Chapter 5 - National Forest Lands and Resources: Ownership, Use, and Control of Land in Arizona and New Mexico

A critical element in understanding the regional significance of national forest lands and resources in the Southwest is understanding the development and relationships of public and private land ownership and control. It is also helpful to have a mental picture of land ownership and land control at the time of the creation of the first forest reserve in the Southwest in 1892, in order to better understand how changes have occurred since then.

Although the United States acquired the lands that basically comprise Arizona and New Mexico by the Treaty of Guadalupe-Hidalgo in 1848, by 1890 there were still pending in Congress 107 private land claims covering 8,704,785 acres in New Mexico and 15 claims affecting 414,833 acres in Arizona.[1] One of the large land grants was the Sangre de Cristo Grant, covering over a million acres in southern Colorado and northern New Mexico. Another grant, the Las Animas Grant (or Virgil and St. Vrain Grant) was in northern New Mexico. Often, original claims of large areas of grant lands were surveyed and legally settled for very small acreages. Such was the Canon de Chama Grant, "from an estimated 740,000 acres in 1873" to final patent of "1,422.62 acres in 1905.[2] Another grant of "126,024.53 acres reported by the surveyors in 1877" was reduced to 60,084.29 acres by official survey.[3]

Private Lands Control Public Lands

Those who owned the private lands controlled the use of much of the adjoining public lands by their presence and their actions. Some of the original settlers and other users of the land and its resources employed various land acts to promote their own ends. For example, in northern Arizona, the exclusive possession of small scattered parcels of land with springs and wells on them effectually provided control of large tracts of adjacent dry land. Efforts by the Arizona Cattle Company and Preston Nutter, a promoter and an officer of the company, to perfect title to one watered tract on the Colorado River would have given them "monopolistic control of vast areas of public grazing lands, and thus destroy the possible use and sale value of adjoining public lands of the United States."[4]

Ranchers used grass and woodland ranges on adjoining public lands just as if they owned them. Some public lands were acquired by ranchers as "stone lands," when, in fact, they were grazing lands.[5] Although, in many of the Western States public timberland sometimes became private timberland under dubious means, these practices were not widespread on the national forests of Arizona and New Mexico, where according to forester Dean Cutler:

> Most claims were under the Atlantic & Pacific Railroad, mineral claims and homesteads. Civil War veterans took small areas in New Mexico. There was finagling with surveys and land corners on railroad sections, mining patents and homesteads so springs wound up on the private land and where there was railroad logging, the rock corner monuments usually went into the railroad grade. [6]

Generally, in New Mexico and Arizona, private landowners, ranchers, farmers, miners, and lumbermen have had the use of many more acres than they owned. Because national forest

resources, from the beginning, were meant to be used, the private landowners in particular have benefited. For example, with nearly 14 million acres of farm and ranch land in Arizona in 1945 in private ownership, another 48 million acres of public lands were available for grazing. In New Mexico, the acreage was about 30 million and 74 million acres, respectively. [7]Similarly, owners of sawmills and other manufacturing facilities using wood could purchase national forest timber without having to own much timber land of their own. In 1945 in Arizona, there were 2,300,000 acres of commercial sawtimber land in the national forests and only 34,000 acres (1.0 percent of all timber land) in private ownership. In New Mexico in that year, there were 1,040,000 acres of private sawtimber land, mostly as Spanish land grants, comprising 24.4 percent of all timber land in the State.[8]

In 1891, Arizona land ownership/use was as follows, on a percentage basis: private, 0.7; Indian reservations, 15.5; railroad grants and selections, 5.2; university, 0.1; military reservations, 0.2; miscellaneous, 2.5; and public domain (vacant, subject to entry), 75.7. In the same year, there were 54,893,679 acres of vacant public domain in New Mexico, or 70.7 percent of the total area in the territory. [9]

A far larger portion of Arizona lands has remained in the public domain than in New Mexico. By 1945 the following distribution of land (in percentages) existed in Arizona and New Mexico.[10]

	Federal	State	Private farms & ranches	Other private	National forests
Arizona	65.85	11.47	19.17	3.54	15.68
New Mexico	41.68	16.18	37.71	4.43	11.03

