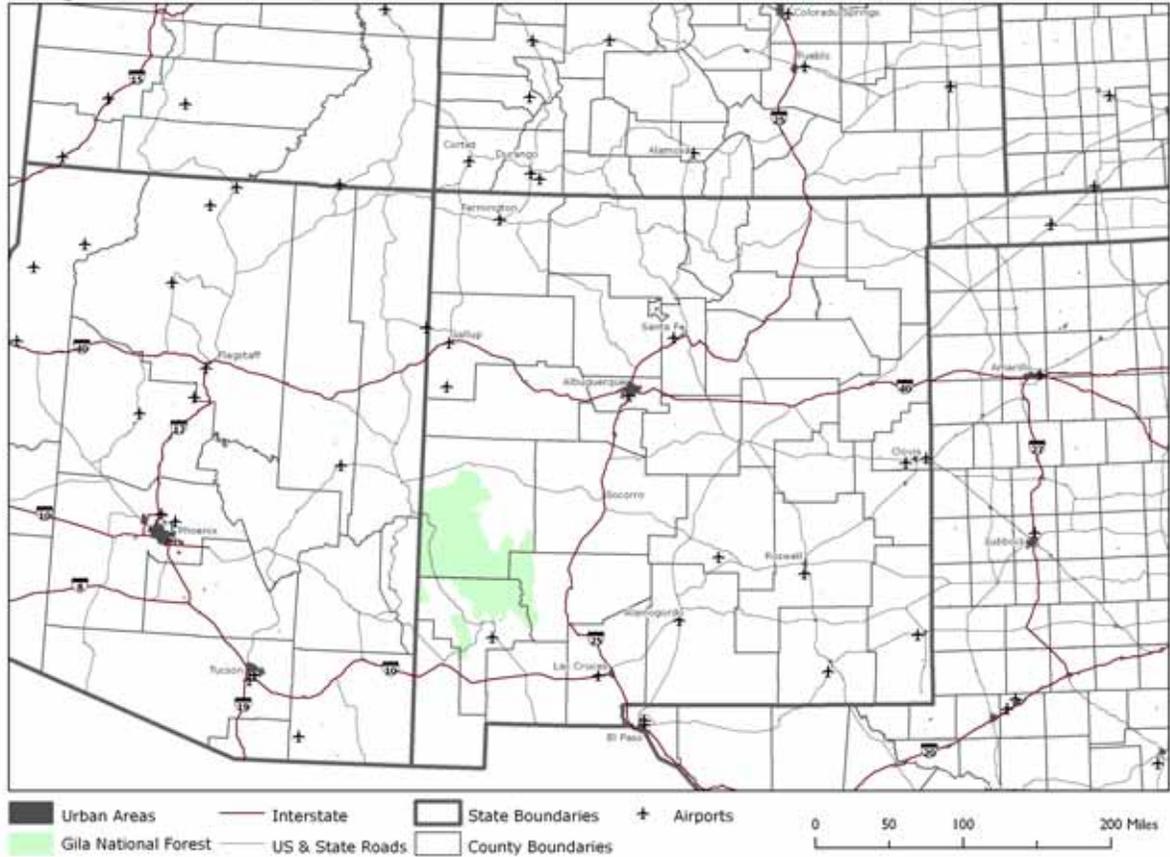


Figure 3.1: Map of Principle Highways and Airports in Region

Table 3.1: Major Roadways to Gila NF RDs

	Black Range	Glenwood	Quemado	Reserve	Silver City	Wilderness
US Routes		US 60 US 180 US 491	US 60 US 180 US 491	US 60 US 180	US 180	
State Roads	NM 52 NM 59 NM 152 NM 163	NM 12 NM 78 NM 159	NM 12 NM 32 NM 36 NM 117	NM 12 NM 32 NM 435	NM 15 NM 26 NM 35 NM 90 NM 152	NM 15 NM 35 NM 152

Source: ESRI StreetMap USA 2004

Table 3.2 shows the distance of each of the Gila RDs to the major metropolitan statistical areas (MSAs) in the southwestern region of the United States.⁴⁵ The Gila NF is somewhat isolated

⁴⁵ According to the U.S. Census Bureau website, a metropolitan statistical area is “A geographic entity defined by the federal Office of Management and Budget for use by federal statistical agencies, based on the concept of a core area with a large population nucleus, plus adjacent communities having a high degree of economic and social integration with that core. Qualification of an MSA requires the presence of a city with 50,000 or more inhabitants, or the presence

from the MSAs in the region. Las Cruces is the closest MSA, with travel distances to the Silver City, Black Range, and Wilderness RDs all within 150 miles. El Paso is next, with the same ranger districts all within 200 miles. Albuquerque is 250 miles or less from all six of the RDs. Tucson is within 250 miles of the Glenwood, Silver City, and Wilderness RDs. Many of the cities listed below have another national forest located closer to them than the Gila NF.

Table 3.2: Distance from Major Metropolitan Areas to the Gila NF RDs

City	Black Range	Glenwood	Quemado	Reserve	Silver City	Wilderness
Albuquerque, NM	192	246	204	213	245	250
Amarillo, TX	479	533	492	519	532	559
Denver, CO	638	692	650	659	691	718
El Paso, TX	181	217	316	325	163	190
Farmington, NM	374	429	319	337	427	432
Las Cruces, NM	137	175	272	221	121	148
Lubbock, TX	513	567	525	552	566	593
Phoenix, AZ	477	277	298	316	326	352
Pueblo, CO	526	580	538	547	579	606
Roswell, NM	261	332	290	317	314	341
Santa Fe, NM	453	308	266	275	306	333
Tempe, AZ	474	266	287	305	324	350
Tucson, AZ	363	239	299	306	212	238

Table 3.3 shows rural and urban lane miles in each county in the assessment area by road classification of the NMDOT. The assessment area is primarily rural. The NMDOT defines rural areas to be areas where the population is under 5,000 persons; any area with more than 5,000 persons is an urbanized area.⁴⁶ The primary function of interstate and arterial roads is to move people and goods efficiently. The function of collector and local roads is to provide access to homes and businesses.

While I-40 touches none of the counties in the Gila assessment area, I-25 runs through Sierra County and I-10 runs through Hidalgo and Grant Counties. Catron County, the most sparsely populated of the counties, is only served by rural roads, but forest areas are accessible by other principal roads. Interestingly, this county, which has a majority of the Gila NF within its borders, also has the most lane miles. Ninety-two percent of the lane miles in Catron County are collector and local. Comparable figures for the percent of lane miles that are collector and local in the other counties are as follows: Grant, 86 percent; Hidalgo, 74 percent; and Sierra, 88 percent.

of an Urbanized Area (UA) and a total population of at least 100,000 (75,000 in New England).”

http://factfinder.census.gov/home/en/epss/glossary_m.html.

⁴⁶ Bureau of Transportation Statistics,

http://www.transtats.bts.gov/FieldInfo.asp?Field_Desc=Rural/Urban%20Designation&Field_Type=Num&Lookup_Table=L_HPMS_RURAL_URBAN&Table_ID=1102&SYS_Table_Name=T_HPMS_CORE_DATA&Sys_Field_Name=RURAL_URBAN.

Table 3.3: Lane Miles of Road by County and Classification

Rural					
County	Interstate	Other Principal			County Total
		Arterial	Minor Arterial	Collector & Local	
Catron	0	171	121	3,481	3,773
Grant	80	55	171	2,091	2,397
Hidalgo	137	19	153	1,742	2,051
Sierra	195	0	2	1,690	1,887
Total	412	245	447	9,004	10,108
Urban					
County	Interstate	Other Principal			County Total
		Arterial	Minor Arterial	Collector & Local	
Catron	0	0	0	0	0
Grant	0	53	14	152	219
Hidalgo	137	19	153	0	309
Sierra	12	21	2	21	57
Total	149	93	169	173	585

Source: US Department of Transportation HPMS Database

3.2 Traffic Flows

Table 3.4 shows estimated daily vehicle miles traveled (VMT) and VMT per lane mile by county for all counties in the assessment area. VMTs are calculated by multiplying the average annual daily traffic (AADT) by road length in an area.⁴⁷ VMT per lane-mile offers a useful measure of the intensity of road traffic and is strongly correlated with population density. The measure is also useful for comparing traffic density among geographical areas. As the Gila NF counties are rural and relatively sparsely populated, the VMTs and VMT per lane mile are quite low. By contrast, the 2001 VMT for Bernalillo County totaled 11.9 million, with a VMT per lane mile of just over two thousand.

Table 3.4: Vehicle Miles Traveled and Vehicle Miles Traveled Per Lane Mile

County	Estimated VMT	VMT per Lane-Mile
Catron	181,859	48
Grant	906,301	346
Hidalgo	559,662	273
Sierra	472,475	243

Note: VMT is calculated as AADT*Section_Length

Source: US Department of Transportation (2001), HPMS Database, Calculated by UNM-BBER

⁴⁷ The daily flow of motor traffic is averaged out over the year to give average annual daily traffic flows, a useful and simple measurement of how busy the road is. The data comes from the Highway Performance Monitoring System (HPMS), maintained by the Federal Highway Administration, and can be accessed online from the Bureau of Transportation Statistics, <http://www.transtats.bts.gov>.

The Environmental Protection Agency estimates VMT growth factors using population projections for each county.⁴⁸ Traffic flows in the four Gila NF counties are expected to increase by nearly 50 percent between 2007 and 2030.⁴⁹ Rates of growth in excess of 50 percent are forecast for Bernalillo County, with even higher rates forecast for Valencia and Santa Fe Counties. All these counties have interstate highways, so much of the increase is associated with use of this system. Commuting undoubtedly accounts for a large part of the increased road use.

3.3 Airports

The closest airport to the Gila is the municipal airport for Silver City, which is about 10 miles south of the city and which has regularly scheduled flights to Albuquerque and other cities.⁵⁰ The City of Las Cruces International Airport is a general aviation airport, offering business charters and pleasure flights, but having no scheduled service. The largest airport in the vicinity of the Gila NF is the Albuquerque International Sunport in Albuquerque, New Mexico. This airport is within 250 miles of all the Gila Ranger Districts with access to all the Gila NF districts via I-25. This airport is the largest and busiest airport in New Mexico with roughly six million travelers a year.⁵¹ The Gila is also accessible from the El Paso International Airport, some 200 miles to the east, and from the Tucson International Airport to the west. Refer to **Figure 3.1** to see the airport locations on a map.

3.4 Capital Outlays and Transportation Infrastructure Improvements

As part of Governor Richardson's Investment Program (GRIP), monies have been programmed for transportation infrastructure improvements throughout New Mexico. A number of projects will improve access to Silver City – from the west, from the south, and also from Albuquerque and points north, if traveling via Hatch and Deming – and will thereby improve access to the Silver City RD, the Black Range RD, and the Wilderness RD. These improvements may also improve access via Silver City to the Glenwood and Reserve RDs. A more comprehensive list of State capital outlay projects in the Gila NF can be found in the appendix in **Table A.1. Exhibit 3.1** below provides a list and brief description of the major GRIP projects around the Gila NF.⁵²

⁴⁸ Estimates of the projected growth of VMT for the counties in the assessment area are provided by the Environmental Protection Agency and are based on 1996 HPMS data. VMT Growth Factors by County: New Mexico. U.S. Environmental Protection Agency. <http://www.epa.gov/ttn/naaqs/ozone/areas/vmt/stindex.htm>.

⁴⁹ Ibid. According to the EPA estimates, Catron is expected to increase by 49.1%; Grant by 49.0%; Hidalgo by 48.9%, and Sierra by 48.8.

⁵⁰ VillageProfile.com®, "New Mexico, Grant County, Silver City Website, Community Statistics: Transportation," <http://www.villageprofile.com/newmexico/silvercity/03/main.html>.

⁵¹ City of Albuquerque, "Albuquerque International Sunport," <http://www.cabq.gov/airport/>.

⁵² New Mexico Department of Transportation, "Governor Richardson's Investment Partnership: Investing in New Mexico/Summary of GRIP Projects," <http://www.nmgrip.com/summary.asp#15069>.

Exhibit 3.1: GRIP Projects Near the Gila NF

NM 11 Columbus to Deming

Improvements provide for widening of existing shoulders and reconstruction and rehabilitation of existing lanes to an enhanced two-lane facility. This corridor is a major link for imports from Mexico and provides a vital link for economic development. Target end date: August, 2010.

NM 26 Deming to Hatch

This improvement provides for some widening of existing shoulders of this two-lane highway to a two-lane “enhanced highway”; enhancements consist of reconstruction and rehabilitation of the existing lanes and shoulders. This corridor is a major link between I-10 and I-25. Truck traffic has increased significantly, as goods are being transported east to west and north to south. According to NMDOT, this improvement provides a major link for economic development. Target end date: June, 2010.

U.S. 180 - Deming to Bayard

The objectives of the project are reconstruction and widening of the existing roadway to an enhanced two-lane facility. Improvements include construction of passing lanes, replacement of pavement structure, soil stabilization, replacement of drainage structures, guardrail, permanent signing, and striping. This roadway serves as a vital link to the southwest region and is also an important support for the local economy. Target end date: November, 2010.

I-10 between Lordsburg and N.M. 146

This corridor is a four-lane commercial route in southern New Mexico. The highway has two lanes going east and two lanes headed west. Improvements include repaving and road rehabilitation. Target end date: December, 2007.

I 10 - Texas State Line to Las Cruces

This important route for commuters and cross-country transport will be expanded to six lanes. Target end date: May, 2011.

In addition to the major improvements discussed above, the GRIP program is also involved in investment to improve and expand the traffic capacity of I-40 and of I-25 near population centers like Albuquerque. These improvements could mean more people accessing the Gila NF.

Finally, the NMDOT Aviation Division’s 5-year Capital Improvement Plan provides funding for projects at municipal and other airports serving the Gila NF.⁵³

3.5 Forest Roads and Trails

Forest roads provide access for both forest users and Forest Service (FS) officials to areas of interest in the Gila NF. These roads are essential because they allow the only access to certain areas, permitting maintenance and rehabilitative activities. Access to the forest becomes critical in the event of a forest fire or other catastrophic event.

⁵³ Joe Shain, “State Funded Projects,” New Mexico Department of Transportation, Aviation Division, *Fly New Mexico!* (Winter 2004), <http://nmshtd.state.nm.us/upload/images/Aviation/winter%202004R.pdf>.

The Gila NF features about 6,627 miles of roadways on NF-managed land.⁵⁴ About 90 percent of the total road miles are covered with “native materials,” meaning a dirt road in most cases. Only 1 mile of the roads captured in the FS infrastructure (INFRA) database is indicated to be paved with asphalt. The most common road treatment, besides native material, is crushed aggregate (320 miles). Crushed aggregate is mostly gravel or other screened materials.⁵⁵ **Table 3.5** breaks down road types by ranger district. Note that the INFRA database does not have a RD identified for all the various roads in the forest. Quemado RD is indicated to have the most miles of forest roads.

The FS maintains designated areas of forest wilderness as roadless areas, where roads cannot be constructed or reconstructed. This particular use of land is discussed further in section 6.4, below.

Table 3.5: Length of Forest Roads and Road Types in Gila NF

District Not Identified			Black Range			Quemado		
Surface Type	Segment Length (Miles)		Surface Type	Segment Length (Miles)		Surface Type	Segment Length (Miles)	
SINGLE LANE	Asphalt	0	SINGLE LANE	Asphalt	0	SINGLE LANE	Asphalt	0
	Crushed Aggregate	48		Crushed Aggregate	2		Crushed Aggregate	147
	Bituminous Surface	29		Bituminous Surface	1		Bituminous Surface	0
	Improved Native	11		Improved Native	49		Improved Native	15
	Native Material	438		Native Material	707		Native Material	1,660
	Paved	1		Paved	0		Paved	0
Single Lane Total		527	Single Lane Total		759	Single Lane Total		1,822
DOUBLE LANE	Asphalt	0	DOUBLE LANE	Asphalt	0	DOUBLE LANE	Asphalt	0
	Crushed Aggregate	8		Crushed Aggregate	0		Crushed Aggregate	17
	Bituminous Surface	46		Bituminous Surface	0		Bituminous Surface	0
	Improved Native	1		Improved Native	0		Improved Native	0
	Native Material	29		Native Material	0		Native Material	2
	Paved	0		Paved	0		Paved	0
Double Lane Total		84	Double Lane Total		0	Double Lane Total		19
TOTAL		611	TOTAL		759	TOTAL		1,841

Glenwood			Wilderness			Reserve		
Surface Type	Segment Length (Miles)		Surface Type	Segment Length (Miles)		Surface Type	Segment Length (Miles)	
SINGLE LANE	Asphalt	0	SINGLE LANE	Asphalt	0	SINGLE LANE	Asphalt	1
	Crushed Aggregate	3		Crushed Aggregate	6		Crushed Aggregate	66
	Bituminous Surface	0		Bituminous Surface	1		Bituminous Surface	0
	Improved Native	25		Improved Native	18		Improved Native	82
	Native Material	689		Native Material	390		Native Material	1,398
	Paved	0		Paved	0		Paved	0
Single Lane Total		717	Single Lane Total		415	Single Lane Total		1,547
DOUBLE LANE	Asphalt	0	DOUBLE LANE	Asphalt	0	DOUBLE LANE	Asphalt	0
	Crushed Aggregate	1		Crushed Aggregate	0		Crushed Aggregate	11
	Bituminous Surface	1		Bituminous Surface	2		Bituminous Surface	19
	Improved Native	1		Improved Native	0		Improved Native	0
	Native Material	9		Native Material	0		Native Material	10
	Paved	0		Paved	0		Paved	0
Double Lane Total		12	Double Lane Total		2	Double Lane Total		40
TOTAL		729	TOTAL		417	TOTAL		1,587

Silver City			Gila NF Total		
Surface Type	Segment Length (Miles)		Surface Type	Segment Length (Miles)	
SINGLE LANE	Asphalt	0	SINGLE LANE	Asphalt	1
	Crushed Aggregate	10		Crushed Aggregate	282
	Bituminous Surface	2		Bituminous Surface	33
	Improved Native	14		Improved Native	214
	Native Material	625		Native Material	5,907
	Paved	0		Paved	0
Single Lane Total		651	Single Lane Total		6,437
DOUBLE LANE	Asphalt	0	DOUBLE LANE	Asphalt	0
	Crushed Aggregate	1		Crushed Aggregate	38
	Bituminous Surface	2		Bituminous Surface	70
	Improved Native	5		Improved Native	7
	Native Material	24		Native Material	74
	Paved	0		Paved	0
Double Lane Total		32	Double Lane Total		189
TOTAL		683	TOTAL		6,627

Source: USDA Forest Service Infra Roads Database. Calculations done by UNM-BBER.

⁵⁴ Estimates of forest road are based on data in the FS infrastructure (INFRA) database, which was provided to BBER by the FS. Any estimation errors inherent in the data (such as missing records) are not accounted for in this report. Duplicates were removed.

⁵⁵ INFRA Data Dictionary

The Gila NF has 88 trailheads, and according to the INFRA database, almost 1,900 miles of trails.⁵⁶ **Table 3.6** below presents the INFRA data on the mileage of forest trails in each ranger district. These figures are different from those provided for the different districts on the official Gila NF webpage. There, the Black Range RD is indicated to have 263 miles of trails, most of which are in those portions of the Aldo Leopold and Gila Wilderness areas that are part of this district; Glenwood RD is indicated to have more than 322 miles of trails; and, Reserve RD, 155 miles, including 55 miles of the Continental Divide Trail. No trail mile totals are given for the Quemado, Silver City, or Wilderness RDs, but the trails listed on the website for each RD total about 10, 49, and 119 miles, respectively. A complete list of all trailheads in the Gila NF is provided in the appendix (**Table A.2**).

Table 3.6: Length of Forest Trails and Trail Types in Gila NF

District Not Identified		Segment Length (Miles)	Black Range		Segment Length (Miles)
Trail Type			Trail Type		
	Native Natural	7		Native Natural	178
	Unidentified Type	1,284		Unidentified Type	4
TOTAL		1,291	TOTAL		182
Quemado		Segment Length (Miles)	Glenwood		Segment Length (Miles)
Trail Type			Trail Type		
	Native Natural	0		Native Natural	0
	Unidentified Type	0		Unidentified Type	0
TOTAL		0	TOTAL		0
Wilderness		Segment Length (Miles)	Reserve		Segment Length (Miles)
Trail Type			Trail Type		
	Native Natural	252		Native Natural	7
	Unidentified Type	0		Unidentified Type	0
TOTAL		252	TOTAL		7
Silver City		Segment Length (Miles)	Total Gila		Segment Length (Miles)
Trail Type			Trail Type		
	Native Natural	109		Native Natural	553
	Unidentified Type	32		Unidentified Type	1,320
TOTAL		141	TOTAL		1,873

Source: USDA Forest Service Infra Trails Database. Calculations done by UNM-BBER.

3.6 Travel Management Rule

The roads and trails catalogued above do not include all the roads and trails that have been created in the forest by people taking their motorized vehicles, typically their off-highway vehicles (OHVs), “off road” – to haul out an animal carcass or perhaps a load of firewood, because its convenient or “because they can.”⁵⁷ OHVs provide an increasingly popular recreation alternative. They also can have great utility on a ranch. Unfortunately, OHVs can have many

⁵⁶ Estimates of forest trails are based on data provided in the INFRA database. Any estimation errors inherent in the data (such as missing records) are not accounted in this report. Duplicates were removed.

⁵⁷ One of the participants in the focus groups conducted by John Russell and Peggy Adams-Russell for their report “Values, Attitudes and Beliefs Toward National Forest System Lands: The Gila National Forest” provided an example, “Anybody that recreates out there has concerns about the 4-wheelers. Like the Saddle Rock area where you have all these sand washes, and the 4-wheelers cruise up and down the washes. They don’t do any harm there, but they go beyond there and start going straight up these arid desert hills just because they can...”. John C. Russell and Peggy A. Adams-Russell, “Values, Attitudes and Beliefs toward National Forest System Lands: The Gila National Forest,” *Adams-Russell Consulting* (released as a Forest Service report under the same name) (2005): 40.

adverse effects, as they can cause damage to riparian and other areas of the forest. This is particularly true in drier climates, where it may take years to restore vegetative ground-cover. Other objections relate to noise, fear, and the various ways in which OHVs may degrade the experience of the forest.⁵⁸ In part to address the problem of OHVs, the FS has promulgated a new management directive, the Travel Management Rule, requiring each of the NFs to designate those roads, trails, and areas that are open to motor vehicle use.⁵⁹ The new rules went into effect on December 9, 2005.⁶⁰ Overall, these policy revisions call for the re-designation of trails and routes and allow for various strategies, including making better maps, to show which trails are designated for different types of uses.

3.7 Right-of-Way and Other Access Issues

Most of the land that abuts the Gila NF is privately owned, although there are some holdings by the Bureau of Land Management and a few parcels are State lands. The compactness of the Gila NF means that there are fewer opportunities to hold land right on the edge of the national forest than around other national forests, e.g., the Cibola NF. While the Bureau of Business and Economic Research (BBER) did not find documentation on this, it is suspected that many of the holdings adjacent to the forest are cattle ranches with grazing on the ranches and on FS allotments. There are a number of parcels of private land within the Gila NF's exterior boundaries, particularly within the Quemado RD. Historically, many of these parcels have been owned by ranchers who would graze their cattle on these private parcels as well as on their FS allotments.

As it has become more and more difficult to make a living as a rancher with grazing allotments on federal land, some in the Gila NF counties have gone out of business entirely, while others have seized opportunities to sell some of their acreage for residential use. The low mortgage rate environment of the past few years, in combination with a depressed financial asset market (since the collapse of stock prices in March 2001), have provided conditions ripe for a housing boom in the U.S. Many retirees and those not restricted to doing their job at a particular worksite ("lone eagles") are migrating or building second homes in areas with considerable amenities. New Mexico is attractive to many of these people. A particular draw is the many acres of land adjacent to or within the national forest itself. These retirees and others seeking a change in lifestyle have provided a ready market for lands such as those in and around the Gila NF. Ranchers with acres to sell have found ready customers willing to pay many times the value of the land for farming and ranching purposes.

These newcomers create challenges for forest management in terms of access. If they own interior parcels, they may want access via better roads to the land they own. Whether they live inside the forest boundaries or on the forest periphery, they may not want people trespassing

⁵⁸ OHVs and all-terrain vehicles (ATVs) can create strong emotions in other forest users who may startle at the noise, react in fear, or otherwise feel that the encounter has degraded their experience. One participant explained, "If you go out in the forest, then it is you, God, and the animals. And you have this silence and solitude and then some ATV comes screaming down the trail and disturbs everything." Ibid, p. 39.

⁵⁹ USDA FS, "USDA Forest Service Releases Final Rule for Motorized Recreations in National Forests & Grasslands," FS Press Release, November 2, 2005, <http://www.fs.fed.us/news/2005/releases/11/travel-management.shtml>.

⁶⁰ USDA FS, "The Federal Register Part IV / Department of Agriculture Forest Service / 36 CFR Parts 212, 251, 261, and 295 / Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule," *National Archives and Records Administration* 70, no. 216 (November 2005), <http://www.fs.fed.us/recreation/programs/ohv/final.pdf>.

through their property to access the NF, even though the route may be one of long-term use by local residents.

Indeed, many forest-users (especially those who live nearest to the forest) fear that increased access invites damage through overuse, neglect, and deliberate vandalism.⁶¹ To protect their privacy and property, many landowners block access to the forest with locked gates and “No Trespassing” signs. Long-time residents and forest visitors are often unpleasantly surprised when they encounter a locked gate, denying them access to the public forest. Ranchers have also been known to prevent access to the forest to other users.⁶²

The issue of access and right-of-way is long-standing and extremely difficult to resolve. In some areas, the FS has attempted to address right-of-way issues through land-exchanges. In the Albuquerque area, for example, the City of Albuquerque has purchased land adjacent to the Cibola NF (in Three Gun Canyon near Carnuel) in an effort to preserve access to the forest via a trailhead that connects to an extensive trail system.⁶³

3.8 Challenges and Opportunities for Forest Management

While the Gila NF remains relatively remote, growing populations in the Albuquerque MSA, in the Las Cruces and El Paso MSAs, and in Tucson mean more people seeking out the diverse recreation opportunities offered by the Gila NF. A more immediate new source of forest visitors may be employees of the huge copper mine Phelps Dodge is building right across the Arizona border in Morenci, which is northeast of Stafford, Arizona.⁶⁴

The areas in and around the Gila NF are attracting new residents who want to live next to the wild and beautiful, but who may require certain creature comforts and demand certain services. In so doing, they may close off traditional routes of access into and around the forest. On the other hand, the access that these new residents require may open up the forest to new threats. The Quemado RD, which has seen an influx in new residents in or adjacent to the forest, reports increased problems of vandalism.

Finally, there is the new Travel Management Rule, requiring each of the NFs to designate those roads, trails, and areas that are open to motor vehicle use.⁶⁵ Such a designation provides a way of restricting OHV use in much of the forest and thus of reducing potential damage to the forest as well as limiting the conflicts with other users. OHV recreational users can come into conflict with just about every other user, from traditional and cultural users to grazing and ranching users.

⁶¹ The forest ranger for the Quemado RD confirmed additional vandalism as a problem. (Personal communication.)

⁶² John C. Russell and Peggy A. Adams-Russell, “Values, Attitudes and Beliefs toward National Forest System Lands: The Gila National Forest,” *Adams-Russell Consulting* (released as a Forest Service report under the same name) (2005): 43.

⁶³ City of Albuquerque, “Land Protection Measure Sponsored by Council President Heinrich Clears Committee Hurdle, Moves to Full Council,” Media Release November 6, 2006, http://www.cabq.gov/blogs/councilhighlights/2006/11/land_protection_measure_sponsored_by_council_president_heinrich_clears_committee_hurdle_moves_to_full_council.html

⁶⁴ “Morenci is a porphyry copper open pit mine and processing facility. It consists of approximately 60,000 acres and is located in southeast Arizona, 50 miles north of Safford.” Phelps Dodge, “Phelps Dodge: Worldwide Locations,” <http://www.phelpsdodge.com/AboutUs/WorldwideLocations/>.

⁶⁵ USDA FS, “The Federal Register Part IV / Department of Agriculture Forest Service / 36 CFR Parts 212, 251, 261, and 295 / Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule,” *National Archives and Records Administration* 70, no. 216 (November 2005), <http://www.fs.fed.us/recreation/programs/ohv/final.pdf>.

However, not all users want to outright ban or even strongly curtail OHV use: to do so would infringe on users' right to access public land. Also, OHVs have become part of the lifestyle of many people and OHVs have substantial utility to ranchers and hunters and others who go into the forest to harvest firewood and other products. The FS is challenged to somehow accommodate this assorted range of users while still protecting the integrity and health of the forest lands.

4 Land Cover, Ownership, and Forest Health

This chapter examines the land cover types and related land ownership and use patterns in the Gila National Forest (Gila NF), and discusses threats both to the health of the forest and to the specific plants and animals that live therein. The first section examines land cover and ownership in each of the ranger districts (RDs). The second section discusses recent land exchanges and the policy environment around future conveyances. The third section discusses major developments that threaten forest health.

4.1 Land Cover on the Gila National Forest

Data for this section were derived from the United States Geological Survey National Land Coverage Data set (NLCD), raster-based Landsat imagery. The data were obtained for each county with a 30-meter resolution. The ESRI® ArcInfo™ Geographic Information Systems software was used to extract the necessary data for each contextual geographic area.

Figure 4.1 is a map based on the NLCD displaying the Gila NF's land cover. **Table 4.1** provides land cover classifications for each RD based on data compiled in the NLCD.⁶⁶ For the most part, the six RDs have little variety in the types of land cover. Overall, two thirds of the land in the Gila (67 percent) is covered with evergreen forest, with 22.6 percent covered with shrubland, 8.5 percent in herbaceous grasslands, and 1.7 percent mixed forest. Evergreen forests account for 79 percent of the cover in Quemado RD, over seventy percent also in Wilderness and Reserve RDs, almost 65 percent in Black Range RD, 57 percent in Silver City RD, and 49 percent in the Glenwood RD.

Forty-two percent of the Glenwood RD is shrubland, with 36 percent of Silver City, 23 percent of Black Range, and 22 percent of Wilderness RDs under this cover. By contrast, only about 10 percent of Quemado and of Reserve RDs are classified as shrubland. Herbaceous grasslands cover 13.5 percent of the Reserve RD, 11.6 percent of the Black Range RD and 10.2 percent of the Quemado RD, but only 5.9 percent of the Silver City RD, 5.1 percent of the Glenwood RD, and 4.2 percent of the Wilderness RD. The most suitable areas for grazing are shrubland and grasslands. All the RDs have some mixed forest, with the highest percentage (3.2 percent) occurring in the Glenwood RD. Across the districts there are 1,288 acres of open water, providing some opportunities for boating and other water activities.

⁶⁶ See Table A.7. in the appendix for land cover descriptions and definitions.

