

### 3 Access and Travel Patterns

This chapter discusses current and potential access issues in each of Lincoln National Forest’s ranger districts. The analysis considers the existing transportation networks that serve Lincoln National Forest (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 Ranger Districts (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 Lincoln 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 major access obstacles.

**Figure 3.1** presents the major highways that serve as primary thoroughfares for the state and which encircle Lincoln NF. Interstate 40 (I-40), which runs east-west, and Interstate 25 (I-25), which runs north-south, are both major cross-national shipping routes that support high levels of heavy truck traffic. Lincoln NF may be accessed from either of these Interstates. From the Albuquerque area, one may access the Smokey Bear RD via I-25 and U.S. 380, or via I-40, NM 3, and U.S. 54. To access the Sacramento RD from the Albuquerque area, one may use I-25 and U.S. 70 or I-40, NM 3, and U.S. 54. Access to the Guadalupe RD is most easily made from the El Paso area, using U.S. 54.

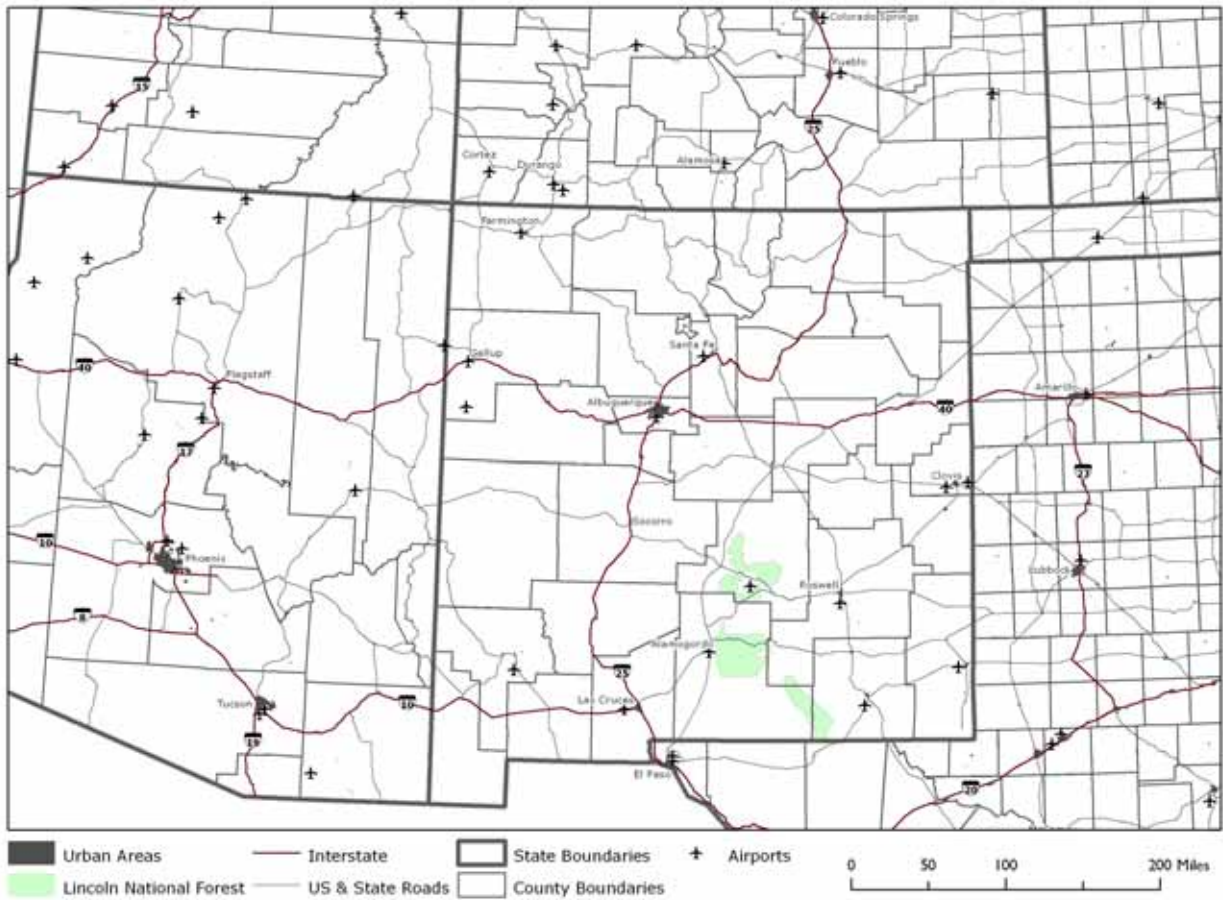
**Table 3.1** provides a list of roadways around the three ranger districts.<sup>1</sup> Two scenic byways (Billy the Kid and Sunspot) are popular routes for visitors who want to enjoy the aesthetic resources of south-central New Mexico.

**Table 3.1: Roadways Around Lincoln NF**

	<b>Smokey Bear</b>	<b>Sacramento</b>	<b>Guadalupe</b>
<b>US Route</b>	<b>54</b>	<b>54</b>	<b>62</b>
	<b>70</b>	<b>70</b>	<b>285</b>
	<b>380</b>	<b>82</b>	
<b>State Road</b>	<b>37</b>	<b>24</b>	<b>137</b>
	<b>48</b>	<b>130</b>	<b>396</b>
	<b>220</b>	<b>244</b>	

Source: ESRI StreetMap USA 2004.

<sup>1</sup> Geographical data on national roads is obtained from the ESRI Streetmaps USA 2004.



**Figure 3.1: Map of Principle Highways and Airports in Region**

**Table 3.2** shows the distance from each of the three Lincoln NF ranger districts to the major metropolitan statistical areas (MSAs) in the southwestern region of the United States. Overall, Lincoln NF is closest to Roswell, with travel distances of less than 130 miles to all three districts. Las Cruces and El Paso (both with travel distances of less than 200 miles) are two other nearby MSAs. Because many of the MSAs listed below have a national forest located closer to them than Lincoln NF, travelers’ first destination choice may not be Lincoln NF.

**Table 3.2: Distance from Major MSAs to the Lincoln NF Ranger Districts**

City	Smokey Bear	Sacramento	Guadalupe
Albuquerque, NM	191	241	320
Amarillo, TX	331	389	334
Denver, CO	551	610	625
El Paso, TX	186	126	162
Farmington, NM	373	432	500
Las Cruces, NM	164	105	194
Lubbock, TX	263	283	250
Phoenix, AZ	552	501	582
Pueblo, CO	437	496	511
Roswell, NM	66	126	119
Santa Fe, NM	452	311	311
Tempe, AZ	550	499	580
Tucson, AZ	438	387	468

Source: <http://www.mapquest.com>

**Table 3.3** shows lane miles in each county in the assessment area by road classification of the NMDOT. The assessment area is primarily rural. NMDOT defines rural areas to be areas where the population is under 5,000 persons; any area with more than 5,000 persons is defined as an urbanized area.<sup>2</sup> In the four counties, there are only 1,675 miles of urban road and over 17,000 miles of rural road. Most roads in the assessment area are collector and local roads, which provide access to homes and businesses.

<sup>2</sup> Bureau of Transportation Statistics: [http://www.transstats.bts.gov/Tableinfo.asp?Table\\_ID=1102](http://www.transstats.bts.gov/Tableinfo.asp?Table_ID=1102)

**Table 3.3: Lane Miles of Road by County and Classification**

<b>Rural</b>					
County	Interstate	Other Principal			County Total
		Arterial	Minor Arterial	Collector & Local	
Chaves	0	459	162	4,293	4,914
Eddy	0	376	129	3,981	4,486
Lincoln	0	294	113	2,845	3,252
Otero	0	461	91	4,311	4,863
<b>Total</b>	<b>0</b>	<b>1,591</b>	<b>494</b>	<b>15,431</b>	<b>17,516</b>
<b>Urban</b>					
County	Interstate	Other Principal			County Total
		Arterial	Minor Arterial	Collector & Local	
Chaves	0	81	68	643	793
Eddy	0	112	40	575	726
Lincoln	0	0	0	0	0
Otero	0	61	26	70	156
<b>Total</b>	<b>0</b>	<b>254</b>	<b>134</b>	<b>1,288</b>	<b>1,675</b>

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)<sup>3</sup> by road length in an area. 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.

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

County	Estimated VMT	VMT per Lane-Mile
Chaves	181,859	48
Eddy	1,130,199	217
Lincoln	651,357	200
Otero	1,398,900	279

Note: VMT is calculated as AADT\*Section\_Length

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

<sup>3</sup> The daily flow of motor traffic is averaged over the year to give average annual daily traffic (AADT) flows, a useful and simple measurement of how busy a road is. Data comes from the Highway Performance Monitoring System (HPMS), maintained by the Federal Highway Administration (FHWA) and can be accessed online from the Bureau of Transportation Statistics. <http://www.bts.gov/>

As the Lincoln NF counties are rural and relatively sparsely populated, the VMTs and VMT per lane-mile are quite low. Traffic is especially light in Chaves County, where there are on average only 48 vehicles traveling any given stretch of road on a typical day. Traffic is heaviest in Otero County, but is still quite low relative to the rest of the state. By contrast, the 2001 VMT for Bernalillo County totaled 11.9 million, with a VMT per lane-mile of over two thousand.

### 3.3 Airports

The largest airport in the vicinity of Lincoln NF is the El Paso International Airport in El Paso, Texas. The El Paso International Airport is located within 190 miles of each of the three ranger districts. The Albuquerque International Sunport in Albuquerque, New Mexico is another large airport that is also within approximately 190 miles of the Smokey Bear RD, but is 241 and 320 miles from the Sacramento and Guadalupe RDs, respectively. There are also numerous municipal airports that are near the ranger districts. Alamogordo-White Sands Regional Airport, located 5 miles west of Alamogordo, has regularly scheduled flights to Albuquerque. Although Sierra Blanca Regional Airport (located northeast of Ruidoso), Cavern City Air Terminal (located in Carlsbad), and Roswell Industrial Air Center (located in Roswell) have no scheduled services, these municipal airports are also available for use. 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 Partnership (GRIP), monies have been programmed for transportation infrastructure improvements throughout New Mexico. Below is a list and description of some of the more major projects located in the vicinity of Lincoln NF. See **Table A.1** of the Appendix for a complete list.<sup>4</sup>

#### **I 10, Texas State Line to Las Cruces**

This project involves reconstruction of existing lanes and expansion from a four-lane to a six-lane highway to accommodate high commuter and commercial traffic from El Paso. This is a major corridor for east to west coast transport of goods and services. Construction is scheduled to take place from August 2007 to May 2009.

#### **U.S. 380, Capitan to Hondo**

Project objectives are shoulder widening and pavement and drainage structure replacement along the existing two lanes. Emphasis will be placed on the cultural, natural and historic resources of the area. The project will improve the mobility of people and goods in the area. Construction is scheduled from June 2007 to October 2008.

#### **U.S. 62, Texas State Line to Carlsbad**

The existing two-lane highway will be reconstructed and enhanced with widened shoulders and periodic passing opportunities. This route accommodates tourists going to

<sup>4</sup> GRIP project information comes from the GRIP website: <http://nmgrip.com/>

Carlsbad Caverns National Park, which is the most visited park in New Mexico. The project will run from June 2006 to February 2008.

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

## 3.5 Forest Roads and Trails

Forest roads provide access for both forest users and FS officials to areas of interest in Lincoln NF. These roads are essential because they provide the only access to certain areas, permitting maintenance and rehabilitation activities. Access to the forest becomes critical in the event of a forest fire or other catastrophic event. An ongoing trend of increased recreational use (discussed in Chapter 5) can have implications for an increased need for additional trails.

**Table 3.5** presents roadway information for Lincoln NF as a whole and for each RD individually. Lincoln NF contains nearly 3,400 miles of roadways.<sup>5</sup> Eighty-two percent of the roadways are single lane roads; only 18 percent are double lane roads. Three quarters of all roads are covered with "native materials," in most cases meaning a dirt road. Throughout the entire Lincoln NF, there are only 2 miles of FS-maintained paved roads. Sacramento RD has more miles of roadways than the other two RDs, whereas Guadalupe RD has fewer miles of roadways than the other RDs. This pattern of roadway prevalence can at least in part be explained by the pattern of private ownership of land within Lincoln NF. Sacramento RD has the greatest percent of privately owned land, whereas Guadalupe RD has the lowest percent of privately owned land. The presence of privately owned land requires the presence of roadways for access purposes. Land ownership is discussed in greater detail in Section 4.1.

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<sup>5</sup> Forest road estimates are based on data in the FS infrastructure (INFRA) database. Any estimation errors inherent in the data (such as missing records) are not accounted for in this report. Duplicates were removed.

