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.[4]

[4] Geographical data on national roads is obtained from ESRI® Streetmaps™ USA 2004.

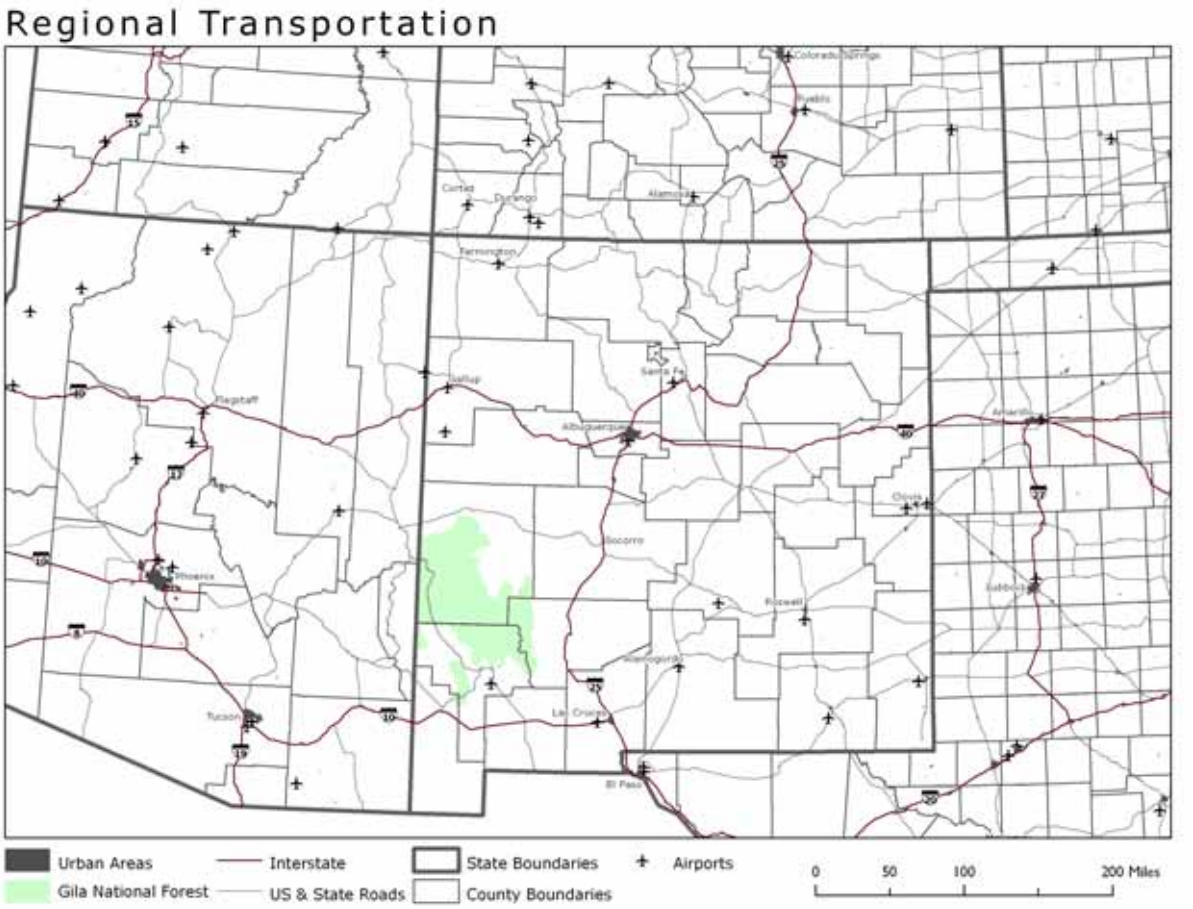

Figure 3.1: Map of Principle Highways and Airports in Region

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.[5] The Gila NF is somewhat isolated from

[5] 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

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.[6] 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 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 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.

[6] 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					
		Other Principal			
County	Interstate	Arterial	Minor Arterial	Collector & Local	County Total
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					
		Other Principal			
County	Interstate	Arterial	Minor Arterial	Collector & Local	County Total
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.[7] 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

[7] 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.[8] Traffic flows in the four Gila NF counties are expected to increase by nearly 50 percent between 2007 and 2030.[9] 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.[10] 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.[11] 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.[12]

[8] 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.

[9] 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.

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

[11] City of Albuquerque, "Albuquerque International Sunport," http://www.cabq.gov/airport/.

[12] 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.[13]

[13] 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.

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.

The Gila NF features about 6,627 miles of roadways on NF-managed land.[14] 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.[15] **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.