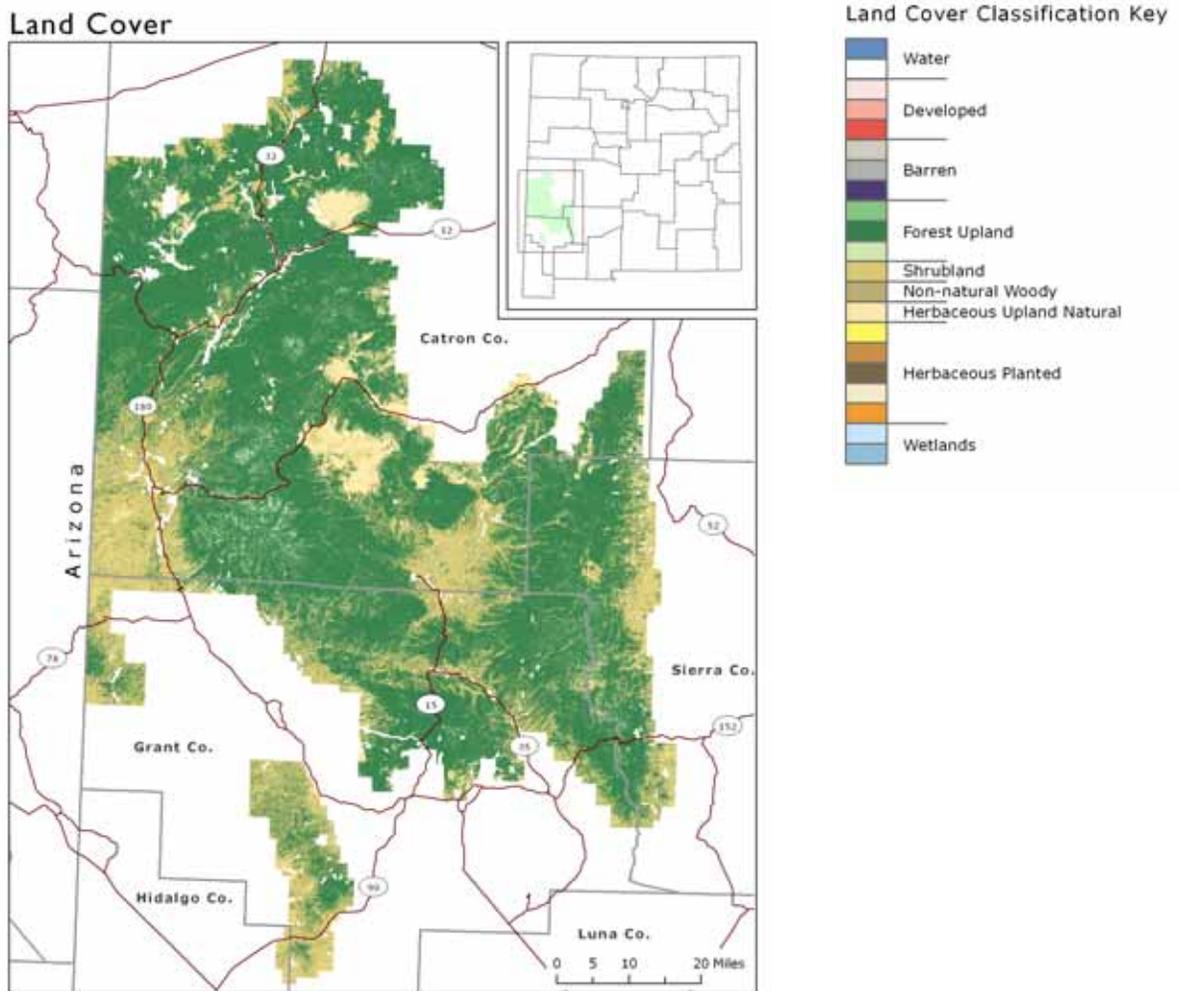


Figure 4.1: Land Cover on Gila NF

Table 4.1: Land Cover on Gila NF (Acres)

	Black Range	Quemado	Glenwood	Wilderness	Reserve	Silver City	Total Gila
Bare Rock/Sand/Clay	62	333	2,436	37	985	124	3,978
Comm/Industrial/Trans	1	12	32	5	38	69	156
Deciduous Forest	0	24	158	124	3	4	314
Emergent Herbaceous Wetlands	14	211	1	7	17	1	250
Evergreen Forest	359,182	479,036	256,630	492,573	453,494	231,656	2,272,651
Fallow							
Grasslands Herbaceous	64,724	61,639	27,053	28,491	82,972	24,097	289,258
High Intensity Residential							
Low Intensity Residential	1	6	0	4	32	1	44
Mixed Forest	6,110	3,483	16,973	14,725	12,411	2,877	56,600
Open Water	7	319	140	260	301	261	1,288
Orchards/Vineyards/Other						23	23
Pasture/Hay		110	824	131	1,130	28	2,219
Quarries/Strip Mines/Gravel Pits		9	11	11		4	36
Row Crops		7	23	9	36		75
Shrubland	126,526	58,958	221,827	149,710	62,712	147,014	766,944
Small Grains		2	0	1	1	1	5
Urban/Recreational/Grasses		1	0	0	6		8
Woody Wetlands	0	18	144	0		3	165
Total	556,627	604,168	526,252	686,087	614,138	406,164	3,394,014

Note: Small errors in calculations are the result of 'edge rounding' associated with the use RASTER based NLCD. Where there is no land with a particular coverage, a blank is used. Zeros indicate acreage less than one acre.

Source: USGS EROS, National Land Cover Data (NLCD), Date 1992 (New Mexico). Calculations by UNM-BBER.

In addition to land cover, land ownership is an important consideration in land use and planning policies. There are 121 thousand acres of privately-owned land on the Gila NF, making up about 3.6 percent of the entire forest. **Figure 4.2** looks at land ownership in the Gila NF and immediate vicinity. Striking is the amount of public ownership – other federal (primarily Bureau of Land Management) and State-owned. **Table 4.2** examines the land cover as it varies across the forest districts and depending upon whether the lands are Forest Service-managed lands or under other ownership, typically private. Across the districts, Forest Service (FS) lands have a much higher proportion of acreage that is evergreen forest, while private lands are disproportionately shrubland and herbaceous grasslands – lands far more suitable for grazing.

Local Scale Roads & Land Ownership

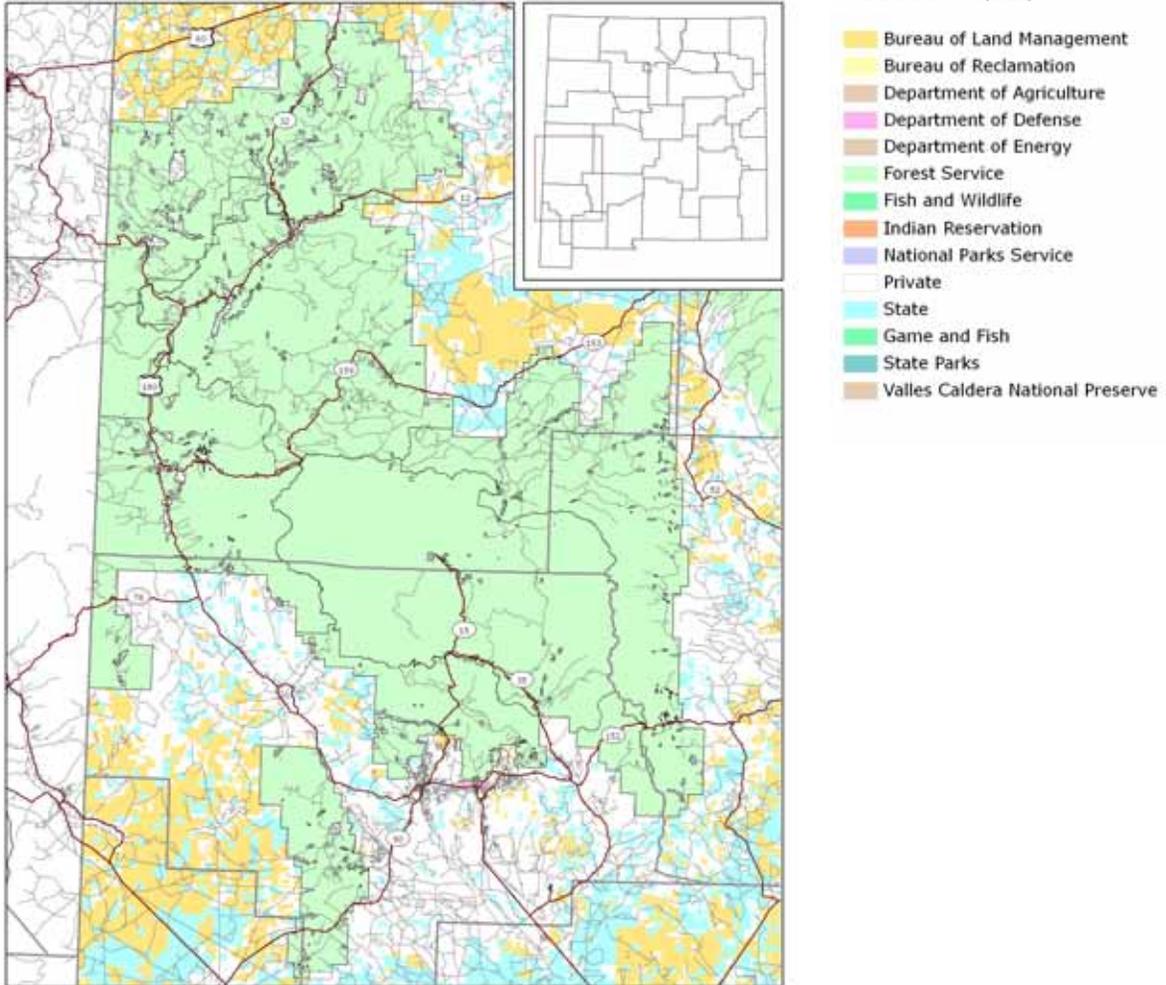


Figure 4.2: Land Ownership in Gila NF and Vicinity

Table 4.2: Land Cover of NF and Other Lands in the Gila NF

	Black Range			Quemado			Glenwood			Wilderness		
	FS	Other	Total									
Bare Rock/Sand/Clay	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%
Comm/Indust/Transport	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Deciduous Forest	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Emerg Herb Wetlands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Evergreen Forest	65%	30%	65%	81%	48%	79%	50%	26%	49%	72%	33%	72%
Fallow												
Grasslands Herbaceous	11%	35%	12%	9%	33%	10%	5%	8%	5%	4%	15%	4%
High Intensity Residential												
Low Intensity Residential	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mixed Forest	1%	0%	1%	1%	0%	1%	3%	0%	3%	2%	0%	2%
Open Water	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Orchards/Vineyards/Oth												
Pasture/Hay				0%	0%	0%	0%	5%	0%	0%	1%	0%
Quarries/Strip												
Mines/Gravel Pits				0%		0%		0%	0%	0%		0%
Row Crops				0%	0%	0%		0%	0%	0%	0%	0%
Shrubland	22%	35%	23%	9%	17%	10%	42%	56%	42%	22%	50%	22%
Small Grains	0%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%
Urban/Recreat/Grasses					0%	0%		0%	0%	0%	0%	0%
Woody Wetlands					0%	0%	0%		0%	0%		0%
Total	100%											

	Reserve			Silver City			Gila NF Total		
	FS	Other	Total	FS	Other	Total	FS	Other	Total
Bare Rock/Sand/Clay	0%	1%	0%	0%	0%	0%	0%	1%	0%
Comm/Indust/Transport	0%	0%	0%	0%	0%	0%	0%	0%	0%
Deciduous Forest	0%	0%	0%	0%	0%	0%	0%	0%	0%
Emerg Herb Wetlands	0%	0%	0%	0%	0%	0%	0%	0%	0%
Evergreen Forest	76%	31%	74%	57%	47%	57%	68%	37%	67%
Fallow									
Grasslands Herbaceous	12%	41%	14%	6%	13%	6%	8%	28%	9%
High Intensity Residential									
Low Intensity Residential	0%	0%	0%		0%	0%	0%	0%	0%
Mixed Forest	2%	0%	2%	1%	0%	1%	2%	0%	2%
Open Water	0%	1%	0%	0%	0%	0%	0%	0%	0%
Orchards/Vineyards/Oth				0%	0%	0%	0%	0%	0%
Pasture/Hay	0%	3%	0%	0%	0%	0%	0%	2%	0%
Quarries/Strip									
Mines/Gravel Pits				0%		0%	0%	0%	0%
Row Crops	0%	0%	0%				0%	0%	0%
Shrubland	10%	23%	10%	36%	40%	36%	22%	31%	23%
Small Grains		0%	0%		0%	0%	0%	0%	0%
Urban/Recreat/Grasses		0%	0%				0%	0%	0%
Woody Wetlands					0%	0%	0%	0%	0%
Total	100%	100%	100%						

Source: USGS EROS, National Land Cover Data (NLCD), Date 1992 (New Mexico). Calculations by UNM-BBER.

Table 4.3 presents the data in a manner that takes into account the role of public and private land managers in promoting particular land uses. The values are the ratio of the share of a given land coverage that is respectively under federal or private ownership within the Gila to the share of all the lands that are under this ownership. So for example, in the Wilderness RD there are 4 acres of land that are low intensity residential in private hands, with no residential acreage under FS ownership. 100 percent divided by the percent of total holdings in the district that are private – by 0.808 percent – yields the index value of 123.8. This value, relative to an index value of 1.00,

reflects the relative commitment of public and private land managers to a particular use. In this case, private owners have a very high commitment to their residential property.

The data show that the FS priority lies in managing the vast evergreen and mixed forest areas, which are typically used for recreational purposes. Recreation is the primary land use for the Gila NF. For the most part, private landowners give more emphasis to shrubland and grasslands. These areas lend themselves to commercial activities, such as grazing. Grazing is the primary economic activity on private lands within the Gila NF. Similar results were found in the National Grasslands socioeconomic assessment conducted by BBER.⁶⁷ It is also true that ranchers are especially interested in grazing on public land, as the fees are less costly than fees for grazing on private land.⁶⁸

Table 4.3: Public and Private Land Use in Gila NF

	Black Range		Quemado		Glenwood		Wilderness		Reserve		Silver City		Gila NF Total	
	FS	Other	FS	Other	FS	Other	FS	Other	FS	Other	FS	Other	FS	Other
% of land	97.3%	2.7%	94.1%	5.9%	96.9%	3.1%	99.2%	0.8%	94.8%	5.2%	95.9%	4.1%	96.4%	3.6%
Bare Rock/Sand/Clay	1.0	1.1	0.6	7.2	0.7	9.2	1.0	3.7	0.8	5.4	0.8	5.1	0.7	8.1
Comm/Industl/Transport	0.7	12.4	0.7	5.8	0.8	8.4	1.0	0.0	0.8	5.0	1.0	1.8	0.9	4.9
Deciduous Forest	1.0	0.0	0.1	15.7	1.0	0.9	1.0	2.0	0.7	6.4	1.0	1.3	0.9	2.8
Emerg Herb Wetlands	1.0	0.0	0.2	13.4	0.7	10.7	1.0	0.0	0.1	17.7	0.6	9.8	0.3	20.5
Evergreen Forest	1.0	0.5	1.0	0.6	1.0	0.5	1.0	0.5	1.0	0.4	1.0	0.8	1.0	0.6
Fallow														
Grasslands Herbaceous	0.9	3.0	0.9	3.2	1.0	1.6	1.0	3.5	0.9	3.1	1.0	2.1	0.9	3.3
High Intensity Residential														
Low Intensity Residential	1.0	0.0	0.3	12.2	0.0	32.2	0.0	123.8	0.0	18.8	0.0	24.5	0.1	26.2
Mixed Forest	1.0	0.0	1.1	0.1	1.0	0.0	1.0	0.0	1.0	0.1	1.0	0.2	1.0	0.1
Open Water	0.0	37.2	0.9	2.3	0.2	24.6	0.9	10.0	0.4	11.7	0.9	3.2	0.7	8.6
Orchards/Vineyards/Oth											0.1	22.2	0.1	25.4
Pasture/Hay			0.0	16.2	0.0	31.1	0.5	65.8	0.0	19.1	0.0	24.3	0.0	26.7
Quarries/Strip														
Mines/Gravel Pits			1.1	0.0	0.0	32.2	1.0	0.0			1.0	0.0	0.7	8.9
Row Crops			1.0	1.1	0.0	32.2	0.3	84.7	0.1	16.6			0.2	22.7
Shrubland	1.0	1.5	1.0	1.8	1.0	1.3	1.0	2.3	0.9	2.2	1.0	1.1	1.0	1.4
Small Grains			0.4	10.6	0.0	32.2	0.2	99.0	0.0	19.2	0.0	24.5	0.2	23.4
Urban/Recreatl/Grasses			0.0	17.0	0.0	32.2	0.5	61.9	0.0	19.2			0.0	27.2
Woody Wetlands			0.0	17.0	1.0	0.0	1.0	0.0			0.0	24.5	0.9	3.5

Note: Small errors in calculations are the result of 'edge rounding' associated with the use RASTER based NLCD.
 Source: USGS EROS, National Land Cover Data (NLCD), Date 1992 (New Mexico). Calculations by UNM-BBER.

4.2 Land Conveyance and Exchanges

The FS provided the Bureau of Business and Economic Research (BBER) with data concerning land conveyances and exchanges in the Gila NF. Generally speaking, parcels of forest land scattered around the boundaries of the forest are often costly and difficult to manage, and pose significant right-of-way issues. However, these parcels can be traded for more valuable land on the edge of or inside forest boundaries in order to expand contiguous forest areas. **Table 4.4** below lists only one land exchange in Gila NF over the past 17 years, that of Camp Thunderbird.⁶⁹ The “Federal Acres” and “Federal Values” columns list the values that were transferred to private ownership. The “Non-Fed” columns show values that were conveyed to the

⁶⁷ Jeffrey Mitchell and Jeremy Cook, “Socioeconomic Assessment of the Region 3 National Grasslands,” *University of New Mexico Bureau of Business and Economic Research*, (September 2005).

⁶⁸ United States Government Accountability Office, “Livestock Grazing Federal Expenditures and Receipts Vary, Depending on the Agency and the Purpose of the Fee Charged,” Report to Congressional Requesters (September 2005), www.gao.gov/cgi-bin/getrpt?GAO-05-869.

⁶⁹ List does not include the National Grasslands.

United States.⁷⁰ In this case, the FS received 35 acres, valued at \$70,000, in exchange for 24.7 acres, valued at \$86,000.

Table 4.4: Land Conveyance and Exchanges for Gila NF

CASE NAME	FEDERAL ACRES	FEDERAL VALUE	NON-FEDERAL ACRES	NON-FEDERAL VALUE	FISCAL YEAR
CAMP THUNDERBIRD	24.7	\$86,000	35.0	\$70,000	1990

Source: USDA Forest Service Exchanges and Conveyances Database

Another controversial aspect of land exchange that could be of future concern in the Gila NF involves the Secure Rural Schools and Community Self-Determination Act of 2000.⁷¹ Almost 100 years ago, legislation was created to give counties a percentage of the revenues raised through timber sales and grazing fees on public lands to be used for schools, roads, and planning – basically, payments in lieu of taxes. This worked well for many schools until the 1980s when timber harvests declined. So in 2000, the Rural Schools Act created a formula to try to stabilize the payments for 2001-2006, by guaranteeing funding based on a formula, along with the historical funding from timber and grazing receipts.⁷² The FY 2007 President's budget proposes to reauthorize the Secure Rural Schools program for another five years. To help fund this initiative, the administration recommends selling a limited number of acres of national forest system lands around the nation. Lands that are potentially eligible have been identified and are listed on the FS website as “Lands Potentially Eligible for Sale by State and National Forest.”⁷³ While 7,373 acres of New Mexico FS lands have been identified, none of these lands are within the Gila NF.

4.3 Forest Health

Forest health is a central concern to the FS and forest users. Healthy forests provide important resources such as clean water and air to villages, towns, and cities. FS research shows that 80 percent of the fresh groundwater in the United States originates in federal forestlands.⁷⁴ The role of forests in absorbing carbon from the air is also well documented.⁷⁵ Forests also provide safe refuge for wildlife and some of the most endangered species of plants and animals. However, the strategies implemented to protect forest health are often at the center of conflicts. For example,

⁷⁰ Personal communication with USDA FS.

⁷¹ USDA FS, “President’s FY 2007 Budget Proposal for the Forest Service – Secure Rural Schools and Community Self-Determination Act Extension,” <http://www.fs.fed.us/news/2006/releases/02/secure-rural-schools.shtml>.

⁷² Eve Byron, “Baucus Plan May Halt Land Sale,” *Helena Independent Record*.

⁷³ USDA Forest Service Lands and Realty Management, “Lands Potentially Eligible for Sale by State and National Forest,” <http://www.fs.fed.us/land/staff/spd.html#Newmexico>.

⁷⁴ James Sedell, Maitland Sharpe, Daina Dravnieks Apple, Max Copenhagen, and Mike Furniss, “Water and the Forest Service,” *United States Department Of Agriculture / Forest Service*, FS-660 (January 2000), <http://www.fs.fed.us/publications/policy-analysis/water.pdf>.

⁷⁵ R. K Monson, A. A Turnipseed, J. P Sparks, P. C Harley, L. E Scott-Denton, K Sparks, T. E Huxman, “Carbon Sequestration in a High-Elevation, Subalpine Forest,” *Global Change Biology* 8 no. 5, (2002), <http://www.blackwell-synergy.com/links/doi/10.1046/j.1365-2486.2002.00480.x/enhancedabs/>.

“The Carbon-Sequestration Potential of a Global Afforestation Program,” *Climatic Change* 30, no. 3 (July 1995), <http://www.springerlink.com/content/n2488570q323486v>.

environmental groups heavily advocated the end of logging in order to protect endangered wildlife, such as the Mexican spotted owl. After the reduction of heavy logging, other forest users became concerned with the resulting overgrowth and associated fire danger.

At the national level, the FS has indicated four areas of major concern that are overarching issues for all NF lands. Presented as the “four threats,” these areas are: fire and fuels, invasive species, loss of open space, and unmanaged recreation. Growing populations and increased use add to the difficulty of reducing these threats on public lands. All of these critical management issues are relevant to the Gila NF, and some are discussed in more detail in other chapters. The specific threats and possible impacts in the Gila NF are briefly described below.

4.3.1 Fire and Fuels

Much of the West has been under drought conditions for the past several years. Continued drought conditions, in addition to high fuel loadings, have created dangerous potential fire conditions for much of the West. Some 26 million acres in the West have been identified as fuels treatment “hot spots” or high priority areas.⁷⁶ Many of these areas are classified as “Fire Regime Condition Class 3,” meaning they are “significantly altered from their historic fire-return interval. Consequently, these lands pose the greatest risk of ecological collapse as a result of catastrophic fire.”⁷⁷

Uncontrolled fires can result in substantial environmental and economic impacts. Wildfire devastation impacts “lives, property, wildlife habitat, fragile ecosystems,” water, soils, and timber resources.⁷⁸ Fires and the corresponding reduction of tree cover can result in deterioration of fresh water supplies and collateral damage because of increased runoff, increased flooding, and aquifer depletion.⁷⁹

Of the 21 million acres of national forest lands in the Southwestern region, more than 80 percent is at moderate to high risk of “uncharacteristic” wildfire. These fires are larger and more intense than naturally occurring wildfires. They can alter soils, reducing their ability to retain moisture, accelerate erosion, and compromise water quality. Further, wildlife habitats and the forests’ aesthetic quality are damaged. According to a fact sheet issued jointly by both the USDA and the U.S. Bureau of Land Management, the Gila NF has the highest number of fire occurrences in the state. The fact sheet cites as contributing factors the mountainous terrain, the dense stands of mature trees, and drought conditions.⁸⁰ Prevention strategies can be expensive and are not always well received by the public. An article in the *Albuquerque Journal* in September 2005 describes a scaling back of a thinning project because of community resistance.⁸¹ However, others are concerned with the heavy undergrowth and dry brush, which are major fuels.

⁷⁶ USDA FS, *Fire and Fuels*. June 2004. <http://www.fs.fed.us/projects/four-threats/documents/firefuels-fs.pdf>.

⁷⁷ According to the U.S. Department of the Interior, “Fire Regime Condition Class (FRCC) is defined as a classification system which describes the amount of departure from the natural (historic) state of an area or landscape to present conditions.” “Eastern Wyoming Zone Fire Management Plan,” United States Department of the Interior Bureau of Land Management (2004), <http://www.blm.gov/style/medialib/blm/wy/fire/fmpdocs.Par.7089.File.dat/001-2004eastern.pdf>.

⁷⁸ USDA FS, *Four Threats: Quick Facts*, “Fire and Fuels,” <http://www.fs.fed.us/projects/four-threats/facts/fire-fuels.shtml>.

⁷⁹ Sedel, *op cit*.

⁸⁰ http://www.healthyforests.gov/projects/state_projects/00-nm-gila-nf.pdf.

⁸¹ Journal Staff, “Cibola Forest Trims Thinning Project Near Tajiue,” *Albuquerque Journal*, September 15, 2005.

Treatments to reduce fuels and restore ecosystems involve various techniques including thinning, prescribed burning, and clearing the forest of debris. Treatments can be biological, mechanical, or chemical. Costs for treatment in 2004 were roughly \$120 per acre, although estimates of costs using mechanical means are cited in the range of \$500 to \$1,000 per acre.⁸² Nevertheless, the costs of responding to and controlling a fire can be hefty as well. In May of 2004, the *Albuquerque Journal* reported that the Lookout Fire in the Sandia and Mountainair Ranger Districts had burned 5,100 acres, required 565 firefighters and personnel, three helicopters, eleven fire engines, and four bulldozers. The total cost was estimated at just over \$1 million.⁸³

One major complicating factor related to fire management is the increased number of people living at the forests' edges – the wild land-urban interface. Many urban subdivisions are being situated closer and closer to forested areas for their aesthetic and economic value. Concerns for both the life and property of these new residents add a new dimension to FS planning for fires at the same time that the new residents may place constraints on fire prevention activities.⁸⁴

4.3.2 Invasive Species and Insects

Invasive species have been characterized as a “catastrophic wildfire in slow motion.”⁸⁵ Non-native, invasive plants and insects can cause major disruptions in ecosystem function. Invasive species can reduce biodiversity and degrade ecosystem health in forest areas. The damage caused by invasive organisms affects the health of not only the forests and rangelands but also of wildlife, livestock, fish, and humans.⁸⁶

Invasive plants such as bull thistle, bindweed, and salt cedar are a concern complicating forest management all over New Mexico. However, some forest managers have come under heated criticism for the use of herbicides to kill these noxious weeds.⁸⁷ Critics argue that herbicides pose risks to fragile aquatic life and sensitive wildlife pollinators, such as butterflies. In the Gila-Cliff area, agricultural areas are being invaded by yellow star-thistle, according to the New Mexico Audubon Society. Non-herbicidal treatments are under investigation.⁸⁸

Salt cedar (tamarisk) is a tree that grows along rivers and streams, absorbing and transpiring large amounts of water, making it an invasive species that greatly impacts watersheds and riparian systems. FS personnel mechanically remove the tamarisk in sensitive areas or where infestations are small. However, mechanical removal is considered impractical for infested areas with many miles of stream or covering hundreds of acres. Unfortunately, the use of herbicides over large

⁸² USDA FS, “Fire and Fuels Build Up,” *USDA FS* position paper (January 2005), <http://www.fs.fed.us/publications/policy-analysis/fire-and-fuels-position-paper.pdf>.

⁸³ Telegraph Staff, “\$5,000 Reward Offered In Lookout Fire,” *Albuquerque Journal*, May 27, 2004.

⁸⁴ More information about this growing trend can be found in [Jesse McKinley](#) and [Kirk Johnson](#), “At Your Peril: On Fringe of Forests, Homes and Fires Meet,” *The New York Times* (June 26, 2007).

⁸⁵ Fred Norbury, “Statement of Fred Norbury Associate Deputy Chief National Forest System Forest Service United States Department Of Agriculture before the Subcommittee on Public Lands and Forests Committee on Energy and Natural Resources,” September 28, 2005,

http://energy.senate.gov/public/index.cfm?FuseAction=Hearings.Testimony&Hearing_ID=1500&Witness_ID=4269

⁸⁶ USDA FS, “Invasive Species Program,” <http://www.fs.fed.us/invasivespecies/definition.shtml>.

⁸⁷ J. Berdie, letter to editor, *Santa Fe New Mexican*, January 14, 2006.

⁸⁸ New Mexico Audubon Society Important Bird Areas fact sheet on the Gila-Cliff area, <http://nm.audubon.org/iba/ibawriteups/gilaciff.html>.

areas means more herbicides in the watershed. Tribal and pueblo peoples have also expressed concern over the use of herbicides that can make their way onto their lands.⁸⁹

The fire danger in New Mexico is oftentimes intrinsically linked to the bark beetle. Forests are at risk of beetle infestations due to recent drought conditions in the area.⁹⁰ Bark beetles infest piñon and other pine varieties distressed from already existing drought conditions. The result is rapid mortality of large stands of trees, resulting in higher fuel levels. The beetles typically have a two-year life cycle and regulate their own population. However, they can cause extensive damage to forests. Conventional wisdom dictates once you see the beetles, it's already too late.

4.3.3 Loss of Open Space and Pristine Areas

According to the FS website on the four threats,

More than 34 million acres of open space were lost to development between 1982 and 2001, about 6,000 acres per day, 4 acres a minute. Of this loss, over 10 million acres are in forestland. Rapid development of forestland is expected to continue over the next couple of decades....The loss of open space affects the ability of forests and grasslands to provide public benefits, ecosystem services, and products – such as clean water, scenic beauty, places to recreate, wildlife and biodiversity, wood and food, and jobs in farming, ranching, and forestry.⁹¹

Forest areas located at the edges of growing towns and cities or in prime recreation areas popular for second-home development are the most at risk of losing open space. Increases in housing density and associated development (such as power lines, septic and sewer systems, and shopping centers) can result in changes in wildlife habitats, changes in forest health, reduced opportunities for outdoor recreation, and greater loss of life and property to wildfire. The development of private lands in and surrounding the Gila NF poses a number of issues affecting forest management.

4.3.4 Unmanaged Recreation

Off-highway vehicle (OHV) use is the primary form of unmanaged recreation in the Gila NF. According to the FS, OHV ownership nationally has grown from 5 million in 1972 to 36 million in 2002.⁹² The growing use of OHVs has major implications for forest planning and management. The effects of OHV use include miles of unplanned trails and roads, erosion, recreational use conflicts, spread of invasive species, damage to cultural resources and historical sites, disturbance to wildlife, destruction of habitats, and risk to public safety.

As discussed in Chapter 3, Section 3.6, the FS implemented the Travel Management Rule for OHV use in national forests and grasslands, which went into effect in December of 2005.⁹³ New

⁸⁹ John C. Russell and Peggy A. Adams-Russell, "Values, Attitudes and Beliefs toward National Forest System Lands: The New Mexico Tribal People," *Adams-Russell Consulting* (released as a Forest Service report under the same name) (2005): 18.

⁹⁰ Tom Sharpe, "Preparing for the Worst," *The Santa Fe New Mexican*, Feb 21, 2006. Regarding New Mexico invasive species, the *invasive.org* website on invasive and exotic species shows pictures of the mountain pine beetle, www.invasive.org/search/action.cfm?q=new%20mexico.

⁹¹ USDA FS, "Four Threats," <http://www.fs.fed.us/projects/four-threats/#space>.

⁹² USDA FS, "Four Threats," <http://www.fs.fed.us/projects/four-threats/#recreation>.

⁹³ USDA FS, "USDA Forest Service Releases Final Rule for Motorized Recreations in National Forests & Grasslands," FS Press Release, November 2, 2005, <http://www.fs.fed.us/news/2005/releases/11/travel-management.shtml>.

guidelines provide re-designation of trails and routes for different types of uses. Response to the plan has been mixed, and it has been suggested by users that there may be a need for more clarity in the designations.⁹⁴

4.4 Endangered and Threatened Species

As has been mentioned, the Gila NF supports a vast variety of birds and other animals. A number of the species in the Gila NF are listed as endangered or threatened species under the Endangered Species Act. Endangered species include the Southwestern willow flycatcher, the lowland leopard frog, the Mexican gray wolf, and the spikedace. Threatened species on the list include the loach minnow and the Gila woodpecker.⁹⁵

The Mexican gray wolf was reintroduced into the Blue Range Wolf Recovery Area in Central Arizona and New Mexico in 1998.⁹⁶ This area includes the Gila NF. Reintroduction of a top predator is highly complex and very controversial. Some conflict with particular forest uses, such as cattle grazing, was no doubt inevitable.⁹⁷

4.5 Challenges and Opportunities for Forest Management

Forest health and fire are the major issues regarding land cover in the Gila NF. The majority of the forest is covered with evergreen forests. Forest users and forest planners lament the overgrowth of trees in the forests. They say some areas of federal land that were once open and park-like with 150 to 200 trees per acres now have as many as 800 trees per acre, a situation some have described as “choking to death.”⁹⁸ Historically, brush and many small-diameter trees would have been destroyed by fire. Ironically, and as is now widely recognized, the FS’s decades-old policy of fire suppression has created conditions ripe for a small fire to quickly become a conflagration capable of completely destroying thousands of acres of forest. Such fires can also take out homes. The Gila NF has the highest occurrence of fires among NFs within the state. The stakes have become higher in the Gila NF as more and more people take up residence within the forest or along the forest periphery.

How to restore the forest so that natural processes including fire will have a sustaining role in maintaining the health of the forest is the FS’s charge. Many forest-users perceive the need for

⁹⁴ “At entry ways to the forest, there needs to be information about what the use issues are and how areas can be used.” John C. Russell and Peggy A. Adams-Russell, “Values, Attitudes and Beliefs toward National Forest System Lands: The Gila National Forest,” *Adams-Russell Consulting* (released as a Forest Service report under the same name) (2005): 41.

⁹⁵ New Mexico Department of Game and Fish Conservation Services Division, “Threatened and Endangered Species of New Mexico 2006 Biennial Review,” August 25, 2006, <http://www.wildlife.state.nm.us/documents/06BiennialReviewExecSumm06RvulnInfo.pdf>.

⁹⁶ For a discussion of the history of legal controversy surrounding this reintroduction program, see Edward A. Fitzgerald, “Lobo Returns from Limbo: New Mexico Cattle Growers Association vs. U.S. Fish & Wildlife Service,” *Natural Resources Journal* 46, no. 1 (Winter 2006): 9-64.