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

Sacramento			Segment Length (Miles)	Smokey Bear			Segment Length (Miles)
	Surface Type				Surface Type		
SINGLE LANE	Asphalt		0	SINGLE LANE	Asphalt		0
	Crushed Aggregate		41		Crushed Aggregate		9
	Bituminous Surface		9		Bituminous Surface		1
	Improved Native		136		Improved Native		21
	Native Material		1266		Native Material		801
	Paved		1		Paved		0
Single Lane Total			1,453	Single Lane Total			832
DOUBLE LANE	Asphalt		0	DOUBLE LANE	Asphalt		0
	Crushed Aggregate		24		Crushed Aggregate		51
	Bituminous Surface		180		Bituminous Surface		170
	Improved Native		2		Improved Native		40
	Native Material		8		Native Material		60
	Paved		1		Paved		0
Double Lane Total			215	Double Lane Total			321
<b>TOTAL</b>			<b>1,668</b>	<b>TOTAL</b>			<b>1,153</b>

Guadalupe			Segment Length (Miles)	Lincoln NF Total			Segment Length (Miles)
	Surface Type				Surface Type		
SINGLE LANE	Asphalt		0	SINGLE LANE	Asphalt		0
	Crushed Aggregate		11		Crushed Aggregate		61
	Bituminous Surface		0		Bituminous Surface		10
	Improved Native		49		Improved Native		206
	Native Material		434		Native Material		2501
	Paved		0		Paved		1
Single Lane Total			494	Single Lane Total			2,779
DOUBLE LANE	Asphalt		0	DOUBLE LANE	Asphalt		0
	Crushed Aggregate		16		Crushed Aggregate		91
	Bituminous Surface		54		Bituminous Surface		404
	Improved Native		6		Improved Native		48
	Native Material		0		Native Material		68
	Paved		0		Paved		1
Double Lane Total			76	Double Lane Total			612
<b>TOTAL</b>			<b>570</b>	<b>TOTAL</b>			<b>3,391</b>

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

The FS maintains designated areas of forest wilderness and additional inventoried roadless areas, where roads cannot be constructed or reconstructed. This land use is discussed in Chapter 6.

**Table 3.6** provides data on the type and length of trails found within each of the three Lincoln NF RDs. According to the FS infrastructure database (INFRA), Lincoln NF contains more than 500 miles of trail. For a complete list of trails located within Lincoln NF, see **Table A.2** in the Appendix.

The roads and trails information given in **Tables 3.5** and **3.6** does not include roads and trails created by individuals driving motorized vehicles (typically off-highway vehicles [OHVs]<sup>6</sup>) off road, either for purposes of recovering an animal carcass, loading firewood, or recreating. OHVs and ATVs are becoming increasingly popular but unfortunately can have adverse effects, particularly in drier climates where vegetative recovery may take years.

<sup>6</sup> Off-highway vehicles (OHVs), off-road vehicles (ORVs) and all terrain vehicles (ATVs) are used interchangeably. For consistency, this document uses the term off-highway vehicles (OHVs)

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

Trail Type		Segment Length (Miles)	Trail Type		Segment Length (Miles)
<b>Sacramento</b>			<b>Smokey Bear</b>		
	Native Natural	26		Native Natural	62
	Unidentified Type	211		Unidentified Type	152
<b>TOTAL</b>			<b>TOTAL</b>		
		237			214
Trail Type		Segment Length (Miles)	Trail Type		Segment Length (Miles)
<b>Guadalupe</b>			<b>Total Lincoln</b>		
	Native Natural	10		Native Natural	98
	Unidentified Type	57		Unidentified Type	420
<b>TOTAL</b>			<b>TOTAL</b>		
		67			518

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

### 3.6 Right-of-Way and Other Access Issues

The checkerboard pattern of landownership that exists within the Lincoln NF boundaries complicates both public access to the forest and access of landowners to private property within the NF boundaries. Lincoln NF is currently able to provide reasonable access to its lands for multiple purposes, including timber harvesting, fire management, recreation, and hunting activities. This access is, however, threatened over the long term by the fact that many of the access routes (both trails and roads) cross private or other lands where perfected (deeded or purchased) right-of-ways (ROWs) have not been acquired, and are therefore subject to potential closure by present or future landowners. As a result, the FS has identified high-priority ROWs (those most frequently used, those most likely subject to closure, and those required as escape routes for fire evacuations). Efforts are being made to acquire these high-priority ROWs through purchase at fair market value. Since 1990, Lincoln NF has acquired ROWs in the following areas:

- Road and Trail access to Trestle Recreation Site
- Weed
- Mayhill Administrative Site
- Access to Cloudcroft school land

The FS is also working with and encouraging county and state public road agencies to acquire ROWs for public use, especially on arterial roads that access smaller roads. In addition, the New Mexico Game and Fish Department is working with the FS both to identify certain parts of the NF where hunting is limited due to access problems and to acquire ROWs (mostly in the form of roads). Re-routing roads and/or trails around non-FS land is another possible solution to access problems that is also considered.

Access is also a concern as it pertains to the ability of private landowners to access their land within forest boundaries. As a result of these access needs, Lincoln NF uses considerable resources (personnel time, etc.) to analyze the many requests placed for special use permits for roads. (Special use permits are further discussed in Chapter 5.)

During the next four years, all national forests will be working to develop new travel management policies. The process will entail examining designated travel routes open for motorized vehicles and determining whether the existing transportation system needs to be revised – whether changes need to be made to which roads and trails are open and closed. The FS will also re-assess



what type(s) of motorized travel will be allowed on the various motorized trails. In addition, illegal user-created routes will be considered for inclusion in the new transportation system and ROW needs will be reconsidered. Significant public involvement will be sought next year.<sup>7</sup>

The pattern of land ownership that surrounds Lincoln NF, and therefore existing and potential access issues, differs across the three RDs. Smokey Bear RD is surrounded primarily by Indian reservation, private, and State lands. Sacramento RD is surrounded also primarily by Indian reservation, private, and State lands, as well as by Bureau of Land Management (BLM) and Department of Defense (DOD) lands. Guadalupe RD is surrounded almost entirely by BLM and national park lands. Private and State lands are those most likely to pose access problems. Private landowners have the most clearly defined rights, and therefore have the more control over access to their property than do other landowners. State laws and regulations exist that govern State lands (public trust lands) and create difficulties for gaining access to Lincoln NF across State lands. State lands' leaseholders (typically grazing, oil, and gas entities) have the right to say whether individuals can have access. Access to DOD lands is restricted to hunting purposes only; a system is currently in place for hunters to gain hunting licenses for DOD lands. BLM, national parks, and Indian reservation lands currently do not pose access problems. Lincoln NF presently has access across Mescalero Apache Tribe land in all areas where access is needed. Access across National Parks land is not an issue as such access has not yet been necessary. Access across BLM has not posed a challenge; there are presently no high priority ROW needs across BLM land, and it is part of the BLM program to allow access for public use. However, problems can arise when access to FS land first requires access across private or State lands and subsequently across Indian, BLM, or national parks land.<sup>8</sup>

As discussed in Chapter 4, the significant portion of land within the Sacramento and Smokey Bear RDs that is privately owned is not consolidated in one area, but rather creates a checkerboard pattern of landownership. This intermingling of public and private lands has caused access problems that are becoming more crucial as recreation use of the forest increases. Private ownership has created insufficient access in some areas, thereby causing areas of the forest to be unavailable for public use. This is especially true for the Smokey Bear RD.<sup>9</sup>

### 3.7 Challenges and Opportunities for Forest Management

Lincoln NF is located in a remote location. The four county region in which the forest is located is predominately rural, with a population density well below that of New Mexico as a whole. The forest is also a considerable distance from the principal metropolitan areas in Southwestern U.S.; El Paso is the only large MSA within a two-hour drive from the forest boundaries. Likewise, Lincoln NF is a considerable distance from a large airport; all RDs are between 120 and 190 miles from the nearest airport, in El Paso. There are a number of smaller, municipal airports in the area, but flight schedules may be too limited for tourist use.

Because of the remoteness of the forest, traffic is quite light. Indeed, population and traffic forecasts suggest that it is unlikely that there will be any significant increase in traffic through the area.

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<sup>7</sup> Personal communication with Johnny Wilson (Lincoln NF Recreation/Lands/Minerals Staff Officer).

<sup>8</sup> Ibid.

<sup>9</sup> U.S. Forest Service. 1986. *Environmental Impact Statement for Lincoln National Forest Plan*.

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Yet, the remoteness of the region, combined with the checkerboard pattern of landownership in the area, means that access to and through NF land is critical to the transportation dynamics of the area. Forest officials and local residents use forest roads and trails as the primary way of accessing various points of interest in the forest and, in many cases, public and private land both within and neighboring the forest boundaries. As such, it is imperative that these roads and trails remain in good condition.

All evidence suggests that the FS and other public agencies have acted assertively to meet access and transportation challenge. A number of federal and state roads surrounding the forest are slated for significant improvements over the next few years. Further, the FS has undertaken a large number of collaborative projects and acquired high-priority ROWs to ensure continued access forest resources.

## 4 Land Cover and Ownership

This chapter examines land cover and ownership in Lincoln National Forest (NF) and discusses related emerging management issues. The first section examines the various types of land cover and ownership within each of the ranger districts (RDs). The second section discusses recent land exchanges and the policy environment around future conveyances. The third section discusses endangered and invasive species, both of which relate to land cover.

The geographic data for this section is taken from the United States Geological Survey National Land Coverage Data set (NLCD), a raster based Landsat imagery. The data is obtained for each county with a 30-meter resolution making the data fairly accurate. ESRI Desktop GIS<sup>10</sup> software is used to extract the necessary data for each contextual geographic area. The Forest Service (FS) provided land exchange and conveyance data. Endangered and invasive species information was obtained from archival sources.

### 4.1 Land Cover on Lincoln National Forest

**Table 4.1** provides land cover classifications for each ranger district based on data compiled in the NLCD. (Land cover information is also provided in map form – see **Figure 4.1**.) The predominant land cover in Lincoln NF as a whole is evergreen forest (58 percent), followed by herbaceous grasslands (22 percent) and shrub land (19 percent). Land cover patterns vary across ranger districts. Evergreen forest accounts for 73 percent and 72 percent of land cover in the Sacramento and Smokey Bear RDs, respectively, but only 11 percent in the Guadalupe district. Shrub land and herbaceous grasslands are dominant in the Guadalupe district, accounting for 48 percent and 39 percent of land cover, but are less prevalent in Sacramento and Smokey Bear RDs. The Sacramento RD is 15 percent herbaceous grasslands and 11 percent shrub land, whereas the Smokey Bear RD is 18 percent herbaceous grasslands and 8 percent shrub land. Because Guadalupe RD provides the greatest amount of herbaceous grasslands and shrub land, this district is well suited for grazing purposes.<sup>11</sup>

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<sup>10</sup> <http://www.esri.com>.

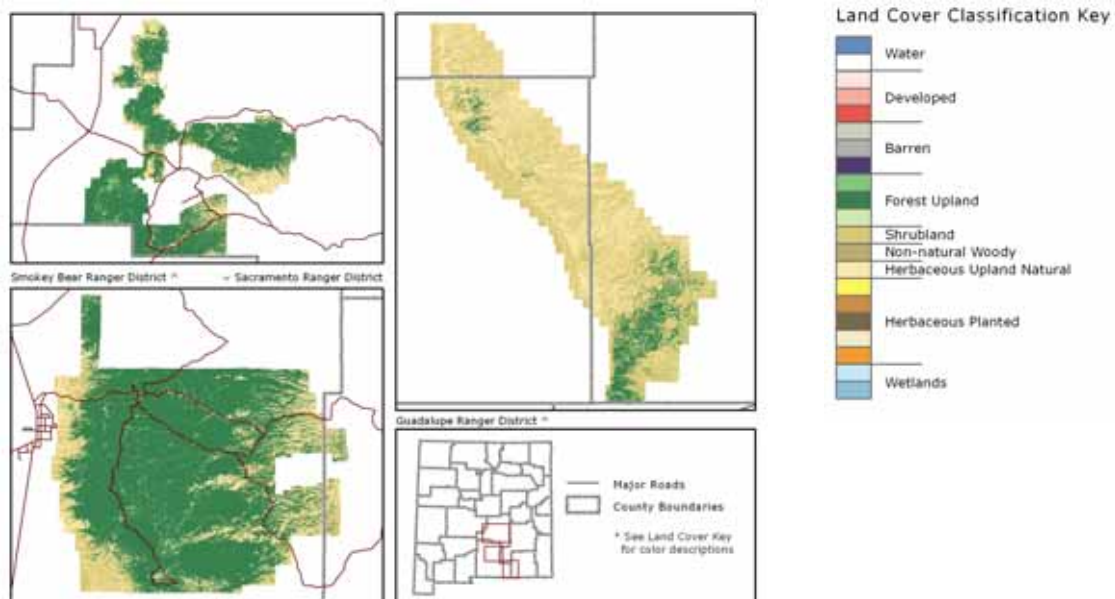
<sup>11</sup> The more open and less-forested southern regions of the LNF in the Guadalupe were cited as a particularly rich grass resource. A participant in discussion sessions conducted by Russell and Adams-Russell stated, “We don’t have a lot of trees, but we have some of the best grass for grazing you will find anywhere. The blue and black gramma grass we have here is just about some of the best you will find.” Source: Russell, J.C. and Adams-Russell, P.A. 2006. *Values, Attitudes and Beliefs toward National Forest System Lands: The Lincoln National Forest* (Draft).

**Table 4.1: Land Cover on Lincoln NF (Acres)**

	Sacramento	Smokey Bear	Guadalupe	Total Lincoln NF
Bare Rock/Sand/Clay	0	21	92	114
Commercial/Industrial/Transportation	124	604	83	811
Deciduous Forest	5,532	5,094	4,809	15,435
Emergent Herbaceous Wetlands			2	2
Evergreen Forest	398,024	304,556	31,262	733,841
Fallow	3	0		3
Grasslands/Herbaceous	83,589	76,746	113,876	274,212
High Intensity Residential		2		2
Low Intensity Residential	66	870	1	938
Open Water	27	56	2	86
Pasture/Hay	4	154	0	158
Quarries/Strip Mines/Gravel Pits		172		172
Row Crops	56	771		828
Shrubland	61,421	34,219	138,457	234,096
Small Grains	51	75		126
Urban/Recreational Grasses	21	125		146
<b>Total</b>	<b>548,920</b>	<b>423,464</b>	<b>288,585</b>	<b>1,260,969</b>

Note: Small errors in calculations are the result of 'edge rounding' associated with the use RASTER based NLCD.