Since 1945, land ownership profiles in the two States have changed little. By 1977, Federal land in Arizona had increased to more than 71 percent of all land, but in New Mexico it had decreased to less than 34 percent. Indian reservations comprised nearly 27 percent of Arizona's land area and about 9 percent in New Mexico. Private land ownership was about 16 percent in Arizona and about 45 percent in New Mexico in 1977. The percentages in national forests remained the same. The single largest private landowner in the State of Arizona is Tenneco West, owning the Diamond A. Ranch north of Seligman and a smaller ranch in the southeast, for a total of 604,000 acres. The New Mexico-Arizona Land Company is the second largest landowner with 461,482 acres in the State. The Santa Fe Railroad still owns about 124,000 acres in Arizona.[11]

Forest Acreage, Types Remain Stable

Total acreages in forests and the types of forests have remained very stable since 1898. In 1898, the USDI Geological Survey estimated that 22 percent of Arizona and 19 percent of New Mexico was forested. By 1924, these percentages were 20.9 and 16.6, respectively, and in 1977, forests covered 25 percent of Arizona and about 17 percent of New Mexico.[12]

The national forests in the Southwestern Region contain several ecosystems. The most common ecosystem classifications used today are the one by A.W. Kuchler[13] of potential natural vegetation communities and the other by R.G. Bailey [14]of broad ecological regions. Arizona has four of the Bailey ecological regions (all four are found on its national forests) and 11 of the Kuchler vegetation communities (nine are found on its national forests). New Mexico has five and 13 of these, respectively, with all of Kuchler's and nine of Bailey's 13 regions found on the national forests of the State.

The area of forest reserves/national forests in Arizona and New Mexico has varied throughout the history of the Southwestern Region. The National Forest System expanded rapidly in the early years, by Presidential proclamation. There were some deletions or additions as boundaries were surveyed and land titles checked. Small areas were acquired through purchase using Land and Water Conservation Fund Act money and others acquired by exchanging cutover land for cutting rights on national forest land. National forest areas are listed in table 2, to illustrate the fluctuating sizes of the national forests in the region.

Table 2. Total area (acres) In forest reserves and national forests, Arizona and New Mexico

Date	Arizona	New Mexico
Forest Reserves		
Setember 28, 1893	1,851,520	311,040
July 1, 1899	4,496,000	2,758,060
National Forests		
June 30, 1908	13,385,990	8,474,547
June 30, 1909	15,258,861	10,971,711
June 30, 1910	15,214,745	11,140,123
June 30, 1911	14,898,000	11,111,300
June 30, 1912	12,462,257	8,819,408
June 30, 1915	12,288,125	8,469,511
June 30, 1925	11,234,670	8,482,315
June 30, 1935	19,926,500	
June 30, 1945	11,422,225	8,657,704
June 30, 1955	11,387,927	9,386,554
June 30, 1965	11,369,557	8,856,656
June 30, 1975	11,220,161	9,104,855
June 30, 1984	11,269,406	9,325,489

Source: USDA, Forest Service, Southwestern Region.

The Forests as Watersheds

A watershed is “the catchment area or drainage basin from which the waters of a stream system are drawn.” Even though National Forest System lands constitute only 14 percent of Arizona and New Mexico, 40 percent of the surface and subsurface water of the region originates on lands administered by the USDA Forest Service.[15] One of the goals of the Forest Service from the very beginning was to protect the watersheds under its authority consistent with the directives provided by Congress.

Congress through the years has passed innumerable acts to protect, enlarge, and maintain American watersheds. Some of the more important legislation have been the National Reclamation Act of 1902 (sometimes called the Newlands Act), the Watershed Protection Act (or Weeks Act) of 1911, the Multiple Use-Sustained Yield Act of 1960, and the National Environmental Policy Act of 1969. The Environmental Policy Act requires the study and assessment of all activities that will impact on the environment. The act invokes public participation in forest management decisions and reflects the Forest Service’s early concern for the total environment, which recognized the interrelationships between watersheds and vegetation. The Southwestern Region conducted research into how the forests could be made more productive, and a research forest was established in 1908 under the direction of Gus A. Pearson at Fort Valley outside Flagstaff. At the same time, research was begun on how the ground cover could best be preserved and improved to maintain the permeability of the lands. It was

recognized that the best way to control erosion was to prevent gully and arroyo formation and to maintain a covering flora of grass, forbs (herbs that are not grasslike), brush, and trees. Much energy has been expended in the control of excessive grazing, wildfires, and destructive timber harvesting, and to ensure that all human alteration is in harmony with existing environmental conditions.[16]