⁹⁷ For a history of the Mexican gray wolf recovery effort, see U.S. Fish & Wildlife Service, The Mexican Wolf Recovery Program, “Welcome to the Mexican Gray Wolf Recovery Program,” <http://www.fws.gov/southwest/es/mexicanwolf/index.shtml>.

⁹⁸ Harv Forsgren, “Statement of Harv Forsgren / Regional Forester, Southwestern Region / USDA Forest Service / Subcommittee on Forests and Forest Health / Committee on Resources / U. S. House of Representatives / Concerning Issues Affecting Rural Communities in the Southwest - National Forest Management and the Endangered Species Act,” September 20, 2004, <http://www.fs.fed.us/congress/108/house/oversight/forsgren/092004.html>.

logging, or forest thinning, to promote forest health in the long term, and they see possibilities for economic development based on processing small-diameter trees. There are a number of promising projects around the Gila NF. (See Chapter 8.) Making it work in the longer term requires investment; it requires finding, developing, and expanding markets for the products as well as the byproducts, and it requires developing a continual local supply of input (small diameter trees) to keep sawmills running and customer orders filled. While these projects seem to be a win-win for the forest and for the communities that surround them, there are some who voice concerns about any type of logging or removal of trees from the forest.

Controlled burns, either intentionally set or naturally started, are an alternative and may be pursued as a complimentary strategy. This is indeed happening in the Gila, as Chapter 8 describes. Of course, there are numerous examples of “controlled” burns that have raged out of control. Complicating the strategy of allowing fire to destroy the brush and the small trees are the growing number of people who have taken up residence within or right next to the forest and who may voice opposition because they fear damage to or loss of their property.

The presence of a number of endangered species within the Gila NF puts considerable pressure on the FS (including the continual threat of litigation) to protect habitat. Protecting habitat, however, may mean restrictions or outright bans on certain uses in certain areas. The reintroduction of the Mexican gray wolf creates additional challenges, given the potential threat to livestock in a forest with extensive grazing allotments.

5 Forest Uses and Users

The purpose of this chapter is to describe the ways in which the Gila National Forest (NF) is used and by whom. The Forest Service (FS) works to allow the land to be accessed for multiple uses, including recreation, hunting, wood gathering, and grazing, as well as to provide scenic resources for the community and visitors. The groups of people who own, manage, and use NF resources are diverse, and they interact with the forest environment in ways that have significant consequences for forest ecosystems and the people who depend on them.⁹⁹

The FS is guided by a multiple-use mandate to administer lands for the purposes of recreation, grazing, timber, watershed, fish, and wildlife.¹⁰⁰ However, there is a basic challenge inherent in the multiple-use principle: increased usage by diverse and growing populations inevitably runs up against the fundamental constraint of limited resources. As a result, one type of use begins to impinge on another, potentially resulting in conflict. Land-use conflict is a major challenge for FS officials because it is involved in practically every forest planning decision. While philosophically many forest users are hesitant to limit access, increasing attention is being given to how some users are degrading the land and the experiences of other users.

In the Gila NF, there has been a long-standing conflict between resource-based uses such as grazing and logging and the need to protect the forest, including the Gila NF's riparian areas and old growth forests, which also may provide critical habitat for endangered species. Recreational users themselves frequently come into conflict. Mountain bikers share many of the same trails as hikers and horseback riders. Their presence may startle or otherwise disturb other users; bikes also cause damage to trails, leaving ruts and bare roots. Motorized off-highway vehicles (OHVs) pose an even greater threat to the enjoyment of other recreational users and to the overall health of the forest. One major result of the growing use of motorized vehicles is the growing number of unauthorized user-created roads. (See Chapter 3, section 3.6.)

5.1 Recreation

Recreation is a major use of the Gila NF. Data collected by the FS indicate that over one million people visited the Gila NF from October 2000 to September 2001.¹⁰¹ As **Table 5.1** indicates, local visitors make up about 57 percent of total recreational visitors. **Table 5.1** is based on data from the National Visitor Use Monitoring (NVUM) survey conducted by the FS.¹⁰² The database breaks down visits as either for recreation (e.g., hiking, camping, and picnics) or for wildlife-related purposes (e.g., hunting and fishing and wildlife watchers, like photographers and bird-watchers). Unfortunately, there is no break-out by ranger district (RD). While the Gila NF has some "fee areas", most areas of the forest are not fee areas, so visitors can access many sites without charge.

⁹⁹ John F. Dwyer and Herbert W. Schroeder, "The Human Dimensions of Urban Forestry," *Journal of Forestry* 92 no. 10 (October 1994): 12-15. John F. Dwyer, "Integrating Social Sciences in Ecosystem Management: People-Forest Interactions in the Urban Forest," in *Integrating Social Sciences and Ecosystem Management: A National Challenge*, ed. H. Ken Cordell, (Athens, GA: USDA Forest Service, Southern Research Station, December 1995), 39-43.

¹⁰⁰ "Multiple-Use Sustained-Yield Act of 1960," 16 U.S.C. §§ 528-531, <http://www.fs.fed.us/emc/nfma/includes/musya60.pdf>.

¹⁰¹ This number does not include non-primary visitors. USDA FS, "National Visitor Use Monitoring Results," http://www.fs.fed.us/recreation/programs/nvum/reports/year2/R3_F6_gila_report.htm#_Toc18390772.

¹⁰² The NVUM Program is an effort within the Recreation, Heritage & Wilderness Programs that collects visitor satisfaction and use information for national forests and grasslands. Information can be found at the USDA FS website: <http://www.fs.fed.us/recreation/programs/nvum/>.

Table 5.1: Number of Recreational & Wildlife Visitors to the Gila NF

Type of Visit	Recreation	Wildlife	Total	%
Non-local Day Travel to Forest	8,960	4,413	13,373	1.3%
Non-local Overnight Stay on Forest Land	98,555	48,542	147,098	13.9%
Non- local Overnight Without Stay on Forest Land	197,111	97,084	294,195	27.8%
Local Day Travel to Forest	215,030	105,910	320,940	30.4%
Local Overnight With Stay on Forest Land	44,798	22,065	66,863	6.3%
Local Overnight Without Stay on Forest Land	143,353	70,607	213,960	20.3%
Total Gila Forest Users	707,806	348,621	1,056,428	100%

Source: NVUM Gila 2000.

The Gila NF has some major attractions, including the Catwalk in the Glenville RD and the Gila Cliff Dwellings in the Wilderness RD, but many visitors come to enjoy the wilderness areas and the vast areas of the forest that are roadless and relatively undisturbed. They come to hike and backpack, to view wildlife, to fish, or to avail themselves of the superb hunting opportunities. The Gila NF has hundred of miles of trails available to both horseback riders and mountain bikers. There are also rafting opportunities on the Gila and San Francisco Rivers. The Gila NF also has a number of hot springs and pools. The rich mineral deposits which made the Gila area a center for mining a century ago today provide opportunities for rock hounds. Visitor spending is the single most important contributor to the economic impact of the Gila NF. Spending profiles of various recreational visitors is discussed in Chapter 7, “Economic Impacts.”

5.2 Hunting and Wildlife

Many visitors, especially hunters and other wildlife enthusiasts, are attracted by the diverse wildlife in the Gila NF area. In 2001, 595,000 New Mexico residents participated in hunting, fishing, or wildlife watching, contributing about \$1 billion to the state’s economy.¹⁰³ The Gila NF offers world class hunting, particularly in the Reserve and Quemado RDs. There are a number of local outfitters and guides who take people out into the NF to hunt elk, deer, bear, mountain lions, and smaller animals, such as javelina and turkeys. According to the websites of some of these outfitters, a 5-day hunting trip for bull elk can cost \$3,500 to \$4,500 plus the permit (draw) fee of \$760.¹⁰⁴ Coue deer can be more expensive. Smaller game are typically much less – \$200-300 a day.

Under federal mandate, hunting is regulated by the states, which are responsible for issuing permits and licenses. In New Mexico, permits for big game, elk, bear, big horn sheep, deer, and antelope are issued on a lottery basis to New Mexico residents and non-residents, always with higher fees for non-residents. The seasons and hunting dates are highly regulated. A full description of elk and deer hunting regulations can be found in the appendix, **Table A.3**.

¹⁰³ U.S. Fish & Wildlife Service, “2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation National Overview” (May 2002), U.S. Department of the Interior, Fish and Wildlife Service, 50 State Reports, http://library.fws.gov/nat_survey2001.pdf.

¹⁰⁴ Starkweather Canyon Outfitter and Guide Service, <http://www.gilanet.com/starkweather/>; Walker Outfitters, <http://www.gilawilderness.com/elk/>; L.J. Armstrong Big Game Outfitter, <http://www.highcountryhunts.com/index.htm>.

Elk is the premier big game in the state, especially in the Gila NF. A later section in this chapter will provide data indicating that hunting guides and outfitters purchase the greatest number of special use permits in the area. The New Mexico Game & Fish Department has divided the state into geographical areas designated as Game Management Units (GMUs). Regulations regarding hunting dates and limits are set at the unit-level. **Table 5.2** provides information on the GMUs in the Gila NF for elk and big game and for antelope.

Table 5.2: Game Management Units in the Gila NF

Gila NF	Elk and Big Game	Antelope
Catron	15,16A,16B,16C,16D,16E	9,11,13
Sierra	21A,21B,20,24	17,19,21
Grant	16B,22,23,24	14
Hidalgo	26,27	16

Source: New Mexico Game and Fish

The New Mexico Department of Game and Fish issues up to 250 elk hunting licenses for bow hunters between September 1st and 24th. Additionally, the department issues up to 500 licenses in unit 17 for muzzleloader hunters.¹⁰⁵

The Gila NF is also a favored place for wildlife watching. According to the Gila NF website, “Approximately 337 bird species have been sighted. Of these, 166 species are known to breed on the forest, 114 are more or less regular non-breeders, and 57 are considered to be casual or accidental.”¹⁰⁶ The number and variety of birds reflects the diverse ecology and the Gila NF’s location on a migratory flight path. The Gila River Bird Habitat Area is located in the Burro Mountain region and draws bird watchers from all over the world. The rare Black-Hawk can be found in this area, as well as other birds ranging from cardinals to Gila Woodpeckers. The Bird Habitat Area supports 180 species of breeding birds, along with numerous other wildlife. Superb birding is also found in the deciduous and coniferous riparian woodland nestled in ponderosa pine forest near the Cherry Creek and McMillan campgrounds. The various habitats of riparian, oak, pinon-juniper, ponderosa pine woodland, and grassland areas of the Fort Bayard Historic District also provide diverse habitats for many bird species.

Although the Gila is relatively dry, fishing opportunities can be found in many miles of perennial creeks and rivers as well as in man-made lakes. Some of the more common sport fish found in these waters include rainbow and brown trout, large and small mouth bass, and channel and flathead catfish. Many native fish are also found in the streams on the Gila, several of these, such as the Gila Trout are considered threatened or endangered.¹⁰⁷ Recovery efforts are underway to help establish fishable populations of the Gila Trout.¹⁰⁸

The Gila NF offers several lake and stream fishing opportunities. The following text describing locations and opportunities is from the Gila NF recreation website.

¹⁰⁵ New Mexico Department of Game and Fish, “New Mexico Wildlife Rules and Information Booklets,” <http://www.wildlife.state.nm.us/publications/BigGameRulesandInformationBooklet.htm>.

¹⁰⁶ USDA Forest Service, Gila National Forest, “Recreation – Birding,” <http://www2.srs.fs.fed.us/r3/gila/recreation/recactivity.asp?activity=bird>.

¹⁰⁷ New Mexico Department of Game and Fish Conservation Services Division, op cit.

¹⁰⁸ USDA Forest Service, Gila National Forest, “Recreation – Fishing,” <http://www2.srs.fs.fed.us/r3/gila/recreation/recactivity.asp?activity=fish>.

Lake fishing on the Gila National Forest is limited to three manmade lakes, which are stocked with rainbow trout by the New Mexico Department of Game and Fish (NMDGF) in fall, winter and spring months. Quemado Lake and Snow Lake offer year round trout fishing and Lake Roberts offers trout fishing during the cooler months and warm water fishing for channel catfish and small mouth bass during the summer months.¹⁰⁹ There are an additional three lakes, Bear Canyon Reservoir, Wall Lake, and Bill Evans Lake located adjacent to the Forest that are leased by the NMDGF and where the public is welcome to fish The Gila National Forest contains many miles of streams that provide both cold and warm water fishing opportunities. Both the Gila River and the San Francisco River along with their many tributaries are located within the Forest. Upper reaches and headwater tributaries of both [the Gila and the San Francisco Rivers, which are within FS boundaries,] offer trout fishing, while the lower reaches of both rivers offer quality warm water fishing opportunities.¹¹⁰

Available NVUM data did not differentiate hunters from wildlife watchers. Consequently, it is difficult to confidently state how many people hunt or watch wildlife in the Gila NF, but one can use the “wildlife” counts of the NVUM database as an approximate estimate. **Table 5.1** indicates that as many as 350,000 people visited the forest to watch or hunt wildlife.

5.3 Grazing

Approximately 95 million acres, accounting for 65 percent of the entire NF system, is used for grazing in the western states. The Southwestern region of the NF system is responsible for 22 percent of all grazing on public land. Grazing is the second most substantial commercial activity after visitors and recreation on the Gila NF and has a significant economic impact on surrounding rural communities. This will be explored in full detail in Chapter 7, “Economic Impacts.”

Table 5.3 lists the number of grazing permits issued over the past several years by each RD.¹¹¹ An allotment is an area of land where one or more individuals graze their livestock. An allotment may have single or multiple permits in operation at the same time. Glenwood, Quemado, and Silver City RDs are the most active in terms of the number of grazing allotments.

¹⁰⁹ The Quemado Lake Recreation Area in the Quemado RD includes the 131 acre manmade trout lake with two ADA fishing piers, two boat ramps, and several developed and one primitive campground. In the Reserve RD, Snow Lake Developed Recreation Area includes a 50-acre man-made lake, with an ADA accessible fishing pier, boat ramp, and one developed and one undeveloped campground.

¹¹⁰USDA Forest Service, Gila National Forest, “Recreation – Fishing,” <http://www2.srs.fs.fed.us/r3/gila/recreation/recactivity.asp?activity=fish>.

¹¹¹ FS staff indicated the data covered “the past several years.” Personal communication, 27 March 2006.

Table 5.3: Number of Grazing Permits Sold in Gila NF

	# Permittees	# Allotments			
		Active	Closed	Combined	Vacant
Black Range	19	17	0	0	0
Glenwood	30	26	0	0	3
Quemado	30	26	0	1	1
Reserve	28	21	0	0	1
Silver City	30	26	3	2	1
Wilderness	10	10	0	0	1
District Total	147	126	3	3	7

Source: USDA Forest Service Grazing Permits and Grazing Allotment Databases

Table 5.4 lists the number of animal unit months (AUMs) on the Gila NF. An AUM is the amount of forage needed to sustain one cow and her calf, one horse, or five sheep or goats for a month. The grazing fee for western public lands was raised to \$1.43 per AUM from \$1.35 in 2003.¹¹² The 2005 fee is \$1.79 per AUM.¹¹³ Note that the total AUMs have generally been lower in recent years than a decade ago. The table also provides the Bureau of Business and Economic Research's (BBER) estimate of the number of employees needed to sustain each year's level of grazing based upon estimates of man-hours derived from the IMPLAN[®] model.¹¹⁴

Table 5.4: Animal Unit Months on Gila NF, 1990-2002

Year	AUM's	Employees
1990	240,648	182
1991	238,761	181
1992	231,373	175
1993	246,081	187
1994	272,180	206
1995	264,047	200
1996	245,431	186
1997	223,011	169
1998	192,834	146
1999	208,704	158
2000	224,495	170
2001	198,514	151
2002	212,439	161

USDA Forest Service Grazing INFRA Database

Grazing fees are charged per AUM. The INFRA database had substantial missing data on grazing fees, so BBER did not attempt to calculate the total revenues from the permit allotments. The

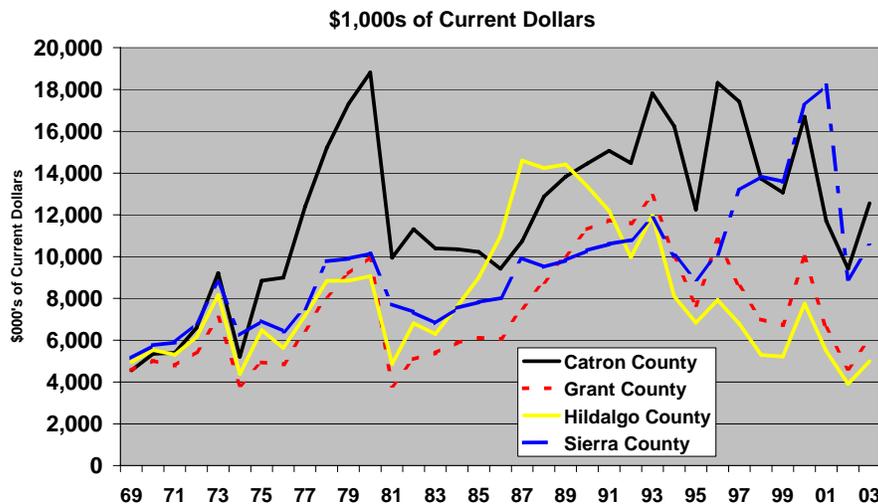
¹¹² USDA FS, "2004 Federal Grazing Fee Announced," News Release: FS-0406, February 20, 2004, <http://www.fs.fed.us/news/2004/releases/02/grazing-fee.shtml>. United States Government Accountability Office, op cit.

¹¹³ U.S. Department of the Interior Bureau of Land Management, "IM 2005-067, The 2005 Grazing Fee, Surcharge Rates, and Penalty for Unauthorized," February 9, 2005, <http://www.blm.gov/nhp/efoia/wo/fy05/im2005-067.htm>.

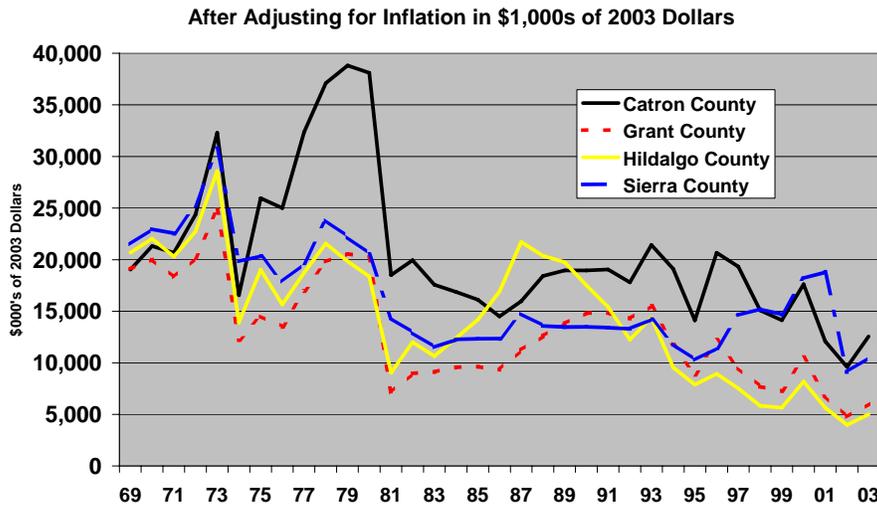
¹¹⁴ IMPLAN[®] is a PC-based regional economic analysis system. Originally developed by the USDA Forest Service, it is now used by multiple federal agencies. The current IMPLAN database and model is maintained and sold by Minnesota IMPLAN Group, Inc., <http://www.implan.com>.

INFRA database contains data on the acreage of grazing allotments; however, BBER staff was informed that the data represented “ballpark estimates” of acreage and may include additional acreage such as Bureau of Land Management land, private land, and in-holdings. Testimony by Steve Libby, Forest Staff Officer for Range, Wildlife, Watershed, and Forest Planning on the Gila NF, at a hearing of the Public Land Grazing Task Force in 2000, indicated that most of the 3.3 million acres of FS land in the Gila NF is open to grazing with only about 6 percent closed.¹¹⁵ At that time, 2.5 million acres, or about 81 percent, were actually grazed. Within the 870,000 acres of wilderness, 323,000 acres were grazed, 350,000 acres had vacant allotments, and 193,000 acres were closed to this use.

BBER did make use of data on the farm sector available from the U.S. Bureau of Economic Analysis (BEA) to examine trends in farm receipts from livestock in the four assessment area counties. **Figure 5.1** presents the history from 1969 through 2003, the latest year available in current dollars. The top graph presents the data in current dollars; the second graph presents the data after adjusting for inflation using the BEA’s Price Index for Personal Consumption Expenditures and in 2003 dollars. As the graphs indicate, ranchers have generally been losing ground in terms of their cash receipts. In Hidalgo County, the situation has been deteriorating since the mid-1980s; in Grant County, the change occurred in the early 1990s.



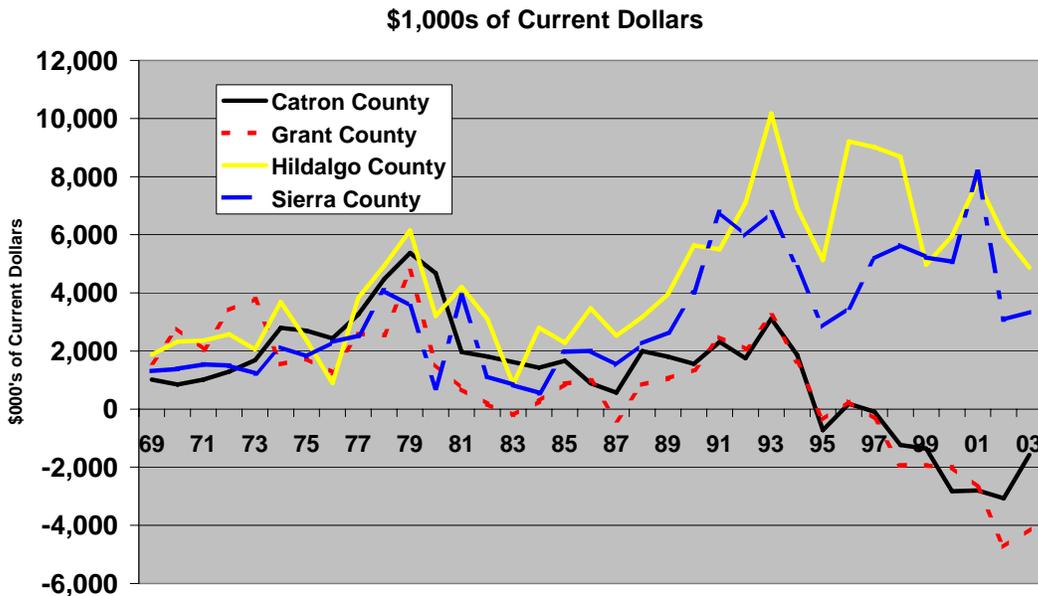
¹¹⁵ New Mexico Department of Agriculture, “Public Land Grazing Task Force Gila National Forest Hearing,” 7-8.



Source: U.S. Bureau of Economic Analysis

Figure 5.1: Cash Receipts from Livestock and Products, 1969-2003

Figures on farm income are not available separately for livestock operations versus crops. **Figure 5.2** presents the data for each of the four counties from 1969 forward. Note that the farm sector in both Catron and Grant Counties has been running on negative earnings since the mid-1990s, even without adjusting for inflation. The situation in these two counties is in marked contrast with the situation in Hidalgo and Sierra Counties, where the farm sector is more diversified and overall farm income was helped by production of crops.



Source: U.S. Bureau of Economic Analysis

Figure 5.2: Farm Proprietors and Employee Income, 1969-2003

The BEA figures on the farm sector do not include data on either the number of farms nor on the number of acres in farming. However, that information is available from the Census of Agriculture, which is conducted every five years. The data for the four counties of the assessment area and New Mexico are tabulated in **Table 5.5**. Most interesting for the purposes here is the number of farm acres, which increased in the assessment area between 1992 and 1997, but showed a decline in 2002. The decline reflects developments in a single county, Catron County, which expanded farm acreage considerably between 1992 and 1997, but showed sharp declines thereafter. Hidalgo and Sierra Counties gained farm acreage both in 1997 and in 2002. Grant County lost farm acreage between 1992 and 1997, but the total for 2002 was slightly above that of a decade earlier.

Table 5.5: Farms, Land in Farms, Land in Crops

	Catron	Grant	Hidalgo	Sierra	Assessment	
					Area	New Mexico
Number of Farms						
1992	236	297	147	207	887	14,297
1997	217	286	146	180	829	14,094
2002	206	272	144	223	845	15,170
Land in Farms						
1992	1,553,328	1,209,335	843,401	1,233,794	4,839,858	46,849,244
1997	1,816,901	1,187,882	1,113,354	1,289,287	5,407,424	46,177,267
2002	1,644,937	1,218,119	1,127,578	1,362,866	5,353,500	44,810,083
Total Cropland						
Number of Farms						
1992	69	148	77	126	420	9,447
1997	77	138	83	120	418	11,234
2002	94	123	92	156	465	10,855
Cropland						
1992	27,209	10,433	D	D	37,642	2,252,970
1997	13,748	14,856	25,110	24,823	78,537	2,307,719
2002	16,937	12,921	35,101	38,349	103,308	2,575,107
2002 % of total	1.0%	1.1%	3.1%	2.8%	1.9%	5.7%

Source: 1997 and 2002 Census of Agriculture - County Data

The data for Catron County help to explain the reduction in livestock cash receipts, particularly since 1997, but how can one explain the increases in farm acreage in the other counties? For Sierra and Grant, the explanation may partly lie in the increases in cropland between 1997 and 2002. The percentage of land in crops, as opposed to woodland or pasturage, is everywhere below the state average in 2002, but the percentages in Hidalgo and Sierra Counties – close to 3 percent – are well above the 1 percent levels found in Colfax and Grant Counties. This finding is consistent with the BEA data, which show greater reliance on crops for these two counties. The increasing farm acreage in Grant County cannot be thus explained, as cropland actually fell between 1997 and 2002. Perhaps Grant County is seeing more “gentlemen farmers,” those whose income is derived from other activities. This is one form of amenity migration. Perhaps, as seems to be true in other New Mexico national forests, there are ranchers who continue ranching as a way of life but who have developed other means of making a living.

The data on farm receipts, income, and acreage farmed attest to some problems in ranching. Ranchers face problems relating to the general drought conditions in the Southwest; they may face deteriorating market conditions and declining prices that threaten not only their short-term operations, but also the likelihood of their children being able to afford to take over their

operations.¹¹⁶ In addition, the sustainable grazing practices mandated by the Rangeland Renewable Resources Planning Act and the Multiple Use Sustained Yield Act, as well as the protections of animal habitat and water quality required by the Endangered Species Act and the Clean Water Act, have led to changes in FS management of the grazing program for the Gila and other national forests.¹¹⁷ For some allotments, these changes have meant lower limits on the number of animals that can be grazed; in some cases, ranchers have been required to move their herds and fence them in areas to prevent over-use and over-grazing. In other cases they have been forced to pipe in water, which requires additional investment and raises operating costs.¹¹⁸ The compounding of these circumstances can drive ranchers to the margin, with some deciding to quit entirely. Others may decide to sell off their rangelands, within or on the perimeter of the forest, taking advantage of the much higher prices paid for land used for residential development. This development has been discussed in several of the previous chapters.

5.4 Timber

Timber has a long history of traditional uses in the Gila NF, and logging was once a very important activity. Once a major industry, the timber industry today provides relatively few jobs, as Chapter 7 will show. However, there has been growing interest in small diameter wood products, and a number of partnerships have formed (see Chapter 8). There are enterprises to take this input to market, but one of the problems in the Gila NF and elsewhere has been guaranteeing a long-term supply of wood.

Table 5.6 shows the revenues gained from selling rights to harvest timber and other products within the Gila NF from 2000 to 2004. The data in this and other tables in this section are from the Timber Information Management (TIM) database.¹¹⁹ When an entity purchases rights to the forest, it can access the forest for a certain period of time, typically one year. The “Actual Cut” column applies the same per board foot prices as in the permit and indicates the value of the timber actually harvested in a given calendar year.

¹¹⁶ John C. Russell and Peggy A. Adams-Russell, “Values, Attitudes and Beliefs toward National Forest System Lands: The Gila National Forest,” *Adams-Russell Consulting* (released as a Forest Service report under the same name) (2005): 21.

¹¹⁷ United States Congress. “Forest and Rangeland Renewable Resources Planning Act of 1974,” Public Law 93-378, 16 U.S.C. §§ 1600-1687. As Amended Through Public Law 106-580. United States Congress. “Clean Water Act,” 33 U.S.C. §§ 1251-1387, October 18, 1972, as amended 1973-1983, 1987, 1988, 1990-1992, 1994, 1995 and 1996.

¹¹⁸ This discussion is based on an April 2006 telephone conversation with Ralph Pope, Range Specialist for the Gila NF.

¹¹⁹ The TIM is a set of computer systems and databases used by the FS and the USDA for managing technical and financial data about the sale of forest products and timber on FS lands.

Table 5.6: Timber Sales on Gila NF, 2000-2004

Year	Rights to Harvest	Actual Cut
2000	\$24,378	\$26,032
2001	\$40,239	\$35,585
2002	\$39,777	\$36,536
2003	\$47,452	\$52,340
2004	\$51,350	\$53,040
Total	\$203,196	\$203,532

Note: All timber is valued at USFS prices per million board feet.

Source: USDA Forest Service TIMS Database, Gila National Forest.

Summary statistics on timber and non-timber special product activity in the Gila NF are provided in **Table 5.7**. Note that the most valuable forest product in the Gila in 2004 was fuelwood, accounting for about 42 percent (\$670,861) of the sales value of the total timber cut in that year. Poles, with a total sales value of \$600,478, were a close second, while pinesaw timber was a distant third (\$153,019).¹²⁰ In terms of special forest products, the major draw is Christmas trees. The data show that the FS collected about \$51,000 in permits in 2004.

Table 5.7: Timber and Non-Timber (Special) Product Activity on the Gila NF, 2004

Product	Rights to Harvest Volume (MBF)	USFS Value of These Rights (Permits)	Actual Cut Volume (MBF)	Estimated Market Prices	Sold Value ^d
Pine Sawtimber ^a	385	\$4,068	214	\$397.47	\$153,019
Hard Sawtimber ^a	0	\$0	0		\$0
Pine Pulpwood ^b	207	\$0	49	\$61.59	\$12,746
Hard Pulpwood	0	\$0	0		\$0
Poles	1,079	\$998	1,079	\$556.51	\$600,478
Posts ^c	34	\$832	34	\$4.35	\$149
Fuelwood	2,096	\$41,891	2,096	\$160.00	\$670,861
Total Timber	3,802	\$47,790	3,472		\$1,437,253
Misc. Convert	9	\$65	9		\$65
Christmas Trees	562	\$2,790	562		\$2,790
Misc. Not Convert	0	\$0	0		\$0
Transplant	0	\$0	0		\$0
Total Non-Timber	571	\$2,855	571		\$2,855
Total	4,373	\$50,645	4,043		\$1,440,108

a. Montana delivered prices

b. Texas Timber Price Trends, 2002

c. Missouri/MBF

d. Sold value reflects use of estimated market prices, except for non-timber, where the forest service fees are used.

Source: USDA Forest Service TIMS Database, Gila National Forest.

Wood gathering activities have additional benefits for the forest, as they help to reduce fire dangers caused by excessive overgrowth. Small-scale fuelwood harvesting is a form of subsistence for residents who depend on the wood for heat. A twenty dollar permit allows the harvesting of a maximum of four cords of dead and down firewood as well as dead standing pine and juniper. Up to ten cords of wood for personal use are allowed per household. Some people also harvest firewood to sell, as a way of bringing in additional cash.

¹²⁰ The data show the cut and sales volume of a million board feet (MBF). MBF is a measure of wood where one board foot equals the volume of a one inch thick board, 12 inches wide and 12 inches long.

There is great potential for rural economic development in the use of small-diameter wood to create products such as vigas and other building materials, fencing, and wood pellets to be used in stoves for heating. In Silver City, Tierra Alta Fuels, which produces pellets from small diameter trees, was started in 1998. Another local effort is Gila WoodNet, a nonprofit corporation that was set up in 1999 to find viable markets for wood products made from small diameter wood that would otherwise choke the forest and pose a major fire hazard.¹²¹ Small diameter wood is often referred to as an underutilized resource because it can be used for a variety of products, including those used in sustainable house building. If managed well, small-diameter wood harvesting can be a major economic resource for small, rural communities.