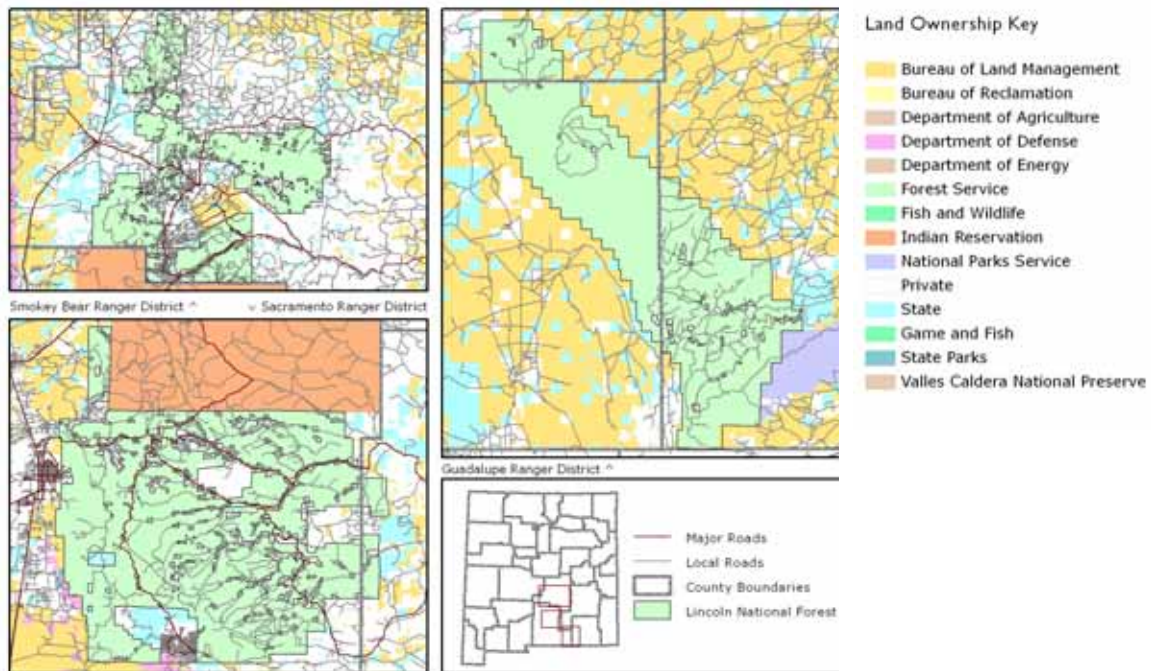
Source: USGS EROS, National Land Cover Data (NLCD), Date 1992 (New Mexico). Calculations by UNM-BBER.



**Figure 4.1: Land Cover on Lincoln NF**

Land ownership is an important consideration in formulating appropriate policies regarding land use. Of the roughly 1.3 million acres within the boundaries of the Lincoln NF, approximately 167 thousand acres (13 percent) are privately owned; the remaining 1.1 million acres (87 percent) are publicly owned. The amount of privately owned land on Lincoln NF is consistent with patterns in other National Forests in New Mexico: Gila, Carson, and Santa Fe National Forests are 4, 7, and 8 percent privately owned, respectively, while Cibola NF is 24 percent privately owned. **Figure 4.2** provides a map of land ownership in Lincoln NF and the surrounding areas. As this figure shows, there is a checkerboard pattern of land ownership within Lincoln NF. The lack of

contiguous ownership has implications for effective and efficient land management, as various landowners are likely to have dissimilar management interests and priorities.



**Figure 4.2: Land Ownership in Lincoln NF and Vicinity**

**Table 4.2** compares land cover on private and FS-owned lands on Lincoln NF by district. In general, privately owned lands within Lincoln NF consist of a greater proportion of evergreen forest and open water, and commensurately fewer shrub lands than FS-owned lands. However, this trend does not hold for all ranger districts. For example, the FS owns a greater proportion of evergreen forest acreage within the Smokey Bear RD and a greater proportion of open water acreage within the Sacramento RD than do private landowners do. Across districts, private parties hold a greater proportion of herbaceous grasslands acreage – lands more suited for grazing purposes – than does the FS. Note that a much greater percent of Lincoln NF is privately owned within the Sacramento and Smokey Bear RDs (18 and 15 percent, respectively) than in the Guadalupe RD (2 percent).

**Table 4.2: Land Cover of Publicly and Privately Owned Land in Lincoln NF**

	Sacramento			Smokey Bear		
	USFS	Private	Total	USFS	Private	Total
Bare Rock/Sand/Clay		0	0	12	9	21
Commercial/Industrial/Transportation	38	86	124	9	595	604
Deciduous Forest	3,435	2,097	5,532	4,783	311	5,094
Evergreen Forest	326,510	71,521	398,031	267,608	36,913	304,521
Grasslands/Herbaceous	66,830	16,760	83,590	60,107	16,640	76,747
Low Intensity Residential	6	61	66	1	870	870
Open Water	25	2	27	0	56	56
Pasture/Hay	2	2	4		154	154
Quarries/Strip Mines/Gravel Pits				76	96	172
Row Crops		56	56	25	746	771
Shrubland	53,560	7,852	61,413	27,997	6,205	34,202
Small Grains		51	51	9	65	75
Urban/Recreational Grasses		21	21	17	109	126
<b>Total</b>	<b>450,406</b>	<b>98,514</b>	<b>548,920</b>	<b>360,644</b>	<b>62,770</b>	<b>423,414</b>

	Guadalupe			Total Lincoln NF		
	USFS	Private	Total	USFS	Private	Total
Bare Rock/Sand/Clay	92		92	104	10	113
Commercial/Industrial/Transportation	75	8	83	122	689	811
Deciduous Forest	4,705	115	4,820	12,922	2,523	15,446
Evergreen Forest	30,566	699	31,265	624,684	109,133	733,817
Grasslands/Herbaceous	111,470	2,422	113,893	238,407	35,822	274,230
Low Intensity Residential	1		1	7	931	938
Open Water	2		2	28	58	86
Pasture/Hay	0		0	2	156	158
Quarries/Strip Mines/Gravel Pits			-	76	96	172
Row Crops			-	25	803	828
Shrubland	136,316	2,041	138,356	217,872	16,098	233,971
Small Grains			-	9	116	126
Urban/Recreational Grasses			-	17	129	146
<b>Total</b>	<b>283,229</b>	<b>5,286</b>	<b>288,515</b>	<b>1,094,278</b>	<b>166,571</b>	<b>1,260,848</b>

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.

Table 4.2, Continued

	Sacramento			Smokey Bear		
	USFS	Private	Total	USFS	Private	Total
Commercial/Industrial/Transportation					1%	
Deciduous Forest	1%	2%	1%	1%	0%	1%
Evergreen Forest	72%	73%	73%	74%	59%	72%
Grasslands/Herbaceous	15%	17%	15%	17%	27%	18%
High Intensity Residential						
Low Intensity Residential					1%	0%
Row Crops					1%	
Shrubland	12%	8%	11%	8%	10%	8%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

	Guadalupe			Total Lincoln NF		
	USFS	Private	Total	USFS	Private	Total
Commercial/Industrial/Transportation		0%		0%	0%	0%
Deciduous Forest	2%	2%	2%	1%	2%	1%
Evergreen Forest	11%	13%	11%	57%	66%	58%
Grasslands/Herbaceous	39%	46%	39%	22%	22%	22%
Low Intensity Residential				0%	1%	0%
Row Crops				0%	0%	0%
Shrubland	48%	39%	48%	20%	10%	19%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

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

Land exchange is a key strategy for mitigating the management issues associated with the checkerboard pattern of landownership created by privately owned lands scattered within and around the NF. Changes in land ownership have occurred through land-for-land exchanges, land-for-timber exchanges, fee purchases, and land sales. Exchanges have been the most commonly used means of consolidating ownership. Efficient and effective management of forest areas in general increases as the contiguity of the forest area increases. The FS may therefore choose to trade isolated parcels of FS land for privately held land located either within the forest boundary or along the forest periphery. Land may also be acquired for numerous other reasons, including the support of threatened and endangered species, access provision, and research.

Although still ongoing, the frequency of changes in land ownership has declined in recent decades due to a lack of funds available for purchases, the time consuming nature of exchanges, and decreased interest by private landowners as the value of their land for subdivision purposes has increased.

Table 4.3 summarizes three land exchanges that have taken place within the Lincoln NF during the past 10 years. Information in the table include federal acres and federal values: the number of acres transferred to private ownership and the associated dollar value; and non-federal acres and non-federal value: the number of acres transferred from private ownership to the FS and the associated dollar value. The Lessentine and Patterson land exchanges resulted in the transfer of 80 acres (values at \$147,500) of NF land to private ownership in exchange for 78.22 acres

(valued at \$354,400). From the Cloudcroft School conveyance the FS exchanged 40 acres valued at \$214,000 for a cash payment of equivalent value.

**Table 4.3: Land Conveyance and Exchanges for Lincoln NF**

Case Name	Federal Acres	Federal Value	Plus Cash	Non-Federal Acres	Non-Federal Value	Fiscal Year
Cloudcroft Schools		Cash in lieu of land	\$214,000	40.000	\$214,000	1997
Lessentine, Richard	40.000	\$103,500		38.220	\$96,500	1989
Patterson, Karl	40.000	\$44,000		40.000	\$44,000	1990
<b>Total</b>	<b>80.000</b>	<b>\$147,500</b>	<b>\$214,000</b>	<b>118.220</b>	<b>354,500.000</b>	

Source: USDA Forest Service Exchanges and Conveyances Database

The Secure Rural Schools and Community Self-Determination Act of 2000 (commonly known as Payments to States) has introduced another aspect of land adjustment of concern for Lincoln NF. Nearly 100 years ago, legislation was created to give counties a percentage of the revenues raised through timber sales and grazing fees on public lands. Revenues received by counties were to be used for schools, roads, and planning. This worked well for many schools until the 1980s when timber harvests declined. The Secure Rural Schools Act was passed into law in 2000 with the intent of addressing the revenue declines; payments to counties for years 2001-2006 were to be based upon the state's top three years of payments from timber and grazing receipts.<sup>12</sup> 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. Potentially eligible lands have been identified and are displayed in a table as Lands Potentially Eligible for Sale by State and National Forest.<sup>13</sup> Of the 7,373 acres of New Mexico NF lands identified as potentially eligible for sale, nearly 1,780 acres are located within Lincoln NF (1,072 acres in Otero County and 708 acres in Lincoln County).

Lands eligible for exchange are often justified as "suitable for conveyance because they are isolated or inefficient to manage."<sup>14</sup> Critics of the plan argue that it is "a dollar of forest for a dime of education,"<sup>15</sup> implying that it is inappropriate to sell the land to address an ongoing need.

### 4.3 Endangered and Invasive Species

Lincoln NF is home to several plant and animal species listed as either threatened or endangered under the Endangered Species Act (ESA). ESA-listed plants located within Lincoln NF include the Sacramento prickly poppy, Sacramento Mountain thistle, Texas Madrone, and Kuenzler hedgehog cactus. Threatened or endangered animals include the Mexican spotted owl, the Chiricahua leopard frog, and the bald eagle.<sup>16</sup> Lincoln NF also provides habitat suitable for numerous threatened and endangered species.<sup>17</sup>

<sup>12</sup> [http://wwwnotes.fs.fed.us:81/r4/payments\\_to\\_states.nsf](http://wwwnotes.fs.fed.us:81/r4/payments_to_states.nsf).

<sup>13</sup> [http://www.fs.fed.us/land/staff/rural\\_schools.shtml](http://www.fs.fed.us/land/staff/rural_schools.shtml).

<sup>14</sup> Oversight Field Research before the Subcommittee on Forests and Forest Health.

<sup>15</sup> Hananala, S. March 19, 2006. The Associated Press.

<sup>16</sup> Information accessed online: [http://www.fws.gov/ifw2es/NewMexico/ES\\_bio\\_op.cfm](http://www.fws.gov/ifw2es/NewMexico/ES_bio_op.cfm).

<sup>17</sup> For a complete list see: U.S. Forest Service. 1986. *Environmental Impacts Statement for the Lincoln National Forest Plan*.



The presence of threatened or endangered species has had implications for conducting prescribed burns and the treatment of overgrown woodlands. For example, the presence of a high number of Mexican spotted owls (more than 100), in conjunction with management requirements stipulated by the Basin & Range – East Recovery Unit Plan, have challenged the ability of the FS to meet two of the primary goals defined by Region 3 under the Healthy Forests Restoration Act of 2003: protection of communities adjacent to NF land and restoration of the ecological functionality of fire-adapted ecosystems.<sup>18</sup>

Non-native, invasive plants and insects can cause major disruptions in ecosystem function. Wildlife habitat can be compromised when weeds take over native plant communities – palatable forage decreases as weeds like thistle, leafy spurge, and yellow toadflax take over, and weeds such as black henbane, poison hemlock, and yellow star thistle can be poisonous to animals.<sup>19</sup> Invasive or noxious weeds are common along roads, trails, and riparian areas, and can be spread by OHVs, grazing animals, visitors, and water flow. Drought conditions can affect the spread of both noxious weeds and invasive insect species.