[14] 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.
[15] INFRA Data Dictionary

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

District Not Identified	Surface Type	Segment Length Miles)
SINGLE LANE	Asphalt	0
	Crushed Aggregate	48
	Bituminous Surface	29
	Improved Native	11
	Native Material	438
	Paved	1
Single Lane Total		527
DOUBLE LANE	Asphalt	
	Crushed Aggregate	8
	Bituminous Surface	46
	Improved Native	1
	Native Material	29
	Paved	0
Double Lane Total		84
TOTAL		**611**

Black Range	Surface Type	Segment Length Miles)
SINGLE LANE	Asphalt	0
	Crushed Aggregate	2
	Bituminous Surface	1
	Improved Native	49
	Native Material	707
	Paved	0
Single Lane Total		759
DOUBLE LANE	Asphalt	0
	Crushed Aggregate	0
	Bituminous Surface	0
	Improved Native	0
	Native Material	0
	Paved	0
Double Lane Total		0
TOTAL		**759**

Quemado	Surface Type	Segment Length Miles)
SINGLE LANE	Asphalt	0
	Crushed Aggregate	147
	Bituminous Surface	0
	Improved Native	15
	Native Material	1,660
	Paved	0
Single Lane Total		1,822
DOUBLE LANE	Asphalt	0
	Crushed Aggregate	17
	Bituminous Surface	0
	Improved Native	0
	Native Material	2
	Paved	0
Double Lane Total		19
TOTAL		**1,841**

Glenwood	Surface Type	Segment Length Miles)
SINGLE LANE	Asphalt	0
	Crushed Aggregate	3
	Bituminous Surface	0
	Improved Native	25
	Native Material	689
	Paved	0
Single Lane Total		717
DOUBLE LANE	Asphalt	0
	Crushed Aggregate	1
	Bituminous Surface	1
	Improved Native	1
	Native Material	9
	Paved	0
Double Lane Total		12
TOTAL		**729**

Wilderness	Surface Type	Segment Length Miles)
SINGLE LANE	Asphalt	0
	Crushed Aggregate	6
	Bituminous Surface	1
	Improved Native	18
	Native Material	390
	Paved	0
Single Lane Total		415
DOUBLE LANE	Asphalt	0
	Crushed Aggregate	0
	Bituminous Surface	2
	Improved Native	0
	Native Material	0
	Paved	0
Double Lane Total		2
TOTAL		**417**

Reserve	Surface Type	Segment Length Miles)
SINGLE LANE	Asphalt	1
	Crushed Aggregate	66
	Bituminous Surface	0
	Improved Native	82
	Native Material	1,398
	Paved	0
Single Lane Total		1,547
DOUBLE LANE	Asphalt	0
	Crushed Aggregate	11
	Bituminous Surface	19
	Improved Native	0
	Native Material	10
	Paved	0
Double Lane Total		40
TOTAL		**1,587**

Silver City	Surface Type	Segment Length Miles)
SINGLE LANE	Asphalt	0
	Crushed Aggregate	10
	Bituminous Surface	2
	Improved Native	14
	Native Material	625
	Paved	0
Single Lane Total		651
DOUBLE LANE	Asphalt	0
	Crushed Aggregate	1
	Bituminous Surface	2
	Improved Native	5
	Native Material	24
	Paved	0
Double Lane Total		32
TOTAL		**683**

Gila NF Total	Surface Type	Segment Length Miles)
SINGLE LANE	Asphalt	1
	Crushed Aggregate	282
	Bituminous Surface	33
	Improved Native	214
	Native Material	5,907
	Paved	0
Single Lane Total		6,437
DOUBLE LANE	Asphalt	0
	Crushed Aggregate	38
	Bituminous Surface	70
	Improved Native	7
	Native Material	74
	Paved	0
Double Lane Total		189
TOTAL		**6,627**

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

The Gila NF has 88 trailheads, and according to the INFRA database, almost 1,900 miles of trails.[16] **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)**.

[16] 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.

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

Trail Type	Segment Length (Miles)	Trail Type	Segment Length (Miles)
District Not Identified		**Black Range**	
Native Natural	7	Native Natural	178
Unidentified Type	1,284	Unidentified Type	4
TOTAL	1,291	**TOTAL**	182
Quemado		**Glenwood**	
Native Natural	0	Native Natural	0
Unidentified Type	0	Unidentified Type	0
TOTAL	0	**TOTAL**	0
Wilderness		**Reserve**	
Native Natural	252	Native Natural	7
Unidentified Type	0	Unidentified Type	0
TOTAL	252	**TOTAL**	7
Silver City		**Total Gila**	
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."[17] OHVs provide an increasingly popular recreation alternative. They also can have great utility on a ranch. Unfortunately, OHVs can have many 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.[18] 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

[17] 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.

[18] 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.

those roads, trails, and areas that are open to motor vehicle use.[19] The new rules went into effect on December 9, 2005.[20] 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 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.[21] To protect their

[19] 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.
[20] 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.
[21] The forest ranger for the Quemado RD confirmed additional vandalism as a problem. (Personal communication.)

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.[22]

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.[23]

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.[24]

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.[25] 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. 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

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[22] 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.

[23] 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

[24] "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/.

[25] 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.

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.[23] 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.

[23] See Table A.7. in the appendix for land cover descriptions and definitions.

