United States
Department of
Agriculture

Forest
Service

FS-409

August 1988

Timeless Heritage: A History of the Forest Service in the Southwest

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Acknowledgments

The authors have genuinely enjoyed the task of writing the history of Region 3, the Southwestern Region of the USDA Forest Service. The Southwest is a beautiful and distinctive part of the country. The history of the Forest Service there is an integral part of the modern history of the Southwest and of the Forest Service as a National agency. Our associates in this task, in person and in spirit, have added to the enjoyment.

We began work in 1984, with the personal cooperation and support of the regional forester, Milo Jean Hassell, who retired in July 1985, and are completing it under the supervision of the current regional forester, Sotero Muniz. Both have provided the tangible and moral support to make our research as open and accessible as possible. This has been reflected by the willingness and cooperation of both active staff and retired personnel to lend assistance and offer information and advice.

Many individuals have been most helpful, and we are very appreciative of their assistance, counsel, and advice. Dr. David Gillio, our official liaison with Region 3, provided invaluable directions in solving some of our problems and offered good editorial advice on a reading of the entire manuscript, all the while maintaining an intensive regular work schedule. Dr. Dennis Roth, Head of the History Section in the Washington Office of the USDA Forest Service, and Frank Harmon, also in the History Section, were thorough but gentle editors, and invaluable resources. We are most grateful to William D. Hurst, who retired as regional forester of Region 3 in 1976. Bill Hurst read every page several times, offered extensive advice and editorial assistance, and saved us from many errors and omissions.

Paul D. Weingart, Director of Recreation for the Southwestern Region, greatly facilitated our research by providing resource materials, directing us to resource persons, and personally reading and editing some of the manuscript chapters. Several individuals with whom we had no direct contact read large portions, if not all, of the manuscript in its formative stages, and we want to thank them for their contributions. They include Frank Carroll, Dick Spray, and Harold Harper. Many other individuals read chapters or segments of the manuscript and offered very constructive and useful advice. We tried, as best we could, to incorporate the suggestions and corrections offered.

The staffs at the Federal Records Centers in Denver, Colorado; Laguna Niguel, California; and Forth Worth, Texas, were most helpful, cooperative, and tolerant. Specifically we want to thank Robert Svenningsen, Sharon Roadway, and Lloyd Spring in Denver; Vance Thompson and Bob Flores in Laguna Niguel; and Kent Carter and Dorothy Tenney in Fort Worth.

Many people in the national forests, ranger districts, and research facilities gave us their time and assistance despite our sometimes unannounced intrusions into their busy schedules. Some of these, but not all, are identified among the lists of persons interviewed in the bibliography. The others, unnamed, we thank just the same. Those many retired foresters who allowed us time for an interview and conversation, or who took the time to write or send us a bit of their recollections about times past in the Southwestern Region, in doing so gave us invaluable insight into those times. Many of these are noted in the bibliography, because their material was used directly in the manuscript. We thank also those unnamed others who helped indirectly. Finally, Professor Thomas G. Alexander, of the Charles Redd Center for Western Studies at Brigham Young University, shared with us some of his experiences with work on the history of the Intermountain Region, and Professor E.A. "Swede" Scholer, at the University of New Mexico, offered counsel and resources on recreational history and activities in the Southwestern Region.

Where there are errors, and we hope they are nonexistent or few, we accept full responsibility. The interpretations, inclusions, and omissions are ours.

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Chapter 1. The Southwest and the Forest Service

Secretary of Agriculture James Wilson's directive of February 1, 1905, held special significance for the people of Arizona and New Mexico. Wilson announced the transfer of the Forest Reserves to the Department of Agriculture as authorized by Congress (H. R. 8460) on that same day.