Invasive plant species present on Lincoln NF include Russian knapweed, musk thistle, Canada thistle, bull thistle, leafy spurge, teasel, Dalmatian toadflax, whitetop, poison hemlock, and burdock.<sup>20</sup> With the exception of the musk thistle, these weeds are primarily prevalent on the Sacramento RD; the musk thistle is evenly distributed on both the Sacramento and Smokey Bear RDs. Weeds are not a significant problem in the Guadalupe RD as this district is much drier and more remote. Fewer roads, traffic, and visitors translate into fewer vectors to bring weeds into the area.

Roughly 2,000 acres of weeds are treated with herbicides each year. Funding and weather conditions both cause fluctuations in the number of acres treated. In some areas herbicidal treatments are causing a reduction in the number of infested acres, while in other areas treatments are only keeping the extent of the weed infestation from increasing. The presence of weeds on private lands can hinder FS efforts to treat weeds. Because private landowners are not required to treat weed infestations, the presence of weeds on private lands (both within and abutting FS land) often serve as a seed source for weeds on FS land.

In addition to herbicidal treatments, the FS is also moving toward requiring the use of certified weed-free hay by horse groups, hunters, outfitters, guides, etc. Progress in this direction is dependent upon a reliable supply of such feed.

Bark beetles are native to the southwest United States and traditionally play a key function in the forests' ecosystems. However, exceptionally high population levels have in recent years led to excessive numbers of tree deaths, and therefore higher fuel levels and increased fire danger. Bark beetle populations “crashed” in 2004, but the forest is at risk for a new infestation due to the recent drought conditions in the area<sup>21</sup> – bark beetles only reach infestation levels when tree health has already been compromised by other factors, such as drought or overcrowding. According to FS officials, the beetle infestation will continue until drought conditions subside and

<sup>18</sup> *Forest Plan Monitoring and Evaluation Summary: Lincoln National Forest Fiscal Year 2004*, [http://www.fs.fed.us/r3/lincoln/contact/planning/2004\\_LNF\\_monitoring\\_report.pdf](http://www.fs.fed.us/r3/lincoln/contact/planning/2004_LNF_monitoring_report.pdf).

<sup>19</sup> U.S. Forest Service, Final Environmental Impact Statement – *Invasive Plan Control Project*.

<sup>20</sup> Information regarding invasive plants comes from personal communication with Larry Cosper (Lincoln NF Range/Wildlife/Watershed Staff Officer).

<sup>21</sup> Tom Sharpe, “Preparing for the Worst,” *The Santa Fe New Mexican*, February 21, 2006.

trees recover their vigor. In order to reduce the impacts of future outbreaks, forest health must be improved by thinning overcrowded stands of trees.

### 4.4 Fire and Fuels

Much of the West has been under drought conditions over the last several years. Continued drought conditions combined with high fuel loads have created dangerous 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. The Cree and Scott-Able Fires both occurred during 2000 and burned a total of 22,500 acres, the majority of which were FS lands. Both were human-caused fires. In May of 2004, the lightning-caused Peppin Fire burned 65,000 acres within the Capitan Mountain Wilderness (Smokey Bear RD). In addition to drought and elevated fuel loads, high winds, low humidity, and steep and rugged terrain complicated fire-fighting efforts.<sup>22</sup>

The Peppin Fire has resulted in New Mexicans’ increased awareness of fire and the contentious issues and difficulties inherent in forest and fire management. Due to the steep and rugged terrain in which the Peppin Fire burned, the FS originally took an “indirect” containment approach, constructing fire lines well away from the fire. However, after a week’s time the fire blew up – within a short amount of time the fire had rapidly spread and destroyed numerous homes.<sup>23</sup>

High fuel loads and subsequent high severity burns are the result of years of active fire suppression, and can hamper the ability to restore ecological functionality through the use of fire. The FS is facing increased urgency to reduce the hazardous fuel loads and reduce the likelihood of a crown fire near the adjacent communities. Reduced fuel loads also provide safer conditions for firefighters and allow them greater access to protect homes in and around the forest. However, some residents and environmentalists are concerned with the methods used in reducing fuel loads. Common treatments to reduce fuels include thinning, prescribed burning, and clearing the forest of debris. In some cases, the FS uses herbicides to kill invasive weeds that become fire fuel.<sup>24</sup>

### 4.5 Challenges and Opportunities for Forest Management

The key issues regarding land cover and ownership that confront the Lincoln NF pertain to ecological diversity and the management of invasive species, and fire and fuels management. Directly or indirectly, each of these issues is shaped by patterns of landownership – specifically the checkerboard pattern of public-private landownership. This factor plays a greater role in the two northern RDs, where about 17 percent of the land within the forest boundaries is privately owned, than in the southern Guadalupe RD, where only 2 percent of land within the boundaries is privately owned.

The fragmented pattern of landownership can be both problematic and beneficial to FS efforts to maintain ecological diversity, protect endangered and threatened species and manage the spread of invasive species. The challenge posed by this fragmented pattern of landownership is that public and private land managers, given different priorities, objectives and resources allocations, often implement dissimilar land management programs, undermining the contiguous application

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<sup>22</sup> USFS Lincoln National Forest. Monitoring and Evaluation Summary—FY2004: Lincoln National Forest.

<sup>23</sup> Adam Burke. “As Fire Season Ignites, Smokey Bear’s Legacy Lingers”, *High Country News*, June 21, 2004.

<sup>24</sup> Associated Press, “Environmentalists Want Alternatives for Killing Weeds,” January 12, 2006.

of management practices that are essential to the success of such programs. For instance, programs to eradicate an invasive species must be consistent in its application or improvements will be only temporary. Likewise, programs to protect endangered and threatened species must be enacted on an ecosystem-wide basis to be effective over the long term.

Yet, the checkerboard pattern of landownership also represents a valuable opportunity for Lincoln NF managers to demonstrate alternative and sustainable management practices to private landowners; the diffusion of information and technology can be facilitated by the existence of non-contiguous land ownership. This enables the FS to better achieve its land management objectives and fulfill in broadest mission to “demonstrate the sustainable multiple-use management concept.”<sup>25</sup>

A second challenge to the Lincoln NF regards fire and fuels management. Years of fire suppression policy have caused forests to become much more densely populated than under historical and natural conditions. The effects of dense forests for fire management have been immense – whereas historically fires would burn cool and serve to rejuvenate the forest, today’s dense tree stands cause fires to burn hot and more destructively.<sup>26</sup> Again, the presence of private development within and along NF boundaries complicates this management issue, increasing the risks of fire while exposing persons and private property to the hazards of forest fire. Yet, the presence of private landowners can contribute to better fire management programs, contributing to the knowledge and awareness of FS managers, and advocating for sustainable fire management policies.

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<sup>25</sup> The USDA Forest Service Mission, Motto, Vision, and Guiding Principles.  
<http://www.fs.fed.us/aboutus/mission.shtml>.

<sup>26</sup> The concept of an increase in tree density resulting in an increase in the likelihood for catastrophic fire is discussed and alluded to in numerous reports published by the FS. For example, see Forest Plan Monitoring and Evaluation Summary: Lincoln National Forest Fiscal Year 2004,  
[http://www.fs.fed.us/r3/lincoln/contact/planning/2004\\_LNF\\_monitoring\\_report.pdf](http://www.fs.fed.us/r3/lincoln/contact/planning/2004_LNF_monitoring_report.pdf)

## 5 Forest Uses and Users

The purpose of this chapter is to describe how different parts of the Lincoln National Forest (NF) are used and by whom. The mission of the Forest Service (FS) is to allow the land to be accessed for multiple uses including: recreation, tourism, subsistence, and grazing, as well as maintaining scenic resources for the community and visitors. The groups of people who use NF resources are diverse, and they interact with the forest environment in a broad assortment of ways that have significant consequences for forest ecosystems and the people who depend on them.<sup>27</sup>

The multiple-use mandate poses a fundamental management challenge. Increased usage by diverse and growing populations inevitably runs up against the constraint of limited resources. As a result, one type of use begins to impinge on another, raising challenges for FS management. The coordination of multiple land uses 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.

Historically, the Lincoln assessment area had a resource-based economy. The makeup of the economy changed over time as recreation and tourism uses became more prominent. Tensions are caused by the fact that visitors and new residents increase the variety and amount of demands placed on forest resources, impinging on traditional uses. The overall rise in recreational demand has caused an increased concentration of users, which subsequently has increased the likelihood of conflicts among users and uses. The nature and intensity of these land use conflicts varies substantially among the three Lincoln NF ranger districts (RDs).

### 5.1 Recreation

Recreation is one of the major uses of the Lincoln NF. **Table 5.1** summarizes data on recreational users provided by the FS. The data included in this table are estimates based on the National Visitor Use Monitoring (NVUM) surveys conducted by the FS. The NVUM database classifies visits as either recreation-related (e.g. hiking, picnic, camping) or wildlife-related (e.g. hunting, fishing, wildlife watching).

The data estimates that 780,000 people visited Lincoln NF during 1999 and 2000. Unfortunately the data is not delineated by RD. Visitors may access most forest areas without charge, although there are some “fee areas” at sites that have developed recreation facilities.

The majority of visitors (71 percent) were locals, though nearly a third of visitors were non-locals.<sup>28</sup> The vast majority of visitors (98 percent) engaged in recreational activities, compared to only 2 percent in wildlife activities. More than one-half of visitors to Lincoln NF (52 percent) spent at least one night within the forest.

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<sup>27</sup> Dwyer, J.F. 1995. Integrating social sciences in ecosystem management: People-forest interactions in the urban forest, in H.K. Cordell (Ed.), *Integrating Social Sciences and Ecosystem Management: A National Challenge*. Athens, GA: USDA, Forest Service, Southern Research Station.

<sup>28</sup> Local users are defined as those visiting for day use only, returning to residence at the end of the day.

**Table 5.1: Number of Recreational & Wildlife Visitors to Lincoln NF**

	Recreation	Wildlife	Total	%
Non-local Day Travel to Forest	116,759	2,383	119,142	15%
Non-local Overnight Stay on Forest Land	100,079	2,042	102,122	13%
Local Day travel to Forest	225,178	4,595	229,774	29%
Local Overnight With Stay on Forest Land	300,237	6,127	306,365	39%
Local Overnight Without Stay on Forest Land	25,020	511	25,530	3%
NonPrimary	33,360	681	34,041	4%
<b>Total</b>	<b>767,273</b>	<b>15,659</b>	<b>782,932</b>	<b>100%</b>

Lincoln NF is home to a unique cave system, two wilderness areas, and two ski areas. The higher and cooler elevations of Lincoln NF and the fact that Lincoln NF is an easy two-hour drive from west Texas communities such as El Paso and Lubbock make it an attractive destination for many Texans. In this manner especially Lincoln NF is a resource that serves to attract many tourists and their money to the surrounding communities.

The Southern Guadalupe Mountains contain some of the most unique and scenic cave formations in the world, the product of what is generally considered the best-preserved Permian-aged fossil reef in the world.<sup>29</sup> There are more than 100 caves known to exist within the three ranger districts, nearly all in the Guadalupe RD.<sup>30</sup> Although some caves are open to the public, others have been closed for restoration, research, or to protect threatened and endangered species.<sup>31</sup> The Sitting Bull Falls Recreation Area, located in the Guadalupe RD, is a primary attraction for locals and visitors to southeastern New Mexico. The recreation area is one of the fee areas within the Lincoln NF, where 50 percent of operation and maintenance costs are funded with user fees. The area provides 26 miles of trails, a picnic area, and is the location of Sitting Bull Falls Cave.

There are numerous developed recreation sites – including campgrounds, picnic areas, snow play areas, and interpretive centers – located throughout Lincoln NF. In addition, many visitors come to hunt, backpack, hike, horseback ride, and otherwise enjoy the vast tracts of roadless and relatively undisturbed areas found within the Lincoln NF. These areas include inventoried roadless areas, most notably within the White Mountain and Capitan Mountain Wilderness areas, both located within the Smokey Bear Ranger District. In addition to numerous trails available for cross-country ski purposes, two downhill ski areas are partially located on Lincoln NF land – Ski Apache and Ski Cloudcroft. Downhill skiing opportunities contribute significant dollars to the economies of both Ruidoso and Cloudcroft.

Visitor spending is the single most important contributor to the economic impact of Lincoln NF. Information regarding the spending profiles of different kinds of recreational users is discussed in Chapter 7.

<sup>29</sup> GEOLOGY 101 – Permian reef to limestone mountains, cave dissolution to cave decoration.

<http://www.nps.gov/cave/geology.htm>.

<sup>30</sup> U.S. Forest Service. 2004. *Lincoln National Forest Stakeholder's Report for 2003*.

<sup>31</sup> FS efforts to inventory and manage the caves continue, but have been limited due to low funding levels.

## Hunting and Wildlife

Numerous visitors, especially hunters and wildlife viewers, are attracted by the diversity of wildlife in Lincoln NF. The statewide importance of wildlife is illustrated by the fact that almost 600 thousand New Mexico residents participated in hunting, fishing, or wildlife watching during 2001, contributing nearly \$1 billion to the State's economy.<sup>32</sup>

Under federal mandate, wildlife and hunting are regulated by states, which are responsible for issuing permits and licenses, although wildlife habitat is managed by the appropriate land management agency. In New Mexico, permits for elk, deer, and antelope are issued on a lottery basis to New Mexico residents and non-residents by the state Department of Game and Fish. The seasons and hunting dates are highly regulated. A full description of elk and deer hunting regulations specific to Lincoln NF can be found in **Table A.3** of the Appendix.