The initiative and the environmental concerns established by Gifford Pinchot and such pioneers as Aldo Leopold in the Southwestern Region have been sustained in the management of the individual national forests. Forest management plans and environmental impact statements now assess the quantity of water produced by a watershed, the quality of water, and soil conditions and then project the impact of programs or plans on future water supplies and soil conditions.

The national forests of the Southwestern Region are diverse in many respects and similar in others. Their locations, salient features, “personalities,” and major uses are discussed briefly in the following pages.

Apache-Sitgreaves National Forests

The Apache-Sitgreaves National Forests are located in the White Mountains of east-central Arizona and along the Mogollon Rim. The Mogollon Rim, an escarpment that is the southern boundary of the Colorado Plateau, is a major topographic feature. Elevations in the forests vary from about 5,000 feet in the Clifton area to 11,400 feet on Mount Baldy, third highest point in the State. Annual precipitation averages 20 inches. These forests abut the Gila National Forest on the east, the White Mountain Indian Reservation and Tonto National Forest on the south, and the Coconino National Forest on the west. There is a broad spectrum of vegetation types, from desert grassland/shrub grassland, pinyon-juniper woodland, to extensive ponderosa pine forests with mixed conifer, spruce-fir, and aspen at higher elevations. High-elevation recreation areas provide a retreat from the summer heat of the valleys. Hunting for deer, elk, bear, turkey, and mountain lion attracts many people to the area. Lake fishing is popular throughout much of the year.

The White Mountains contain the headwaters of many Arizona rivers, including the Salt, Little Colorado, and San Francisco. The Blue Range Primitive Area lies below the Mogollon Rim, along the Blue River and its tributaries. It is the only remaining primitive area in the Southwestern Region. Much of it has been proposed to Congress for wilderness classification.

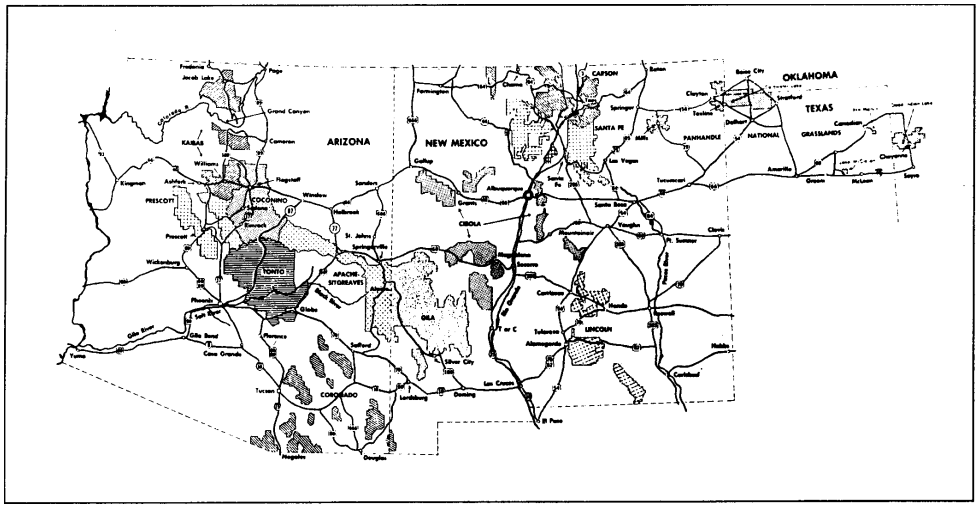

Figure 4. National Forest and Grasslands of the Southwestern Region (region 3).