5.5 Mining and Extractive Industries

As previous sections have described, there has been considerable mining activity (gold, silver, and more recently, copper) on or near the Gila NF.¹²² Extractive uses have declined drastically over time in the Gila NF, resulting in job and often population losses. BBER was unable to document any existing mining production or extractive activities occurring in the Gila NF today. However, the lack of current activity does not rule out future activity.¹²³ **Table 5.8** documents the mining claims on or near roadless areas within the Gila NF.

¹²¹ Gila WoodNet, <http://www.gilawoodnet.com/>.

¹²² Sherman, op. cit.

¹²³ As a later section of this report documents, there are special use permits for energy generation/ transmission, typically gas pipelines. Susan Kamat, geologist with the New Mexico Mining and Minerals Division, determined that the only registered mine in the Gila River basin that is new since 2001 is a perlite mine in Grant County. The mine is under development and hasn't started surface operations yet. Details for the mine include the following:

St. Cloud McCauley Perlite Mine
 Operator: St. Cloud Mining, P.O. Box 1670, T or C, NM 87901
 Contact: Pat Freeman (505) 742-5215
 Location: Sec19 T16S R18W
 USGS Quad: Antelope Ridge Type of Operation: Surface Mine

Table 5.8: Mining Industry Control of Public Lands on or Near the Gila NF Roadless Area

Control Summary: Gila Forest Roadless Area	Controls inside the boundary	Controls within 5 miles
Tier 1 control - active mining and drilling		
Mining plans/notices - active and proposed mining operations	0	2
Tier 2 control - land controlled by industry		
Mining claims - current land claims by mining industry	27	947
Oil & gas leases - active leases not yet producing	0	3
Tier 3 control - abandoned or defunct operations		
Closed or abandoned mines/plans/notices	8	135
Mining patents - mineral-rich public lands titled to mining industry	20	450
Oil & gas leases - formerly drilled and pumped	18	75
Tier 4 control - sites refused or abandoned		
Mining claims - land formerly claimed by industry	2,091	10,015
Oil & gas leases - lands formerly leased by industry	35	130

Source: EWG analysis of the Bureau of Land Management's Land and Mineral Records 2000 (LR2000) database (BLM 2004), the United States Geological Survey's Mineral Availability and Mineral Industry Location records (USGS 1998), and various industry sources. Land use records are current through October 15, 2004.

5.6 Special Use Permits

The Gila NF sanctions the use of NF lands by issuing special use permits. Permits authorize occupancy, usage, rights to, and privileges on the forest lands. As **Table 5.9** shows, from 1949 to 2005 in the six Gila NF RDs combined, special use permits have been granted most commonly for recreational and transportation uses.

Among recreational uses permitted in the Gila NF, the vast majority went for outfitters and guides. The FS's Special Uses Database System indicates 99 active permits for outfitters and guides and 43 cases closed. These permit-holders, past and present, accounted for \$27,350 in rent. There were 120 active transportation permits and three closed. These permits have generated just under \$5,000 in rent across the districts. There were only six permits for energy generation/ transmission. However, this category has generated over \$28,000 in rent. Finally, there were 37 active permits for communications, accounting for \$23,000 in rent.

Table 5.9: Special Use Permits on Gila NF (1949-2005)

Permit Category	Black Range District				Quemado District				Glenwood District			
	Active	Closed	Revoke	\$ Rent	Active	Closed	Revoke	\$ Rent	Active	Closed	Revoke	\$ Rent
Recreation	15	13	0	7,297	35	9	0	2,937	7	3	0	4,576
<i>Outfitters and Guides</i>	15	10	0	6,967	33	9	0	2,726	6	3	0	2,142
Agriculture	-	-	-	-	-	-	-	-	1	0	0	61
Community/Public Info	4	0	0	0	4	0	0	0	2	0	0	0
Feasibility, Research, Training, Cultural Resources, & Historical	1	0	0	121	2	0	0	0	0	1	9	61
Industry	2	0	0	0	-	-	-	-	1	0	0	0
Energy Gen/Trans	2	0	0	121	2	0	0	27,714	1	0	0	309
Transportation	6	0	0	2,583	34	0	0	741	24	1	0	514
Communications	*	*	*	*	7	0	0	6,852	6	0	0	2,728
Water (Non-Power Gen)	1	1	0	0	5	0	0	0	4	0	0	0
TOTAL SPECIAL USE PERMIT:	31	14	0	10,123	89	9	0	38,245	46	5	9	8,249
	Wilderness District				Reserve District				Silver City District			
Recreation	20	16	0	11,646	18	3	0	3,525	12	13	0	727
<i>Outfitters and Guides</i>	16	11	0	11,586	18	3	0	3,525	11	7	0	405
Agriculture	3	3	0	121	4	0	0	121	2	0	0	61
Community/Public Info	5	1	0	-	3	0	0	-	1	1	0	0
Feasibility, Research, Training, Cultural Resources, & Historical	1	2	0	-	2	1	0	-	6	2	0	111
Industry	-	-	-	-	-	-	-	-	2	0	0	61
Energy Gen/Trans	-	-	-	-	1	0	0	61	-	-	-	-
Transportation	12	0	0	61	16	0	0	336	28	2	0	668
Communications	2	0	0	-	1	0	0	61	21	0	0	13,895
Water (Non-Power Gen)	6	1	0	131	6	1	0	325	9	0	0	286
TOTAL SPECIAL USE PERMIT:	49	23	0	11,959	51	5	0	4,429	81	18	0	15,808

Notes: 1). Permits Issued Encompass Those from 1952-2005. 2). The Number of Active Permits were calculated as "the number of issued minus the number of closed and revoked permits for each district."

Source: USDA Forest Service 2005 Special Use Permit Database (SUDS). Calculations by UNM-BBER..

In the Black Range RD, 45 special use permits have been issued since 1949, with a total of just over \$10,000 in rent. Thirty-one of those permits are still active. The majority (62 percent) of permits have been issued for recreational purposes, and most of those (all of the active and all but three of the closed) have been for outfitter and guide services. Recreation accounts for about \$7,300 of the total revenues received, with outfitters and guide services contributing just under \$7,000. The six permits issued for transportation, all of which are still active, have generated about \$2,600 in revenues.

Of the 98 special use permits that have been issued for Quemado RD, 89 are still active. Recreation permits (44, with 35 active) account for roughly half the total number of permits issued, but less than \$3,000 of the over \$38,000 in revenues. Outfitters and guides dominate among the recreational permits, accounting for all but two of the active permits and all of those that are closed. Some \$27,700 in revenue has been received from the two permits issued for energy generation/ transmission (gas pipelines), while almost \$6,900 has been received from 7 permits for communications. There were 34 permits (all active) for transportation, but these have thus far generated only \$741 in revenues.

Glenwood RD has granted 60 total special use permits, nine of which were revoked and 46 of which are still active. Transportation-related uses account for 24 of the active and one of the

closed permits, but only \$514 of the revenue. Recreational permits number seven active and three closed and account for almost \$4,600 in revenues. All but one of the active recreational permits is to outfitters and guides. The six communications permits have generated \$2,700 in revenues.

Wilderness RD has 72 permits, 49 of which are still active. Thirty-six of these (20 active) are recreational permits that have generated over \$11,600 in revenues. As in the other districts, outfitters and guides account for the bulk of the revenues and three-fourths of the permits. Twelve still active transportation permits have generated only \$61, while six water permits and three agricultural permits account for the rest of the revenue, \$131 and \$121, respectively.

Reserve RD has 51 active and five closed permits that have generated about \$4,400 in revenues. Recreation dominates with 18 active and three closed and \$3,500 in revenue. All the recreation permits are for outfitters and guides. Sixteen transportation permits contributed \$336 to revenues.

Silver City RD has 99 permits, 81 of which are active, that have generated about \$15,800 in revenues. Communications, with 21 active permits, accounts for the bulk of the revenue – \$13,900. Transportation, with 28 active and two closed, accounts for only \$668 of the revenues. There are 12 active and 13 closed recreation permits with only \$727 in revenues. Eleven of the active and seven of the closed are for outfitters and guides.

5.7 Illegal Uses

According to data provided to BBER from the FS's Law Enforcement and Investigations Management Attainment Reporting System database, in 2005, nearly 1,300 violations were recorded in the Gila NF. **Table 5.10** lists the most common violations. The most common offense (478 incidents) related to sanitation, in most instances possessing or leaving refuse, debris, or litter in an exposed condition. There were 271 violations regarding timber and other forest products, with the most common (137 incidents) involving cutting or otherwise damaging timber or other forest trees. The 187 property violations most commonly involved damaging a natural feature or other property of the U.S. Ninety-six of the fire violations involved leaving a fire without completely extinguishing it, which is actually coded as a recreation use violation. A complete list of violations is provided in the appendix (**Table A.4**).

Table 5.10: Violations on Gila NF

Code	# Incidents	Violation Categories
36CFR261.10	97	Occupancy and use (General Prohibitions)
36CFR261.11	478	Sanitation (General Prohibitions)
36CFR261.12	12	National Forest System roads and trails (General Prohibitions)
36CFR261.15	27	Admission, recreation use and special recreation permit fees (General Prohibitions)
36CFR261.16	8	National Forest Wilderness (General Prohibitions)
36CFR261.18	2	Pacific Crest National Scenic Trail (General Prohibitions)
36CFR261.3	2	Interfering with a Forest Officer, volunteer, or human resource (General Prohibitions)
36CFR261.4	3	Disorderly conduct (General Prohibitions)
36CFR261.52	5	Fire (Area Prohibitions)
36CFR261.54	10	Forest development roads (Area prohibitions)
36CFR261.56	36	Use of vehicles off National Forest System roads (Area Prohibitions)
36CFR261.58	1	Occupancy and use (Area Prohibitions)
36CFR261.5	144	Fire (General Prohibition)
36CFR261.6	271	Timber and other forest products (General Prohibitions)
36CFR261.7	12	Livestock (General Prohibitions)
36CFR261.9	187	Property (General Prohibitions)

Source: USDA Forest Service, LEIMARS

5.8 Challenges and Opportunities for Forest Management

The multiple use debate is not fading. Rather, it is evolving and becoming more complex. A decade or two ago, the protections required under the Endangered Species Act (and as litigated by various environmental groups) basically shut down logging in the Gila NF and the associated sawmill operations in nearby communities like Reserve. This underlying conflict is manifest again and again in the concerns about critical habitat, clean water, and forest health that have been driving restrictions on grazing within the Gila NF. The loss or diminution of key NF resource-based industries is changing the character of communities, as retirees and others move in and purchase lands in and adjacent to the forest from ranchers and others sometimes all too ready to sell. Communities historically dependent on resource-based activities – mining, timber, and ranching – find amenity migrants to be a growing segment of their population and recreation-tourism to be a growing force in their economies.

As the recreational uses made of the Gila NF have expanded, new conflicts between recreational users and other users, including other recreational users, have emerged. The most dramatic are undoubtedly the conflicts between non-motorized recreational users – hikers, mountain-bikers, wildlife watchers, and horseback riders – and the recreational users who drive OHVs. As discussed in Chapter 4, the FS acknowledges that unmanaged recreation, namely OHV use, is one of the four largest threats facing the NF system, and, on November 2, 2005, the FS announced its final rule on OHV recreation in national forests and grasslands.¹²⁴ (See Section 3.6 on the Travel Management Rule.)

Grazing remains one of the most important economic activities on the Gila NF and it remains the chosen way of life for many local residents in the communities surrounding the Gila NF. A debate between ranchers and environmentalists (among others) is causing the public and the FS to evaluate the impacts of grazing on public land. Environmental groups (and even FS staff) often

¹²⁴ USDA FS, “USDA Forest Service Releases Final Rule for Motorized Recreations in National Forests & Grasslands,” FS Press Release, November 2, 2005, <http://www.fs.fed.us/news/2005/releases/11/travel-management.shtml>.

argue that grazing causes soil compaction, reducing the absorption of rainfall and also the recharge of aquifers and water tables.¹²⁵ Others will argue that grazing decreases the fire danger because livestock trample much of the overgrown brush. Ranching interests often perceive environmental groups as ‘non-local’ entities who do not understand the land and its condition as much as those who depend on it for their livelihood. They feel that they are good stewards, conserving the resource for future generations.¹²⁶

Timber products are no longer a major industry in the Gila NF, but timber products still have potential as a source of economic growth. The harvesting of small diameter wood can provide economic benefits for small rural communities. In a national economy where oil prices are over \$60 a barrel and there is no relief in sight, alternative energy sources become more important. Wood-pellet stoves are becoming more and more popular, causing the demand for wood pellets to skyrocket. Small-diameter wood is a perfect material to use in making pellets. There are also numerous construction and other uses for small diameter timber, including vigas and coyote fences.

Creating viable industries for harvesting small diameter trees is not without challenges. Sawmill production requires skills and equipment, a ready supply of raw timber, and markets for the output. The last sawmill closed in Catron County in the early 1990s, so the workers with similar skills are largely gone. Obtaining a continual supply of raw timber can be a challenge, as Gila WoodNet found when they initially started up operations and had to import the raw material from elsewhere. Despite these challenges, this industry would seem to be a win-win for everyone: it deals with the proliferation of small diameter trees that are choking the forest and that provide kindling for forest fires, and it provides new employment opportunities in small rural communities with limited economic development options. Chapter 7 provides more detail on the partnerships that have developed around this opportunity. Of course, there are legitimate concerns that opening up the forest to the harvesting of small-diameter trees will not stop there. In managing this process, the FS needs to be mindful of these concerns and also of the role of decaying trees and their nutrients in replenishing the forest.

As is discussed in Chapters 6 and 7, there is ongoing use of FS lands by tribes for religious and other purposes. The Gila NF has archaeological resources, cultural landscapes, and sacred sites that are unequivocally important to tribes. Tribal communities are concerned with protecting their sacred sites and in limiting outsider knowledge about the areas and how they are used. Lacking knowledge of which sites are considered sacred, however, means the FS may end up inadvertently planning trails and facilities near these sites. So the question becomes how to best bring the tribes into planning decisions.

¹²⁵ See February 23, 1998 letter to Mike Dombeck, Chief of the U.S. Forest Service by ex-FS Biologist Leon Fager, <http://www.rangebiome.org/cowfree/fsblastfs.html#fager>.

¹²⁶ For a nice discussion of this fundamental clash in views regarding grazing, see John C. Russell and Peggy A. Adams-Russell, “Values, Attitudes and Beliefs toward National Forest System Lands: The Gila National Forest,” *Adams-Russell Consulting* (released as a Forest Service report under the same name) (2005): 17-25, 35-6.

6 Special Areas

This chapter describes special areas in the Gila National Forest (NF), including recreational sites, sites of historical and archeological interest, special management sites, and inventoried roadless areas (IRAs).

6.1 Recreational Sites

The Gila NF features 162 designated recreational sites. For a complete list of recreational sites, please see **Table A.5** in the appendix. **Table 6.1** lists the number of designated recreation sites in each district, according to the Forest Service (FS) infrastructure database. More than half (88) of the designated sites in the Gila NF are trailheads. There are also 35 campgrounds, seven picnic sites, 17 interpretive sites and five observation sites. The Wilderness Ranger District (RD) has the most designated recreational sites – 48 in total.

Table 6.1: Recreation Site Type by RD

Recreation Site Type	Black Range	Quemado	Glenwood	Wilderness	Reserve	Silver City	Gila NF
Campground	2	7	4	9	6	7	35
Picnic Site			1	1	1	4	7
Trailhead	9	3	24	27	14	11	88
Interpretive Site	3	2	2	7	1	2	17
Observation Site			1	3		1	5
Wildlife Viewing Site						1	1
Specialized Rec		1			1	1	3
Fishing Site		1			1		2
Boating Site		1		1	1		3
Other					1		1
	14	15	32	48	26	27	162

Source: US Forest Service INFRA Database

Recreational sites are classified as either developed or dispersed sites. A developed site is a discrete place containing a concentration of facilities and services used to provide recreation opportunities to the public. Developed sites include campgrounds, picnic areas, shooting ranges, visitor centers, and historic sites. Dispersed recreation involves activities that occur outside of developed recreation sites, such as boating, hunting, fishing, hiking, and biking. In other words, dispersed sites are popular areas that have no facilities or services. Information on dispersed sites is not readily available for the Gila NF. However, **Figure 6.1** does indicate the approximate location of the Gila NF's developed recreational sites.¹²⁷

¹²⁷ Data was obtained from Forest Service INFRA database. The data was unclear as to which sites were developed and which were dispersed, so the map shows approximations.

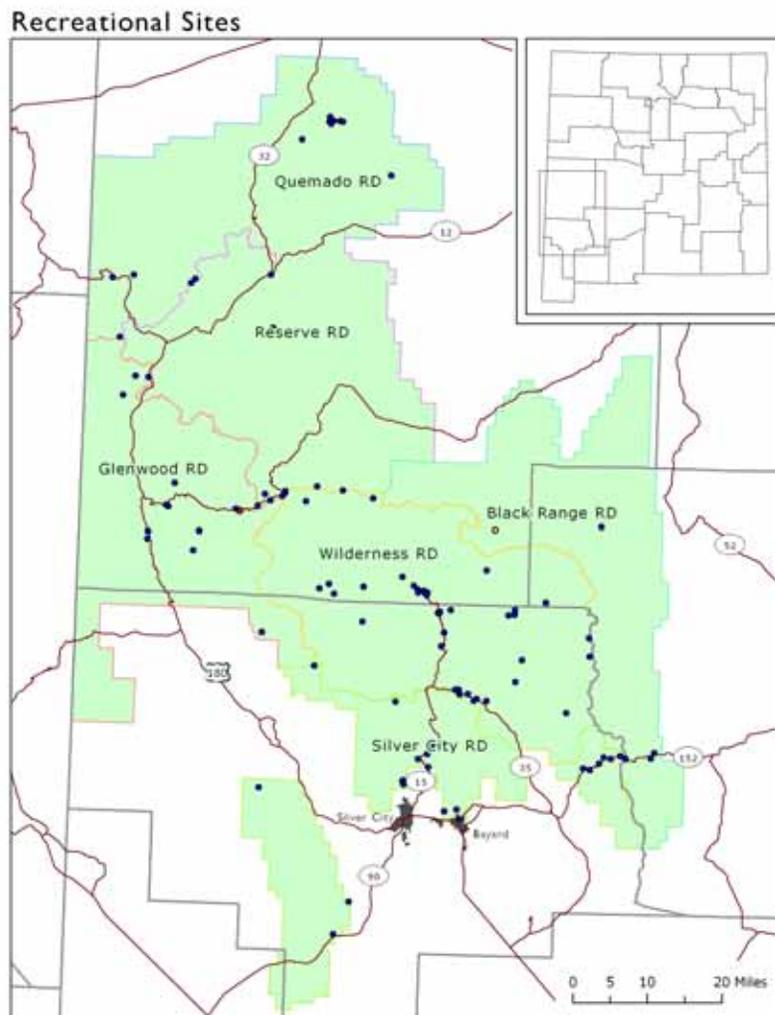


Figure 6.1: Gila NF Developed Recreational Sites

In many cases, recreational sites are maintained by volunteers. The Bureau of Business and Economic Research (BBER) was unable to determine how many of the recreational sites were maintained by volunteers, but Chapter 8 will present more information on volunteers and the critical roles that they play in the Gila NF.

In addition to the developed recreation sites and dispersed recreation activities that take place on lakes and within the forest, there are a number of undeveloped sites of interest to recreational users. Major examples are the many hot springs and pools within the Gila NF. Several hot springs are described on the official website with directions and some recommended precautions. Other examples include areas where particular wildlife are known to congregate, and those where there are challenging rock climbs or particularly beautiful spots for stopping to have lunch.

The FS maintains information on scenery resources, which have a formal rating system (Visual Quality Objectives) and special regulations regarding their management. Unfortunately, BBER was unable to obtain such information regarding scenery resources in the Gila NF.

6.2 Heritage Sites

According to Gila NF Archeologist Gail Firebaugh-Smith, the Gila NF has more than 6,700 sites of archeological or historical interest. These include everything from rock art and the ruins of pre-historic villages to Civilian Conservation Core camps and lookouts. The Gila NF has an internal list of priority heritage assets, which includes over 500 of these sites.

Some designated sites are major attractions. Examples include the Gila Cliff Dwellings National Monument in the Wilderness RD, the structures which comprised Fort Bayard in the Fort Bayard Historic District within the Silver City RD, the old mining town of Mogollon along Bursum Road in the Glenwood RD, and the mill ruins and catwalk up Whitewater Canyon, now part of the Catwalk National Recreation Area, also in the Glenwood RD.

The Gila NF also contains a number of properties that are listed on the National Register of Historic Places. In addition to these priority assets are historic and prehistoric structures and a great number of archeological sites. Finally, there are archival collections and artifacts.

In addition to formally designated areas, some areas are considered “special places,” especially to Native American communities. Much of the Gila NF includes or abuts areas that were inhabited by native tribes on and off for hundreds of years. Formal boundaries designated by the FS, or anyone else, do not change the sanctity of areas that have been grounds for traditional uses. Where known, the identity and other information about these areas is kept confidential out of respect for the privacy of tribal activities and uses. Information is not provided to visitors on brochures or maps, nor is it shared freely among local communities. As discussed above, the FS does maintain information on “heritage resources,” which includes some of these special places. Many of the sites, however, are unknown to the FS.

The Mogollon and Mimbres peoples who inhabited areas of the Gila NF many centuries ago have modern-day descendants. The descendants of the Mimbrenos probably include the Tarahumara Indians of the Copper Canyon region of northern Mexico, but this group has made no claims, nor are they known to return to the Gila.¹²⁸ However, the Zuni and the Acoma Pueblo Indians claim the Upland Mogollon as ancestors, so they have rights under the Native American Graves Protection and Repatriation Act (NAGPRA).¹²⁹ While their reservations are not close to the Gila NF, these two tribes have an attachment to places within it.¹³⁰ The sacred places of the Zuni and the Acoma are not listed in published FS documents. The fact that many of these sites are unknown complicates managing multiple uses on the resource. The Hopi also have claims on the Gila NF under NAGPRA, but there are no known links to the nearby Arizona tribes of the White River and San Carlos Apache.¹³¹ The Apache with the closest ancestral ties to the Gila are the “Red Paint” People or the Warm Springs Apache, also known as the Chiricahua or Chihene Apache, most of whom were relocated to Sims, Oklahoma, but some of whom may now reside with the Mescalero near Ruidoso. Places in the Gila NF relate to the origin stories of these people and are sacred to them. While distant, they return to what they view as their ancestral

¹²⁸ Cox, *op. cit.*

¹²⁹ “The territory of the Upland Mogollon stretched from south-central Arizona to south-central New Mexico. The Upland Mogollon territories are claimed, currently inhabited, or used by the Pueblo of Acoma, New Mexico; Hopi Tribe of Arizona; and Zuni Tribe of the Zuni Reservation, New Mexico.” USDI, National Park Service. “National NAGPRA: Notice of Intent to Repatriate Cultural Items,”

http://www.cr.nps.gov/nagpra/fed_notices/nagpradir/nir0303.html.

¹³⁰ The Pueblo of Zuni, “About Us,” <http://www.ashiwi.org/AboutUs.aspx>.

¹³¹ *Ibid.*

homeland. The nearby Alamo Navajo and Ramah Navajo both also have historic ties to places within the Gila.¹³²

6.3 Special Management Areas

Wilderness areas were established via the Wilderness Act of 1964.¹³³ Wilderness areas are part of a system of wild lands that contribute significantly to the ecological, educational, and social health of its users and surrounding communities. Wilderness provides clean air and water, a shelter for endangered species, sacred places for indigenous peoples, and a living laboratory for research. Beyond community benefits, the wilderness areas provide individual resources, such as an opportunity to explore personal values while experiencing risk, reward, and self-reliance.¹³⁴ The Act describes a wilderness as "an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain."¹³⁵

The Gila NF includes three wilderness areas: the Gila, Aldo Leopold, and Blue Range Wildernesses. The 558,065-acre Gila Wilderness, created in June, 1924 at the urging of Aldo Leopold, was the world's first designated wilderness. Most of the Gila Wilderness is in the Wilderness RD, with the western region in the Glenwood RD. The Aldo Leopold Wilderness is 202,016 acres straddling the Black Range Mountains on the eastern side of the forest. The 29,304 acre Blue Range Wilderness is in the Glenwood RD to the west and adjoins Arizona's rugged Blue Range Primitive Area. **Figure 6.2** shows the wilderness areas of the Gila NF.

¹³² Trail of the Mountain Spirits National Scenic Byway, "TMS Byway History: The Apache History," http://www.tmsbyway.com/history_overview.php?CID=71M7335U99.

¹³³ United States Congress, Wilderness Act of 1964, Public Law 88-577, 16.S. C. §§ 1131-1136, 88th Congress, Second Session.

¹³⁴ Olympic National Park, "The Olympic Wilderness," <http://www.nps.gov/archive/olym/wic/wilderness.htm>.

¹³⁵ U.S. Congress, Wilderness Act of 1964, Public Law 88-577 (16.S. C. 1131-1136), 88th Congress, Second Session.

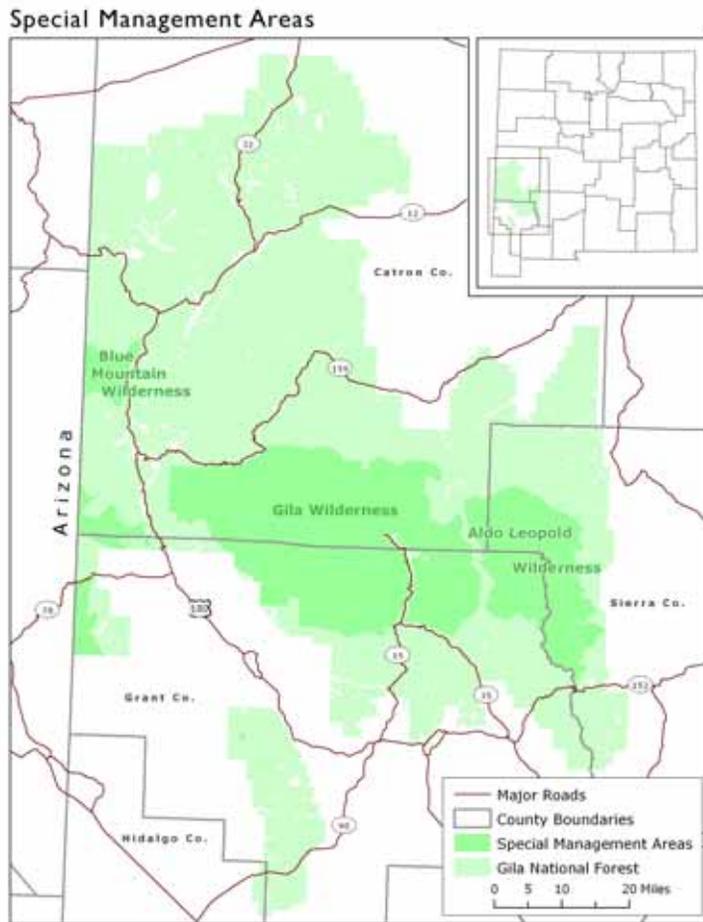


Figure 6.2: Special Management Areas: Wilderness

6.4 Inventoried Roadless Areas

In January 2001, the Clinton administration enacted the Roadless Area Conservation Rule (“The Roadless Rule”), protecting 58.5 million acres of wild national forest land from most commercial logging and road building.¹³⁶ In July 2004, the Bush administration announced a plan that would eliminate the Roadless Rule. Governors may petition to have the protections re-instated, but they may also petition to have the areas developed. If a governor does not petition, the area is still vulnerable to development. In other words, protections are eliminated from the IRAs. New Mexico Governor Bill Richardson is on record as opposing elimination of the Roadless Rule.¹³⁷ Critics argue that the bureaucratic requirements involved in the petition process provide little

¹³⁶ USDA FS, “The Federal Register Part VI / Department of Agriculture Forest Service / 36 CFR Part 294 Special Areas; Roadless Area Conservation; Final Rule,” *National Archives and Records Administration* 66, no. 9 (January 12, 2001), http://roadless.fs.fed.us/documents/rule/roadless_fedreg_rule.pdf.

¹³⁷ New Mexico Governor Bill Richardson joined eight other governors on November 12, 2004 to send a comment letter opposing the administration’s draft rule and supporting the Roadless Rule. Wilderness Society’s Chronology of the Roadless Area Conservation Policy available at: <http://www.wilderness.org/OurIssues/Roadless/chronology.cfm?TopLevel=Chronology>.

incentive for governors to participate, which may result in the opening of IRA lands to commercial interests. Supporters of the plan argue that roads allow access necessary for firefighters and offer additional recreational opportunities. The interim direction regarding IRAs was issued in July 2004 and was scheduled to expire on January 16, 2006; however, it has been reissued/extended for an additional 18-month period.

In New Mexico, there are 1,597,000 acres of IRAs, making up about 12 percent of the NF system land in the state. Of this 1.6 million acres, 66,000 acres have been recommended designation as wilderness by the federal forest plan.¹³⁸ In the Gila NF, there are 734,000 acres of IRAs, much of which is in the established wilderness areas, which are shown in **Figure 6.2** above. **Figure 6.3** below shows the IRAs within the Gila (a much more detailed map may be found in the appendix, **Figure A.1**). Of the IRA acreage in the Gila NF, 49,000 acres, or 1 percent of the IRA acreage, consists of IRA upon which road construction and reconstruction is allowed; 685,000 acres, or 20 percent of the IRA acreage, is IRA upon which no road construction or reconstruction is allowed.

¹³⁸ USDA FS, "Inventoried Roadless Area Acreage, Categories of NFS Lands Summarized by State," http://roadless.fs.fed.us/documents/feis/data/sheets/acres/appendix_state_acres.html.

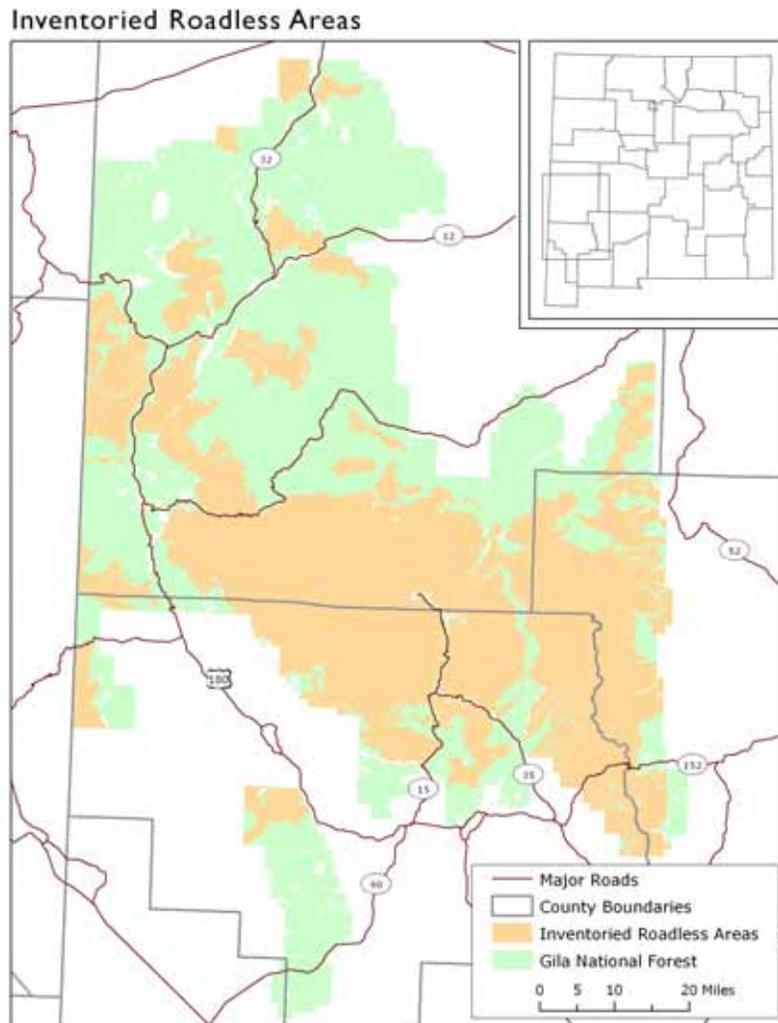


Figure 6.3: Inventoried Roadless Areas on Gila NF

6.5 Challenges and Opportunities for Forest Management

Key issues involving special areas are intrinsically linked to the cultural values and to how different groups use the forest. Special areas often provoke the most heated multiple use debates.

The elimination of the Roadless Rule and the new policy involving IRAs has raised concern among NF users all over the country that NF lands are being opened up to provide more access to motorized vehicles, including access to areas that have been historically protected as wilderness areas. Critics argue that the new federal plan will exploit wilderness areas and make them vulnerable to commercial activities of various types. No timber volumes were planned for Gila NF IRAs through 2004. As is indicated in Chapter 5, there are a number of mining claims in or near the IRAs in the Gila NF. Discussion of increased access for vehicles raises concerns that such will be a detriment to the integrity and health of the forest landscapes (especially with off-highway vehicles).