Hunting occurs during the autumn months in the form of both guided and unguided hunts, although the majority of permits and licenses are issued to outfitters and guides. In New Mexico, small geographical areas in the national forests are designated as hunting management "units." The units are used to designate hunting areas, as regulations regarding hunting dates and limits are set at the unit-level. **Table 5.2** provides hunting management unit information for large game (primarily elk and antelope) within the Lincoln NF.

**Table 5.2: Management Units in Lincoln NF**

Management Unit	Elk and Big Game	Antelope
Lincoln NF	36,37,38	34,37
Chaves	32,33	32,33,34
Otero	28,29,43,45	29,35
Eddy	30	28,30

Source: New Mexico Department of Game and Fish

The Capitan Mountain Wilderness is well known for hunting, especially for deer, bear, and turkey. White Mountain Wilderness provides opportunities to hunt deer, elk, bear, and turkey. According to a FS report (1986), Lincoln NF is home to 235 bird species and thus provides opportunities for wildlife watchers. As a whole, fishing opportunities within Lincoln NF are rather limited. However, fishing opportunities are of an especially high quality in the Southern Sacramento Mountains.<sup>33</sup> Fishing opportunities in the Capitan Mountain Wilderness are limited to a couple of small streams on the northern side, and are limited in the White Mountain Wilderness to small stretches of the Rio Bonito and Three-Rivers Creek.

## 5.2 Grazing

Grazing has been ongoing in the area surrounding the Lincoln NF since the mid- to late-1800s, when a large cattle industry developed in the area.<sup>34</sup> Although historically the area was home to multi-

<sup>32</sup> U.S. Department of the Interior, Fish and Wildlife Service, 2001 *National Survey of Fishing, Hunting, and Wildlife-Associated Recreation: State Overview*. [http://library.fws.gov/Pubs/State\\_overview01.pdf](http://library.fws.gov/Pubs/State_overview01.pdf)

<sup>33</sup> <http://www.fs.fed.us/r3/lincoln/>.

<sup>34</sup> Spoerl, P.M. 1983. *Thousands of Years of Use: Prehistory and History on the Lincoln National Forest*.

generational ranching families, economic and social changes have meant that these lifestyles must be supplemented with additional sources of income. Despite this fact, ranching continues because it is part of the area's heritage and culture. Local ranchers assert that access to grazing on Lincoln NF is critical to the continued survival of the area's ranching culture.<sup>35</sup>

Seven hundred thousand of Lincoln NF's 1.1 million acres (64 percent) are considered suitable for rangeland.<sup>36</sup> **Table 5.3** lists the number of grazing permits issued during the past several years<sup>37</sup> by each ranger district within Lincoln NF. It is interesting to note that the Smokey Bear and Sacramento RDs provide a much higher number of grazing allotments than does the Guadalupe RD. Ranching activities associated with Lincoln NF have a significant impact on the area's local economy. Because almost all permittees are local residents,<sup>38</sup> it is reasonable to assume that local residents receive the majority of the economic impacts from grazing activities that occur within Lincoln NF. The magnitude of economic impacts stemming from ranching is second only to those stemming from recreation and Lincoln NF visitors.

**Table 5.3: Number of Grazing Permits Sold in Lincoln NF**

	# Permits	# Allotments			
		Active	Closed	Vacant	Other/ Combined
Guadalupe	11	16	1	0	0
Sacramento	45	43	6	2	1
Smokey Bear	52	45	7	1	2
<b>District Total</b>	<b>108</b>	<b>104</b>	<b>14</b>	<b>3</b>	<b>3</b>

Source: USDA Forest Service Grazing Permits and Grazing Allotment Databases

**Table 5.4** shows the legal address of the 117 holders of grazing permits to Lincoln NF. With few exceptions, permittees are local to the Lincoln NF area; only three permittees (in Dallas and Fort Worth) are not in close proximity to the forest, suggesting a strong relationship between ranchers and the NF allotments. Furthermore, the data indicates that there is no particular concentration of permits. Residents of Capitan, adjacent to the Smokey Bear RD, hold the greatest number of permits (14), and residents of no other community hold even 10 percent of all permits.

Grazing fees are charged per animal unit month (AUM) and are subject to change. The 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.<sup>39</sup> The 2005 fee is \$1.79 per AUM.<sup>40</sup>

<sup>35</sup> Russell, J.C. and Adams-Russell, P.A. 2006. *Values, Attitudes and Beliefs toward National Forest System Lands: The Lincoln National Forest (Draft)*.

<sup>36</sup> U.S. Forest Service. 1986. *Environmental Impact Statement for the Lincoln National Forest Plan*.

<sup>37</sup> FS staff indicated the data covered "the past several years," personal communication 03/27/2006.

<sup>38</sup> Residency of holders of grazing permits is summarized in **Table 5.4**, and reviewed below.

<sup>39</sup> U.S. Forest Service News Release: FS-0406 February 20, 2004

<sup>40</sup> <http://www.blm.gov/nhp/efoia/wo/fy05/im2005-067.htm>.

**Table 5.4: Location of Lincoln NF Grazing Permittees**

	Guadalupe	Sacramento	Smokey Bear	Total Lincoln NF
Alamogordo		10		10
Artesia	1	5	1	7
Capitan			14	14
Carlsbad	8	1		9
Carrizozo			10	10
Cloudcroft		5		5
Glencoe			5	5
Hagerman		1		1
Hobbs			1	1
Hope	2	1	1	4
Las Cruces		4	2	6
Lincoln			1	1
Mayhill		9		9
Nogal			7	7
Pinon		3		3
Portales		1		1
Rio Rancho			1	1
Roswell			3	3
Ruidoso			1	1
Ruidoso Downs			3	3
Tinnie			2	2
Tularosa		2		2
Weed		3		3
Clint, TX		1		1
Dallas, TX	1		1	2
El Paso, TX	2	1		3
Fort Worth, TX			1	1
Sudan, TX	2			2
<b>Total</b>	<b>16</b>	<b>47</b>	<b>54</b>	<b>117</b>

Source: USDA Forest Service, INFRA Grazing Database.

**Table 5.5** lists the number of AUMs on Lincoln NF. Note that the number of AUMs has generally been lower in recent years than a decade ago. The table also shows the Bureau of Business and Economic Research (BBER) estimates of the number of full-time ranching and agricultural workers



supported by each year's level of grazing.<sup>41</sup> Within the assessment area, the number of employment opportunities created by grazing is second only to that created by the FS itself. This will be analyzed in greater detail in Chapter 7. Although the FS infrastructure database (INFRA) also contains data indicating the acreage of grazing allotments, BBER was informed that the data represented "ballpark estimates" of acreage and may include additional acreage such as BLM, private land, and in-holdings. For this reason, BBER was unable to determine the number of acres used for grazing purposes within each RD.

**Table 5.5: Animal Unit Months on Lincoln NF, 1986-2002**

Year	AUM's	Employees
1986	142,070	108
1987	139,821	106
1988	107,750	82
1989	120,090	91
1990	118,804	90
1991	131,863	100
1992	NA	NA
1993	134,201	102
1994	135,214	103
1995	133,694	101
1996	136,819	104
1997	137,215	104
1998	105,429	80
1999	120,692	92
2000	144,254	109
2001	128,840	98
2002	121,020	92

Source: USDA Forest Service Grazing INFRA Database

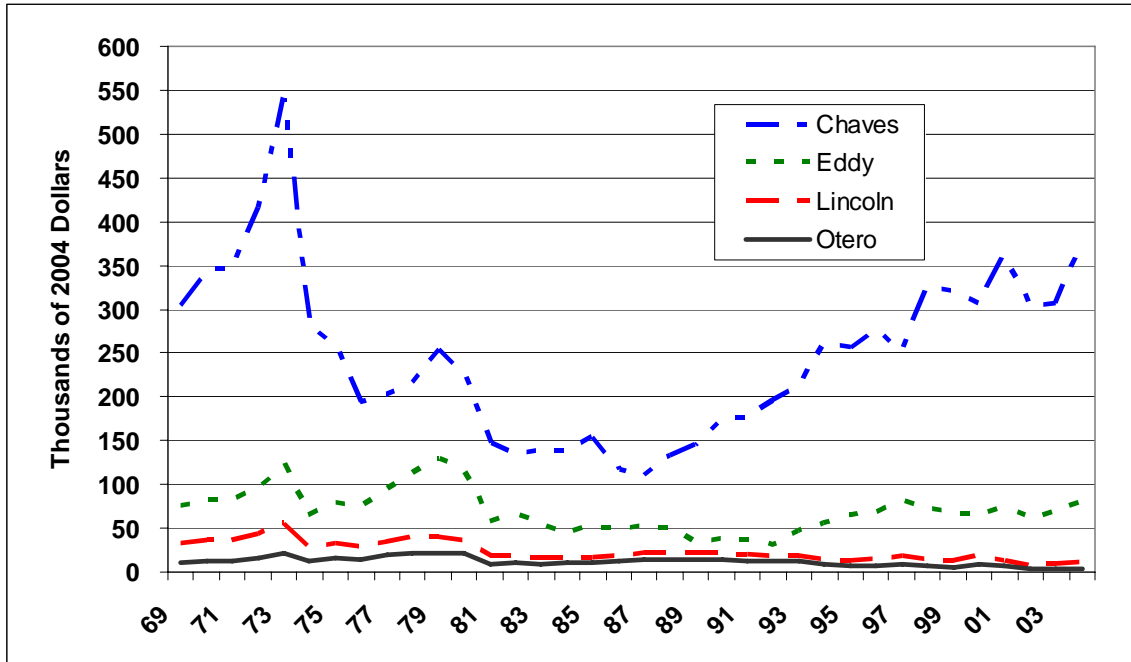
Ranchers face numerous challenges and frustrations. Population growth and an increase in the number of vacation homes have created a demand for land, which has led to the sale of ranch land for subdivision purposes. There is a frustration among ranchers with visitors and newcomers who wish to alter the way the land is used and change the area's culture (Russell and Adams-Russell 2006). Another difficulty faced by both ranchers and wildlife managers is the competition for forage that occurs between elk and livestock, which is exaggerated by the area's current and ongoing drought conditions. Competition is most severe in big game unit 34. The New Mexico Department of Game and Fish and Lincoln NF together coordinate the monitoring of elk and livestock.<sup>42</sup>

**Figure 5.1** presents information regarding trends in cash receipts from livestock and products for years 1969 through 2004 (the latest year for which information was available in 2004 dollars),

<sup>41</sup> The number of ranch and agricultural workers is an estimate based on based upon estimates of man-hours derived from the IMPLAN<sup>®</sup> mode

<sup>42</sup> U.S. Forest Service. 2005. *Forest Plan Monitoring and Evaluation Report: Lincoln National Forest, Fiscal Year 2004*.

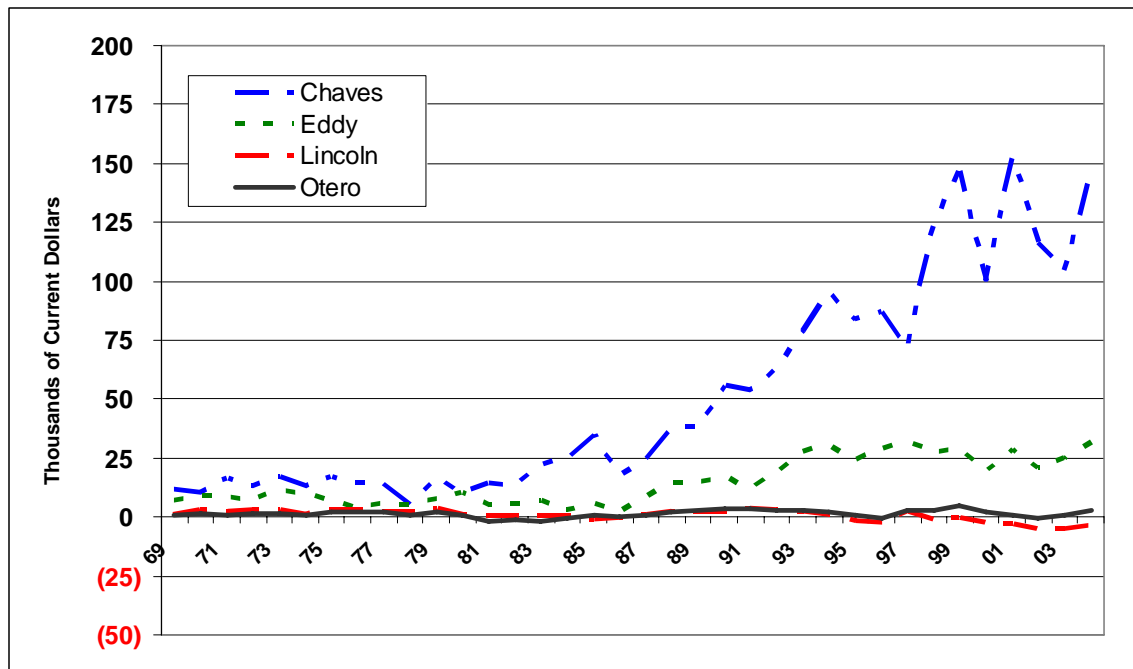
adjusted for inflation using the price index for personal consumption expenditures from the Department of Commerce Bureau of Economic Analysis. As depicted in the figure, cash receipts have in general declined over the last three decades. Chaves County fared better than the other three counties, as cash receipts in Chaves County have experienced an upward trend since the mid- to late-1980s, as the dairy industry has grown in importance.