Carson National Forest

Named for noted frontier scout, Kit Carson, this national forest in northern New Mexico offers some of the most spectacular scenery in the Southwest. The Sangre de Cristo Mountains include Wheeler Peak, at 13,161 feet above sea level, the highest point in New Mexico. Perennial streams, small lakes, alpine valleys, meadows, and virgin spruce-fir forests highlight the area. The meadows provide excellent forage for domestic livestock and wild animals. The Rio Grande draws much of its water from this region. The forest abuts the Santa Fe National Forest on the south.

Normal winter weather patterns provide outstanding recreational opportunities. Snowfall contributes heavily to runoff water needed throughout the Rio Grande valley for agricultural purposes. Ski areas include Rio Castillo, Red River, Taos Valley, and Sipapu. The forest comprises some of the most productive and important watersheds in the region. This area of New Mexico is a “melting pot” of society and culture. The original Pueblo Indian way of life has been blended with Mexican/Spanish influences from the days of the Conquistadores and contemporary Anglo-American values. This blend has resulted in a lifestyle unique to this area.

Cibola National Forest

The Cibola National Forest is located in central New Mexico on both sides of the Rio Grande River. Annual precipitation averages 18.2 inches. The forest is divided into eight divisions of national forest and four national grasslands located in northwestern New Mexico, western Oklahoma, and the Texas panhandle. Elevations range from 5,000 to 11,301 feet. The higher elevations provide skiing, skating, and tobogganing activities during the winter, and offer cool mountain temperatures during the warm summer months. The Sandia Ski area is on the Sandia Division. The Mount Taylor Division contains an extinct volcano. One of the first uranium mines was adjacent to the east boundary, and the major uranium mining activity was just west of the Division. The volcanic activity extended to the southwestern portion of the Zuni Division. Vegetation includes grass and woodland, with pine and mixed conifers at higher elevations.

The national grasslands are basically prairie grasslands that were retired from farming during the post-depression era. Grazing is the predominant use, although leases for oil and natural gas have increased in recent years. Recreational opportunities include hunting, fishing, boating, camping, and picnicking.

Coconino National Forest

The Coconino National Forest, third largest in the region, lies in north-central Arizona. It reaches from the desert below Camp Verde up over the Mogollon Rim to the San Francisco Peaks, and from the wildly beautiful Sycamore Canyon and red rock country of Oak Creek to the cool, tall-timbered lake country above Mormon Lake. It averages 19.37 inches of precipitation a year, containing highly productive watersheds. Elevations range from 2,600 to over 12,600 feet. The San Francisco Peaks are a dormant volcano, and much of the surrounding area is malpais rock and cinders with numerous cones in the northeastern portion of the national forest.

Vegetation at lower elevations ranges from desert scrub and pinyon juniper woodland to deciduous hardwoods. Ponderosa pine constitutes the majority of vegetation at higher elevations, but other vegetation types include other conifers (white fir, Douglas-fir, white pine, corkbark fir, Engelmann spruce), some hardwoods, tundra species, and a few bristlecone pines. Stands of commercial timber in the Coconino National Forest have helped support an important logging and lumber economy in northern Arizona for over one hundred years. A sawmill was established when the Atlantic and Pacific Railroad reached Flagstaff in 1881. Logging has continued since then, with railroad logging taking place until the early 1930’s.

The area above the Mogollon Rim has been used for grazing in the summer season, and a considerable portion of the Verde Valley takes winter grazing use. The Sedona and adjacent Verde Valley experienced a rapid population growth after World War II when the movie industry discovered the beautiful scenery and good weather. The forest is a popular recreation destination for local and metropolitan populations. The Snow Bowl ski area attracts thousands annually.

Coronado National Forest

The scattered units of the Coronado National Forest spread 150 miles across southeastern Arizona and into southwestern New Mexico. The widely separated mountain ranges are exceptionally rich in the number and diversity of plants and animals, many of them rare and endangered species, an important factor in determining :management policy. Elevation varies from 3,500 feet near Tucson to 10,717 feet on Mt. Graham in the Pinaleno Mountains, which contain some of the finest Douglas-fir in the Southwest. This wide range of elevations allows recreation to be an important use year-round.

Watershed is an extremely important value of the Coronado National Forest, especially for Tucson residents. It has the lowest annual precipitation of any forest in the Southwest, 15.28 inches. It includes great stretches of arid desert lands where the saguaro cactus reaches 50 feet in height and luxuriant grasslands along the Mexican border. The forest is very important from the standpoint of livestock grazing, for it contains many acres of excellent range land. It has few streams of any size.