The situation is further complicated by the privacy concerns of the local tribes. Tribal uses of land can easily conflict with non-tribal uses. In a study examining tribal attitudes and values regarding FS-managed lands, tribal representatives suggested that they take a more active role in forest planning, management, and decision-making processes. This would allow them to ensure their special areas are not compromised by other uses.¹³⁹

The Gila NF, with its long history of settlement dating back to pre-historic times and its more recent experiences with mining booms and busts, logging, ranching, and the Apache Indian wars, has many sites of archeological and historical interest. This situation confronts the FS with the challenge of how to preserve and protect sites and of how to prioritize resources to do this.

Protection of sites can easily come into conflict with other uses of the forest, as it may require restrictions of use, including outright bans, or fencing off areas. On the other hand, the need to protect sites grows as more people come into the forest. Trails bring people into the forest, where they may discover sites of interest, taking home arrowheads and potshards. The rewards of pot hunting can be very high in the illicit trade in Indian artifacts. Mimbres' pots were buried with their dead, so pot-hunting in the Gila NF inevitably raises concerns about disturbing graves protected under NAGPRA. Vandalism can also be a problem. The Gila NF is such a vast area that policing what happens at remote sites throughout the forest is simply not practical.

The Gila NF area was the ancestral home of the Warm Springs Apache and it is an essential feature in their origin stories. Other modern day tribes have historical ties to the land and or view themselves as descendants of early residents. NAGPRA mandates certain actions by federal agencies with regard to human remains. No agreements are currently in place between the Gila NF and tribes claiming cultural affiliation, nor with those claiming historical use.

At the heart of many debates regarding land use, and especially in special areas, there appears to be conflict over who has “more” rights to the land. While the forest is public land, and thus should be accessible to all, some believe they should have privileged status when it comes to forest planning and decision-making. For instance, many ranchers are frustrated by the ability of “non-locals” to affect decisions regarding grazing policies in the Gila NF when they are the ones with the intimate knowledge and understanding of the land.¹⁴⁰ Another example may be Native Americans who identify with the area as their homeland or claim cultural affiliation or historical use.¹⁴¹ They have a permanent attachment that is very different from other relationships, and they have certain rights under NAGPRA.¹⁴²

¹³⁹ John C. Russell and Peggy A. Adams-Russell, “Values, Attitudes and Beliefs toward National Forest System Lands: The New Mexico Tribal People,” *Adams-Russell Consulting* (released as a Forest Service report under the same name) (2005).

¹⁴⁰ John C. Russell and Peggy A. Adams-Russell, “Values, Attitudes and Beliefs toward National Forest System Lands: The Gila National Forest,” *Adams-Russell Consulting* (released as a Forest Service report under the same name) (2005): 17.

¹⁴¹ John C. Russell and Peggy A. Adams-Russell, “Values, Attitudes and Beliefs toward National Forest System Lands: The New Mexico Tribal People,” *Adams-Russell Consulting* (released as a Forest Service report under the same name) (2005).

¹⁴² According to the NAGPRA website, “The Native American Graves Protection and Repatriation Act is a Federal law passed in 1990. NAGPRA provides a process for museums and Federal agencies to return certain Native American cultural items – human remains, funerary objects, sacred objects, or objects of cultural patrimony – to lineal descendants, and culturally affiliated Indian tribes and Native Hawaiian organizations. NAGPRA includes provisions for unclaimed and culturally unidentifiable Native American cultural items, intentional and inadvertent discovery of Native American cultural items on Federal and tribal lands, and penalties for noncompliance and illegal trafficking.” USDI National Park Service, National NAGPRA, “Frequently Asked Questions,” <http://www.cr.nps.gov/nagpra/FAQ/INDEX.HTM#Claimants>.

7 Economic Impacts

7.1 Gila National Forest Regional Economy

The Gila National Forest (NF) lies within Catron, Grant, Hidalgo, and Sierra Counties, with a significant majority of the forest land in Catron and Grant Counties. In terms of affected settlements, Silver City (2000 population 10,545), the largest city in Grant County, abuts the forest land, while Reserve (2000 population 387), the largest settlement in Catron County, is surrounded by the Gila NF. Other significant settlements in the region include Truth or Consequences (2000 population 7,359) in Sierra County and Lordsburg (2000 population 3,379) in Hidalgo County. These four counties comprise the assessment area used in this study, but the net economic contribution of the forest should be considered to lie mainly in Catron and Grant Counties, with a smaller but significant impact on Sierra County, and a minor effect on Hidalgo County.

Except for small micropolitan areas such as Silver City and Truth or Consequences, the assessment area is extremely rural and sparsely populated.¹⁴³ In 2000, the four counties combined had a population of 53,747. As seen in Chapter 2 on demographic trends, Grant County contains a large percentage of the assessment area's population, with Sierra County being the next largest, and Catron and Hidalgo Counties having small portions of the assessment area's population. **Table 7.1** shows employment for each county and it follows a similar pattern, with Grant County claiming 61 percent of the assessment area's jobs in 2003 while the other counties have only a small portion of the assessment area's jobs.

As shown in **Table 7.1**, the assessment area is also characterized by very low incomes, with the per capita incomes less than 60 percent of the U.S. average. Within the assessment area, this value is slightly higher for Grant and Sierra Counties, which contain the largest settlements, and lower in Catron and Hidalgo Counties, which are more sparsely populated.

Table 7.1: Total Unemployment by County, 2003

	Employment	Percent of Region	Per Capita Income	PCI Relative to US
Catron County	1,531	7%	16,303	0.52
Grant County	13,329	61%	19,190	0.61
Hidalgo County	2,352	11%	17,370	0.55
Sierra County	4,514	21%	18,295	0.58
Gila Region	21,726	100%	17,790	0.57
New Mexico	1,015,365	--	24,892	0.79
United States	167,488,500	--	31,484	1.00

Source: Bureau of Economic Analysis, 2003

The industrial composition of employment (full- and part-time and including self-employment) in each county from 1980 to 2000 is shown in **Table 7.2**. In general, the assessment area as a whole is characterized by an increase in the relative size of the service sector and a decrease in the relative size of farm and natural resource-based employment. The increased relative size of retail and services within the assessment area reflects a growing dependence on tourism and visitor spending, much of which is directly related to the Gila NF. In addition, the relative size of government employment has decreased slightly from 1980 to 2000 in Catron and Sierra Counties.

¹⁴³ A micropolitan area is "... a community that is too urban to be called rural and too rural to be called urban; a location where the community mixes with the rural area that surrounds it and vice versa and that is seen locally as a small metropolitan area or the mother town in a small region."
http://www.findmehere.com/search/dictionary/m_index.htm#metro.

7 Economic Impacts

Despite this decrease, government employment provides about 25 percent of jobs in the assessment area. These trends are reflected throughout the assessment area as a whole, but each county differs in significant ways from its counterparts.

Table 7.2: Total Employment by Private Sector by County, 1980, 1990, and 2000

Catron	1980	1990	2000	1980%	1990%	2000%	Change in %	
							1980-1990	1990-2000
TOTAL	1,059	1,246	1,456	100%	100%	100%	0.00%	0.00%
Farm Employment	349	282	274	33%	23%	19%	-10.32%	-3.81%
Non-farm Employment	710	964	1,182	67%	77%	81%	10.32%	3.81%
Private Employment	418	607	825	39%	49%	57%	9.24%	7.95%
Agricultural services, forestry, and fishing	(D)	(D)	(D)	--	--	--	--	--
Mining	(L)	(D)	(L)	--	--	--	--	--
Construction	40	64	(D)	4%	5%	--	1.36%	--
Manufacturing	117	106	58	11%	9%	4%	-2.54%	-4.52%
Transportation and utilities	12	46	69	1%	4%	5%	2.56%	1.05%
Wholesale trade	(L)	(L)	(L)	--	--	--	--	--
Retail trade	86	110	160	8%	9%	11%	0.71%	2.16%
Services	127	188	287	12%	15%	20%	3.10%	4.62%
Government and government enterprises	292	357	357	28%	29%	25%	1.08%	-4.13%
Federal, civilian	127	151	129	12%	12%	9%	0.13%	-3.26%
Military	12	13	12	1%	1%	1%	-0.09%	-0.22%
State and local	153	193	216	14%	15%	15%	1.04%	-0.65%
State government	34	66	63	3%	5%	4%	2.09%	-0.97%
Local government	119	127	153	11%	10%	11%	-1.04%	0.32%
Grant	1980	1990	2000	1980%	1990%	2000%	Change in %	
TOTAL	10,408	12,046	14,720	100%	100%	100%	0.00%	0.00%
Farm Employment	379	366	390	4%	3%	3%	-0.60%	-0.39%
Non-farm Employment	10,029	11,680	14,330	96%	97%	97%	0.60%	0.39%
Private Employment	7,837	8,857	10,754	75%	74%	73%	-1.77%	-0.47%
Agricultural services, forestry, and fishing	49	70	(D)	0%	1%	--	0.11%	--
Mining	2,613	1,496	(D)	25%	12%	--	-12.69%	--
Construction	577	870	1,001	6%	7%	7%	1.68%	-0.42%
Manufacturing	434	703	508	4%	6%	3%	1.67%	-2.38%
Transportation and utilities	344	436	451	3%	4%	3%	0.31%	-0.56%
Wholesale trade	181	221	314	2%	2%	2%	0.10%	0.30%
Retail trade	1,678	2,187	3,014	16%	18%	20%	2.03%	2.32%
Services	1,562	2,333	3,270	15%	19%	22%	4.36%	2.85%
Government and government enterprises	2,192	2,823	3,576	21%	23%	24%	2.37%	0.86%
Federal, civilian	239	218	265	2%	2%	2%	-0.49%	-0.01%
Military	135	140	102	1%	1%	1%	-0.13%	-0.47%
State and local	1,818	2,465	3,209	17%	20%	22%	3.00%	1.34%
State government	733	1,072	1,377	7%	9%	9%	1.86%	0.46%
Local government	1,085	1,393	1,832	10%	12%	12%	1.14%	0.88%
Hidalgo	1980	1990	2000	1980%	1990%	2000%	Change in %	
TOTAL	2,490	2,838	2,388	100%	100%	100%	0%	0%
Farm Employment	370	302	311	15%	11%	13%	-4%	2%
Non-farm Employment	2,120	2,536	2,077	85%	89%	87%	4%	-2%
Private Employment	1,749	2,099	1,524	70%	74%	64%	4%	-10%
Agricultural services, forestry, and fishing	(D)	88	(D)	--	3%	--	--	--
Mining	(D)	(L)	(D)	--	--	--	--	--
Construction	88	102	84	4%	4%	4%	0%	0%
Manufacturing	542	629	(D)	22%	22%	--	0%	--
Transportation and utilities	84	102	75	3%	4%	3%	0%	0%
Wholesale trade	80	162	(D)	3%	6%	--	2%	--
Retail trade	510	502	521	20%	18%	22%	-3%	4%
Services	352	442	454	14%	16%	19%	1%	3%
Government and government enterprises	371	437	553	15%	15%	23%	0%	8%
Federal, civilian	36	38	71	1%	1%	3%	0%	2%
Military	28	30	19	1%	1%	1%	0%	0%
State and local	307	369	463	12%	13%	19%	1%	6%
State government	59	51	78	2%	2%	3%	-1%	1%
Local government	248	318	385	10%	11%	16%	1%	5%

Sierra	1980	1990	2000	1980%	1990%	2000%	Change in % 1980-1990	Change in % 1990-2000
TOTAL	2,774	3,334	4,603	100%	100%	100%	0.00%	0.00%
Farm Employment	390	302	328	14%	9%	7%	-5.00%	-1.93%
Non-farm Employment	2,384	3,032	4,275	86%	91%	93%	5.00%	1.93%
Private Employment	1,731	2,299	3,315	62%	69%	72%	6.56%	3.06%
Agricultural services, forestry, and fishing	63	50	(D)	2%	1%	--	-0.77%	--
Mining	63	61	(D)	2%	2%	--	-0.44%	--
Construction	164	191	320	6%	6%	7%	-0.18%	1.22%
Manufacturing	36	(D)	(D)	1%	--	--	--	--
Transportation and utilities	163	166	124	6%	5%	3%	-0.90%	-2.29%
Wholesale trade	34	(D)	(D)	1%	--	--	--	--
Retail trade	533	669	879	19%	20%	19%	0.85%	-0.97%
Services	504	832	1,252	18%	25%	27%	6.79%	2.24%
Government and government enterprises	653	733	960	24%	22%	21%	-1.55%	-1.13%
Federal, civilian	146	104	120	5%	3%	3%	-2.14%	-0.51%
Military	39	51	44	1%	2%	1%	0.12%	-0.57%
State and local	468	578	796	17%	17%	17%	0.47%	-0.04%
State government	186	221	297	7%	7%	6%	-0.08%	-0.18%
Local government	282	357	499	10%	11%	11%	0.54%	0.13%

Notes: (D) Non-disclosure of confidential information, but included in totals, (L) Less than 10 jobs, and (N) Data not available for this year.

Source: Bureau of Economic Analysis

Catron County has experienced percent-wise growth in retail and services and a corresponding decrease in the percent of employment in nearly every other sector. A significant portion of economic activity in Catron County is derived from tourist spending, much of which is likely to be related to forest uses.

Economic activity in Grant County is centered in Silver City and the surrounding micropolitan area. The industrial composition of Grant County employment has remained relatively constant from 1980 to 2000, with small decreases in manufacturing and increases in retail and services. One of the most important changes in the assessment area as a whole, but especially for Grant County, is the sharp decrease in mining, which decreased from 25 percent of Grant County employment in 1980 to 12 percent in 1990, and by 1990 was small enough to warrant nondisclosure. In Grant County, the important mining activity was copper, and this industry virtually went out of existence as world copper prices tumbled. High copper prices over the past few years prompted the reopening of a Phelps Dodge mine, but the copper industry, including the copper smelting activity classified under manufacturing, in Grant County today is a shadow of its former self. The importance of mining, and the subsequent loss of jobs as mining decreased, is a theme throughout the assessment area, where some communities tout ghost towns as tourist attractions.

While most of the assessment area has experienced small declines in the relative size of government employment, Hidalgo County experienced an increase of 8 percent from 1990 to 2000, of which local government accounted for more than half. Again contrary to the assessment area trend, the relative size of private employment decreased from 1990 to 2000, while the size of farm employment had a slight increase. Hidalgo County has been impacted by the decline of the copper industry, specifically, the closure of a large copper smelter.

Sierra County, like Grant, exhibits more stability, probably largely because of the presence of Truth or Consequences and a large retirement community. Most of the changes in the composition of employment in Sierra County are small, but they reflect the overall trend of a reduced relative size of the farm sector, primary industries, and government, while showing an increase in the service sector. While a shift away from farming and toward retail and services is not surprising, it does suggest that the assessment area is largely dependent, and becoming more so, on those activities such as tourism that generate spending in the retail and services sector.

However, this is not to say that farming is not important, especially in Catron County, where it makes up nearly 20 percent of the total employment in the county.

To examine these ideas in more detail, **Table 7.3** shows employment and output by relevant industrial sector, with detail for each county and for the assessment area as a whole for 2002.

As we discuss the economic contribution of the Gila NF below, it is useful to compare the estimated impacts of the Gila NF to each of the industries included in **Table 7.3**. The industries shown are those industries that make the most use of the Gila NF as a resource, specifically ranching, timber harvesting, recreation related industries, and Forest Service (FS) operations.

The data in **Table 7.3** show the regional economic importance of ranching, services, and federal non-military activity, all of which exist largely because of the presence of the Gila NF. Note the distinct lack of a logging sector, which reflects the very minor degree to which the Gila NF is now used for logging purposes.

**Table 7.3: Employment and Output for Select Industries by County, 2002
(Output in Thousands of 2002 Dollars)**

	Employment	% Of Total	Output	% Of Total
Catron County	1,005	100.0%	78.84	100.0%
Cattle Ranching, Farming	246	24.5%	19.75	25.1%
Logging	17	1.7%	4.66	5.9%
Food Services and Drinking Places	17	0.1%	0.60	0.1%
Federal Non-Military	147	14.6%	10.79	13.7%
Grant County	12,307	100.0%	1,047.44	100.0%
Cattle Ranching, Farming	354	2.9%	24.23	2.3%
Logging	0	0.0%	0.00	0.0%
Copper, Nickel, Lead, Zinc Mining	711	5.8%	144.21	13.8%
Primary Smelting and Refining of Copper	160	1.3%	172.19	16.4%
Food Services and Drinking Places	1119	9.1%	36.97	3.5%
Federal Non-Military	263	2.1%	19.66	1.9%
Hidalgo County	2,389	100.0%	204.00	100.0%
Cattle Ranching and Farming	212	8.9%	11.54	5.7%
Logging	0	0.0%	0.00	0.0%
Agricultural and Forestry Support	471	19.7%	5.11	2.5%
Gold, Silver etc. Mining	4	0.2%	0.26	0.1%
Primary Smelting and Refining of Copper	80	3.3%	85.19	41.8%
Food Services and Drinking Places	249	10.4%	8.80	4.3%
Federal Non-Military	109	4.6%	8.21	4.0%
Sierra County	3,545	100.0%	295.79	100.0%
Cattle Ranching and Farming	147	4.1%	13.66	4.6%
Logging	0	0.0%	0.00	0.0%
Food Services and Drinking Places	430	3.5%	15.04	1.4%
Federal Non-Military	110	3.1%	8.35	2.8%
Gila Region	19,246	100.0%	1,626.07	100.0%
Cattle Ranching, Farming	959	5.0%	69.19	4.3%
Logging	17	0.1%	4.66	0.3%
Food Services and Drinking Places	1815	9.4%	61.41	3.8%
Federal Non-Military	629	3.3%	47.01	2.9%

Source: IMPLAN 2002 data, calculations by UNM-BBER. Percents do not sum to 100 because not all industries are included.

To complete the picture, **Table 7.4** shows private employment by percent of occupation for each county and the assessment area as a whole. The occupational data support the data from previous tables, showing a large percent of jobs in management, sales, and services occupations, with construction representing a substantial portion as well. (Differences in the total employment between **Table 7.2** and **Table 7.4** reflect the fact that the Bureau of Economic Analysis data [Table 7.2] are establishment data by place of work and include multiple job holders, whereas the occupation data [Table 7.4] are from the 2000 census on households.)

Table 7.4: Private Employment by Occupation for Assessment Area Counties in 2000

	Catron County	Grant County	Hidalgo County	Sierra County	GNF Region
Management and Professional	31%	30%	21%	27%	28%
Professional and related	19%	20%	11%	15%	18%
Education, training, and library	8%	9%	6%	5%	7%
Healthcare practitioners and technical	2%	5%	2%	5%	4%
Service	16%	20%	23%	23%	20%
Sales and office	22%	22%	21%	22%	22%
Farming, fishing, and forestry	5%	1%	5%	3%	2%
Construction, extraction, and maintenance	16%	16%	17%	16%	16%
Production and transportation	10%	12%	14%	9%	11%
Total Private Employment	1,270	11,413	2,119	4,470	19,272

Source: US Census 2000. Calculations by UNM-BBER.

Finally, **Table 7.5** shows the unemployment rates for each of the counties and the assessment area as a whole from 1995 to 2004. Sierra and Hidalgo Counties have maintained unemployment rates that are quite low (with the exception of 1999 in Hidalgo County, the year following the closure of the Phelps-Dodge smelter), often below the New Mexico average, while Catron and Grant Counties have somewhat higher levels of unemployment. This has been particularly true in Catron County, which had very high unemployment levels in the late 1990s, but has stabilized somewhat since then.

Table 7.5: Average Annual Unemployment Rate for Assessment area Counties, 1995-2004

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Catron County	15.3	14.5	13	10.9	11	6.7	6.2	7.1	8.1	7.9
Grant County	7.6	7	6	6.9	6.9	4.8	6.5	9.4	10.6	6.9
Hidalgo County	5.1	4.7	4.2	5.4	14.4	4.9	4.8	3.8	5	5.5
Sierra County	5.4	3.6	4.4	3.1	3.2	3.8	5	5	5.1	5.3
GNF Region	8.4	7.5	6.9	6.6	8.9	5.1	5.6	6.3	7.2	6.4
NM TOTAL	6.4	7.4	7.1	6.3	6	5.2	4.8	5.2	5.8	5.9

Source: Bureau of Labor Statistics, Local Area Unemployment Statistics (LAUS).

The data presented in this section show a region that is very rural with the exception of a few small cities and towns. As is typical of rural regions, incomes are low and unemployment rates are somewhat higher than in more urban parts of the state. The rural nature of the region in and of itself makes the Gila NF assessment area more dependent on forest resources as a source of economic activity. The prevalence of the Gila NF in the assessment area, in both an economic and geographic sense, contributes to this dependence as well. This is particularly true in Catron and Grant Counties, where the forest plays such a large role. Finally, it is apparent from Chapter 5 on Uses and Users that a significant number of assessment area residents, especially in Catron and Grant Counties, make extensive use of the forest's food and fuel products to supplement their low incomes.

7.2 Methodology and Organization of Gila National Forest Economic Impact

In estimating the contribution of the Gila NF to the assessment area economy, we consider both the operations of the FS in the assessment area as well as the various uses of forest-related products. IMPLAN software is used to determine the total economic value of each activity and the operations of the FS.¹⁴⁴ IMPLAN uses county-level input-output data to determine the extent to which these activities contribute to the local economy. In doing so, IMPLAN distinguishes between direct, indirect, and induced impacts, where:

Direct impacts include the economic value generated by the activity itself, such as the value of cattle grazed on Gila NF land.

Indirect impacts include the value generated by purchases to support that activity and the corresponding purchases to support those activities, in perpetuity. For example, indirect impacts would include the value of fencing purchased for ranching, the value of steel purchased to make the fencing, and so on.

Induced impacts capture the value of economic activity generated from spending by employees that produce the direct and indirect goods. The ranch employees will purchase food, pay for electricity, etc., all of which generates additional value from the purchases, as well as sparking new rounds of indirect and induced value.

The IMPLAN region is the same region used throughout this report, consisting of all counties containing or bordering any of the Gila NF districts: Catron, Grant, Hidalgo and Sierra Counties. This region makes up the area considered as “local,” and the results obtained from IMPLAN are for this region.

As discussed in Chapter 5, the principal economic value-generating activities related to the forest land itself include ranching, timber harvests, and recreation and wildlife visits. There are no currently active oil or gas wells in the Gila NF, nor are there mining operations. For each activity, we estimate the direct impact and use IMPLAN to estimate the total economic value by direct, indirect, and induced impacts. The FS is unusual in that it does not directly produce a good or service, so there is no easy measure of its direct economic value. Instead, we look at FS expenditures and salaries and wages to estimate the first round of indirect and induced impacts of the FS, and the corresponding economic activity generated by each. The indirect activity is captured by FS expenditures, and the induced activity is captured by the disposable income of FS employees. Of course, in examining the contribution of the FS, we also consider direct employment by the FS.

This analysis draws on a wide range of data and information sources. Data on the structure of the local economies and characteristics of the workforce come largely from the 2000 decennial census summary file 3 and U.S. Department of Labor local area unemployment statistics. The FS provided data on the specific activities that occurred on the forest. Specific sources included the Forest Service infrastructure (INFRA) database (grazing), National Visitor Use Monitoring (NVUM) Survey (recreation and wildlife), and the Region 3 Office (procurement, wages &

¹⁴⁴ IMPLAN® is a PC-based regional economic analysis system; originally developed by the Forest Service, it is now used by multiple federal agencies. The current IMPLAN database and model is maintained and sold by Minnesota IMPLAN Group, Inc. <http://www.implan.com>.

salaries). The U.S. Department of Agriculture National Agricultural Statistics Service was the source of data on agricultural land values and cattle stocking rates.

To maintain consistency, data for 2004 were used wherever possible. However, if data for that year did not exist or more recent data were more easily available, the recent data were used with values adjusted back to 2004. Data for recreation and wildlife visitors are from 2001, and data for FS salaries and wages are from fiscal year 2005 adjusted to 2004 dollars. Data on grazing land are from 2002. All other data are for 2004 unless noted.

The FS provided data on cattle grazing from the INFRA database in terms of Animal Unit Months (AUMs), and we estimated the number of employees needed per AUM. Together, these values provide an estimated number of employees needed to produce the 2002 AUMs. Using the IMPLAN value for output per employee, we derived a ranching output for grazing on the Gila NF. This is the direct value of ranching on the Gila NF land.

Similarly, timber harvesting data were derived from the Timber Information Management database provided by the FS. We used 2004 timber prices to derive the total value of timber cut, which measures the direct value of timber harvested in the Gila NF in 2004.

For recreation and wildlife visitors, we used estimates of visitors from NVUM data, broken out into several categories based on locality (local or non-local), the type of trip (day, overnight on the forest, overnight off the forest), and the reason for the visit (recreation or wildlife). The FS provided an average expenditure profile for each type of visitor that estimates the direct economic value of visitor spending to the local economy. It is likely that there are several benefits here that are not captured. Many of the additional benefits of a NF in terms of recreation do not involve economic transactions and hence cannot be measured. In addition to these un-measurable benefits, there is some degree of outfitter and guide activity that is probably not captured. The outfitter businesses include guided hunting trips, whitewater rafting on the Gila River, and other specialized uses by private companies. The impacts from this segment are small, but can be important, since the customers are almost exclusively non-local and the trips can be quite expensive.

Finally, for FS operations, the FS provided data on salaries and wages for its Gila NF employees and total spending with an associated expenditure profile for use in IMPLAN. Since the direct economic value associated with the FS is unknown, we use expenditures to capture the first round indirect impacts and salaries and wages to capture the first round induced impacts. In both cases, the associated later rounds of indirect and induced impacts are calculated using the IMPLAN model.

7.3 Direct Impact of the Gila National Forest on the Local Economies

The principal economic activities on the Gila NF include ranching, timber harvests, recreation and wildlife visits, and the operation activities of the FS. Most of these activities are quite large economically, with the exception of timber harvests, which have been reduced to a very small amount. As we will see later on in this chapter, a substantial portion of the ranching industry is supported by the use of Gila NF grazing land. Additionally, there is a large degree of economic activity in terms of guided trips, including hunting tours, whitewater rafting, horseback riding

vacations, and other luxury recreational activities that are either not captured in the recreational data used here or are likely to be substantially underrepresented.

Table 7.6 is a summary of the output, employment, and labor incomes directly associated with ranching, timber harvesting, visits and recreation, and FS operations activities.¹⁴⁵ These direct impacts are, in effect, ‘what you see’ – a measure of activities and their economic value as they actually occur on the Gila NF. For example, there is the equivalent of 2,122 full-time annual jobs that directly supply the goods and services supported by the spending of recreation and wildlife visitors, and a similar 161 jobs in the ranching industry. In the case of the FS, employment is the number of employees directly employed by the FS in the Gila NF, and labor income is the wages paid to those employees. Output for the FS is actually FS spending on operations. In the analysis discussed below, we do not include the costs of fighting wildfires, which involve large amounts of non-local labor and business.

The question of the impact of wildfire suppression spending is a difficult one. Certainly the impact of worker spending while on the job in a location is significant. In fiscal year 2004, FS spending on wildfire suppression in the Gila NF exceeded \$5 million, of which \$2.7 million was for compensation.¹⁴⁶ At a minimum, some fraction of this \$2.7 million is certainly going to be spent in the nearest local town, and the impact of that could be significant. We discuss this issue in further detail below.

Table 7.6: Direct Impacts on Gila NF, 2004
(Output and Income Figures in Thousands of 2002 Dollars)

	Output	Employment	Labor Income
Ranching¹	11,617	161	1,254
Timber Harvesting	1,359	4	270
Visitors & Recreation	111,170	2122	42,009
Forest Service Operations²	8,563	374	9,942
Total	132,709	2,661	53,476

¹ For Ranching, we use proprietor income from 2001, since proprietor income for 2002 is negative

² Forest service operations output is actually the first round of indirect spending, while labor income is disposable employee income

The direct impacts indicate that visitor spending is by far the largest contributor to the economic activity of the assessment area, providing \$111 million in output and 2,122 jobs. FS operations account for a substantial number of jobs as well, and ranching operations on FS land produce \$11.6 million of output with an estimated 161 employees. Because workers are paid on a federal pay scale, the comparative contribution of the FS to labor income, and hence induced spending, is quite large.

Before looking at the indirect and induced impacts of these values, some idea of their importance for the assessment area economy can be found by comparing the values in **Table 7.6** with the industry values in **Table 7.3**. In particular, notice that the estimated direct economic activity

¹⁴⁵ Labor income is the sum of employee compensation and proprietor income.

¹⁴⁶ FS region 3 Summary of Financial Obligations.

generated from recreation and visitor spending makes up a substantial portion of the service sector shown in **Table 7.3**. Similarly, estimated ranching activity on federal lands is a large part of the total ranching activity for the assessment area as a whole, with 161 jobs in ranching on federal land compared with 959 ranching sector jobs for the assessment area as a whole. This impact is even more substantial if we consider that a large majority of grazing on FS land occurs in Catron and Grant Counties, which only contain 600 ranching jobs. Additionally, the 374 employees of the FS in the assessment area make up more than half of the 629 federal non-military employees in the assessment area and a substantial portion of employment in the assessment area as a whole. The same is true for timber harvesting, though the sector is practically non-existent in the IMPLAN data from **Table 7.3**. All of this indicates, without considering the additional impacts generated by business purchases or employee spending, that the role of the Gila NF and the FS in the assessment area economy is quite substantial.

7.4 Economic Impacts and Multipliers

The direct activities associated with the Gila NF create indirect and induced impacts, as businesses and workers make expenditures and purchases and these funds cycle through the local economy. The sum of the direct, indirect, and induced expenditures constitutes the total impact that the Gila NF has on the economies of the neighboring communities. These impacts, in terms of employment, income, and total output, are summarized in **Table 7.7**.

Table 7.7: Direct, Indirect, and Induced Impacts of the Gila NF, 2004

TOTAL OUTPUT IMPACTS (000s of 2002 \$)				
	Direct	Indirect	Induced	Total
Ranching	11,617	7,230	989	19,836
Timber Harvesting	1,244	317	123	1,685
Visitors & Recreation	111,170	15,196	14,993	141,359
Forest Service Operations	--	8,940	5,546	14,485
Total	124,031	31,683	21,652	177,366

TOTAL EMPLOYMENT IMPACTS (#)				
	Direct	Indirect	Induced	Total
Ranching	161	109	15	285
Timber Harvesting	4	5	2	10
Visitors & Recreation	2122	196	222	2540
Forest Service Operations	374	88	79	540
Total	2661	398	317	3376

TOTAL LABOR INCOME IMPACTS (000s of 2002 \$)				
	Direct	Indirect	Induced	Total
Ranching	1,254	1,740	301	3,295
Timber Harvesting	270	93	38	400
Visitors & Recreation	42,009	4,750	4,561	51,319
Forest Service Operations	4,172	3,118	1,604	8,894
Total	47,705	9,699	6,504	63,908

In total, the Gila NF contributes directly or indirectly an estimated 3,376 jobs and \$63.9 million in income to the economies of the four counties included in this study. This is equivalent to about 17.5 percent of the 19,245 jobs in these areas in 2002. Visitor spending is by far the largest source of activity, contributing a total of 75 percent of the jobs and 80 percent of the labor income impacts. Ranching also contributes significantly, while the impacts of timber harvesting are negligible.

The comparatively large contribution of recreational and visitor spending is a result of the number of people visiting the Gila NF. More than one million parties visited the Gila NF in 2001, which indicates a substantial degree of use.

The economic multipliers shown in **Table 7.8** offer additional insights into the economic dynamics of the Gila NF. Economic multipliers, equal to the total impact divided by the direct impact, indicate the effectiveness of the industry in generating growth in the local economy. A

first observation is that the multipliers are fairly low, though typical of New Mexico in general, indicating that direct activities either require few inputs or, more likely, that the small local economies are unable to provide many of the inputs, forcing expenditures to leave the region.

Table 7.8: Economic Multipliers for the Gila NF, 2004

	Output	Employment	Income
Ranching	1.71	1.77	2.63
Timber Harvesting	1.35	2.69	1.48
Visitors & Recreation	1.27	1.20	1.22
Forest Service Operations	--	1.44	2.13
Total	--	1.27	1.34

While the impacts discussed above capture a large degree of the contribution of the Gila NF to the economic activity of the assessment area, there are a number of special, high income activities that warrant special attention and that may not be satisfactorily captured in the visitor survey measurements. In particular, there are a number of private businesses that offer guided tours and hunting trips.