Source: U.S. Bureau of Economic Analysis

**Figure 5.1: Cash Receipts From Livestock and Products, 1969-2004**

**Figure 5.2** presents incomes generated by agricultural sector, including ranching, for each of the four counties from 1969 through 2004. Chaves County is again the anomaly, with farm income showing a steady increase since the mid- to late-1980s. Note that the data indicate occasional losses to proprietors in Lincoln and Otero Counties. This is significant but should not be overstated, as many New Mexican ranchers accept low or negative operating incomes as part of a broader interest in developing long-term equity.



Source: U.S. Bureau of Economic Analysis

**Figure 5.2: Farm Proprietors and Employee Income, 1969-2004**

Figures 5.1 and 5.2 attest to some problems in ranching. Ranchers have been challenged by the drought conditions that exist across the Southwest as well as by legal developments that have changed how the FS must manage the grazing program for Lincoln and other national forests. Federal legislation, including the Endangered Species Act and the Water Quality Protection Act, as well as regulatory structure of the National Environmental Protection Act, has had significant impacts on grazing practices. Commonly, these measures either limit the number of animals on the forest land or otherwise force changes in livestock practices. In some cases, regulatory changes force ranchers to adopt new strategies to remain viable, while in other cases ranchers respond by selling land (both within the forest and on its perimeter) for residential development.

### 5.3 Timber

Logging has occurred in the area of Lincoln NF since the early 1900s, when spur lines were added to the local railroad to access valuable timber country. The area along the summit of the Sacramento Mountains was heavily logged, as this was where some of the area's best timber was located. By the mid-1900s increased logging costs and construction of highways made railroad logging unproductive, so the tracks were taken up. Throughout this time, grazing rather than logging was the dominant industry on Lincoln NF; most timber harvesting occurred on private lands in the surrounding area.<sup>43</sup> As with grazing, the assessment area was historically home to multi-generational families associated

<sup>43</sup> Spoerl, P.M. 1983. *Thousands of Years of Use: Prehistory and History on the Lincoln National Forest*.

with timber harvesting. However, recent economic and social changes have necessitated that this lifestyle be supplemented with additional sources of income.<sup>44</sup>

According to the FS (1986) there are nearly 260 thousand acres within Lincoln NF classified as tentatively suitable for timber harvest.<sup>45</sup> Harvested species are primarily Douglas fir, white fir, ponderosa pine, southwestern white pine, and aspen. Relative to other areas of the Southwest, productivity on Lincoln NF is average to high.

**Table 5.6** presents the revenues from timber sold by Lincoln NF between 2000 and 2004. The purchase of a contract to harvest timber allows an entity access to the forest for a specified period of time, typically one year. To determine the value of the harvested timber (values displayed in the “Actual Cut” column), the same per board foot values used in the permit are applied to the quantity of harvested timber.

**Table 5.6: Timber Sales on Lincoln NF, 2000-2004**

Year	Contracts Sold	Actual Cut
2000	\$74,540	\$53,028
2001	\$132,549	\$109,509
2002	\$66,554	\$72,766
2003	\$136,205	\$149,203
2004	\$144,757	\$80,892
<b>Lincoln Total</b>	<b>\$554,606</b>	<b>\$465,398</b>

Source: USDA Forest Service TIMS Database

Due to its location near large and growing population centers in both Texas and New Mexico, Lincoln NF faces a growing demand for timber products. Saw logs are primarily processed into building materials. Current production levels are insufficient to meet the needs of local mills. To keep local mills operating, saw logs have in the past been hauled from as far away as the Gila NF.<sup>46</sup>

Summary statistics on Lincoln NF from the Timber Information Manager database<sup>47</sup> are provided in **Table 5.7**. The data clearly illustrate that the most valuable forest product is saw timber, with a sales value of more than \$2.6 million (82 percent of the value of all timber products harvested from Lincoln NF in 2004). This is in contrast to many other national forests within New Mexico (such as Gila, Cibola, and Carson NFs) where fuel wood is the most valuable forest product. The second most valuable forest product is fuel wood; 2004 fuel wood harvests are valued at nearly \$404 thousand (13 percent of the value of all timber products). Fuel wood harvesting can be used as a means of cleaning up slash from logging and thinning activities, and serves to reduce fire dangers. Future demand for fuel wood is expected to increase as populations grow and energy prices increase. The “FS Permit

<sup>44</sup> Russell, J.C. and Adams-Russell, P.A. 2006. *Values, Attitudes and Beliefs toward National Forest System Lands: The Lincoln National Forest* (Draft).

<sup>45</sup> To be classified as tentatively suitable for harvest, the area must meet the following criteria: the area must 1) be located outside wilderness boundaries, 2) be capable of being logged without causing irreversible damage to resources, and 3) reforestation must be possible within 5 years of harvest.

<sup>46</sup> U.S. Forest Service. 1986. *Environmental Impact Statement for the Lincoln National Forest Plan*.

<sup>47</sup> The TIM is a set of computer systems and databases used by the FS and the U.S. Department of Agriculture for managing technical and financial data about the sale of forest products and timber on FS lands.

Value” for Christmas trees is \$13,525 and the “Sold Value” for soft poles is \$147,319. These dollar figures indicate that poles and Christmas trees are also important forest products.

As discussed in an Otero County Economic Development Council newsletter (2004), the economic viability of Lincoln NF as a source of wood products has declined in recent years, in part as a result of the Endangered Species Act. The Mescalero Apache Tribe operates two of the state’s few remaining sawmills, and finds it difficult to obtain adequate timber from Lincoln NF. Efforts are underway to formulate a plan to harvest more timber from Lincoln NF (Otero County Economic Development Council 2004).<sup>48</sup> Further evidence of the currently small impact of the timber industry on the region’s economy is provided and discussed in Chapter 7.

**Table 5.7: Timber and Non-Timber Product Activity on Lincoln NF, 2004**

Type	Actual Cut Volume (MBF)	Actual Sales Volume (MBF)	USFS Permit Values (\$)	Market Price (Dollars per MBF or Cord)*	Cut Value (Dollars)	Sold Value (Dollars) <sup>d</sup>
Soft Sawtimber <sup>a</sup>	1,960	6,624	\$104,653	\$397	\$778,993	\$2,632,876
Hard Sawtimber <sup>a</sup>	0	0	\$0	\$425	\$0	\$0
Soft Pulpwood <sup>b</sup>	0	445	\$700	\$62	\$0	\$27,375
Hard Pulpwood	0	0	\$0	\$62	\$0	\$0
Soft Poles	270	265	\$899	\$557	\$150,035	\$147,319
Hard Poles	0	0	\$0	\$557	\$0	\$0
Soft Posts <sup>c</sup>	5	4	\$157	\$4	\$22	\$19
Hard Posts <sup>c</sup>	0	0	\$0	\$4	\$0	\$0
Fuelwood	1,206	1,262	\$18,451	\$320	\$385,760	\$403,680
<b>Total Timber</b>	<b>3,440</b>	<b>8,599</b>	<b>124,860</b>	<b>2,387</b>	<b>1,314,809</b>	<b>3,211,268</b>
Misc. Convert	293	300	\$1,542	\$0	\$0	\$0
Christmas Trees	2,700	2,705	\$13,525	\$0	\$0	\$0
Misc. Not Convert	0	0	\$0	\$0	\$0	\$0
Transplant	0	0	\$0	\$0	\$0	\$0
<b>Total Non-Timber</b>	<b>2,993</b>	<b>3,005</b>	<b>15,067</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Lincoln Total</b>	<b>6,433</b>	<b>11,604</b>	<b>139,927</b>	<b>2,387</b>	<b>1,314,809</b>	<b>3,211,268</b>

<sup>a</sup> Montana delivered prices  
<sup>b</sup> Texas Timber Price Trends, 2002  
<sup>c</sup> Missouri/MBF  
<sup>d</sup> Sold Value reflects use of stated market prices, except for non-timber, where the forest services fees are used.

Source: USDA Forest Service TIMS Database

## 5.4 Mining

The northern portions of Lincoln NF have a long history of mineral exploration and development, although extractive uses have declined dramatically over time. Most locatable minerals occur in the Smokey Bear RD; although some are located within the Sacramento RD. Sources of actual and potential mineral production include gold (discovered in the 1870s), silver, lead, copper, tungsten, uranium, molybdenum, and iron.<sup>49</sup> **Table 5.8** documents the mineral activity on or near Lincoln NF. At present, though there are numerous active mining claims and oil and gas leases on Lincoln NF, only one oil and gas lease is currently producing and no mines are known to be in production.

Controversy exists pertaining to the issue of oil and gas development on a parcel of BLM land, known as Otero Mesa, which lies in the same general vicinity as the Guadalupe RD. Controversy has

<sup>48</sup> Otero County Economic Development Council Report. April 2004. [http://www.ocado.com/newsletter/Newsletter\\_April04.pdf](http://www.ocado.com/newsletter/Newsletter_April04.pdf).

<sup>49</sup> U.S. Forest Service. 1986. *Environmental Impact Statement for the Lincoln National Forest Plan*.

arisen because the area is also North America's largest and wildest Chihuahuan Desert grassland on public land. There are numerous concerns regarding the effects of oil and gas development on the ecosystem, groundwater, ranching operations, and wildlife. Various environmental and conservation organizations are working to halt oil and gas development in the Otero Mesa area. However, pressures from the oil and gas industry have increased as energy prices have risen.

**Table 5.8: Mining Industry Control of Public Lands on or near Lincoln NF**

Lincoln National Forest Control Summary:	Controls inside the boundary	Controls within 5 miles of boundary
<b>Tier 1 control: Active drilling and pumping</b>		
Oil & gas leases - active drilling and pumping	1	11
<b>Tier 2 control: land controlled by industry</b>		
Mining claims - current land claims by mining industry	236	22
Oil & gas leases - active leases not yet producing	6	56
<b>Tier 3 control: abandoned or defunct operations</b>		
Closed or abandoned mines/plans/notices	27	15
Mining patents - mineral-rich public lands titled to mining industry	82	60
Oil & gas leases - formerly drilled and pumped	50	48
<b>Tier 4 control: sited refused or abandoned</b>		
Mining claims - land formerly claimed by industry	5,800	592
Oil & gas leases - lands formerly leased by industry	498	689

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.

[http://www.ewg.org/reports/losingground/sitedetail.php?place\\_name=Gila+Forest+Roadless+Area](http://www.ewg.org/reports/losingground/sitedetail.php?place_name=Gila+Forest+Roadless+Area)

## 5.5 Land Use Authorizations, Leases and Easements

The FS requires specific approval, in the form of written authorization, for a variety of different uses of national forest lands. Uses that require such authorization include water transmission, agriculture, outfitting and guiding, commercial recreation, telecommunications, research, photography and video-productions, and road and utility rights-of-way. Uses are authorized if they provide a benefit to the general public, if they protect public and natural resource values, and if the overall needs of the individual or business applying for the permit cannot be met on nonfederal land. As shown in **Table 5.9**, the distribution of special-use permits varies across districts within Lincoln NF. In general, special-use permits are authorized in Lincoln NF for recreation; communications; non-power generating water transmission; and feasibility, research, training, cultural resources, and historical use purposes. The number of active permits is far greater on the Smokey Bear and Sacramento RDs than on the Guadalupe RD.

**Table 5.9: Special Use Permits on Lincoln NF (1952-2005)**

Permit Category	Smokey Bear			Sacramento			Guadalupe		
	# Active	# Closed	Rent Total	# Active	# Closed	Rent Total	# Active	# Closed	Rent Total
Recreation	69	17	\$36,843	30	29	\$6,253	3	0	\$0
Agriculture	2	0	\$121	0	0	\$80	0	0	\$0
Community/Public Information	2	0	\$61	6	2	\$161	3	0	\$0
Feasibility, Research, Training, Cultural Resources, & Historical	10	5	\$425	20	4	\$318	4	0	\$0
Industry	6	1	\$0	0	0	\$0	2	0	\$0
Energy Generation/Transmission	4	0	\$61	1	0	\$0	3	0	\$0
Transportation	40	2	\$313	23	1	\$1,140			\$0
Communications	32	1	\$17,000	46	0	\$20,281	8	0	\$3,848
Water (Non-Power Generating)	14	0	\$731	42	1	\$2,240	2	0	\$0
<b>TOTAL SPECIAL USE PERMITS</b>	<b>179</b>	<b>26</b>	<b>\$55,555</b>	<b>168</b>	<b>37</b>	<b>\$30,473</b>	<b>25</b>	<b>0</b>	<b>\$3,848</b>

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 (SUDDS). Calculations by UNM-BBER.

Within the Smokey Bear RD, a greater portion of permits (39 percent) has been authorized for recreational purposes than for any other special use. Similarly, recreation permits account for a greater portion of rents (66 percent) than does any other permit category. Ski Apache, located in part within the Smokey Bear RD, is operated under a special-use permit.<sup>50</sup> Transportation permits account for another large portion of special-use permits within the Smokey Bear RD (22 percent), but constitute only \$313 (less than 1 percent) of the district's rents. In contrast, there are 32 permits (20 percent of all permits) for communications purposes that account for \$17,000 (30 percent) of the total rents for the district.