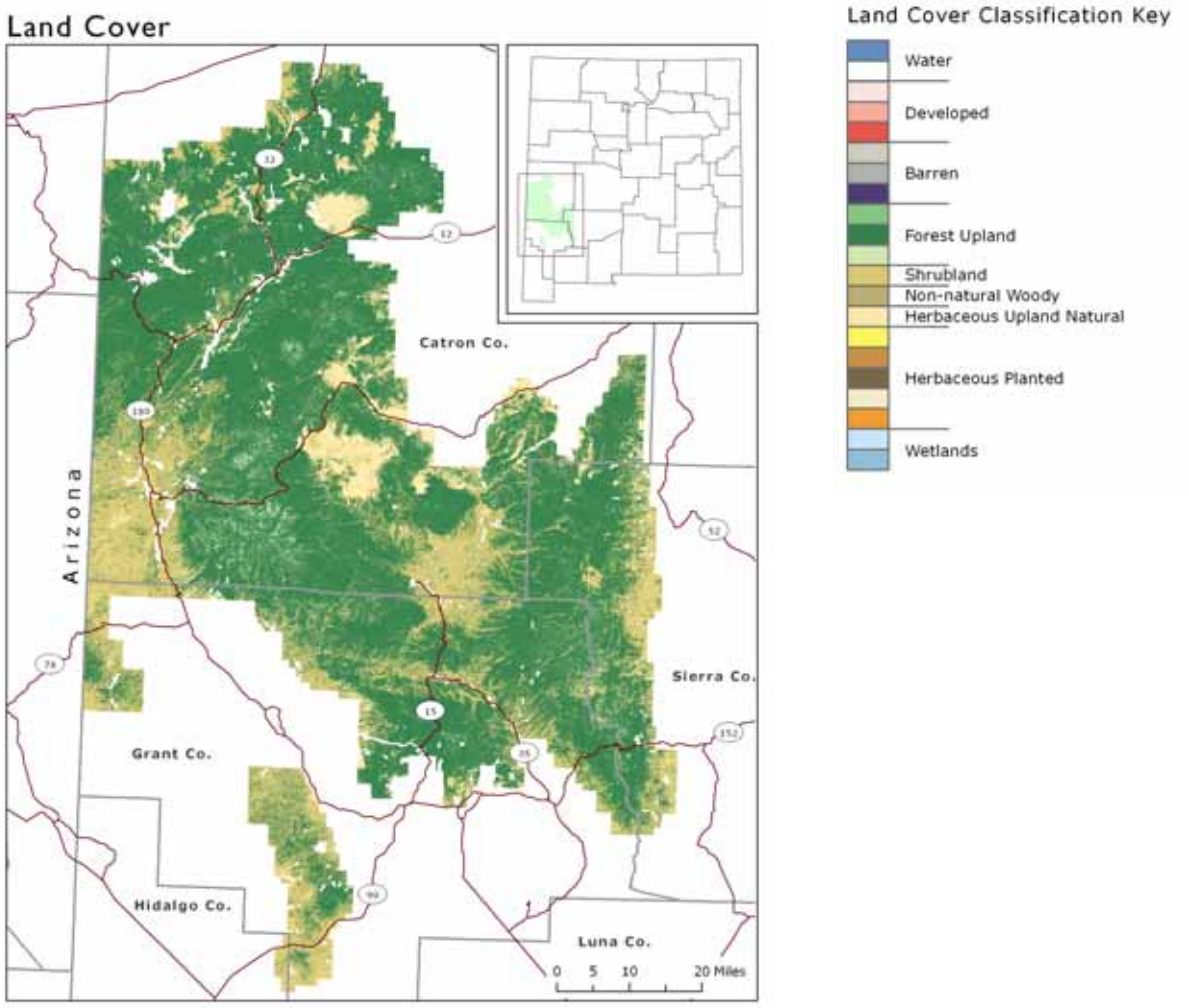

Figure 4.1: Land Cover on Gila NF

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
Comml/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.