As noted in chapter 5, the FS's Special Uses Database System shows that there are 142 permits for outfitters and guides, 99 of which are active. Some of the 99 open permits issued are for organizations from outside the assessment area, and it is likely that the economic contribution of their business to the assessment area is marginal. However, those outfitters and guides that are located within the assessment area represent a significant amount of economic activity. For hunting outfitters, standard prices seem to range from \$600 to \$700 per day, often with a multiple day minimum. Customers of these companies are almost exclusively from outside the local region, so they represent an important flow of money into the region. Without specific data from these companies on their revenues, it is difficult to measure their economic contribution, but it should be recognized that this is a potential contribution of the forest that is not well incorporated into the measurements above.

A factor not discussed yet, but introduced above, is the impact of wildfire suppression spending. As a conservative estimate, if we assume that nearly all equipment and personnel are hired from outside the region, we are left with the spending by workers during the fire suppression activity. Using the above multipliers and recognizing that disposable income is significantly lower than the personnel compensation, a quick estimate of the economic activity generated by wildfire personnel is about \$2.1 million dollars. This is roughly equivalent to 40 annual full-time jobs. Alternatively, including wildfire suppression spending and using the associated IMPLAN profile, additional economic activity of \$3 million in output, 18 jobs, and \$459,000 of labor income is generated.

7.5 Challenges and Opportunities for Forest Management

Looking strictly at economic impacts, it is estimated that the Gila NF contributes to almost 18 percent of the assessment area economic activity in terms of employment. It is likely that the majority of this impact occurs in Catron and Grant Counties. The distribution of Gila NF lands

throughout the counties, and the differences in the size of the economy in each county, suggest different degrees of reliance on the Gila NF as a source of economic activity.

In addition to the strict economic contributions described above, there are several less strictly economic impacts that are nevertheless capable of causing a significant difference in the economic activity of the assessment area. One particularly good example is the water retention and generation properties of the forest, but other factors, such as the role the forest (and more appropriately, the minerals underneath it) played in the initial founding of settlements, are also important. In arid southwest regions such as this, the presence of a river is crucial to enabling the survival of local populations. Analyzing how the Gila NF impacts the quality and availability of water so critical to local settlements and their economies is beyond the scope of this report. Suffice it to say that there are ecological impacts from the forest that support economic activity in the assessment area beyond the activities that have been measured here.

Catron County is possibly, for a variety of reasons, the most dependent of the four counties on the use of the Gila NF. First of all, a large portion of its land is forest land. Additionally, the county is extremely rural, with a very small population and economic base. In **Table 7.3**, it can be seen that just over 25 percent of Catron County's economic output is from ranching and farming, and it is likely that a substantial portion of these activities make use of the Gila NF. Additionally, in economies as small as that of Catron County, visitor spending is a vital source of money, and the Gila NF is the primary tourist attraction of Catron County. The dependence of the Catron County economy on the Gila NF is very probably limitless. Given that 47.9 percent of Catron County is covered by the Gila NF, associating even 25 percent (844) of the total Gila NF employment impacts with Catron County would produce a result that equals more than 50 percent of the county's total 2003 employment.

Grant County also contains a significant portion of the Gila NF, though the slightly more urban region of Silver City and the correspondingly more robust economy serve to make it less dependent than Catron County on the economic contribution of the forest. That said, the Gila NF covers almost 35 percent of Grant County, and a large majority of the impacts from the forest are likely to occur there. The presence of Silver City as the largest city in the region also serves to increase the portion of the forest impacts that are felt in Grant County. In all, despite the more robust economy of Grant County, the economic contribution of the Gila NF is substantial, and tourist dollars are a particularly important part of that contribution.

The impact of the Gila NF on Hidalgo County is likely to be relatively small, and, in truth, a greater impact is probably felt from whatever trade relationship exists between Silver City and the residents of Hidalgo County than from the existence of the forest. The Gila NF covers only 0.35 percent of Hidalgo County, so whatever activities can be said to be generated from the forest must be quite small. Though we can see from **Table 7.3** that Hidalgo County has a substantial ranching sector, very little, if any of it, involves grazing on Gila NF lands. Correspondingly, few if any Gila NF employees are located in Hidalgo County, and it is likely that virtually all visitor spending benefits occur in other counties. There is some impact that occurs as the benefits of the forest accrue in other counties and that generates further rounds of spending, some of which undoubtedly occurs in Hidalgo County, but these benefits are nebulous and by definition much smaller.

Sierra County contains a fair portion of the Gila NF, and 13.5 percent of the county is covered by the Gila NF, so it is not as removed from the forest's economic benefits as Hidalgo County. In

addition, Sierra County contains Truth or Consequences, which appears to serve as an important base for non-local visitors to the forest, much as Silver City does. In this respect, and in the contribution from ranching and FS employment, the presence of the Gila NF is important to the county. However, like Grant County, Sierra County has a substantially larger population and a stronger economic base, and so is not as dependent on the economic contribution of the forest as Catron County.

One particular issue that may arise, as discussed in Chapter 5 on Uses and Users, is the effect of falling rancher income in Catron and Grant Counties. Farm income in these counties has been declining substantially over the past several years. Most of the farm activity in these two counties is based around cattle, which has accounted for the decline in incomes, especially since the more diversified farm sectors of Hidalgo and Sierra Counties have not experienced the same trend. This situation, coupled with the fact that a large amount of grazing land in Catron and Grant Counties is located on the Gila NF, has created the potential for a tense situation. Though compared with recreational spending the impact of ranching is relatively small, it makes up a large portion of economic activity in Catron County in particular.

In examining forest planning and management issues, we are left with the difficulty of assessing the relevance of the Gila NF to an assessment area that consists of four counties that each contain substantially different amounts of the Gila NF and share a rural and generally poor economic profile. Certainly, as discussed above, the economic contribution of the forest is felt most keenly in Catron and Grant Counties, if nothing else simply because of the huge portion of the forest that they contain. This is particularly true for the very small economy of Catron County. The Gila NF also plays an important role in the Sierra County economy, but is much less important for the economy of Hidalgo County. Forest planning should recognize the extreme dependence of Catron County residents on the Gila NF, not just in terms of the economic benefits discussed here, but also as a source of food and fuel. This is also true, albeit to a lesser extent, for Grant and Sierra Counties.

It is also important to recognize, as some previous events have indicated, that many of the assessment area's residents consider the use of forest products to be a right, and actively resist any attempt to curtail their use. Planning for future management of the forest must balance the needs of the local population with the mandate of maintaining a national forest and wilderness areas.

8 Community Relationships

This chapter describes the relationships between communities surrounding the Gila National Forest (NF) and the Forest Service (FS). The FS has an extensive history of working with local communities on various projects, ranging from economic development to forest health and sustainability. Partnerships are an indispensable method of managing operations and conducting business. They are a vital means of achieving goals that might not be met by the FS alone.

8.1 Gila National Forest Communities

Chapter 2 provided a demographic profile of the four counties that make up the Gila NF assessment area. Some information was also provided on the major communities within these counties. **Table 8.1** below provides links to socioeconomic information from the 2000 census on each of the major communities in the area.

Table 8.1: Gila NF Communities: Socioeconomic Profiles from Census 2000

<u>County/Community</u>	<u>Link to Socio-Economic Information</u>
<u>Catron County</u>	
Reserve	http://www.unm.edu/~bber/census/sample/1603562620.pdf
<u>Grant County</u>	
Silver City	http://www.unm.edu/~bber/census/sample/1603573260.pdf
Bayard	http://www.unm.edu/~bber/census/sample/1603506270.pdf
Hurley	http://www.unm.edu/~bber/census/sample/1603533850.pdf
<u>Hidalgo County</u>	
Lordsburg	http://www.unm.edu/~bber/census/sample/1603542180.pdf
<u>Sierra County</u>	
Truth or Consequences	http://www.unm.edu/~bber/census/sample/1603579840.pdf
Elephant Butte	http://www.unm.edu/~bber/census/sample/1603522720.pdf

The people who make up these communities have very diverse histories, cultural backgrounds, and ways of using the Gila NF. As a result, their relationships with each other, the Gila NF, and the FS are also varied. In their 2005 report *Values, Attitudes and Beliefs Toward National Forest System Lands: The Gila National Forest*, John Russell and Peggy Adams-Russell isolated areas of contention and of agreement among residents of the communities surrounding the Gila NF. The participants in this study indicated that the most prominent divide in the values, attitudes, and beliefs of community residents is rooted in “conflicts about resource uses, particularly grazing and wilderness.” While this conflict is long-standing and at times seemingly insurmountable, Russell and Adams-Russell also isolated several areas of agreement that included participants from both sides of the divide: a shared “outdoor lifestyle,” an admiration for the vastness of the forest, a love of the diversity and richness of the resources in the forest, and an appreciation for the ease of access to the forest, among others. The study also found that, despite the “pervasive”

conflicts, “some local groups composed of a cross-section of diverse interests . . . are working together in collaborative efforts.”¹⁴⁷

Study participants indicated several areas of contention with the FS: frustration with perceived political influence on FS decision making, criticism of “one issue” management versus “whole system” management, and concern over a perceived lack of funding and expertise for effective management of the Gila NF.¹⁴⁸ Many participants expressed their desire for FS staff to spend more time in direct interaction with the forest and the community members around it.¹⁴⁹ The following sections describe some of the ways in which the FS has gotten involved with these communities.

8.2 Partnerships

Data provided by the FS show that over 200 community organizations and businesses partner with the FS on various projects around the state. **Table 8.2** below lists the types of partners the FS worked with in 2005 and gives examples relevant to the Gila NF.

Table 8.2: Partnership Types for Gila NF, 2005

Partner Type	Example	Number of Partnerships
Federal	Bureau of Land Management	15
State Government	NM Game and Fish Dept.	22
Local Government	Catron County Commission	38
Tribal	Ramah Band of Navajos	19
Non Governmental Org.	Center for Biological Diversity	48
Private	Gila Woodnet	36
Universities/ Public Schools	Western New Mexico Univ.	28
		206

Source: USDA Forest Service

The most common partners are non-governmental organizations, which are typically non-profit organizations such as neighborhood associations and agricultural sustainability groups, like the Center for BioDiversity, and State government agencies, like the New Mexico Department of Game and Fish. The partnerships work to benefit both the forest land and the users. Appendix **Table A.6** provides a list of all the grants and agreements between the Gila NF and other organizations. The list is extensive. It gives the name of the partner and the contribution amounts, both dollar and in-kind, from the partner and from the FS itself. Missing are descriptions of the project and lists of the other partners involved. Many of the projects are collaborations among a variety of different types of organizations.

Below are descriptions of some of the projects going on in the Black Range RD, as listed on their webpage.¹⁵⁰

¹⁴⁷ John C. Russell and Peggy A. Adams-Russell, “Values, Attitudes and Beliefs toward National Forest System Lands: The Gila National Forest,” *Adams-Russell Consulting* (released as a Forest Service report under the same name) (2005): 12-13.

¹⁴⁸ *Ibid*, pp. 33-34.

¹⁴⁹ *Ibid*, pp. 37-38, 49.

¹⁵⁰ USDA FS: Gila National Forest, “Black Range Ranger District,” <http://www2.srs.fs.fed.us/r3/gila/about/distmain.asp?district=black>.

Exhibit 8.1: Current Collaborative Projects in the Black Range RD

Wildland-Urban Interface Fuels Reduction – around the Kingston and Poverty Creek areas.

Wahoo Watershed Partnership Planning – a collaborative partnership approach to address watershed, forest and grassland restoration.

Hermosa Prescribed Burn Project – coordinated with Ted Turner’s Ladder Ranch, this project aims to reduce fuel load and enhance wildlife habitat on thousands of acres on the Black Range.

Continental Divide Trail – New construction and maintenance of the Continental Divide Trail, working with partners and volunteer groups like the Back Country Horseman’s Association.

Fire Use Program – This program is extensive. “Fire use” is simply allowing naturally occurring fires to burn when no threat to people or property exists. These low-intensity fires rid the forest of heavy fuel loads and debris, and improve our rangelands, watersheds and wildlife habitat. Nearly 20 percent of the district burned in 2003. The effort is open to all volunteers.¹⁵¹

8.3 Collaborative Forest Restoration Program

One way the Gila NF has been teaming up with community groups is through the Collaborative Forest Restoration Program (CFRP). The Community Forest Restoration Act of 2000 (Title VI, Public Law 106-393) established a cooperative forest restoration program in New Mexico.¹⁵² The program provides cost-share grants to stakeholders for forest restoration projects on public land that are designed through a collaborative process. Projects must address specific issues, such as wildfire threat reduction, ecosystem restoration, preservation of old and large trees, and increased utilization of small diameter wood products. The Act authorizes up to \$5 million annually.¹⁵³ State, local, and tribal governments, educational institutions, landowners, conservation organizations, and other interested public and private entities can apply for funds.¹⁵⁴

In New Mexico, about 13 projects were funded between 2001 and 2005. The three projects in the Gila NF that were funded in 2005 are described in **Exhibit 8.2** below.

Exhibit 8.2: 2006 Collaborative Forest Restoration Projects in Gila NF

JL Enterprises

JL Enterprises of Catron County received \$17,993 for purchase of equipment to increase firewood sales. Linda Cooke of JL Enterprises said, “This program will enable us to purchase a trailer, which will be used to transport packaged firewood. We will be able to make 7 trips

¹⁵¹ Ibid.

¹⁵² Secure Rural Schools and Community Self-Determination Act of 2000 (May also be cited as the “Community Forest Restoration Act”), H.R. 2389 (Title VI, Pub. L. No. 106-393)

¹⁵³ USDA FS, Southwestern Region, “State and Private Forestry, Collaborative Forest Restoration Program (CFRP),” <http://www.fs.fed.us/r3/spf/cfrp/index.shtml>.

¹⁵⁴ Southwest Area Forest, Fire, and Community Assistance Grants, “Collaborative Forest Restoration Program,” <http://www.southwestareagrants.org/nm/cfrp.php>.

to Albuquerque for what it would cost to ship one load by semi. These 7 trips will equal 3½ semi loads. The ability to transport larger quantities of packaged firewood will increase our customer base and provide additional jobs in Catron County."

Lower Frisco Wood Products

Lower Frisco Wood Products, operators of a sawmill south of Reserve, was awarded \$120,000 to replace a malfunctioning log loader that reduced mill productivity. The mill employs six people full-time and manufactures products including vigas, utility poles and rough-cut dimensional lumber. The grant also includes funds for personnel training on existing mill equipment.

Upper Gila Watershed Alliance

The Upper Gila Watershed Alliance received \$360,000 to conduct wildlife and archeological surveys as components of a National Environmental Policy Act (NEPA) assessment in the Signal Peak area. The NEPA analysis will provide the basis for future forest restoration management decisions. Along with educational and monitoring components, the work plan includes approximately 165 acres of forest restoration treatment near Pinos Altos.

Trout Unlimited, Inc.

Trout Unlimited, Inc. was awarded \$360,000 for environmental assessments associated with forest restoration planning in the Aldo Leopold Wilderness. The NEPA assessments will assist the Gila National Forest in planning for the reestablishment of natural fire regimes to reduce the threat of large scale, high intensity wildfire. The consequent reduction in detrimental watershed impacts will enhance and protect Gila trout habitat. The project also includes restoration of streams near Glenwood and Reserve to expand loach minnow and other native fish habitat.¹⁵⁵

8.4 New Mexico Fire Plan Collaborative Efforts

One of the areas where significant progress is being made as a result of collaboration is a broad-based coalition of federal land management agencies, state agencies, local governments, industry groups, and environmental groups working on issues relating to fire.¹⁵⁶ In working together, the groups hope to develop and implement a comprehensive strategic framework to accomplish the following goals:

- Restore the natural fire cycles and ecological processes of watersheds across all ownerships.
- Provide support for the development of economically viable uses of resources derived from forest and rangeland restoration projects on all ownerships.
- Promote awareness and accelerate work to reduce the risk of catastrophic

¹⁵⁵ USDA FS, Gila National Forest, "Collaborative Forest Restoration Program," <http://www2.srs.fs.fed.us/r3/gila/cfrp/>.

¹⁵⁶ The discussion that follows is based on the USDA FS report, "New Mexico Fire Plan/National Fire Plan 2004 Accomplishment Report, Southwestern New Mexico," The "regional command team" included "New Mexico State Forestry, USDA Forest Service, DOI Bureau of Land Management, U.S. Fish and Wildlife Service, New Mexico State Fire Marshal, New Mexico Soil and Water Conservation Division, New Mexico Environment Department, Council of Government Community Groups, Industry/Utilization Representatives, [and] Sierra, Socorro, Grant, San Francisco, Hidalgo, Salado, Quemado and Luna Soil and Water Conservation Districts." http://www.emnrd.state.nm.us/fd/RCT/documents/GilaNMFP_NFP04Layout_indd.pdf.

wildfires to communities and private lands.¹⁵⁷

According to the *New Mexico Fire Plan/National Fire Plan 2004 Accomplishment Report*, in 2004, over 91 thousand acres were treated, with a focus on the “20 Communities Most at Risk” identified by the State Forestry Department in New Mexico and at a cost of over \$3.5 million in federal, state, grant, and matching dollars. The biomass produced during treatment was converted into chips, firewood, saw logs, board lumber, and roundwood. Over 120 jobs were created through contracting with local workers. More than 700 people received certifications to participate in and help with the treatments.¹⁵⁸

The report details several specific examples of successful cooperative projects, two of which are in the assessment area. The first is a CFRP program for forest restoration in the Sheep Basin area southeast of Reserve. One hundred-fifty acres were thinned in the first month. The thinned trees, largely small diameter (under 12 inches), were transported to the Reserve Sawmill to start initial operations. The mill is owned by Catron County and leased to the Catron County Citizens Group. A variety of local business people worked on finding markets for the wood products and also for the wood by-products of the mill.¹⁵⁹

A second success is the Mangas Water Quality Project. The sediment erosion problems of the Mangas watershed had put this important tributary of the Gila River on to New Mexico’s 303-D list.¹⁶⁰ A grant brought together a partnership between the Grant Soil and Water Conservation District, the NM Environment Department, the FS, the Gila NF, the Bureau of Land Management, and residents of the Mangas watershed. In Phase 1, 100 erosion control structures were completed and three prescribed burns were conducted on roughly 9,000 acres. The hope is to restore the forest to 200 trees per acre from as many as 1,200 today.¹⁶¹

8.5 Volunteers

There is no doubt that volunteers comprise a major source of labor for the FS, allowing the agency to take on more projects than it could without volunteers. Volunteers perform a long list of tasks, including maintaining recreation sites and trails, litter pick up, and wildlife restoration. The relationships between volunteers and the FS benefit the national forests and the volunteers, who are provided opportunities to learn about the forest, wildlife, and forest health.

According to data collected from the FS, the Gila NF benefited from the work of 350 volunteers in 2005. **Table 8.3** shows the gender and age breakdown of all Gila NF volunteers in each of the past six years. In the past few years, around 30 percent of the volunteers have been over 55 years of age, which means that the remaining 65-70 percent have been of prime working age, 18 to 54 years old.

¹⁵⁷ Ibid.

¹⁵⁸ Ibid.

¹⁵⁹ Ibid.

¹⁶⁰ Section 303(d) of the Clean Water Act establishes that states are to list waters for which technology-based limits alone do not ensure attainment of applicable water quality standards. This list is commonly called the “303(d) list.”

¹⁶¹ USDA FS, “New Mexico Fire Plan/National Fire Plan 2004 Accomplishment Report, Southwestern New Mexico,” http://www.emnrd.state.nm.us/fd/RCT/documents/GilaNMFP_NFP04Layout_indd.pdf.

Table 8.3: Age and Gender of Gila NF Volunteers, 2000 – 2005

2005					2004				2003					
	< 18	18-54	55+	TOTAL		< 18	18-54	55+	TOTAL		< 18	18-54	55+	TOTAL
Male	6	156	74	236	Male	7	101	51	159	Male	27	94	57	178
Female	5	72	37	114	Female	4	81	38	123	Female	18	84	26	128
Total	11	228	111	350	Total	11	182	89	282	Total	45	178	83	306
2002					2001				2000					
	< 18	18-54	55+	TOTAL		< 18	18-54	55+	TOTAL		< 18	18-54	55+	TOTAL
Male	23	190	121	334	Male	21	93	54	168	Male	22	63	35	120
Female	10	72	13	95	Female	17	93	35	145	Female	23	55	27	105
Total	33	262	134	429	Total	38	186	89	313	Total	45	118	62	225

Source: USDA Forest Service Volunteer Data (Human Resource Department)

The FS estimates the appraised value of 26,531 volunteer hours at over \$289,000 in 2005, as shown in **Table 8.4**. The data account for the “skill-level” of volunteers, adjusting appraised value to the government pay grade scale. The “person years” column illustrates how many years worth of work was subsidized by the efforts of volunteers. Clearly, the FS benefits the most from volunteer efforts related to recreational activities and facilities (campground and trail maintenance); volunteers provide more than \$234,000 worth of time and about 12 person-years worth of work in this area. Volunteers also contribute substantially to heritage programs and business and finance. The amount and value of the time donated is quite large, particularly when one considers that only about 54,000 people lived in the four-county assessment area in 2000. This level of effort is testament to the value of the forest to local residents.

Table 8.4: Value of Volunteers on Gila NF

Resource Category	2005			2004			2003		
	Accum. Hours	Appraised Value (Dollars)**	Person Years*	Accum. Hours	Appraised Value (Dollars)**	Person Years*	Accum. Hours	Appraised Value (Dollars)**	Person Years*
Recreation	21,708	\$234,171	12.06	17,500	\$178,969	9.72	18,821	\$178,377	10.46
Heritage Program	1,289	\$22,869	0.72	6	\$105	0.00	0	\$0	0.00
Wildlife, Fish & Rare Plants	324	\$3,907	0.18	464	\$4,869	0.26	858	\$10,385	0.48
Range Management	80	\$375	0.04	1,087	\$14,527	0.60	3,348	\$41,197	1.86
Forest Management	192	\$1,008	0.11	826	\$5,369	0.46	829	\$9,722	0.46
Watershed & Air Mgt	40	\$95	0.02	30	\$400	0.02	287	\$1,639	0.16
Protection	96	\$1,156	0.05	0	\$0	0.00	414	\$2,331	0.23
Research	0	\$0	0.00	231	\$2,597	0.13	0	\$0	0.00
Business & Finance	1,648	\$15,829	0.92	3,434	\$27,979	1.91	1,888	\$21,704	1.05
Facilities Const (Off-Center)	0	\$0	0.00	0	\$0	0.00	0	\$0	0.00
Facilities Const (On-Center)	494	\$2,500	0.27	0	\$0	0.00	58	\$633	0.03
Other Facilities	0	\$0	0.00	0	\$0	0.00	0	\$0	0.00
Other	660	\$6,943	0.37	1,872	\$21,350	1.04	520	\$5,602	0.29
TOTALS	26,531	\$ 288,853	14.7	25,450	\$ 256,165	14.14	27,023	\$271,590	15.02
Resource Category	2002			2001			2000		
	Accum. Hours	Appraised Value (Dollars)**	Person Years*	Accum. Hours	Appraised Value (Dollars)**	Person Years*	Accum. Hours	Appraised Value (Dollars)**	Person Years*
Recreation	17,906	\$193,124	9.95	25,633	\$274,767	14.24	14,382	\$140,775	7.99
Heritage Program	340	\$4,080	0.19	1,480	\$54,101	0.82	0	\$0	0.00
Wildlife, Fish & Rare Plants	812	\$9,584	0.45	3,258	\$36,809	1.81	2,628	\$25,076	1.46
Range Management	2,497	\$29,524	1.39	510	\$6,516	0.28	1,620	\$19,602	0.90
Forest Management	270	\$3,212	0.15	8	\$92	0.00	0	\$0	0.00
Watershed & Air Mgt	0	\$0	0.00	0	\$0	0.00	0	\$0	0.00
Protection	0	\$0	0.00	0	\$0	0.00	72	\$4,861	0.04
Research	10	\$38	0.01	0	\$0	0.00	0	\$0	0.00
Business & Finance	96	\$450	0.05	2,900	\$26,558	1.61	1,134	\$9,312	0.63
Facilities Const (Off-Center)	0	\$0	0.00	50	\$496	0.03	72	\$538	0.04
Facilities Const (On-Center)	0	\$0	0.00	0	\$0	0.00	792	\$6,418	0.44
Other Facilities	0	\$0	0.00	1,262	\$5,280	0.70	0	\$0	0.00
Other	1,378	\$14,935	0.77	402	\$4,333	0.22	0	\$0	0.00
TOTALS	23,309	\$ 254,947	13.0	35,503	\$ 408,952	19.71	20,700	\$206,582	11.50

* Accum. Hours/1800 Hours (Expressed in years)

** Accum. Hours*Estimated Government Pay Grade

Source: USDA Forest Service Volunteer Data (Human Resource Department)

8.6 Challenges and Opportunities for Forest Management

The direct benefits of the Gila NF are concentrated in the communities surrounding the forest. These communities derive substantial economic benefit from the forest, and local residents comprise almost 60 percent of the people who use the forest for recreational purposes. Increasingly, the benefits to local communities are associated with recreational uses of the forest and from tourism. Amenity migrants are also bringing dollars into the region. The transition from economies based on mining, ranching, and timber to economies reliant on tourism, retirees, and lone eagles is not an easy one and has been made more difficult by clashes in values, beliefs, and attitudes regarding the management of NF lands.

Despite fundamental differences, the people who live in proximity to the Gila NF and most of those who visit share a love of the outdoors and treasure the Gila NF. The figures presented in this chapter regarding NF volunteers, along with the narratives regarding collaborative efforts, are a testament to the importance of the forest to local communities and the willingness of residents to work toward finding solutions to complex problems.

9 Principal Findings, Challenges, and Opportunities

The Gila National Forest (NF), with its vast wilderness and undisturbed roadless areas, its abundant wildlife, its streams and rivers, and its heritage resources, is a national treasure. The Gila NF, however, is also a local treasure, a central feature of the landscape for people in the surrounding communities; it is also an asset that has major economic impacts on the counties of the assessment area and that holds promise for the future prosperity of these areas.

9.1 Changing Economic Fortunes

The Gila NF assessment area is an area of changing economic fortunes, and many of the changes relate to the natural resources of the area and to changing policies regarding the use of national forests. Reflecting these changes, there are sharp divisions over Forest Service (FS) policies and over how FS lands should be managed.

- Over the past few decades, much of the logging industry in this part of New Mexico has disappeared, with the largest sawmill, in Reserve, closing in 1993. An industry based on harvesting small diameter trees holds much promise, but is as yet in its infancy.
- Ranching continues to be a major activity in the Gila NF assessment area counties, but the economic viability of ranching is threatened by prolonged drought conditions and by market forces over which individual producers have no control. In New Mexico as elsewhere, the population engaged in ranching is aging. Some ranching operations have undoubtedly also been adversely affected by the restrictions imposed on some federal grazing allotments in an effort to encourage more sustainable grazing practices in compliance with federal law.
- Falling copper prices on international markets were one major factor in the layoffs and closures that occurred in the mines and also in the smelters of Grant and Hidalgo Counties, but in today's environment of high copper prices, only a fraction of the industry has returned. (Phelps-Dodge is instead investing in a new mine across the Arizona border in Morenci. While the jobs will be elsewhere, the Gila NF may well attract visitors from the growing community surrounding the Morenci mine.)
- On the other hand, the Gila NF has attracted increasing numbers of recreational users. The local tourism industries have expanded and there has been considerable amenity migration into the area by retirees and others, along with major investments in vacation homes. New subdivisions are opening up on the wildland-urban interface.

The Gila NF is a major asset for communities in the assessment area counties. The Gila NF has many lands under grazing allotments and there may be opportunities for the FS to work with ranchers to increase the viability of their enterprises through the adoption of sustainable grazing practices and by helping them to get grants for demonstration projects and loans to cover investments.

There are efforts to create a viable forest products industry in communities around the Gila NF, and the FS has been involved. Work on collaborative efforts to create viable forest product enterprises can be a benefit for the Gila NF.

There are also opportunities for the FS to work in partnership with communities to develop recreational options and heritage sites attractive to tourists from outside the area. With more

options, tourists may be encouraged to spend more time in the area, staying at local hotels, frequenting local restaurants, and buying local art and crafts. It is important that visitors from outside the area have quality experiences, whether at specific recreational activities or at other sites. On the other hand, some recreational uses, like off-highway vehicle drivers, can impinge upon and degrade the experiences of others and may need to be restricted.

9.2 Subdivision of Land for Residential Uses in the Wildland – Urban Interface

The strong market for residential properties in the interior of the forest or at the forest's edge has tempted ranchers and other owners to sell off their properties. New housing inside or on the forest's perimeter creates a whole series of complex management issues: what kind of road access to allow to properties inside the forest; what to do about the denial of traditional local access to the forest as the new owners put up fences and no trespassing signs; how to protect these new properties from fire and other threats (and how to pay for this protection). It is critical to understand the roles those lands now being subdivided have had in the larger ecological systems of the Gila NF, e.g., providing forage and other sustenance for wildlife.¹⁶² It is also critical to understand how the new uses of the land may threaten the health of the forest, e.g., by introducing non-native species. The new residents create new demands that may be incompatible with managing for multiple uses: e.g., they may be opposed to having cattle graze in certain areas or they may not like the smoke generated by programs to clean-out brush and other kindling. They also put new demands on limited local government resources.

There may be an opportunity to protect the wildland-urban interface by working with ranchers to increase the viability of their enterprises. There may also be opportunities for the FS to work collaboratively – with local governments, conservancy groups, and others – to acquire for open space lands that would otherwise be subdivided and sold for residential or other incompatible uses and/or to purchase development rights from ranchers. Additionally, there may be opportunities to work with communities to place reasonable restrictions (where possible) on existing and future residential subdivisions within the public-private interface. The above could be combined with public education campaigns regarding the importance of ranching and open space to the NF and to the quality of life in the assessment area counties. Resort development on the periphery of the forest may or may not be a compatible use, depending upon the nature and extent of the development. However, there should be opportunities to work with local governments and citizen groups to put reasonable restrictions on this development to ensure compatibility for forest needs.

9.3 Growing Popularity of Off-Highway Vehicles

Off-highway vehicles (OHVs) are increasingly popular recreation alternatives, and they can also offer considerable utility to ranchers, hunters, and those harvesting wood products from the forest. However, recreational OHV use can conflict with most other forest uses and has many adverse effects, as these vehicles can cause damage to riparian and other areas of the forest and can result in a whole network of user-created roads. In part to address the problem of OHVs, the

¹⁶² See, for example, Jack Ward Thomas and Stephanie Lynn Gripne, "Maintaining Viable Farms and Ranches Adjacent to National Forest for Future of Wildlife and Open Space," *Rangelands* 24, no. 1 (2002): 10-16.

FS has promulgated a new management directive, the Travel Management Rule, requiring each of the NFs to designate those roads, trails, and areas that are open to motor vehicle use.

This is likely to be an extremely controversial issue. Critical will be the up-front work of planning and advertising meetings to involve the public in shaping policies to restrict OHV use, so that all stakeholders are involved. Because the issue is contentious, good facilitation will be key. OHVs are popular and this use must be provided with designated areas that offer satisfactory recreational experiences, while tightly restricting and prohibiting entirely this use elsewhere. The issues of non-recreational OHV use need to be addressed. In this regard, the State Game and Fish restrictions on vehicle use by hunters may suggest a model.¹⁶³

The FS mission of sustainability is a long-term objective overlaid on a society that tends to think in the short-term. While Americans have become more environmentally conscious, they also exhibit paradoxical behaviors that can create environmental damage. Many of the issues tied to forest health are directly related to the public's desire to obtain short-term benefits (e.g., unmanaged OHV use, but also housing at the wildland-urban interface). Thus, it is increasingly desirable that the public be educated and informed about the fragility of the forest system and the impacts associated with its misuse. FS partners and volunteers help to mediate some of this, and these efforts should be encouraged. It may also be useful to reach out to and educate the communities of special interest groups, such as hunting, fishing, and OHV-user organizations. Participants in these types of organizations tend to be less inclined to violate rules and regulations once they are familiar with them and aware of the consequences. The education of these groups also provides a capacity for policing and reporting of those who violate these rules.

9.4 Overgrowth of the Forest and Fire

Of the 21 million acres of NF lands in the Southwestern region, more than 80 percent is at moderate to high risk of “uncharacteristic” wildfire. These fires are larger and more intense than naturally occurring wildfires. They can alter soils, reducing their ability to retain moisture, accelerate erosion, and compromise water quality. Further, wildlife habitats and the forest's aesthetic quality are damaged. The Gila NF has the highest number of fire occurrences of the NFs in the state. The forest's mountainous terrain, dense strands of mature trees, and continuing drought have combined to create a dangerous wildland fire situation that threatens wildlife habitat and nearby communities. The stakes have become higher as more and more people take up residence within the Gila NF or along the forest periphery.