Some 21 million acres of public lands, almost one-eighth of the surface area of Arizona and New Mexico, were now to be administered by a regional subdivision of the Forest Service. "All land," Wilson said, "is to be devoted to its most productive use for the permanent good of the whole people. . . . All the resources of the forest reserves are for use."[1] In 1908, Chief Forester Gifford Pinchot appointed Arthur C. Ringland the first District Forester of the newly organized Southwestern district, or district 3. These Forest Service "districts" became "regions" after 1930.

The Forest Service was charged to maintain the permanence of the resources of the National Forests, while providing for their use. The great concern of Congress, as reflected in the Organic Administration Act of 1897, was to continue the prosperity of the agricultural, lumbering, mining, and livestock interests directly dependent upon the water, wood, minerals, and forage of the public domain.[2] Over the past three-quarters of a century the use of the renewable and nonrenewable resources of the Southwest had increased at a rapid rate.

The Public Domain

When the United States acquired the territory comprising Arizona and New Mexico by treaty with Mexico in 1848, those lands not owned by private individuals, including earlier Spanish and Mexican land grants, nor reserved by treaty for the various Indian tribes became a part of the "public domain" and open under various laws to settlement, purchase, and use. Only after the American Civil War and the completion of the great transcontinental and regional railroads, such as the Southern Pacific, the Santa Fe, and the Rio Grande Western railroads, did the great change in public use of the land begin. Cutting timber, mining, and raising cattle, for centuries household or domestic operations, had begun to become monolithic corporate enterprises with national and even international markets.

Timber production in Arizona and New Mexico, estimated at some 8 million board feet in 1879, rose to 22 million in 1889, and 67 million in 1900. Cattle grazed on the open ranges of the forests and public domains in ever-greater numbers. Cattle herds, which were estimated at 172 thousand head in 1880, increased to over 1.5 million head by 1890. By 1900, once-lush grasslands were in danger of becoming bare, rock-strewn earth. In 1879, the territory of Arizona urged the sale of all of the territorial timberlands at public auction, and in 1880 Congress authorized the citizens of Arizona and New Mexico to "fell and remove timber from the public domain for mining and domestic purposes." By 1900 it was becoming painfully clear to south-westerners that the renewable and nonrenewable resources of the Southwest were being depleted.[3] In 1891, Congress had given the President the authority to create forest reserves.

Forest Reserves

By the General Provision Act of 1891, Congress authorized the President to designate particular areas of the forested public domain as "reserves," set aside for future use. The first such reserve was the Yellowstone Timberland Reserve, which later was divided into the Teton and Shoshone National Forests. These reserves, which were increased in number and doubled in size by

President Grover Cleveland in 1897, were by law completely closed to public use and were devoid of management or supervision. In the Southwest the 311,040-acre Pecos River Forest Reserve was established in 1892, and the Prescott, Gila River, and Santa Rita Forest Reserves, encompassing millions of acres, were established before 1908.[4] Although Congress restricted the authority of the President in 1897, authorizing him to establish reserves only to preserve timber, protect watersheds, and provide lumber for local use, use of the forests by southwesterners for grazing, hunting, mining, lumbering, and recreation generally continued with no other constraint but the natural difficulty of access.

There was some sense among the older Indian and Spanish communities, in and adjacent to the forest, and among cattlemen, that the ancient traditions of open use and access to the land were simply being reaffirmed by the reserve acts and the Transfer Act of 1905. In these communities, people believed that the land belonged to them, at least for the purpose of grazing, wood gathering, cutting timber, hunting, fishing, or recreation, and that the forest reserves, and now the Forest Service, simply reaffirmed those communal rights.[5] In assuming authority over those public lands in the Southwest, the Forest Service inherited a great system of canyons, mountains, deserts and grasslands, people, and wildlife that characterize a unique sector of the American physical and cultural environment.

Essential Form and Features

It was a land that, long before the migrating tribes or conquering explorers trekked across it, had assumed the essential form and features, including the flora and the fauna, that greet the 20th-century visitor. In Paleolithic times the remnants of the receding glaciers of the last great ice age began to nourish the growth of the forests of the mountain regions and feed the developing river systems.