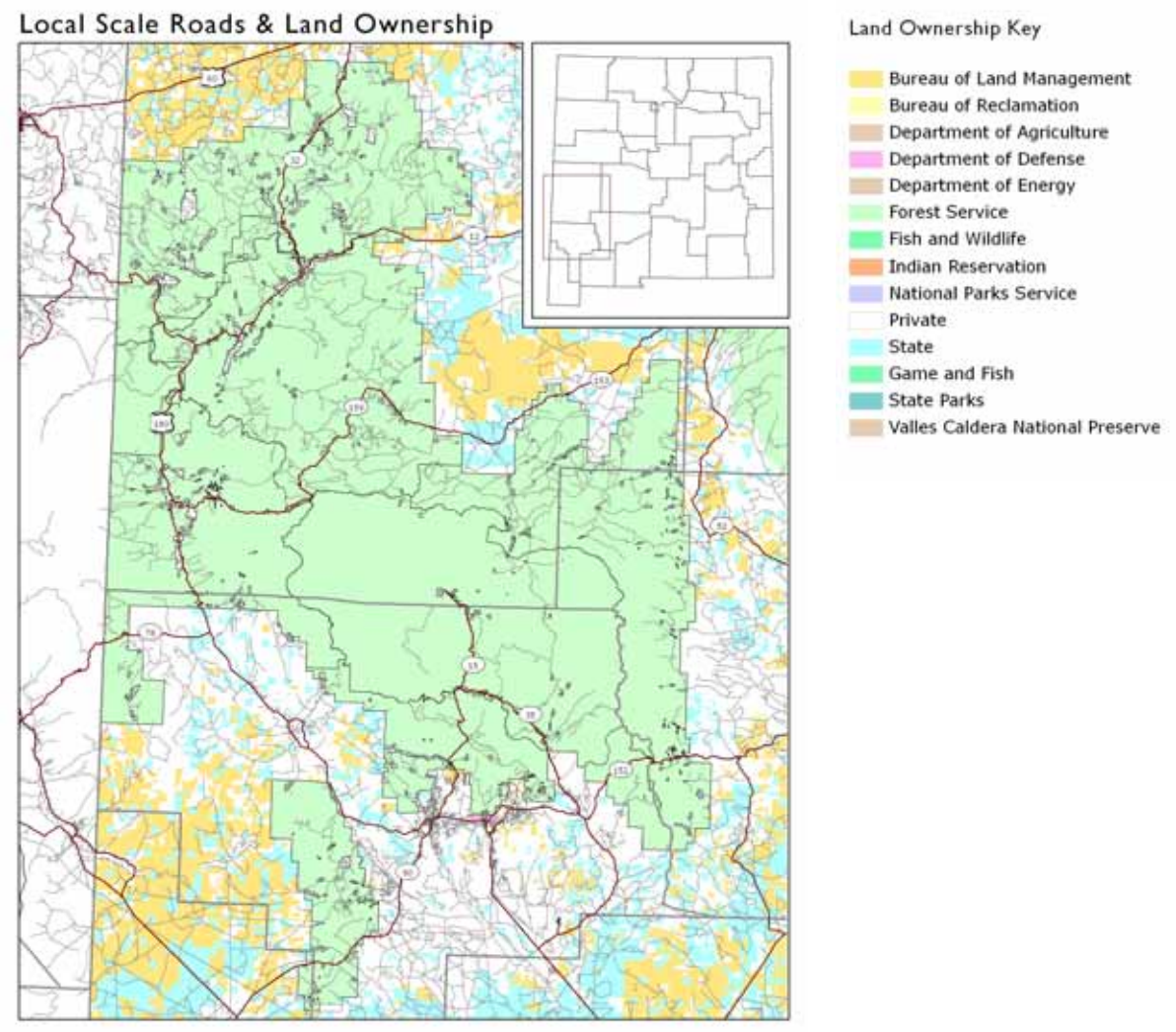

Figure 4.2: Land Ownership in Gila NF and Vicinity

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

	Black Range			Quemado			Glenwood			Wilderness		
	FS	Other	Total	FS	Other	Total	FS	Other	Total	FS	Other	Total
Bare Rock/Sand/Clay	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%
Comml/Industl/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%
Emerg Herb Wetlands	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/Recreatl/Grasses					0%	0%		0%	0%	0%	0%	0%
Woody Wetlands					0%	0%	0%		0%	0%		0%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	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%
Comml/Industl/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				0%		0%	0%	0%	0%
Mines/Gravel Pits									
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/Recreatl/Grasses		0%	0%				0%	0%	0%
Woody Wetlands					0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%	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.[24] 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.[25]

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
Comml/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.[26] The "Federal Acres" and "Federal Values" columns list the values that were

[24] 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).
[25] 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.
[26] List does not include the National Grasslands.

transferred to private ownership. The "Non-Fed" columns show values that were conveyed to the United States.[27] 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.[28] 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.[29] 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."[30] 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.[31] The role of forests in absorbing carbon from the air is also well documented.[32] Forests also provide safe

[27] Personal communication with USDA FS.
[28] 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.
[29] Eve Byron, "Baucus Plan May Halt Land Sale," *Helena Independent Record*.
[30] 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.
[31] 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.
[32] 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/.

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, 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.[33] 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."[34]

Uncontrolled fires can result in substantial environmental and economic impacts. Wildfire devastation impacts "lives, property, wildlife habitat, fragile ecosystems," water, soils, and timber resources.[35] 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.[36]

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

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

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

[34] 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.

[35] USDA FS, Four Threats: Quick Facts, "Fire and Fuels," http://www.fs.fed.us/projects/four-threats/facts/fire-fuels.shtml.

[36] Sedel, op cit.

mature trees, and drought conditions.[37] 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.[38] However, others are concerned with the heavy undergrowth and dry brush, which are major fuels.