How to restore the forest, so that natural processes, including fire, will have a sustaining role in maintaining the health of the forest? Many forest-users perceive the need for logging, or at least selective logging – forest thinning – to promote forest health in the long term, and they see possibilities for economic development based on processing small-diameter trees. There are a number of promising projects around the Gila NF. Making them work in the longer term requires investment; it requires finding, developing, and expanding markets for the products as well as the byproducts, and it requires developing a continual local supply of input (small diameter trees) to keep saw mills running and customer orders filled. While these projects seem to be a win-win both for the forest and for the communities that surround them, there are some who voice concerns about any type of logging or removal of trees from the forest.

¹⁶³ New Mexico Department of Game and Fish, “New Mexico Wildlife Rules and Information Booklets,” <http://www.wildlife.state.nm.us/publications/BigGameRulesandInformationBooklet.htm>.

Controlled burns, either intentionally set or naturally started, are an alternative and indeed may be pursued as a complimentary strategy. This is happening in the Gila NF. Of course, there are numerous examples of “controlled” burns that have raged out of control. Complicating the strategy of allowing fire to destroy the brush and the small trees are the growing number of people who have taken up residence within or right next to the forest and who may voice opposition.

As described in Chapter 8, the Gila NF has a track record in working with communities and non-profits, and it has the opportunity to build on and expand these collaborative efforts. Public education, and particularly education of newer residents in the wildland-urban interface, is important. The FS can make sure necessary resources to contain fires are available by giving some emphasis to training programs. As indicated above, there may be opportunities to work with other entities to restrict or prevent conversion of land in these border areas to residential subdivisions.

9.5 Endangered Species, Invasive Species

The presence of a number of endangered species within the Gila NF – and the continual threat of litigation – puts considerable pressure on the FS to protect habitat. Protecting habitat, however, may mean restrictions or outright bans on certain uses in certain areas. The Mexican spotted owl is seen as having put the logging industry out of business. Protecting habitat for the willow flycatcher and other endangered species, as well as complying with the provisions of the Clean Water Act, has emphasized additional protections for riparian areas – protections that may have the adverse consequences of reducing income and/or increasing costs for some ranchers with grazing allocations. The reintroduction of the Mexican gray wolf creates additional challenges, given both the perceived and perhaps the actual threat to livestock.

Throughout New Mexico, non-native animals and vegetation pose threats to habitat. There should be opportunities to educate the public regarding invasive species and to work with communities and volunteers on programs to eradicate non-native species.

9.6 Inventoried Roadless Areas

The elimination of the Roadless Rule and the new policy involving Inventoried Roadless Areas raised concern among NF users all over the country that forest lands were being opened up to provide more access to motorized vehicles, including access to areas that have been historically protected as wilderness areas. While a recent court decision effectively reinstated the Roadless Rule, this decision may be appealed. Governor Richardson has been outspoken on this issue. As Governor, he would have a key role to play should the policy of Inventoried Roadless Areas be re-instated.

9.7 Heritage Sites

The long history of settlement in the Gila NF area, dating back to prehistoric times, and the more recent experiences with the Apache and the U.S. military campaign against them, with mining booms and busts, and with logging and ranching, have left a legacy of many sites of archeological

and historical interest. This situation confronts the FS with the challenge of how to preserve and protect sites and of how to prioritize resources to do so.

The Gila NF has thousands of archeological sites and sites of historical interest and a list of some 500 heritage sites. Developing, protecting, and preserving these sites requires strategic planning to determine how these sites fit within the larger whole and to set priorities. Protecting sites can easily come into conflict with other uses of the forest, as it may require restrictions of use, including outright bans or the fencing off of areas. On the other hand, the need to protect sites grows as more people come into the forest. Trails bring people into the forest where they may discover sites of interest, taking home arrowheads and potshards or worse. Vandalism can be a problem. Such behavior raises all kinds of concerns, including FS responsibilities under the Native American Graves Protection Act. The Gila NF is such a vast area that policing what happens at remote sites throughout the forest is simply not practical. Public education is critical. FS volunteers and partners are an important resource in efforts both to educate the public and to monitor activities in the more remote areas of the NF.

9.8 Special Places to Native Americans

Where known, the identity and other information about these areas is kept confidential out of respect for the privacy of tribal activities and uses. The fact that many of these sites are unknown and that the tribes desire to keep both their location and what happens there secret complicates managing multiple uses on the resource. Tribal uses of land can easily conflict with non-tribal uses. In a study examining tribal attitudes and values regarding FS-managed lands, tribal representatives suggested that they take a more active role in forest planning, management, and decision-making processes, to ensure their special areas are not compromised by other uses.

There are opportunities both to bring tribal representatives into the process, perhaps making them paid consultants on planning efforts, and to work to develop signed agreements with Native American tribes that have cultural affinity or historical use of areas within the Gila NF.

9.9 Economic Impacts

Looking strictly at economic impacts, it is estimated that the Gila NF contributes to almost 18 percent of the assessment area's economic activity in terms of employment. It is likely that the majority of this impact occurs in Catron and Grant Counties. The distribution of forest land throughout the counties and the differences in the size of the economy in each county suggest different degrees of reliance on the Gila NF as a source of economic activity.

These economic impacts only relate to market activity. Unknown is the importance of the forest – as a source of dietary protein to local families who rely on hunting and fishing, as a source of firewood and fuel with which to heat homes and perhaps to cook, and as a source of building and fencing materials. Also incalculable in this study is the value of the rivers, streams, and watersheds in the Gila NF.

Good decisions require good information. Since NF policies clearly impact the economies of surrounding communities and the overall wellbeing of residents, the subtleties and complexities of policy impacts need to be understood. Casting a broad net in terms of bringing stakeholders into the planning process is critical. Good planning and good decisions require good listening,

sincere efforts to understand different perspectives, probing as to the impacts of decisions, and the ferreting out of unintended consequences.

9.10 Communities are Willing Partners

Despite fundamental differences, the people who live in proximity to the Gila NF share a love of the outdoors and cherish the Gila NF. The figures presented regarding NF volunteers along with the narratives regarding collaborative efforts are a testament to the importance of the forest to local communities and the willingness of residents to work toward finding solutions to complex problems. The future budgetary situation is not encouraging. The Gila NF has a tremendous asset in its volunteers, whose efforts must be valued and appreciated, and there is great potential for further partnering with communities, nonprofits, and other government agencies. The risks lay in failing to establish trust, but it will also be necessary to find areas of common agreement.

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Appendices

TableA.1: Capital Outlays for Counties in Gila NF

Counties	Road	Terminus	Year	Amount	Description
Catron	LOCAL	Mountaineer Road in Reserve	2006	50,000	Road Improvements
Catron	NM0012	JCT US0180 - East	2006	1,250,000	Bridge Replacement
Catron	NM0012	NM 12 Bridges Near Reserve	2007	1,700,000	Bridge Replacement
Catron	NM0012	Rockfall Mitigation	2006	240,000	Rockfall Mitigation
Catron	NM0012	Reserve to Aragon	2007	600,000	Bridge Deck Replacement
Catron	NM0012	Reserve to Aragon	2007	1,700,000	Bridge Replacement
Catron	NM0012	Reserve to Aragon	2007	5,000,000	3R & Reconstruction
Catron	NM0032	Guardrail Installation	2006	210,000	Guardrail, Safety
Catron	NM0032	Rockfall Mitigation	2006	75,000	Rockfall Mitigation
Catron	NM0032	Rockfall Mitigation	2006	113,000	Rockfall Mitigation
Catron	NM0036	Rockfall Mitigation	2006	29,000	Rockfall Mitigation
Catron	NM0435	Sidewalks / Bikeways in Reserve	2008	180,000	Sidewalks/Bikeways
Catron	US0060	Rockfall Mitigation	2006	49,000	Rockfall Mitigation
Catron	US0180	Guardrail Installation	2006	400,000	Guardrail, Safety
Catron	US0180	Rockfall Mitigation	2006	292,000	Rockfall Mitigation
Catron	US0180	Guardrail Installation	2006	150,000	Guardrail, Safety
Catron	US0180	4 miles south of JCT nm0012 - south	2007	500,000	Alignment Study
Catron	US0180	4 miles south of JCT nm0012 - south	2009	6,700,000	Reconstruction
Catron	US0180	Rockfall Mitigation	2006	460,000	Rockfall Mitigation
Catron	US0180	Rockfall Mitigation	2006	224,000	Rockfall Mitigation
Catron	US0180	10 Miles South of JCT NM0012 - South	2010	6,700,000	Reconstruction
Catron	US0180	9.1 Miles north Grant/Catron C/L - South	2009	3,000,000	Pavement Rehabilitation
Catron	US0181	9.1 Miles north Grant/Catron C/L - South	2009	3,000,000	Reconstruction
Catron	US0180	2.0 Miles north of Grant/Catron C/L - South	2009	2,000,000	Pavement Preservation
Catron	US0180	2.0 Miles north of Grant/Catron C/L - South	2009	1,000,000	Reconstruction
Grant	LOCAL	Diaz Avenue Multi-Use Path	2008	250,000	Multi-Use Path
Grant	FL4843	College Avenue, Texas Street to E Street	2006	400,000	Road Improvements
Grant	FL4848	Pope Street/College Avenue	2006	297,000	Signalization
Grant	FL6403	Bayard Street, Village of Santa Clara	2006	1,000,000	Reconstruction
Grant	I10	I-10, Various Locations, MP 44 - MP 58	2007	5,700,000	Pavement Rehabilitation
Grant	NM0015	US 180 to 32nd Street	2008	300,000	Sidewalks/Bikeways
Grant	NM0015	US 180 to 32nd Street	2008	1,800,000	Intersection Improvements
Grant	NM0090	San Vicente Arroyo	2009	3,500,000	Bridge Replacement
Grant	NM0346	Within Bayard	2007	850,000	Miscellaneous Construction
Grant	US0180	.25 Mile West of JCT. Silver Heights - East	2006	4,000,000	Reconstruction
Grant	US0180	.25 Mile West of JCT. Silver Heights - East	2006	300,000	Intersection Improvements
Grant	US0180	.25 Mile West of JCT. Silver Heights - East	2006	700,000	Pavement Rehabilitation
Grant	US0180	.25 Mile West of JCT. Silver Heights - East	2006	1,000,000	Safety
Grant	US0180	.25 Mile West of JCT. Silver Heights - East	2006	275,000	Signalization
Grant	US0180	Deming to Bayard (Segment I of III)	2009	13,700,000	Reconstruction
Grant	US0180	US 180 at Carrasco Avenue	2006	31,000	Lighting -Safety
Grant	US0180	Deming to Bayard (Segment II of III)	2008	10,800,000	Reconstruction
Grant	US0180	Deming to Bayard (Segment III of III)	2008	5,500,000	Reconstruction
Hidalgo	VAR	I-10 Corridor "ITS"	2006	140,000	Miscellaneous Construction
Hidalgo	VAR	I-10 Corridor "ITS"	2006	800,000	Signing

Appendices

Counties	Road	Terminus	Year	Amount	Description
Hidalgo	VAR	I-10 Corridor "ITS"	2006	600,000	Safety
Hidalgo	VAR	I-10 Corridor "ITS"	2007	200,000	Safety
Hidalgo	VAR	I-10 Corridor "ITS"	2008	200,000	Safety
Hidalgo	VAR	I-10 Corridor "ITS"	2009	200,000	Safety
Hidalgo	I10	MP 0.0 - MP 20.0	2010	10,000,000	Pavement Rehabilitation
Hidalgo	I10	Lordsburg West/Interchange East	2007	3,200,000	Pavement Preservation
Hidalgo	I10	Lordsburg to JCT. NM 146 (Segment II of II)	2006	10,955,000	Reconstruction
Hidalgo	L00021	Upgrade Sidewalks to 1991 ADA Requirements	2008	900,000	Pedestrian Facilities
Hidalgo	NM0009	Various Locations	2009	5,000,000	Pavement Preservation
Hidalgo	NM0009	NM 9, Location TBD	2011	10,000,000	Pavement Preservation
Hidalgo	US0070	Arizona State Line to Lordsburg	2008	5,000,000	Overlay
Sierra	I25	I-25, MP 75 to MP 88	2011	7,000,000	Pavement Preservation
Sierra	I25	Truth or Consequences Interchange Structures	2008	2,500,000	Bridge Rehabilitation
Sierra	I25	Cuchillo Interchange- North	2009	1,800,000	Bridge Replacement
Sierra	I25	Cuchillo Interchange- North	2009	400,000	Bridge Rehabilitation
Sierra	I25	Cuchillo Interchange- North	2009	2,000,000	Pavement Rehabilitation
Sierra	I25	Cuchillo Interchange- North	2009	1,800,000	Reconstruction
Sierra	I25	Cuchillo Interchange- North	2009	70,000	Right-of-Way Acquisition
Sierra	I25	Montichello Canyon	2008	4,000,000	Reconstruction
Sierra	I25	Milepost 92 to Milepost 102	2007	1,750,000	Pavement Preservation
Sierra	L00011	Williamsburg Business Loop	2007	150,000	Pedestrian Facilities
Sierra	NM0051	Within T or C	2006	220,500	Pedestrian Facilities
Sierra	NM0051	Various Locations	2011	2,000,000	Pavement Preservation
Sierra	NM0051	Cuchillo Creek/Rio Grande Bridges	2007	3,200,000	Bridge Replacement

Table A.2: Trails on the Gila NF

Name	Trail Type	Designed Use
TURKEY CIENEGA	STANDARD/TERRA TRAIL	
SQUAW CREEK	STANDARD/TERRA TRAIL	
ROCKY POINT	STANDARD/TERRA TRAIL	
MIMBRES	STANDARD/TERRA TRAIL	
STOVE PIPE	STANDARD/TERRA TRAIL	
IRON	STANDARD/TERRA TRAIL	
CCC	STANDARD/TERRA TRAIL	
CCC	STANDARD/TERRA TRAIL	
PURGATORY	STANDARD/TERRA TRAIL	
MIDDLE FORK MIMBRES	STANDARD/TERRA TRAIL	
HELLS HOLE BYPASS	STANDARD/TERRA TRAIL	
ALUM CAMP	STANDARD/TERRA TRAIL	
LITTLE CREEK CUTOFF	STANDARD/TERRA TRAIL	
CREST TRAIL	STANDARD/TERRA TRAIL	
CLIFF DWELLER TRAIL	STANDARD/TERRA TRAIL	
SOUTH FORK MIMBRES	STANDARD/TERRA TRAIL	
PICTOGRAPH N.T.	STANDARD/TERRA TRAIL	
LAKE ROBERTS	STANDARD/TERRA TRAIL	
CAVES	STANDARD/TERRA TRAIL	
ADOBE SPRINGS	STANDARD/TERRA TRAIL	
BYER'S RUN	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
BYER'S RUN	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
POWDERHORN RIDGE	STANDARD/TERRA TRAIL	
QUAKING ASPEN	STANDARD/TERRA TRAIL	
MCKNIGHT CABIN	STANDARD/TERRA TRAIL	
EAST CANYON	STANDARD/TERRA TRAIL	
LOWER BLACK CANYON	STANDARD/TERRA TRAIL	
BIG TIMBER	STANDARD/TERRA TRAIL	
RAILROAD CANYON	STANDARD/TERRA TRAIL	
GILA FLAT	STANDARD/TERRA TRAIL	
JAN	STANDARD/TERRA TRAIL	
HORSE SPRINGS	STANDARD/TERRA TRAIL	
ME OWN	STANDARD/TERRA TRAIL	
GOBBLER CANYON	STANDARD/TERRA TRAIL	
MAIL	STANDARD/TERRA TRAIL	
ANIMAS CREEK	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
SID'S PRONG	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
PRETTY CANYON	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
WATER CANYON	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
EAST RAILROAD	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
NORTH FORK PALOMAS	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
WILLOW SPRING	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
ROUND MTN. RIDGE	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
ROUND MTN.	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
LODGE TRAIL	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
BLACK HAWK	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
SPRUCE SPRING	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
SILVER CREEK	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
SECO	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
CIRCLE SEVEN	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
RATTLESNAKE	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
FRANKS	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
LAKE TRAIL	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
SPUD PATCH	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
EAST CURTIS	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
ANIMAS DIVIDE	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
LADRON CANYON	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
LADRON CANYON	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
KINGSTON BARENDI	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
LOOKOUT MINE	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
SEVEN BROTHERS	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
VIC'S PARK	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
HERMOSA TRAIL	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
HERMOSA TRAIL	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
HERMOSA TRAIL	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
NEGRO BILL	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
HILLSBORO BYPASS	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
WOLF HOLLOW	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
WOLF HOLLOW	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
HOYT CREEK	STANDARD/TERRA TRAIL	
MURPHY	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
SCENIC TRAIL	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
CHRISTIE TRAIL	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE

CHRISTIE TRAIL	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
WILD COW	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
WEST FORK	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
WEST FORK	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
GRANNY MOUNTAIN TRA	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
GRANNY MOUNTAIN TRA	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
GRANNY MOUNTAIN TRA	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
SYCAMORE	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
SYCAMORE	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
APSEN MOUNTAIN	STANDARD/TERRA TRAIL	
ALLIE CANYON	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
ALLIE CANYON	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
TIGE CANYON TRAIL	STANDARD/TERRA TRAIL	
TIGE RIM	STANDARD/TERRA TRAIL	
DANGEROUS PARK	STANDARD/TERRA TRAIL	
COTTONWOOD	STANDARD/TERRA TRAIL	
KELLY CAMP TRAIL	STANDARD/TERRA TRAIL	
W.S. MOUNTAIN	STANDARD/TERRA TRAIL	
CAMP CANYON	STANDARD/TERRA TRAIL	
BONANZA BILL	STANDARD/TERRA TRAIL	
SALIZ	STANDARD/TERRA TRAIL	
FLYING T SPRING	STANDARD/TERRA TRAIL	
FRISCO DEVIL'S PARK	STANDARD/TERRA TRAIL	
POWERHOUSE	STANDARD/TERRA TRAIL	
LOG CANYON	STANDARD/TERRA TRAIL	
S.FORK MINERAL CREE	STANDARD/TERRA TRAIL	
GROUSE MOUNTAIN	STANDARD/TERRA TRAIL	
SPRING MOUNTAIN	STANDARD/TERRA TRAIL	
PUEBLO INTERPERTIVE	STANDARD/TERRA TRAIL	
WATER CANYON	STANDARD/TERRA TRAIL	
FRYING PAN	STANDARD/TERRA TRAIL	
BALKE	STANDARD/TERRA TRAIL	
LONG CANYON	STANDARD/TERRA TRAIL	
GOLD DUST	STANDARD/TERRA TRAIL	
JOHNSON'S CABIN	STANDARD/TERRA TRAIL	
NORTH FORK BIG DRY	STANDARD/TERRA TRAIL	
WEST FORK	STANDARD/TERRA TRAIL	
WEST FORK MOGOLLON	STANDARD/TERRA TRAIL	
WINDY GAP	STANDARD/TERRA TRAIL	
SPIDER CREEK	STANDARD/TERRA TRAIL	
GOLDEN LINK	STANDARD/TERRA TRAIL	
HOLT GULCH	STANDARD/TERRA TRAIL	
STRAIGHT UP	STANDARD/TERRA TRAIL	
LITTLE WHITEWATER T	STANDARD/TERRA TRAIL	
EAST FORK WHITEWATE	STANDARD/TERRA TRAIL	
SOUTH FORK WHITEWAT	STANDARD/TERRA TRAIL	
WHITEWATER	STANDARD/TERRA TRAIL	
CATWALK	STANDARD/TERRA TRAIL	
REDSTONE	STANDARD/TERRA TRAIL	
BURSUM	STANDARD/TERRA TRAIL	
WHITETAIL CANYON	STANDARD/TERRA TRAIL	
MINERAL CREEK	STANDARD/TERRA TRAIL	
RED CANYON	STANDARD/TERRA TRAIL	
LITTLE DEEP CREEK	STANDARD/TERRA TRAIL	
DEADMAN	STANDARD/TERRA TRAIL	
B.S. TRAIL	STANDARD/TERRA TRAIL	
STUB	STANDARD/TERRA TRAIL	
DEEP CREEK	STANDARD/TERRA TRAIL	
BEARWALLOW CREEK	STANDARD/TERRA TRAIL	
PITT RANCH	STANDARD/TERRA TRAIL	
CREST	STANDARD/TERRA TRAIL	
HOLT-APACHE TRAIL	STANDARD/TERRA TRAIL	
LITTLE DRY	STANDARD/TERRA TRAIL	
DELOCHE	STANDARD/TERRA TRAIL	
MOGOLLON	STANDARD/TERRA TRAIL	
BEAD SPRINGS	STANDARD/TERRA TRAIL	
JIM SMITH	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
UPPER COTTONWOOD	STANDARD/TERRA TRAIL	
SAND FLAT	STANDARD/TERRA TRAIL	
ESCONDIDO	STANDARD/TERRA TRAIL	
JEWETT ARAGON	STANDARD/TERRA TRAIL	
WILLIE STEEL	STANDARD/TERRA TRAIL	
APACHE	STANDARD/TERRA TRAIL	

TROUT	STANDARD/TERRA TRAIL	
FREEMAN MOUNTAIN	STANDARD/TERRA TRAIL	
DILLION MOUNTAIN	STANDARD/TERRA TRAIL	
BLANCO	STANDARD/TERRA TRAIL	
LESLIE SPRINGS LOOP	STANDARD/TERRA TRAIL	
QUEMADO LAKE FISHIN	STANDARD/TERRA TRAIL	
LARGO CANYON TRAIL	STANDARD/TERRA TRAIL	
SAWMILL CANYON	STANDARD/TERRA TRAIL	
FRIEBORN CANYON	STANDARD/TERRA TRAIL	
FRISCO DIVIDE	STANDARD/TERRA TRAIL	
OLD SPUR	STANDARD/TERRA TRAIL	
OLD SPUR	STANDARD/TERRA TRAIL	
CDNST	STANDARD/TERRA TRAIL	
CDNST	STANDARD/TERRA TRAIL	
CDNST	STANDARD/TERRA TRAIL	
SPRUCE CREEK CANYON	STANDARD/TERRA TRAIL	
GLENWOOD BRUSHY MT.	STANDARD/TERRA TRAIL	
GOAT CORRALL	STANDARD/TERRA TRAIL	
HOLT MOUNTAIN	STANDARD/TERRA TRAIL	
SNARE CANYON TRAIL	STANDARD/TERRA TRAIL	
CORNER MOUNTAIN TRA	STANDARD/TERRA TRAIL	
SILVER DRIP TRAIL	STANDARD/TERRA TRAIL	
LONE PINE	STANDARD/TERRA TRAIL	
COFFEE GULCH	STANDARD/TERRA TRAIL	
MINER CLIMB	STANDARD/TERRA TRAIL	
RAIN CREEK	STANDARD/TERRA TRAIL	
ASPEN CANYON	STANDARD/TERRA TRAIL	
BEAR CANYON	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
DORSEY CANYON	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
GALLINAS CANYON	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
GALLINAS CANYON	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
GOOSE LAKE	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
GRANDVIEW	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
LITTLE CHERRY	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
SAWMILL WAGON ROAD	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
SHEEP CORAL CANYON	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
SHEEP CORAL CANYON	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
SNOW CREEK	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
SPRING CANYON	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
SPRING CANYON	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
SYCAMORE CANYON	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
TADPOLE RIDGE	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
MONUMENT RIDGE	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
MONUMENT RIDGE	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
A FOUR	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
WOOD HAUL WAGON ROA	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
WOOD HAUL WAGON ROA	STANDARD/TERRA TRAIL	
IRON CREEK	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
GILA RIVER	STANDARD/TERRA TRAIL	
PACK SADDLE	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
PACK SADDLE	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
COW CREEK	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
RAILROAD CANYON	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
RAILROAD CANYON	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
CONTINENTAL DIVIDE	STANDARD/TERRA TRAIL	
SIGNAL PEAK	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
RABB PARK	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
BLACK RANGE CREST	STANDARD/TERRA TRAIL	
BLACK RANGE CREST	STANDARD/TERRA TRAIL	
GALLINAS	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
DONAHUE	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
CONTINENTAL DIVIDE	STANDARD/TERRA TRAIL	
WOODLAND PARK	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
HOMESTEAD	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
TURKEYFEATHER	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN

Appendices

LOCO MTN	STANDARD/TERRA TRAIL	
GRANITE PEAK	STANDARD/TERRA TRAIL	
CONTINENTAL DIVIDE	STANDARD/TERRA TRAIL	
MOGOLLON BALDY	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
MOGOLLON CREEK	STANDARD/TERRA TRAIL	
MOGOLLON CREEK	STANDARD/TERRA TRAIL	
TURKEYCREEK	STANDARD/TERRA TRAIL	
TURKEYCREEK	STANDARD/TERRA TRAIL	
PRIOR CREEK	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
MIDDLE FORK	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
MIDDLE FORK	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
MIDDLE FORK	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
MILLER SPRINGS	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
LITTLE CREEK	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
LITTLE CREEK	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
RING CANYON	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
LILLEY PARK	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
CLEAR CREEK	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
TRAIL CANYON	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
IRON CREEK MESA	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
WHITEWATER BALDY	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
CLAYTON MESA	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
CIENEGA (UPPER MOGO	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
CIENEGA (UPPER MOGO	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
CIENEGA (UPPER MOGO	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
CIENEGA (UPPER MOGO	STANDARD/TERRA TRAIL	PACK - PACK AND SADDLE
JORDAN CANYON	STANDARD/TERRA TRAIL	
SAM MARTIN	STANDARD/TERRA TRAIL	
NORTH MESA	STANDARD/TERRA TRAIL	
CASSIDY	STANDARD/TERRA TRAIL	
GREEN FLY	STANDARD/TERRA TRAIL	
HELLS HOLE	STANDARD/TERRA TRAIL	
WHITE ROCKS	STANDARD/TERRA TRAIL	
BIG BEAR	STANDARD/TERRA TRAIL	
CHICKEN COOP	STANDARD/TERRA TRAIL	
TROTTER	STANDARD/TERRA TRAIL	
KEMP	STANDARD/TERRA TRAIL	
LANGSTROTH	STANDARD/TERRA TRAIL	
TURKEYPARK	STANDARD/TERRA TRAIL	
CANYON CREEK	STANDARD/TERRA TRAIL	
DIAMOND CREEK	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
DIAMOND CREEK	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
DIAMOND CREEK	STANDARD/TERRA TRAIL	HIKE - HIKER/PEDESTRIAN
BRUSHY MTN	STANDARD/TERRA TRAIL	
SHEEP CREEK	STANDARD/TERRA TRAIL	
MEADOW	STANDARD/TERRA TRAIL	
SPRING MTN	STANDARD/TERRA TRAIL	
SOUTH DIAMOND	STANDARD/TERRA TRAIL	
BURNT CANYON	STANDARD/TERRA TRAIL	
BRANNON PARK	STANDARD/TERRA TRAIL	
AEROPLANE MESA	STANDARD/TERRA TRAIL	
FLYING V	STANDARD/TERRA TRAIL	
TOM MOORE	STANDARD/TERRA TRAIL	
TOM MOORE	STANDARD/TERRA TRAIL	
MILITARY ROAD	STANDARD/TERRA TRAIL	
LINK	STANDARD/TERRA TRAIL	
MIDDLE MESA	STANDARD/TERRA TRAIL	
BLACK CANYON	STANDARD/TERRA TRAIL	
GILA RIVER	STANDARD/TERRA TRAIL	
LITTLE BEAR	STANDARD/TERRA TRAIL	
FALLS CANYON	STANDARD/TERRA TRAIL	
COOP MESA	STANDARD/TERRA TRAIL	

Table A.3: Hunting Regulations for Management Units in Gila NF

Species	License/Permit Type	Hunt Dates/Season	Special Weapons	Units/Counties/Zones
Elk	LOS	Varies per unit from 10/8-12/31	Any legal sporting arm	Units 9, 10, 36, 37, 16A, 16B, 16C, 16D, 21A, 21B; 24
Elk	LOS	Varies per unit from 9/1-9/22	Bow only	Units 6A, 16A, 16B, 16C, 16D, 16E, 17, 21A, 21B, 24, 7, 9, 10, 11
Elk	LOS	Varies per unit from 10/1-11/15	Mobility Impaired	Units 16A, 16D, 9
Elk	LOS	Varies per unit from 10/1-12/3	Muzzleloader	Units (9, 10, 36, 37, 7, 16E, 17, 24)
Elk	DL	Varies per unit from 10/1-12/14	Any legal sporting arm	Units 6A, 7, 9, 10, 16A, 16B, 16C, 16D, 16E, 21A, 21B, 24, 36, 37
Elk	DL	Varies per unit from 9/1-9/22	Bow only	Units 5, 6A, 7, 9, 10, 13, 15, 16A, 16B, 16C, 16D, 16E, 17, 18, 21
Elk	DL	Varies per unit from 10/8-11/9	Mobility Impaired	Units 9, 16A, 16D
Elk	DI	Varies per unit from 10/1-12/15	Muzzleloader	Units 6A, 7, 9, 10, 15, 16E, 17, 24, 36, 37
Antelope	DL	Varies per unit from 9/1-10/9	Any legal sporting arm	Units 3, 5, 6, 9-13, 18, 20, 34, 36-39
Antelope	DL	8/20-8/28	Bow only	Units 5, 6, 8-10, 13, 17, 20, 34, 36-38
Antelope	DL	Varies per unit from 8/6-9/10	Mobility Impaired	Units 3, 5, 6, 9, 10, 13, 19-20, 34, 36-39
Antelope	LOS	9/17-9/18 or 9/24-9/25	Any legal sporting arm	Units 3, 5, 8, 10
Deer	DL	11/1-11/15, 10/28-11/1, 11/4-11/6, 9/1-9/22, 1/1-1/15	Any legal sporting arm	Units 6A, 8, 16, 17, 18, 20, 21, 24
Deer	DL	10/28-11/21	Muzzleloader	Units 6A, 7, 8, 10, 14, 15, 16, 17, 18, 20, 21, 24, 36, 37, 38
Deer	DL	9/1-9/22, 1/1-1/15	Bow only	Units 6A, 7, 8, 10, 14, 15, 16, 17, 18, 20, 21, 24, 36, 37, 38
Bear	OTC	Varies per zone from 8/16-11/15	Bow Only	Zones 1, 3, 4, 5, 6
Cougar	OTC	10/1-3/31	Any legal sporting arm	Zones A, B, E, F, G, H, I, J, K, M, O
Turkey	OTC	4/15-4/30	Any legal sporting arm	Unit 2
Barbary Sheep	OTC	4/1/05-3/31/06	Any legal sporting arm	Units 9, 13, 19, 20, 21, 36, 37
Javelina & Barbary Shhep	DL	1/15-3/15	any legal sporting arm	Units 12, 13, 17, 20, 21
Furbearers	OTC	Varies per furbearer from 4/1/05-3/31/06	Dogs, firearms, bows, traps/snares	Specific closed areas

Small Game and Waterfowl Hunting				
Species	License/Permit Type	Hunt Dates/Season	Special Weapons	Units/Counties/Zones
Quail	OTC	11/15-2/15	Any legal sporting arm	Statewide
Pheasant	OTC	12/8-12/11	Any legal sporting arm	Statewide except Valencia County
Pheasant	OTC	12/1/0	Any legal sporting arm	Valencia North & South Public Hunts
Dove	OTC	9/1-10/30	Any legal sporting arm	North zone (McKinley, Sandoval, Cibola, Bernalillo)
Dove	OTC	9/1-9/30, 12/1-12/30	Any legal sporting arm	South Zone (Catron, Socorro, Cibola, Bernalillo, Valencia)
Band Tailed Pigeon	OTC	10/1-10/20	Any legal sporting arm	Southwest (Socorro, Catron, Sierra)
Band Tailed Pigeon	OTC	9/1-10/30	Any legal sporting arm	Remainder of state
Squirrel	OTC	9/1-10/31	Any legal sporting arm	GS-1, S-4
Squirrel	OTC	10/1-11/20	Any legal sporting arm	GS-2
Blue Grouse	OTC	9/1-10/15	Any legal sporting arm	GS-1
Blue Grouse	OTC	10/1-10/31	Any legal sporting arm	GS-2
Sandhill Crane	OTC	11/5-11/6	Any legal sporting arm	Estancia Valley Hunt (SCRO 101)
Sandhill Crane	OTC	Varies per Hunt Area from 10/31/06-1/31/06	Any legal sporting arm	Middle Rio Grande Valley Hunt
Sandhill Crane	OTC	Varies per Hunt Area from 10/31/06-1/31/06	Any legal sporting arm	Southwest Hunt
Waterfowl	OTC	Varies across state from 12/31-1/23	Any legal sporting arm	Statewide

License abbreviations:
DL - Draw License
LOS - Land-Owned Sign-up Issued Permit
Harvest Limit abbreviations:
MB - male bull
A - antlerless elk
APRE - an elk with 5 or more points on a least one antler
ES - any on elk
APRD - a deer with 3 or more points on at least one antler
Hunt Code:
GS -Both Grouse and Squirrel hunt; S - squirrel only

Sources;
New Mexico Department of Game and Fish, *Big Game and Furbearer Rules and Information, 2005-2006*. <http://www.wildlife.state.nm.us/recreation/hunting/index.htm>, accessed July 5, 2005.
New Mexico Department of Game and Fish, *Small Game and Waterfowl Rules and Information, 2004-2005*. <http://www.wildlife.state.nm.us/recreation/hunting/index.htm>, accessed July 5, 2005.