Gila National Forest

The Gila National Forest in southwestern New Mexico is the second largest in the region. It is characterized by mountains, deep rough canyons, rolling grasslands, and timberlands. Precipitation averages 17 inches per year. Elevations range from 4,200 to 10,900 feet. Attendant vegetation changes endow the area with desert life grading, or often changing abruptly, into tall timber, brush, or pinyon-juniper woodland. The first wilderness area in America, the Gila Wilderness, is located in this national forest. The forest contains great expanses of rolling plateau grasslands, extensive stands of ponderosa pine, and mixed forests at higher elevations. Runoff flows into branches of the Gila and San Francisco Rivers as well as the main course of the Gila River.

Kaibab National Forest

The Kaibab National Forest is located in north-central Arizona on the Colorado Plateau and abuts the Coconino National Forest on the east and the Prescott National Forest on the south. It is in three divisions: the Williams Division near the City of Williams, AZ, the Tusayan Division just south of Grand Canyon National Park, and the North Kaibab Division north of Grand Canyon National Park. The entire forest has been open to grazing.

Elevations in this national forest range from 3,300 feet in Kanab Creek to 10,400 feet on the top of Kendrick Mountain, and the climate is usually mild. Average annual precipitation is 16.7 inches. Interesting features include volcanic cinder cones and old volcanoes in the vicinity of Williams, the unique Kaibab squirrel on the North Kaibab Division, the Buffalo Ranch run by the Arizona Game and Fish Department, and the famous North Kaibab deer herd. The ponderosa pine forest that starts just west of Williams is part of a large unbroken forest that follows the Mogollon Rim southeast to the Rio Grande Valley in New Mexico, the largest continuous ponderosa pine forest in the nation. Lower parts of the plateau lands are covered by semidesert grasslands and scrub forests of pinyon pine and juniper. There are few streams of any consequence.

Lincoln National Forest

The Lincoln National Forest in southeastern New Mexico includes the Sacramento, Guadalupe, White, Jicarilla, and Capital mountain ranges. There have been many large springtime fires on this forest over the years, including the human-caused Capital Gap fire of May 1950 that orphaned the small cub who became Smokey the Bear. These fires have altered the vegetative types over large areas; oaks and locusts have come in, making coniferous regeneration difficult. Average annual precipitation is 18.2 inches. Runoff supplies the Rio Ruidoso, Rio Penasco, Rio Bonito, Rio Hondo, and Sacramento.

The range of elevations, from 4,000 to 11,000 feet, fosters five different life zones, from Chihuahuan desert to subalpine. The topography varies from moderately rolling hills to rough and precipitous mountains. Watershed protection was the initial concern in setting aside these lands. Management of recreation, timber, and grazing resources is becoming increasingly important. Timber stands include Douglas-fir, white fir, ponderosa pine, and aspen. Pinyon and juniper grow on lower slopes.

The Lincoln National Forest contains the nearest mountain ranges to the arid plains of southeastern New Mexico and western Texas, providing climatic relief and recreation. Outdoor

recreation opportunities include skiing and other winter sports, camping, hiking, fishing, hunting, and drives through aspen groves in the fall. Motorcycle and horseback riding are popular. The ski area operated by the Apache Indians, under special use, on Mount Baldy is one of the best in the Southwest. There are two other ski areas, at Ruidoso and at Cloudcroft.

The increasing popularity of the extensive cavern system in the Guadalupe Mountains, the Carlsbad Caverns, has led to a management program designed to protect these unique limestone caves, while permitting visitation and exploration.

Prescott National Forest

The Prescott National Forest in central Arizona contains some of the more arid lands in the region and consists of public lands surrounding several expanding communities and subdivisions. The national forest is in two units, with broad expanses of private and State lands between. The forest abuts the Coconino on the east, the Kaibab on the north, and the Tonto on the south.