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.[39] 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.[40]

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.[41]

4.3.2 Invasive Species and Insects

Invasive species have been characterized as a "catastrophic wildfire in slow motion."[42] 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.[43]

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.[44] Critics argue that herbicides pose risks to fragile aquatic life and sensitive wildlife pollinators, such as butterflies. In the Gila-Cliff

[37] http://www.healthyforests.gov/projects/state_projects/00-nm-gila-nf.pdf.
[38] Journal Staff, "Cibola Forest Trims Thinning Project Near Tajique," *Albuquerque Journal*, September 15, 2005.
[39] 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.
[40] Telegraph Staff, "$5,000 Reward Offered In Lookout Fire," *Albuquerque Journal*, May 27, 2004.
[41] 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).
[42] 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
[43] USDA FS, "Invasive Species Program," http://www.fs.fed.us/invasivespecies/definition.shtml.
[44] J. Berdie, letter to editor, *Santa Fe New Mexican*, January 14, 2006.

area, agricultural areas are being invaded by yellow star-thistle, according to the New Mexico Audubon Society. Non-herbicidal treatments are under investigation.[45]

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 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.[46]

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.[47] 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.[48]

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.

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[45] New Mexico Audubon Society Important Bird Areas fact sheet on the Gila-Cliff area, http://nm.audubon.org/iba/ibawriteups/gilacliff.html.

[46] 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.

47 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.

[48] USDA FS, "Four Threats," http://www.fs.fed.us/projects/four-threats/#space.

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.[49] 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.[50] New 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.[51]

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.[52]

The Mexican gray wolf was reintroduced into the Blue Range Wolf Recovery Area in Central Arizona and New Mexico in 1998.[53] 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.[54]

[49] USDA FS, "Four Threats, "http://www.fs.fed.us/projects/four-threats/#recreation.
[50] 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.
[51] "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.
[52] 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/06BiennualReviewExecSumm06Rvulnfo.pdf.
[53] 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.
[54] 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.

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."[55] 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 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.

[55] 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.

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.[56]

The FS is guided by a multiple-use mandate to administer lands for the purposes of recreation, grazing, timber, watershed, fish, and wildlife.[57] 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.[58] 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.[59] 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

[56] 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.
[57] "Multiple-Use Sustained-Yield Act of 1960," 16 U.S.C. §§ 528-531, http://www.fs.fed.us/emc/nfma/includes/musya60.pdf.
[58] 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.
[59] 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/.

some "fee areas", most areas of the forest are not fee areas, so visitors can access many sites without charge.

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.[60] 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.[61] Coue deer can be more expensive. Smaller game are typically much less – $200-300 a day.

[60] 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.
[61] 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.

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**.

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.[62]

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."[63] 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

[62] New Mexico Department of Game and Fish, "New Mexico Wildlife Rules and Information Booklets," http://www.wildlife.state.nm.us/publications/BigGameRulesandInformationBooklet.htm.
[63] USDA Forest Service, Gila National Forest, "Recreation – Birding," http://www2.srs.fs.fed.us/r3/gila/recreation/recactivity.asp?activity=bird.

as the Gila Trout are considered threatened or endangered.[64] Recovery efforts are underway to help establish fishable populations of the Gila Trout.[65]

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

> 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.[66] 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.[67]

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.[68] 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.

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[64] New Mexico Department of Game and Fish Conservation Services Division, op cit.
[65] USDA Forest Service, Gila National Forest, "Recreation – Fishing," http://www2.srs.fs.fed.us/r3/gila/recreation/recactivity.asp?activity=fish.
[66] 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.
[67] USDA Forest Service, Gila National Forest, "Recreation – Fishing," http://www2.srs.fs.fed.us/r3/gila/recreation/recactivity.asp?activity=fish.
[68] 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.[69] The 2005 fee is $1.79 per AUM.[70] 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.[71]

[69] 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.

[70] 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.

[71] 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.