Table A.4: Violations on the Gila NF, 2005

Offense Code	Incidents	Detailed Code	Code Category
36CFR26110A	11	Constructing, placing, or maintaining any kind of road, trail, or structure	Occupancy and use
36CFR26110B	7	Taking possession of, occupying, or otherwise using NFS lands for residential purposes	Occupancy and use
36CFR26110C	1	Selling or offering for sale any merchandise or conducting work related activity not FS authorized	Occupancy and use
36CFR26110D	7	Discharging a firearm or any other implement capable of taking human life	Occupancy and use
36CFR26110E	62	Abandoning any personal property	Occupancy and use
36CFR26110L	8	Violating any term or condition of a special-use authorization	Occupancy and use
36CFR26110O	1	Discharging or igniting a firecracker, rocket or other firework	Occupancy and use
36CFR26111B	376	Possessing or leaving refuse, debris, or litter in an exposed condition	Sanitation
36CFR26111D	52	Failing to dispose of all garbage	Sanitation
36CFR26111E	50	Dumping of any refuse, debris, trash or litter brought from private property	Sanitation
36CFR26112C	6	Damaging and leaving in a damaged condition any such road, trail, or segment	NFS roads and trails.
36CFR26112D	6	Blocking, restricting, or otherwise interfering with the use of road, trail, or gate	NFS roads and trails.
36CFR26115H	26	Admission, recreation use and special recreation permit fees	Recreation use and special permit fees
36CFR26115I	1	Admission, recreation use and special recreation permit fees	Recreation use and special permit fees
36CFR26116B	2	Possessing or using a hang glider or bicycle	National Forest Wilderness
36CFR26116J	2	National Forest Wilderness	National Forest Wilderness
36CFR26116M	2	National Forest Wilderness	National Forest Wilderness
36CFR26116O	1	National Forest Wilderness	National Forest Wilderness
36CFR26116P	1	National Forest Wilderness	National Forest Wilderness
36CFR26118A	2	Pacific Crest National Scenic Trail	Pacific Crest National Scenic Trail
36CFR2613A	2	Interfering with a Forest Officer, volunteer, or human resource	Interfering with a Forest Officer
36CFR2614A	1	Engaging in fighting	Disorderly conduct
36CFR2614C	1	statements or other actions directed toward inciting imminent lawless actions	Disorderly conduct
36CFR2614D	1	Causing public inconvenience, annoyance, or alarm by making unreasonably loud noise	Disorderly conduct
36CFR26152A	2	Building, maintaining, attending or using a fire, campfire, or stove fire	Fire
36CFR26152F	3	Possessing, discharging or using any kind of firework	Fire
36CFR26154A	7	Using any type of vehicle prohibited by the order	Forest development roads
36CFR26154D	1	Operating a vehicle in violation of the speed, load, weight, height, or other specifications	Forest development roads
36CFR26154F	2	Operating a vehicle carelessly, recklessly, or without regard for the rights or safety of others	Forest development roads
36CFR26156	36	Use of vehicles off National Forest System roads	Use of vehicles on NFS roads
36CFR26158A	1	Camping for a period longer than allowed by the order	Occupancy and use
36CFR26158BB	2	Entering or using a developed recreation site or portion thereof	Occupancy and use
36CFR26158E	1	Camping	Occupancy and use
36CFR26158T	2	Possessing, storing, or transporting any part of a tree or other plant	Occupancy and use
36CFR2615A	12	Carelessly or negligently throwing or placing any ignited substance that may fire	Recreation use and special permit fees
36CFR2615C	13	Causing timber, trees, slash, brush or grass to burn except as authorized by permit	Recreation use and special permit fees
36CFR2615D	96	Leaving a fire without completely extinguishing it	Recreation use and special permit fees
36CFR2615E	10	Allowing a fire to escape from control	Recreation use and special permit fees
36CFR2615F	13	Building, attending, maintaining, or using a campfire without removal of flammable material from campfire area	Recreation use and special permit fees
36CFR2616A	137	Cutting or otherwise damaging any timber, tree, or other forest tree product	Timber and other forest products
36CFR2616C	29	Removing any timber or other forest product cut under permit or timber sale contract without permit	Timber and other forest products
36CFR2616E	62	Loading, removing or hauling timber or other forest product not identified in special permit	Timber and other forest products
36CFR2616H	43	Removing any timber, tree or other forest product, except as authorized by special use permit	Timber and other forest products
36CFR2617A	7	Placing or allowing unauthorized livestock to enter or be in National Forest service land	Livestock
36CFR2617C	5	Failing to reclude any gate or other entry	Livestock
36CFR2619A	172	Damaging any natural feature or other property of the US	Property
36CFR2619B	11	Removing any natural feature or other property of the US	Property
36CFR2619E	1	Entering any building, structure, or enclosed area owned or controlled by the US	Property

Table A.5: Designated Areas of the Gila NF

Managing Org	Site Name	Site Type	Development Status	Development Scale	Operational Status	Operator
Black Range 02						
30602	KINGSTON CAMPGROUND	CAMPGROUND	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30602	WALL LAKE	CAMPGROUND	DISPOSED	3	OPEN	FOREST SERVICE
30602	CONTINENTAL DIVIDE NORTH-CDNST	CUA TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30602	DIVIDE-CDNST	CUA TRAILHEAD	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30602	EMORY PASS-TRAIL #79	CUA TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30602	LADRON-TRAIL#127	CUA TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30602	LOOKOUT MOUNTAIN-CDNST	CUA TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30602	MONUMENT PARK	CUA TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30602	UPPER CALEDONIA-TRAIL#42	CUA TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30602	BLACK RANGE DISTRICT OFFICE	INTERPRETIVE SITE (ADMIN)	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30602	EMORY PASS OBSERVATION	INTERPRETIVE SITE (MINOR)	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30602	FOREST BOUNDARY KIOSK	INTERPRETIVE SITE (MINOR)	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30602	TURKEY RUN TRAILHEAD CDNST	TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30602	WOLF HOLLOW-TRAIL #773	TRAILHEAD	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
Quemado 03						
30603	QUEMADO BOAT LAUNCH	BOATING SITE	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30603	HEAD OF DITCH CAMPGROUND	CAMPGROUND	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30603	ARMIJO SPRINGS	CAMPGROUND	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30603	COVE	CAMPGROUND	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30603	HEAD OF DITCH	CAMPGROUND	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30603	QUEMADO LAKE - EL CASO CG	CAMPGROUND	EXISTING - OPERATIONAL	4	OPEN	FOREST SERVICE
30603	QUEMADO LAKE - JUNIPER CG	CAMPGROUND	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30603	QUEMADO LAKE - PINON CG	CAMPGROUND	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30603	QUEMADO LAKE - FISHING	FISHING SITE	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30603	VALLE TIO VINCES PUBLIC CORRALS	HORSE CAMP	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30603	LUNA WORK SITE	INTERPRETIVE SITE (ADMIN)	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30603	QUEMADO OFFICE	INTERPRETIVE SITE (ADMIN)	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30603	CONTINENTAL DIVIDE-CDNST	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30603	LARGO-TRAIL#14	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30603	UPPER FRISCO HOT SPRINGS	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
Glenwood 04						
30604	BIG HORN CAMPGROUND	CAMPGROUND	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30604	BURSUM	CAMPGROUND	EXISTING - ABANDONED	.	OPEN	FOREST SERVICE
30604	COTTONWOOD CANYON	CAMPGROUND	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30604	PUEBLO PARK	CAMPGROUND	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30604	GLENWOOD OFFICE	INTERPRETIVE SITE (ADMIN)	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30604	CATWALK	INTERPRETIVE SITE (MINOR)	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30604	ALDO LEOPOLD VISTA	OBSERVATION SITE	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30604	WHITEWATER PICNIC AREA	PICNIC SITE	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30604	ASPEN MOUNTAIN-TRAIL#814	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30604	COTTONWOOD TRAILHEAD - TRAIL # 44	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30604	HINKLE PARK TRAILHEAD - TRAIL #36	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30604	74 MOUNTAIN-TRAIL#153	TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30604	CATWALK-TRAIL#207	TRAILHEAD	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30604	CREST-TRAIL#182	TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30604	DELOCHE-TRAIL#179	TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30604	GOLD DUST-TRAIL#41	TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30604	HOLT GULCH-TRAIL#217	TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30604	LITTLE DRY-TRAIL#180	TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30604	LITTLE WHITEWATER-TRAIL#214	TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30604	LOG CANYON TH #808	TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30604	MINERAL CREEK-TRAIL#201	TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30604	N. FORK MINERAL CREEK TH #201	TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30604	POWERHOUSE TH #810	TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30604	PUEBLO PARK-TRAIL#515	TRAILHEAD	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30604	RAIN CREEK-TRAIL#189	TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30604	REDSTONE-TRAIL#206	TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30604	S. FORK MINERAL CR. #798	TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30604	SAN FRANCISCO HOT SPRINGS TRAIL HE	TRAILHEAD	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30604	SHERIDAN CORRAL-TRAIL#181	TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30604	WHITEWATER CANYON-TRAIL#202	TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30604	WHITEWATER TH #207	TRAILHEAD	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30604	WS-TRAIL#43	TRAILHEAD	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE

Appendices

Managing Org	Site Name	Site Type	Development Status	Development Scale	Operational Status	Operator
Wilderness 05						
30605	LAKE ROBERTS BOAT LAUNCH	BOATING SITE	EXISTING - OPERATIONAL	4	OPEN	FOREST SERVICE
30605	FORKS	CAMPGROUND	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30605	GRAPEVINE	CAMPGROUND	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30605	LOWER BLACK CANYON	CAMPGROUND	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30605	MESA	CAMPGROUND	EXISTING - OPERATIONAL	4	OPEN	FOREST SERVICE
30605	ROCKY CANYON	CAMPGROUND	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30605	SAPILLO	CAMPGROUND	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30605	SCORPION	CAMPGROUND	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30605	UPPER BLACK CANYON	CAMPGROUND	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30605	UPPER END	CAMPGROUND	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30605	MIMBRES OFFICE	INTERPRETIVE SITE (ADMIN)	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	GILA CLIFF DWELLINGS	INTERPRETIVE SITE (MAJOR)	EXISTING - OPERATIONAL	4	OPEN	FOREST SERVICE
30605	GILA VISITOR CENTER	INTERPRETIVE SITE (MAJOR)	EXISTING - OPERATIONAL	4	OPEN	FOREST SERVICE
30605	TJ RUIN	INTERPRETIVE SITE (MINOR)	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	TRAIL TO THE PAST	INTERPRETIVE SITE (MINOR)	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	CONTACT STATION	INTERPRETIVE SITE (MINOR)	EXISTING - OPERATIONAL	4	OPEN	FOREST SERVICE
30605	VISTA VILLAGE	INTERPRETIVE SITE (MINOR)	EXISTING - OPERATIONAL	4	OPEN	FOREST SERVICE
30605	ADOBE CANYON	OBSERVATION SITE	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	AUSTIN ROBERTS	OBSERVATION SITE	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	SEN. C.P. ANDERSON WILDERNESS OVE	OBSERVATION SITE	EXISTING - OPERATIONAL	4	OPEN	FOREST SERVICE
30605	LAKE ROBERTS	PICNIC SITE	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30605	ALUM CAMP-TRAIL#788	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	BOARD GATE SADDLE-TRAIL#79	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	CANYON CREEK-TRAIL#770	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	CONTINENTAL DIVIDE-TRAIL #24	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	DIAMOND CREEK-TRAIL#40	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	EAST CANYON-TRAIL#93	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	GILA RIVER-TRAIL#724	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	LOWER BLACK CANYON-TRAIL#94	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	LOWER MILITARY TRAIL#96	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	LOWER ROCKY-TRAIL#700	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	MCKNIGHT-TRAIL#79	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	MEOWN-TRAIL#707	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	MIDDLE MESEN-TRAIL#716	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	PICTOGRAPH CANYON	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	POWDERHORN-TRAIL#92	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	PRETTY CANYON-TRAIL#121	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	PURGATORY CHASM	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	ROCKY POINT-TRAIL#76	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	SOUTH DIAMOND-TRAIL#40	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	TOM MOORE CANYON-TRAIL#708	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	TRAILS END - TRAIL #804	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	UPPER BLACK CANYON-TRAIL#72	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	WOODY'S CORRAL-TRAIL#160	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30605	MIDDLE FORK-TRAIL#157	TRAILHEAD	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30605	MILITARY ROAD-TRAIL#97	TRAILHEAD	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30605	TJ CORRAL - TRAIL #729	TRAILHEAD	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30605	WEST FORK TRAILHEAD-TRAIL#151	TRAILHEAD	EXISTING - OPERATIONAL	4	OPEN	FOREST SERVICE
Reserve 06						
30606	SNOW LAKE	BOATING SITE	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30606	SOUTH FORK NEGRITO	CAMPGROUND	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30606	BEN LILLY	CAMPGROUND	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30606	DIPPING VAT	CAMPGROUND	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30606	GILITA	CAMPGROUND	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30606	WILLOW CREEK	CAMPGROUND	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30606	SNOW LAKE	FISHING SITE	EXISTING - OPERATIONAL	3	OPEN	FOREST SERVICE
30606	APACHE CREEK	GROUP CAMPGROUND	EXISTING - OPERATIONAL	2	OPEN	FOREST SERVICE
30606	RESERVE LOBBY	INTERPRETIVE SITE (ADMIN)	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30606	PINE LAWN	PICNIC SITE	EXISTING - OPERATIONAL	4	OPEN	FOREST SERVICE
		PLAYGROUND PARK				
30606	PUBLIC SHOOTING RANGE	SPECIALIZED SPORT	EXISTING - OPERATIONAL	.	OPEN	COUNTY
30606	INDIAN CREEK	RECREATION RESIDENCE	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30606	AEROPLANE MESA-TRAIL#705	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30606	EAGLE PEAK-TRAIL#15	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30606	FRISCO BOX-TRAIL#762	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30606	GILITA-TRAIL#157	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30606	LOCO MTN-TRAIL#143	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30606	LOWER BEAD SPRINGS-TRAIL#135	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30606	LOWER TURKEY CIENEGA-TRAIL#137	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30606	LOWER WILLOW SPRINGS MTN-TRL#113	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE
30606	NEGRITO CREEK-TRAIL#131	TRAILHEAD	EXISTING - OPERATIONAL	.	OPEN	FOREST SERVICE

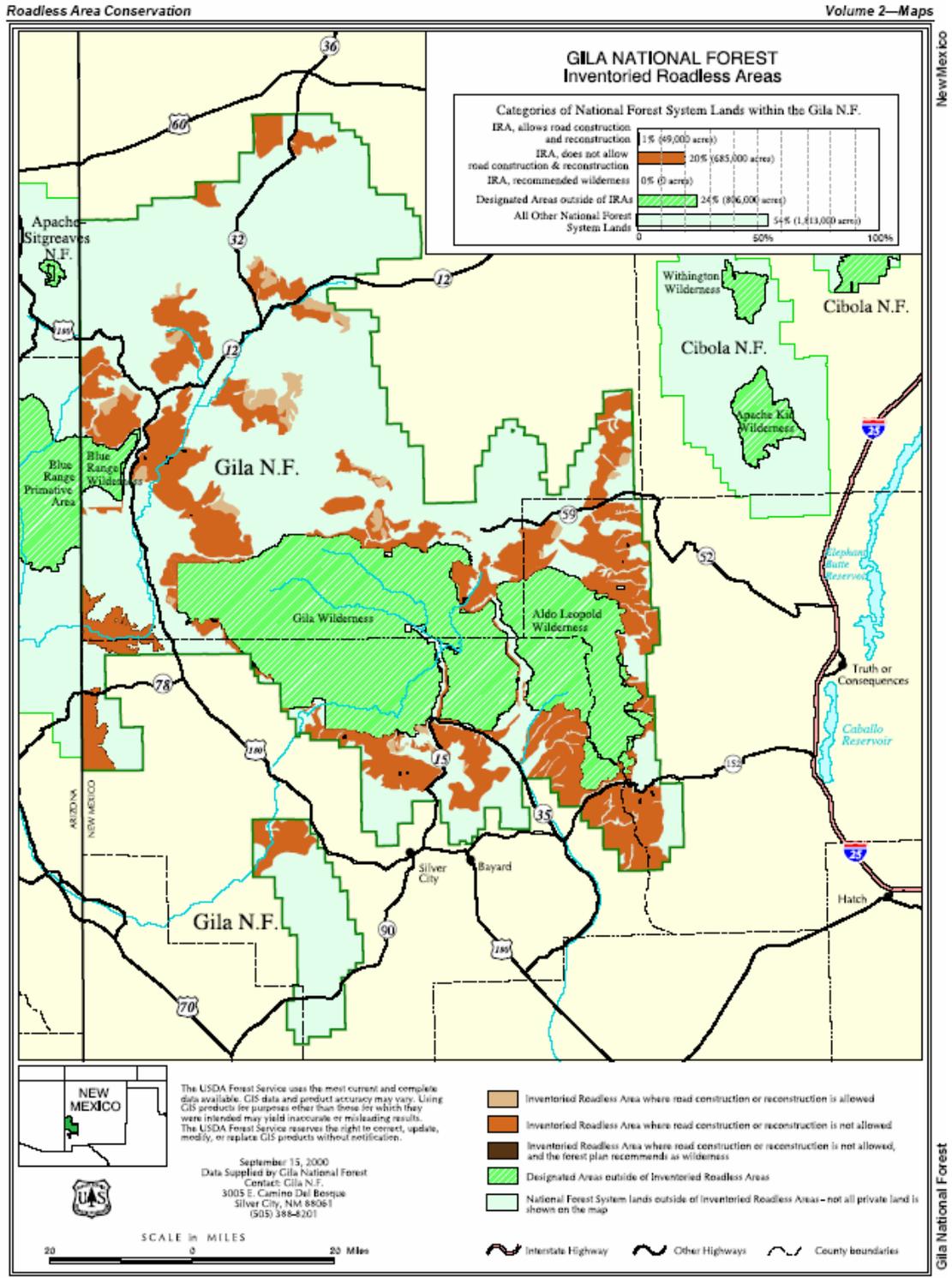


Figure A.1: Roadless Areas Map for the Gila NF

Table A.6: Grants and Agreements Contracts for the Gila NF

Grant & Agreement Number	Cooperator Cash Contribution	Cooperator Other Contribution	Cooperator Total Contribution	FS Cash Contribution	FS Other Contribution	FS Total Contribution	Total G&A Amount
02-CO-11030600-011	\$7,200.00	\$0.00	\$7,200.00	\$0.00	\$0.00	\$0.00	\$7,200.00
	Cooperator/ Contributors: NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT						
02-CO-11030600-018	\$10,000.00	\$0.00	\$10,000.00	\$0.00	\$0.00	\$0.00	\$10,000.00
	Cooperator/ Contributors: ROCKY MOUNTAIN ELK FOUNDATION						
03-CS-11030600-027	\$0.00	\$0.00	\$0.00	\$0.00	\$2,000.00	\$2,000.00	\$2,000.00
	Cooperator/ Contributors: TURNER RANCH PROPERTIES, L.P.						
03-DG-11030600-008	\$0.00	\$0.00	\$0.00	\$360,000.00	\$0.00	\$360,000.00	\$360,000.00
	Cooperator/ Contributors: ALTERNATIVE FORESTRY UNLIMITED, MICHAEL DEUBEL						
03-DG-11030600-023	\$0.00	\$90,150.00	\$90,150.00	\$357,400.00	\$0.00	\$357,400.00	\$447,550.00
	Cooperator/ Contributors: SANTA CLARA WOODWORKS						
03-LE-11030600-010	\$0.00	\$0.00	\$0.00	\$15,000.00	\$0.00	\$15,000.00	\$15,000.00
	Cooperator/ Contributors: HIDALGO COUNTY SHERIFF'S DEPARTMENT, HIDALGO COUNTY SHERIFFS						
03-LE-11030600-011	\$0.00	\$0.00	\$0.00	\$30,000.00	\$0.00	\$30,000.00	\$30,000.00
	Cooperator/ Contributors: SIERRA COUNTY SHERIFF'S, SIERRA COUNTY SHERIFF'S DEPARTMENT						
03-LE-11030600-012	\$0.00	\$0.00	\$0.00	\$45,000.00	\$0.00	\$45,000.00	\$45,000.00
	Cooperator/ Contributors: GRANT COUNTY SHERIFF'S DEPARTMENT, GRANT COUNTY SHERIFFS DEPT						
03-MU-11030600-017	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	Cooperator/ Contributors: HUNT MANGAS RANCH						
03-PA-11030600-022	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	Cooperator/ Contributors: CATRON COUNTY CITIZENS GROUP						
04-CO-11030600-007	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	Cooperator/ Contributors: NEW MEXICO DEPARTMENT OF GAME AND FISH						
04-CO-11030600-011	\$13,000.00	\$0.00	\$13,000.00	\$0.00	\$0.00	\$0.00	\$13,000.00
	Cooperator/ Contributors: GRANT SOIL AND WATER CONSERVATION DISTRICT						
04-CS-11030600-003	\$0.00	\$153,282.00	\$153,282.00	\$51,094.00	\$0.00	\$51,094.00	\$204,376.00
	Cooperator/ Contributors: MONTANA NATURAL HERITAGE						
04-DG-11030600-016	\$0.00	\$0.00	\$0.00	\$360,000.00	\$0.00	\$360,000.00	\$360,000.00
	Cooperator/ Contributors: GILA WOODNET						
04-DG-11030600-017	\$0.00	\$0.00	\$0.00	\$360,000.00	\$0.00	\$360,000.00	\$360,000.00
	Cooperator/ Contributors: KELLAR LOGGING, INC, KELLAR LOGGING, INC.						

Grant & Agreement Number	Cooperator Cash Contribution	Cooperator Other Contribution	Cooperator Total Contribution	FS Cash Contribution	FS Other Contribution	Total Contribution	FS	Total G&A Amount
04-DG-11030600-018	\$0.00	\$0.00	\$0.00	\$120,000.00	\$0.00	\$120,000.00		\$120,000.00
	Cooperator/ Contributors: FORESTRY ASSOCIATION, INC., TFA, INC							
04-DG-11030600-019	\$0.00	\$0.00	\$0.00	\$284,360.00	\$0.00	\$284,360.00		\$284,360.00
	Cooperator/ Contributors: SIERRA SOIL & WATER CONSV., SIERRA SOIL AND WATER CONSERVATION DISTRICT							
04-LE-11030600-006	\$0.00	\$0.00	\$0.00	\$32,000.00	\$0.00	\$32,000.00		\$32,000.00
	Cooperator/ Contributors: CATRON COUNTY SHERIFF'S DEPARTMENT, CATRON COUNTY SHERIFF'S OF							
04-MU-11030600-001	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00		\$0.00
	Cooperator/ Contributors: WOOD, TOM							
05-CO-11030600-001	\$130,129.60	\$0.00	\$130,129.60	\$0.00	\$0.00	\$0.00		\$130,129.60
	Cooperator/ Contributors: NEW MEXICO DEPARTMENT OF GAME AND FISH							
05-CO-11030600-004	\$12,722.40	\$0.00	\$12,722.40	\$0.00	\$0.00	\$0.00		\$12,722.40
	Cooperator/ Contributors: TUCSON ELECTRIC POWER COMPANY							
05-DG-11030600-008	\$0.00	\$0.00	\$0.00	\$120,000.00	\$0.00	\$120,000.00		\$120,000.00
	Cooperator/ Contributors: LOWER FRISCO WOOD PRODUCTS							
05-DG-11030600-014	\$0.00	\$0.00	\$0.00	\$359,009.00	\$0.00	\$359,009.00		\$359,009.00
	Cooperator/ Contributors: GILA TREE THINNERS							
05-PA-11030600-013	\$0.00	\$0.00	\$0.00	\$22,000.00	\$0.00	\$22,000.00		\$22,000.00
	Cooperator/ Contributors: SOUTHWEST YOUTH CORPS							
03-MU-11030602-013	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00		\$0.00
	Cooperator/ Contributors: DIAMOND RANCH							
05-CO-11030602-015	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00		\$0.00
	Cooperator/ Contributors: NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT							
05-CO-11030602-016	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00		\$0.00
	Cooperator/ Contributors: NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT							
04-IA-11030605-002	\$40,000.00	\$0.00	\$40,000.00	\$0.00	\$43,120.00	\$43,120.00		\$83,120.00
	Cooperator/ Contributors: USDI, NATIONAL PARK SERVICE							
04-MU-11030605-023	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00		\$0.00
	Cooperator/ Contributors: STEWART COMPANY							
02-DG-11030606-004	\$0.00	\$0.00	\$0.00	\$356,400.00	\$0.00	\$356,400.00		\$356,400.00
	Cooperator/ Contributors: CATRON COUNTY CITIZENS GROUP, CATRON COUNTY CITIZENS GRP							

Grant & Agreement Number	Cooperator Cash Contribution	Cooperator Other Contribution	Cooperator Total Contribution	FS Cash Contribution	FS Other Contribution	Total Contribution	FS	Total G&A Amount
01-PA-11030607-021	\$0.00	\$0.00	\$0.00	\$35,000.00	\$0.00	\$35,000.00		\$35,000.00
	Cooperator/ Contributors: NEW MEXICO DEPARTMENT OF CULTURAL AFFAIRS, NM STATE FORESTRY DIV							
02-DG-11030607-005	\$0.00	\$0.00	\$0.00	\$356,400.00	\$0.00	\$356,400.00		\$356,400.00
	Cooperator/ Contributors: GILA WOODNET							
04-MU-11030607-010	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00		\$0.00
	Cooperator/ Contributors: PACIFIC WESTERN LAND COMPANY, TOM MCCAULEY AND SON, INC., U BAR RANCH							
Grand Totals:	\$213,052.00	\$243,432.00	\$456,484.00	\$3,263,663.00	\$45,120.00	\$3,308,783.00		\$3,765,267.00
G&A Count:	33							

Table A.7: National LandCover Data (NLCD) Definitions

National Land Cover Data
Version 09-10-2000

This land cover data set was produced as part of a cooperative project between the U.S. Geological Survey (USGS) and the U.S. Environmental Protection Agency (USEPA) to produce a consistent, land cover data layer for the conterminous U.S. based on 30-meter Landsat thematic mapper (TM) data. National Land Cover Data (NLCD) was developed from TM data acquired by the Multi-resolution Land Characterization (MRLC) Consortium. The MRLC Consortium is a partnership of federal agencies that produce or use land cover data. Partners include the USGS (National Mapping, Biological Resources, and Water Resources Divisions), USEPA, the U.S. Forest Service, and the National Oceanic and Atmospheric Administration.

NEW MEXICO Version 09-10-2000

The New Mexico NLCD set was produced as part of a project area encompassing portions of Federal Regions 6. This data set was produced under the direction of the MRLC Regional Land Cover Characterization Project of the USGS EROS Data Center (EDC), Sioux Falls, SD. Questions about the data set can be directed to the MRLC Regional Team at (605) 594-6114 or mrlc@edcmail.cr.usgs.gov.

NLCD Land Cover Classification System Land Cover Class Definitions

Water - All areas of open water or permanent ice/snow cover.

11. Open Water - All areas of open water; typically 25 percent or greater cover of water (per pixel).

Developed - Areas characterized by a high percentage (30 percent or greater) of constructed materials (e.g. asphalt, concrete, buildings, etc).

21. Low Intensity Residential - Includes areas with a mixture of constructed materials and vegetation. Constructed materials account for 30-80 percent of the cover. Vegetation may account for 20 to 70 percent of the cover. These areas most commonly include single-family housing units. Population densities will be lower than in high intensity residential areas.
22. High Intensity Residential - Includes highly developed areas where people reside in high numbers. Examples include apartment complexes and row houses. Vegetation accounts for less than 20 percent of the cover. Constructed materials account for 80 to 100 percent of the cover.
23. Commercial/Industrial/Transportation - Includes infrastructure (e.g. roads, railroads, etc.) and all highly developed areas not classified as High Intensity Residential.

Barren - Areas characterized by bare rock, gravel, sand, silt, clay, or other earthen material, with little or no "green" vegetation present regardless of its inherent ability to support life. Vegetation, if present, is more widely spaced and scrubby than that in the "green" vegetated categories; lichen cover may be extensive.

31. Bare Rock/Sand/Clay - Perennially barren areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, beaches, and other accumulations of earthen material.

32. Quarries/Strip Mines/Gravel Pits - Areas of extractive mining activities with significant surface expression.

33. Transitional - Areas of sparse vegetative cover (less than 25 percent of cover) that are dynamically changing from one land cover to another, often because of land use activities. Examples include forest clearcuts, a transition phase between forest and agricultural land, the temporary clearing of vegetation, and changes due to natural causes (e.g. fire, flood, etc.).

Forested Upland - Areas characterized by tree cover (natural or semi-natural woody vegetation, generally greater than 6 meters tall); tree canopy accounts for 25-100 percent of the cover.

41. Deciduous Forest - Areas dominated by trees where 75 percent or more of the tree species shed foliage simultaneously in response to seasonal change.

42. Evergreen Forest - Areas dominated by trees where 75 percent or more of the tree species maintain their leaves all year. Canopy is never without green foliage.

43. Mixed Forest - Areas dominated by trees where neither deciduous nor evergreen species represent more than 75 percent of the cover present.

Shrubland - Areas characterized by natural or semi-natural woody vegetation with aerial stems, generally less than 6 meters tall, with individuals or clumps not touching to interlocking. Both evergreen and deciduous species of true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions are included.

51. Shrubland - Areas dominated by shrubs; shrub canopy accounts for 25-100 percent of the cover. Shrub cover is generally greater than 25 percent when tree cover is less than 25 percent. Shrub cover may be less than 25 percent in cases when the cover of other life forms (e.g. herbaceous or tree) is less than 25 percent and shrubs cover exceeds the cover of the other life forms.

Non-natural Woody - Areas dominated by non-natural woody vegetation; non-natural woody vegetative canopy accounts for 25-100 percent of the cover. The non-natural woody classification is subject to the availability of sufficient ancillary data to differentiate non-natural woody vegetation from natural woody vegetation.

61. Orchards/Vineyards/Other - Orchards, vineyards, and other areas planted or maintained for the production of fruits, nuts, berries, or ornamentals.

Herbaceous Upland - Upland areas characterized by natural or semi-natural herbaceous vegetation; herbaceous vegetation accounts for 75-100 percent of the cover.

71. Grasslands/Herbaceous - Areas dominated by upland grasses and forbs. In rare cases, herbaceous cover is less than 25 percent, but exceeds the combined cover of the woody species present. These areas are not subject to intensive management, but they are often utilized for grazing.

Planted/Cultivated - Areas characterized by herbaceous vegetation that has been planted or is intensively managed for the production of food, feed, or fiber; or is maintained in developed settings for specific purposes. Herbaceous vegetation accounts for 75-100 percent of the cover.

81. Pasture/Hay - Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops.

82. Row Crops - Areas used for the production of crops, such as corn, soybeans, vegetables, tobacco, and cotton.

83. Small Grains - Areas used for the production of graminoid crops such as wheat, barley, oats, and rice.

84. Fallow - Areas used for the production of crops that are temporarily barren or with sparse vegetative cover as a result of being tilled in a management practice that incorporates prescribed alternation between cropping and tillage.

85. Urban/Recreational Grasses - Vegetation (primarily grasses) planted in developed settings for recreation, erosion control, or aesthetic purposes. Examples include parks, lawns, golf courses, airport grasses, and industrial site grasses.

Wetlands - Areas where the soil or substrate is periodically saturated with or covered with water as defined by Cowardin et al.

91. Woody Wetlands - Areas where forest or shrubland vegetation accounts for 25-100 percent of the cover and the soil or substrate is periodically saturated with or covered with water.

92. Emergent Herbaceous Wetlands - Areas where perennial herbaceous vegetation accounts for 75-100 percent of the cover and the soil or substrate is periodically saturated with or covered with water.