The climate is seasonably mild, offering cool nights and warm days in the summer and moderate winters. Precipitation varies with elevation, ranging from 8 inches along the Verde River to 24 inches in the Bradshaw Mountains; it averages 15.48 inches annually. Elevations from 3,000 to 8,000 feet offer a variety of vegetation, including mixed conifer, ponderosa pine, chaparral, pinyon-juniper, open grassland, and desert shrub.

Recreation opportunities offer year-round possibilities. Developed picnic and campgrounds are located near Prescott on Mingus Mountain, and in the summer, desert residents from the Phoenix area rush to the cool elevations only a few hours' drive away.

Ranching, mining, and timber operations also play an important role in the local area's economic growth and stability. Before 1920 the Mingus Mountain Division supported two copper smelters, and the forests supplied timbers for gold mines in the Prescott area before it became a part of the United States.

Santa Fe National Forest

The Santa Fe National Forest began as the Pecos River Forest Reserve (1892) and Jemez Forest Reserve (1905). These reserves were combined to form the Santa Fe National Forest in 1915. The two divisions of the Santa Fe reflect the boundaries of the reserves. East of the Rio Grande, the southern Sangre de Cristo Mountains dominate the Pecos Division. These mountains are crowned by the spectacular Pecos Wilderness with 13,101-foot Truchas Peak In the headwaters of the Pecos River are great scenery, fine forests of aspen, ponderosa pine, fir, and spruce, big and small game, and many trout streams. The Pecos Division includes the popular Santa Fe Ski Basin, historic Glorieta Pass (the highest point on the Atcheson, Topeka & Santa Fe Railroad), and the old Santa Fe Trail.

Across the Rio Grande to the west lies a cluster of ranges, including the Jemez Mountains with 11,561-foot Chicoma Peak. This region includes rugged scenery and mixed conifer forests. Scattered throughout these mountains are extensive private holdings. Also here are the nuclear research facilities at Los Alamos, several Indian pueblos, and Bandelier National Monument. The predominant geographical features are the volcanic caldera indicated by the Valle Grande and the

ring of mountains surrounding the valley. The Baca Location No. 1, centered on the caldera, comprises about six townships and is privately owned.

Tourism, timber, and domestic cattle production are the mainstays of the north-central New Mexico economy, all being keyed to the resources of the national forests. Much of the Canon de San Diego Spanish Grant (98,614 acres) was acquired in the 1960's through land exchange and will contribute significantly to timber production and recreation in the future.

Tonto National Forest

The Tonto National Forest in central Arizona covers about 3 million acres of rugged and beautiful country, ranging from the saguaro cactus-studded desert to the pine-clad mountains beneath the Mogollon Rim. It is the largest in the region. It abuts the Prescott, Coconino, and Sitgreaves National Forests on the north and the White Mountain and Fort Apache Indian Reservations on the east. The altitude of the Tonto ranges from 1,300 to 8,000 feet. The forest offers outdoor recreation opportunities throughout the year, making it one of the most intensively visited national forests in the nation.

One of the primary purposes for establishing the Tonto National Forest in 1905 was to protect its watersheds. Management efforts are directed at improving watershed conditions. Considerable livestock graze on the forest. Average precipitation is 16.5 inches annually. The forest ranks second in the region in overall water production.

The completion of Roosevelt Dam on the Salt River in 1911, constructed under the authority of the Newlands Act, marked the beginning of large-scale impounding of water in reservoirs in the United States. For many years Roosevelt Dam was the largest and tallest dam in the world, and is still considered large. Reclamation activities continued in the Tonto down through the years, with Saguaro, Apache, and Canyon Dams built below Roosevelt Lake on the Salt River and Bartlett and Horseshoe Dams on the Verde River, a major tributary of the Salt River. The Tonto, thus, is the most important forest in the region as far as water storage is concerned, with its dams that control the floodwaters, prevent undue damage downriver, and impound water for the use of the people of Phoenix and for agriculture.[17]

The Tonto also contains an abundant cultural resource of prehistoric and historic archeological sites and close associations with the Apache, Yavapai, and Pima Indian tribes, whose several reservations abut the forest. Knowing about these resources contributes to the understanding of human adaptation to the various environments of the Southwest. Facilities on some of the high peaks on the forest currently provide important radio, television, and telephone communications links for Arizona.

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