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

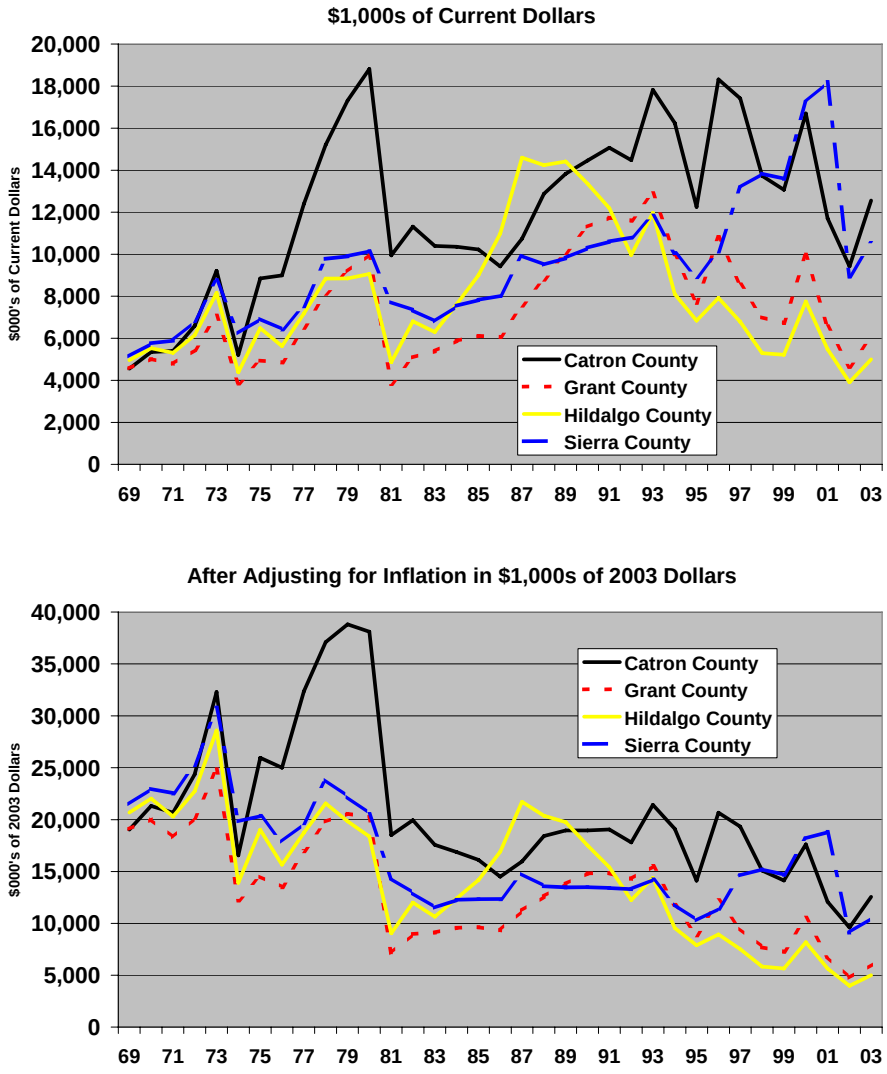
Year	AUM's	Employees
1990	240,648	182
1991	238,761	181
1992	231,373	175
1993	246,081	187
1994	272,180	206
1995	264,047	200
1996	245,431	186
1997	223,011	169
1998	192,834	146
1999	208,704	158
2000	224,495	170
2001	198,514	151
2002	212,439	161

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 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.[72] 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.

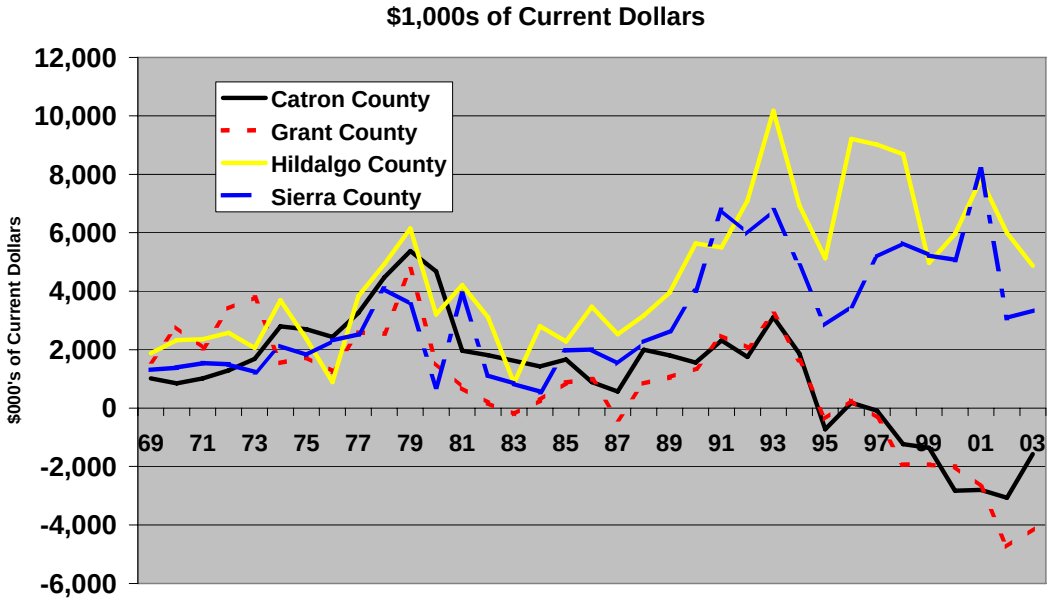
[72] New Mexico Department of Agriculture, "Public Land Grazing Task Force Gila National Forest Hearing," 7-8.



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	Hildalgo	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.[73] 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.[74] For some allotments, these changes have meant lower limits on the

[73] 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.

[74] 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

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.[75] 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.[76] 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.

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

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.

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

[76] 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.

distant third ($153, 019).[77] 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.

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.[78] 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.

[77] 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.
[78] Gila WoodNet, http://www.gilawoodnet.com/.

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.[79] 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.[80] **Table 5.8** documents the mining claims on or near roadless areas within the Gila NF.

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.

[79] Sherman, op. cit.

[80] 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

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	Number of Permits			$	Number of Permits			$	Number of Permits			$
	Active	Closed	Revoke	Rent	Active	Closed	Revoke	Rent	Active	Closed	Revoke	Rent
	Black Range District				**Quemado District**				**Glenwood District**			
Recreation	**15**	**13**	**0**	7,297	**35**	**9**	**0**	2,937	**7**	**3**	**0**	4,576
Outfitters and Guides	*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**
	Wildnerness District				**Reserve District**				**Silver City District**			
Recreation	**20**	**16**	**0**	11,646	**18**	**3**	**0**	3,525	**12**	**13**	**0**	727
Outfitters and Guides	*16*	*11*	*0*	*11,586*	*18*	*3*	*0*	*3,525*	*11*	*7*		*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.[81] (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

[81] 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.

evaluate the impacts of grazing on public land. Environmental groups (and even FS staff) often argue that grazing causes soil compaction, reducing the absorption of rainfall and also the recharge of aquifers and water tables.[82] 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.[83]

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.