On the Sacramento RD, communications special-use permits are most common (27 percent of permits) and generate a greater portion of rents (66 percent of rents) than do other types of special-use permits. Ski Cloudcroft, operated by the village of Cloudcroft and located in part on the Sacramento RD, is operated under a special-use permit. There are 42 active water (non-power generating) permits (25 percent of permits) on the Sacramento RD, which create \$2,240 in rents. Although the number of recreation permits on the district is lower (only 30 permits), recreation permits have yielded more than \$6,000 in rents.

Guadalupe RD has fewer special-use permits than the two northern RDs; only 25 permits have been issued, compared to 179 and 168 on the Smokey Bear and Sacramento RDs, respectively. Communications special-use permits, the most common permit type (32 percent of permits), are the only special-use permits that generate rents on the Guadalupe RD.

Cost recovery programs are to be implemented beginning in 2007 requiring applicants for land-use authorizations to pay for the analysis, issuance and administration, in addition to existing rent payments.

<sup>50</sup> Ibid.

## 5.6 Illegal Uses

**Table 5.10** lists all violations that occurred on Lincoln NF during 2005. In total, there were 192 violations. Of those violations that were categorized, the most commonly occurring offense (31 violations) was leaving a fire without properly extinguishing it. Sanitation is another frequent problem, with 18 occurrences of possessing or leaving refuse in an exposed or unsanitary condition. Damaging natural features and other U.S. property, cutting or damaging timber products without the proper permit, and the abandonment of personal property are other common problems in Lincoln NF.

**Table 5.10: Violations on Lincoln NF, 2005**

Offense Code	Incidents	Violation Categories
Other	38	No codes available
36CFR2615D	31	Leaving a fire without completely extinguishing it
36CFR26111B	18	Possessing or leaving refuse in an exposed and unsanitary condition
36CFR2619A	15	Damaging any natural feature or other property of the United States
36CFR2616A	11	Cutting or otherwise damaging any timber product without permit
36CFR26110E	9	Abandoning any personal property
36CFR26111E	9	Dumping of any refuse from privately owned land
36CFR26156	7	Use of vehicles off National Forest System roads
36CFR2619B	6	Removing any natural feature or other property of the United States
36CFR26111D	5	Failing to dispose of all garbage either by removal or proper receptacle disposal
36CFR26117	5	"No Code Provided"
36CFR26115H	4	Failure to pay any established fee for use
36CFR26158BB	4	Possessing a beverage which is defined as an alcoholic by state law
36CFR2616H	4	Removing any timber, tree or other forest product without permit
36CFR26112C	3	Damaging and leaving in a damaged condition any such road, trail, or segment
36CFR26152A	3	Building, maintaining, attending or using a fire, campfire, or stove fire
36CFR2617A	3	Placing or allowing unauthorized livestock to enter or be in lands under FS control
36CFR26110B	2	Taking possession of, occupying, or otherwise using FS lands for residential use without permit
36CFR26158A	2	Camping for a period longer than allowed by the order
18USC641	1	Embezzling, stealing, or otherwise defrauding US Government Agency
36CFR26110A	1	Constructing, placing, or maintaining any kind of road, trail, or structure on FS land without permit
36CFR26116B	1	Possessing or using a hang glider or bicycle
36CFR26116C	1	Landing of aircraft, or dropping or picking up of any material or person in aircraft
36CFR26116M	1	"No Code Provided"
36CFR26153E	1	Public health or safety
36CFR26154A	1	Using any type of vehicle prohibited by the order
36CFR26154D	1	Operating a vehicle in violation of the speed, load, weight, or height than specified by permit
36CFR2615A	1	Carelessly or negligently throwing or placing any ignited substance that may cause fire
36CFR2615E	1	Allowing a fire to escape from control
36CFR2615F	1	Building, attending, maintaining, or using a campfire without removing flammable material
36CFR2618A	1	Hunting, trapping, fishing, catching, molesting, killing or having in possession any wild animal
36CFR2618D	1	Possessing a dog not on a leash or otherwise confined
<b>TOTAL</b>	<b>192</b>	

Source: USDA Forest Service LEIMARS Database, 2005

## 5.7 Challenges and Opportunities for Forest Management

Lincoln NF use patterns have undergone significant changes, creating new challenges for forest managers. Recreational demand is increasing and becoming more diverse while traditional uses around which much of the regulatory structure of forest management was established are experiencing growing environmental, economic and social pressure. Yet, opportunities to develop strategies to mitigate conflicts among these uses are emerging as new users, new technologies and new priorities come to the fore.

The increase in demand for recreational use has many aspects. Local and regional tourism brings new users to the forest, with interests ranging from hunting to solitude to motorized recreation. Likewise, developments catering to retirees and second homeowners, particularly in Otero and Lincoln



Counties, bring new users; often using more concentrated and developed sites and facilities. The increased level of recreational activity has caused an increase in the concentration of users, making it more likely that users will encounter one another. In some areas use levels are so high that during peak use times the use level exceeds the area's theoretical capacity. In some areas, there is little time for a given site to rest and rehabilitate during the peak season.<sup>51</sup> This poses a challenge to FS managers, especially since recreational demand is expected to continue to rise. To further complicate matters, the FS does not receive sufficient funding to adequately address the issues that stem from heavy recreational use. Rising recreation use has also created a need for additional facilities and trails.<sup>52</sup>

Management issues pertaining to recreation use have become more complicated as the composition of recreational activities has become motorized. The speed and noise associated with motorized and mechanized recreational equipment has resulted in conflicts between the users of such equipment and other recreational visitors, including hikers, horse riders, and skiers. Some perceive quiet to be an under-managed resource. Additionally, more areas have become accessible with the use of such equipment, increasing the number of non-system trails. Approximately 1,360 miles of travel ways have been created and perpetuated by off road vehicles, with approximately 50 additional miles created each year.<sup>53</sup> Management of this sprawling system is a daunting task.

The FS has recognized unmanaged recreation (particularly that in the form of OHV use) as one of four primary threats to the national forests. As a result, on November 2, 2005 the FS announced new rules (implemented December 9, 2005) regarding OHV recreation in national forests and grasslands. The policy revisions require the re-designation of trails and routes, and the provision of better maps to show which trails are designated for which specific purposes.<sup>54</sup>

Related to the overall increase in recreational uses is the growing demand for land for development, for tourism, retirement communities and second homes. Although much of this demand is focused outside the boundaries of Lincoln NF, its effects on forest land management are direct and significant. Ranchers, for instance, face increased grazing costs and argue that access to Lincoln NF is vital to the continued existence of ranching in the region.<sup>55</sup> Likewise, cost pressures encourage ranchers to increase stocking levels, raising concerns as to the sustainability ranching in the region. Other issues regarding grazing uses on forest land are the competition for forage that occurs between elk and cattle, soil compaction and erosion, and water quality.

The Endangered Species Act and legal action by environmental advocates have changed the conditions under which traditional grazing and logging industries must operate. Restrictions imposed on these two industries have greatly increased since passage of the Endangered Species Act, resulting in decreased revenues and increased costs. There has been a concurrent increase in the demand for land as a result of the influx of retirees and other newcomers. As a consequence of declining ranch profits and rising land prices, ranchers are more likely to sell their land for development purposes.

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<sup>51</sup> Ibid.

<sup>52</sup> Russell, J.C. and Adams-Russell, P.A. 2006. *Values, Attitudes and Beliefs toward National Forest System Lands: The Lincoln National Forest* (Draft).

<sup>53</sup> U.S. Forest Service. 1986. *Environmental Impact Statement for the Lincoln National Forest Plan*.

<sup>54</sup> <http://www.fs.fed.us/projects/four-threats/>, <http://www.fs.fed.us/recreation/programs/ohv/>, and <http://www.fs.fed.us/recreation/programs/ohv/final.pdf>.

<sup>55</sup> Russell, J.C. and Adams-Russell, P.A. 2006. *Values, Attitudes and Beliefs toward National Forest System Lands: The Lincoln National Forest* (Draft).

The change in land use from ranching to subdivision can affect issues of access and travel patterns, as discussed in Chapter 3.

Although timber is not a major industry in the assessment area, timber products still offer a potential source of economic growth. Some creative individuals have worked to take advantage of viable market niches for products made from small diameter wood (for example Sherry Barrow Strategies, which makes wood shavings for animal bedding using small diameter wood). With energy prices continuing to rise, alternative energy sources are becoming more attractive and the markets for fuel wood and wood pellets (which also may be made from small diameter wood) are growing. Not only do these niche markets provide opportunities for economic development in small rural communities, but they also provide a use for the small diameter trees that are currently so thick that they create fire hazards. Risks to increasing the harvest and use of small diameter wood include 1) the need to ensure a regular supply of wood required for business development, and 2) the concern of some individuals that harvesting of small-diameter trees will set a precedent for the harvest of larger-diameter trees.

## 6 Special areas

This chapter describes special areas on the Lincoln National Forest (NF), such as sites of historical and archeological interest, recreational sites, special management sites, inventoried roadless areas (IRAs), research neutral areas, and scenic byways.

Lincoln NF contains two wilderness areas – White Mountain and Capitan Mountain Wilderness Areas – that encompass approximately 84,000 acres. There are various restrictions that apply to formally designated wilderness areas, including no mechanized travel (including bicycles), a prohibition against the discharge of firearms, and no camping within 100 feet of wilderness lakes and waterways.

The Forest Service (FS) maintains information on scenery resources, which have a formal rating system (Visual Management System, VMS) and special regulations regarding their management. Unfortunately, the Bureau of Business and Economic Research (BBER) was unable to obtain any information regarding heritage and scenery resources from the FS. As a result, this analysis is limited in regards to understanding qualitative relationships between the FS managed land and its surrounding communities. Many of the special sites in the area are undoubtedly linked to tribal groups and other communities whose connections to the area date back before the FS.

### 6.1 Recreational Sites in Lincoln National Forest

Lincoln NF has 70 designated developed recreational sites. For a complete list, see **Table A.4** in the Appendix. **Table 6.1** lists the type and number of designated recreation sites in each district, according to the FS infrastructure database (INFRA). Almost all of Lincoln NF’s designated recreational sites (97 percent) are located within Sacramento and Smokey Bear Ranger Districts (RDs). Trailheads and campgrounds are the most commonly occurring types of recreational site and comprise more than half of the designated sites – there are 19 trailheads and 21 campgrounds.

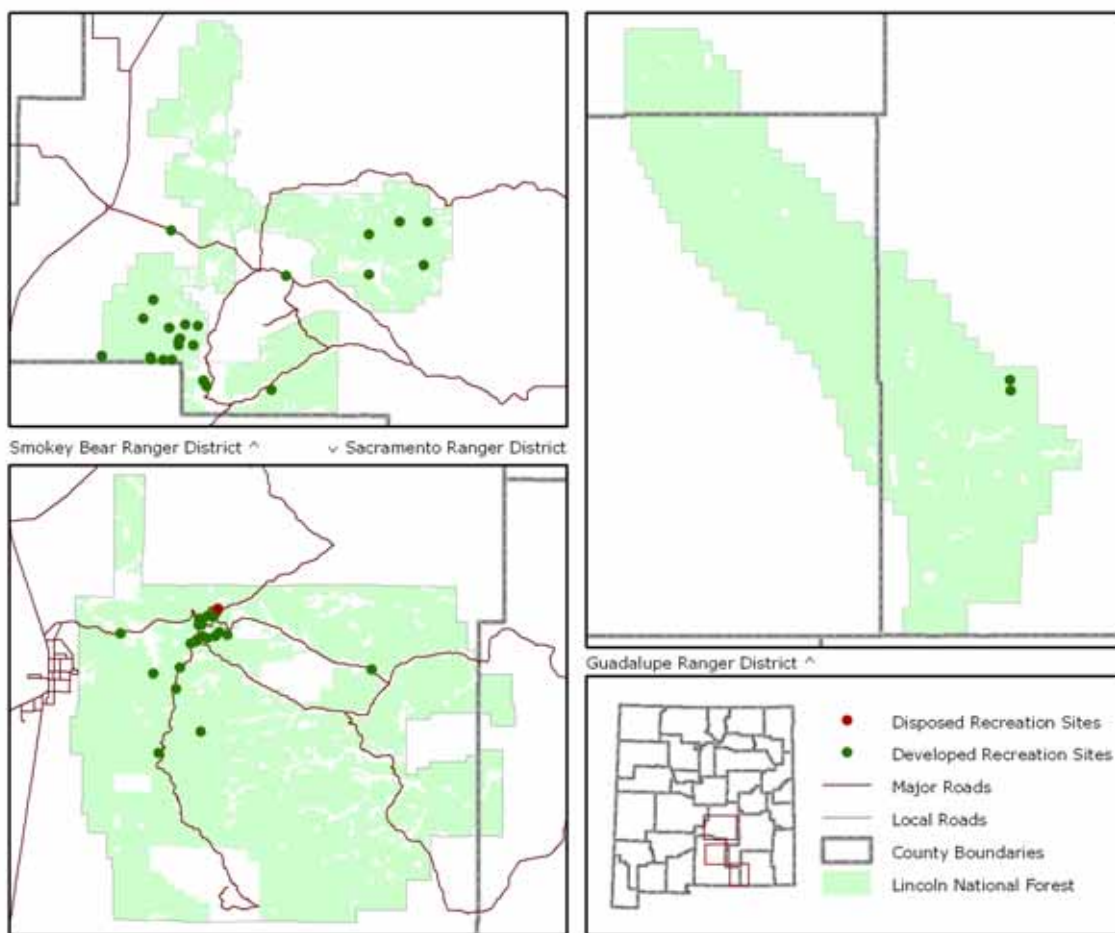
**Table 6.1: Developed Recreation Site Type by Ranger District in Lincoln NF**

	Guadalupe	Sacramento	Smokey Bear
<b>Campground</b>		9	6
<b>Cua Interpretative Site</b>		1	3
<b>Cua Trailhead</b>		1	8
<b>Group Campground</b>		5	1
<b>Interpretive Site</b>		2	1
<b>Observation Site</b>		5	2
<b>Organization Site (Privately Owned)</b>		4	
<b>Other Winter Sports Site</b>		1	
<b>Picnic Site</b>	1	3	2
<b>Playground Park Specialized Sport</b>			1
<b>Recreation Residence</b>			2
<b>Ski Area Alpine</b>		1	1
<b>Trailhead</b>	1	4	5
<b>Total</b>	2	36	32

Source: U.S. 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. **Figure 6.1** shows the approximate location of developed recreational sites in the Lincoln NF (location information for dispersed sites is not readily available).<sup>56</sup>

The enjoyment of scenic resources is another form of recreation often enjoyed by visitors to Lincoln NF. The FS maintains information on scenery resources, has a formal rating system for scenic resources (VMS), and has special regulations regarding their management. Unfortunately, BBER was unable to obtain information regarding scenery resources from the FS.



**Figure 6.1: Developed Recreational Sites in Lincoln NF**

<sup>56</sup> Data was obtained from the FS infrastructure (INFRA) database. The data was unclear as to which sites were developed and dispersed, so the map shows approximations.

## 6.2 Heritage Sites

Much of Lincoln NF includes or abuts areas that were inhabited by native tribes for hundreds of years. The Smokey Bear and Sacramento RDs share common borders with the Mescalero Apache Tribe (see **Figure 1.1**). Formal boundaries designated by the FS do not change the sanctity of areas that have been traditional tribal use areas. The identity and other information regarding these areas are kept secret to honor 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. However, the FS does maintain information on areas such as “heritage resources,” which often include these special areas. The fact that many of these sites are unknown complicates implementation of the multiple-use management mandate.

The FS is currently working to inventory, evaluate, protect, interpret, and stabilize sites of archeological, cultural, or historical interest. It is estimated that the Lincoln NF contains between 12,000 and 15,000 sites, of which roughly 500 sites had been documented as of 1986.<sup>57</sup> During 2003, the FS surveyed 12,000 acres, resulting in the documentation of 67 new sites. In addition, recommendations were made pertaining to the management of 271 archeological sites.<sup>58</sup> Four sites have been listed on the National Register of Historic Places: the Cloudcroft Trestle, the Bonito pipeline, Wizard’s Roost (a prehistoric solar observatory), and the Jicarilla Schoolhouse.<sup>59</sup>

## 6.3 Special Management Areas

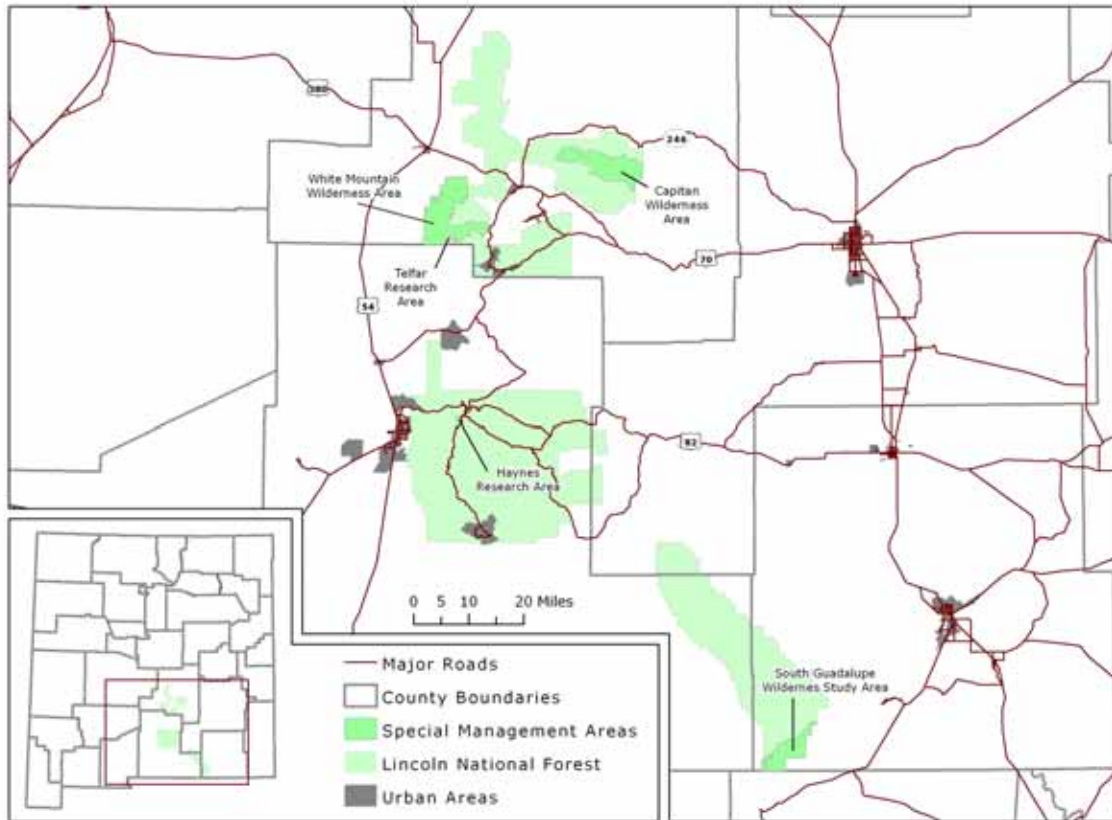
There are two wilderness areas within Lincoln NF – the Capitan Mountain and White Mountain Wilderness areas, both located in the Smokey Bear RD (see **Figure 6.2**). The approximately 35,000-acre Capitan Mountain Wilderness Area was created in 1980. The White Mountain Wilderness Area was originally 25,000 acres and became part of the Wilderness System in 1964; the Wilderness Area now contains roughly 49,000 acres.

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<sup>57</sup> U.S. Forest Service. 1986. *Environmental Impact Statement for the Lincoln National Forest Plan*.

<sup>58</sup> U.S. Forest Service. 2004. *Lincoln National Forest Stakeholder’s Report for 2003*.

<sup>59</sup> U.S. Forest Service. 1986. *Environmental Impact Statement for the Lincoln National Forest Plan*.



**Figure 6.2: Special Management Areas**

Wilderness areas were established under the Wilderness Act of 1964 and later acts. 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. The Wilderness Act describes a wilderness as "an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain."<sup>60</sup>

## 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.<sup>61</sup> In July 2004, the Bush administration announced a plan that would eliminate the Roadless Rule. The plan creates a petition process for governors who want to keep the areas protected. They may also petition to open the area to mining and logging. In other words, protections are eliminated from the IRAs. 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

<sup>60</sup> The Wilderness Society, <http://www.wilderness.org/OurIssues/Wilderness/act.cfm>.

<sup>61</sup> NM PIRG Education Fund.

vulnerable to development. New Mexico Governor Bill Richardson is on record as opposing elimination of the Roadless Rule.<sup>62</sup>

Critics argue that the bureaucratic requirements involved in the petition process provide little incentive for governors to participate, which may result in the opening of IRA lands to commercial interests.<sup>63</sup> 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 scheduled to expire on January 16, 2006, but has been reissued/extended for an additional 18-month period.

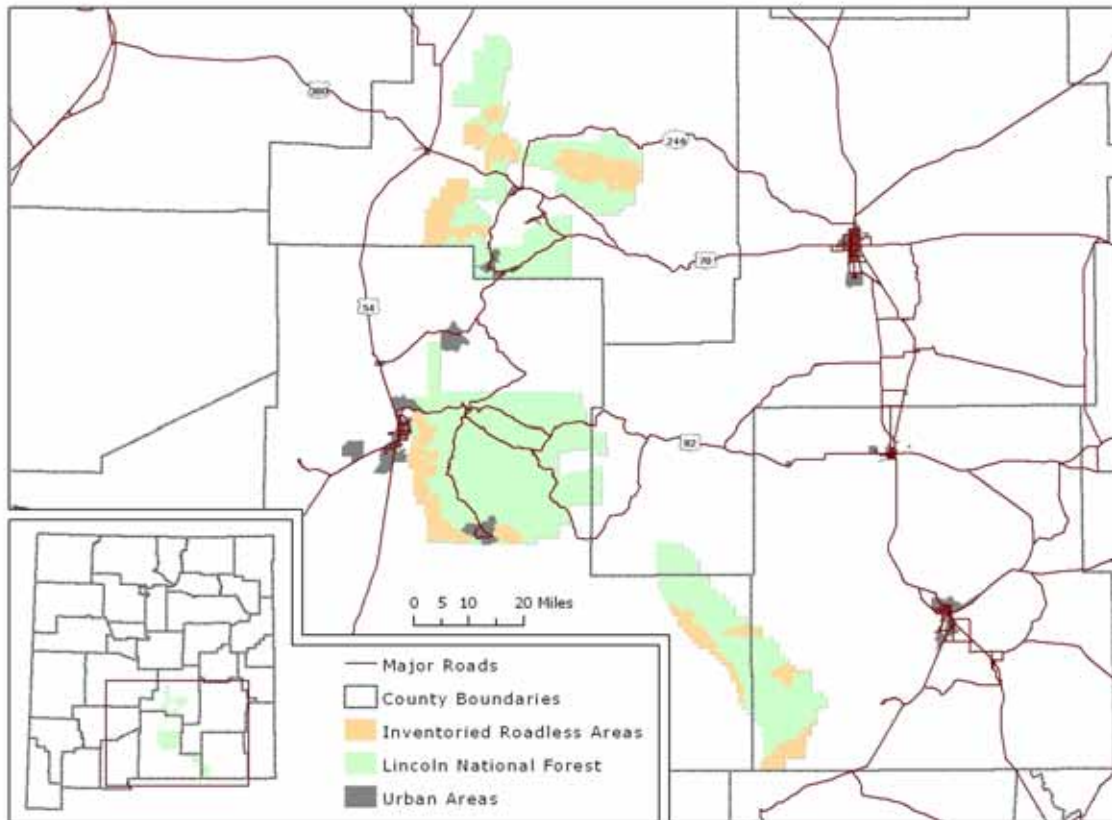
In New Mexico, there are 1,597,000 acres of IRAs, making up about 12% of the NF system land in the state. Of this 1.6 million acres, 66,000 acres have been recommended designation as wilderness by the federal forest plan.<sup>64</sup> Much of the inventoried roadless areas on Lincoln NF exist in the Capitan Mountain and White Mountain Wilderness areas (shown in **Figure 6.2** above). **Figure 6.3** shows the inventoried roadless areas within Lincoln NF.

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<sup>62</sup> 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, <http://www.wilderness.org/OurIssues/Roadless/chronology.cfm?TopLevel=Chronology>.

<sup>63</sup> Ibid.

<sup>64</sup> U.S. Department of Agriculture Forest Service. (2001, January). Inventoried Roadless Area Acreage, Categories of NFS Lands Summarized by State. Retrieved March 27, 2006, from [http://roadless.fs.fed.us/documents/feis/data/sheets/acres/appendix\\_state\\_acres.html](http://roadless.fs.fed.us/documents/feis/data/sheets/acres/appendix_state_acres.html).



**Figure 6.3: Inventoried Roadless Areas in Lincoln NF**

## 6.5 Challenges and Opportunities for Forest Management

Elimination of the Roadless Rule and the new policy involving inventoried roadless areas has raised concern among NF users that forest 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, such as logging and mining. As indicated in Chapter 5, there are a number of mining claims in or near the IRAs in Lincoln NF. Increased vehicular access (especially increased off-highway vehicle access) also raises concerns about the continued integrity and health of forest landscapes. The situation is further complicated by privacy concerns of local tribes, as tribal uses of FS land can conflict with non-tribal users. In the Smokey Bear RD the presence of wilderness areas further complicates matters.

The presence of an estimated thousands of sites of archeological, historical, and cultural interest creates a situation in which the FS must determine how best to allocate resources for the preservation and protection of both known and unknown sites. Protecting sites can easily come in conflict with other forest uses, 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 forest visitation numbers increase. Trails bring people into the forest where they may discover sites of interest, taking home arrowheads and



potshards, and vandalism can be a problem. Lincoln NF is such a vast area that policing what happens at remote sites throughout the forest is simply not practical.

At the heart of many debates regarding land use and especially the use of special areas, is a conflict over who has more or “prior” rights to the land. While the forest is public land, some believe they should have privileged status when it comes to forest planning and decision-making. For example, some ranchers are frustrated by the ability of “non-local” environmental groups to influence planning and decision-making pertaining to grazing on Lincoln NF when ranchers are the individuals who possess an intimate knowledge and understanding of the land. Residents may perceive large numbers of visitors as potentially harmful to the integrity of the area. Another example is Native American groups who identify with the area as their “homeland.” Some tribal groups perceive they have a permanent attachment to the land that is very different from relationships other users have with the forest.