[82] 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/fsblastsfs.html#fager.
[83] 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.[84]

[84] 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.

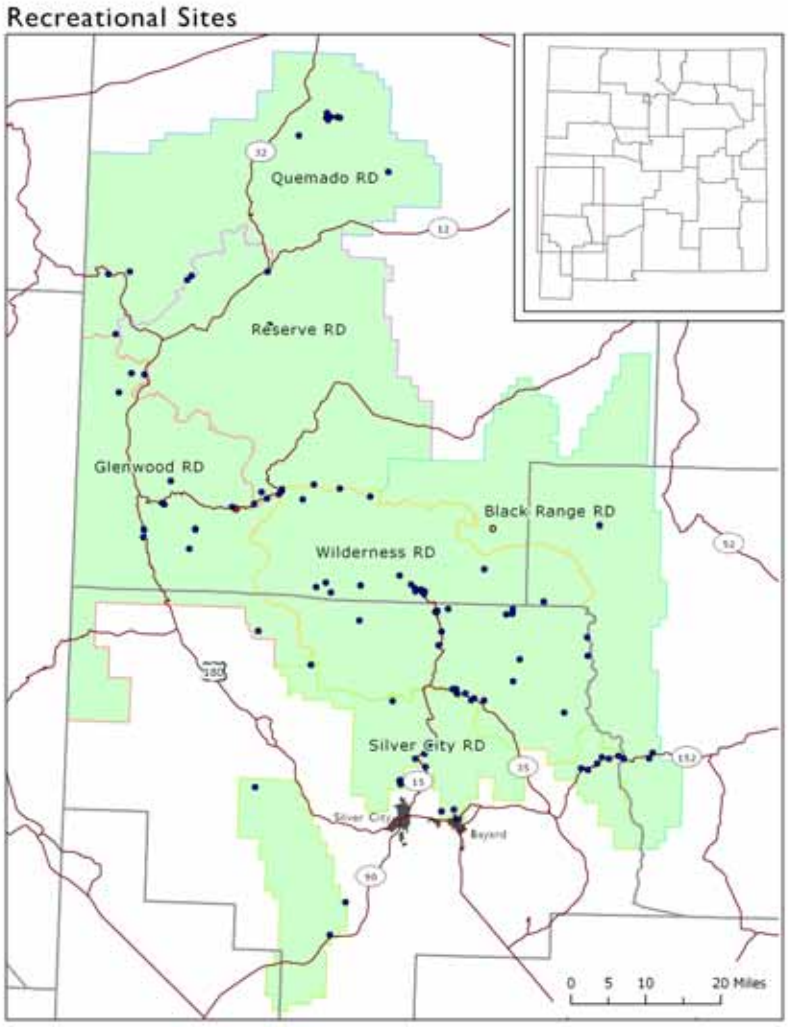


Figure 6.1: Gila NF Developed Recreational Sites

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.[85] 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).[86] While their reservations are not close to the Gila NF, these two tribes have an attachment to places within it.[87] 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.[88] 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

[85] Cox, op. cit.
[86] "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.
[87] The Pueblo of Zuni, "About Us," http://www.ashiwi.org/AboutUs.aspx.
[88] Ibid.

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 homeland. The nearby Alamo Navajo and Ramah Navajo both also have historic ties to places within the Gila.[89]

6.3 Special Management Areas

Wilderness areas were established via the Wilderness Act of 1964.[90] 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.[91] The Act describes a wilderness as "an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain." [92]

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.

[89] Trail of the Mountain Spirits National Scenic Byway, “TMS Byway History: The Apache History,” http://www.tmsbyway.com/history_overview.php?CID=71M7335U99.
[90] United States Congress, Wilderness Act of 1964, Public Law 88-577, 16.S. C. §§ 1131-1136, 88th Congress, Second Session.
[91] Olympic National Park, “The Olympic Wilderness,” http://www.nps.gov/archive/olym/wic/wilderness.htm.
[92] U.S. Congress, Wilderness Act of 1964, Public Law 88-577 (16.S. C. 1131-1136), 88th Congress, Second Session.

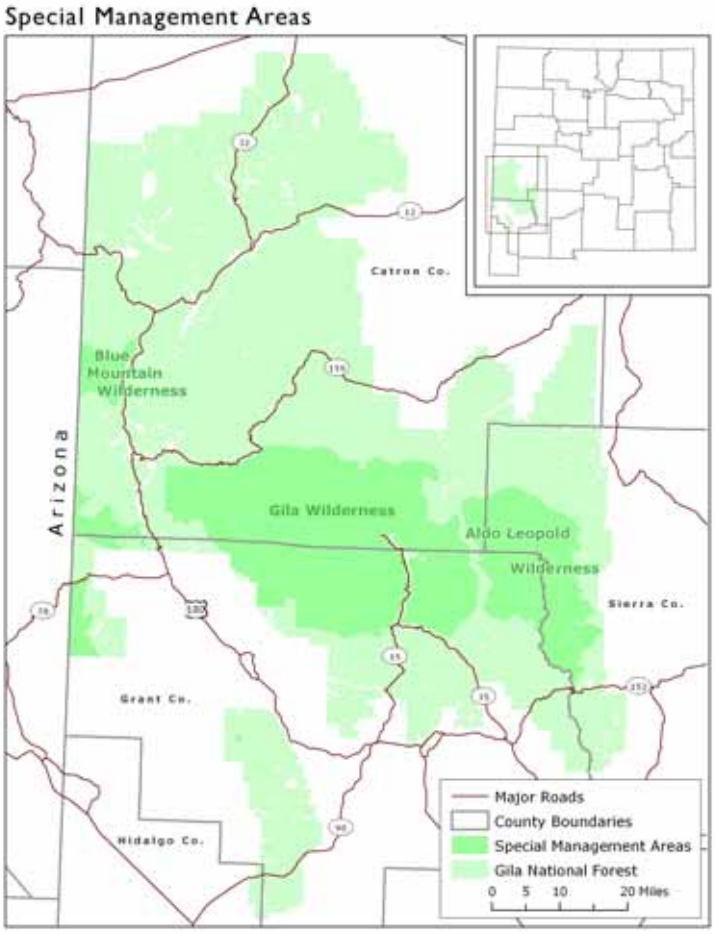


Figure 6.2: Special Management Areas: Wilderness

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.[93] 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.[94] Critics argue that the bureaucratic requirements involved in the petition process provide little

[93] 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.
[94] 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.[95] 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.

[95] 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.

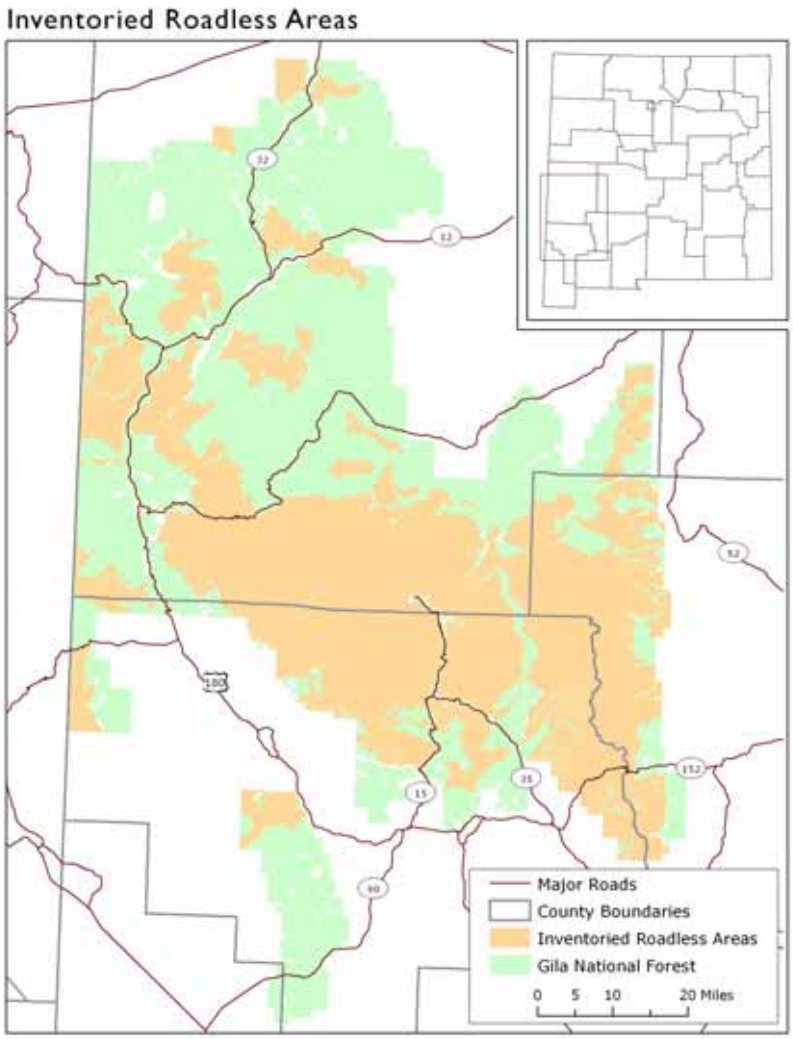


Figure 6.3: Inventoried Roadless Areas on Gila NF

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.[96]

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.[97] Another example may be Native Americans who identify with the area as their homeland or claim cultural affiliation or historical use.[98] They have a permanent attachment that is very different from other relationships, and they have certain rights under NAGPRA.[99]

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[96] 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).

[97] 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.

[98] 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).

[99] 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.