As the ice age ended, the land away from the mountains became increasingly arid—average annual rainfall is less than 12 inches. In the mountains, which range from 13,000 feet elevation at Wheeler Peak to 5,000 and 7,000 feet in the lower ranges, rainfall averages upwards from 12 to24 inches annually. The forests and grasslands supported an unusually diverse animal population, ranging from large bears, elk, mountain lions, buffalo, and mule deer to coyotes, jack rabbits, foxes, bobcats, badgers, squirrels, gophers, gila monsters, rats, snakes, scorpions, and tarantulas. On the mountain slopes there were stands of ponderosa pine, Douglas-fir, and Engelmann spruce that grew at elevations of 7,000 to 11,000 feet and enjoyed rainfall of 18 to 25 inches per year. Down the mountainside grew pinyon and junipers, which could thrive with only 12 to 17 inches of rain annually. Still lower were mixed evergreens and scrub oaks, and on the plateaus and valleys, where rainfall fell below 12 inches, was mesquite. The Petrified Forest, a woodland of some prehistoric day, lay strewn along its present site long before the first migrants ventured into the Southwest.[6]

From Hunters to Farmers

The earliest inhabitants trod lightly on the land and forests. As long as 2,000 years ago the Anasazi (perhaps ancestors of the present Pueblo Indians) made the transition from nomadic hunters to farmers living in permanent dwellings. They used the forests for many purposes. They gathered herbs and seeds, hunted, and secured logs for roof beams, ceiling joists, and other construction needs for the large, multifamily stone buildings they erected. The mountain forests they held in awe as the homes of their gods and goddesses. The Anasazi developed religious rituals that were

performed high on the mountains, and they regarded Mt. Taylor and Sandia Peak, among other locations, as sacred. Because they needed firewood for heat only in the harsher winter months and wood for cooking or for pottery kilns, and because they lacked metal tools to cut and shape timbers, the Anasazi made few demands on the forests of the Southwest. Later Indian nations, including the Hopi, Zuni, Apache, and other tribes that came to the region as recently as the 16th century, lived with rather than on the forests. The stands of ponderosa pine, as well as the pinyon and junipers on the lower slopes, remained virtually untouched for more than 1,000 years.[7]

Spanish Continue Modest Use

The same pattern of modest forest use continued under the Spanish. Beginning with Friar de Niza and Francisco Coronado, missionaries and soldiers crossed and recrossed the Southwest, building missions, forts, and towns at Santa Fe, Albuquerque, Isleta, Las Cruces, Tucson, Tubac, and many other locations. They built mostly structures of stone and adobe that required only hewed wooden beams for the roofs and similar supports. The Spanish used more of the forest for fuel than did the Indians, and they cut pinyon and junipers for fence posts to enclose their sheep and cattle. But these modest uses did not approach the annual growth rate of timber on the mountain slopes. The forests suffered far more damage from lightning, western red rot, mistletoe, and coronation rust than from the inroads of the Spanish. Perhaps more important to the future of the region, though, was the introduction of the range cattle industry by the Spanish. In short, the pattern of forest growth and decay continued much as it had before the advent of the conquistadores and friars.[8]

Part of Mexico

During the single generation that the Southwest region was part of the Republic of Mexico (1821–48), isolation and lack of transportation stifled any efforts to exploit the forests. Trade with the United States followed principally the Santa Fe Trail, which ran from the Missouri River at Independence, west to the Arkansas River, and on to Santa Fe by way of Raton Pass or more directly across the dry grasslands to the Cimarron River. This trail was a winding, tortuous, dangerous route that took two to three months, depending on the weather, to complete. The value of merchandise doubled enroute, and traders confined their shipments largely to cotton goods, manufactured articles, and tools. The return load was made up of furs, blankets, gold, and silver. Trade with California was equally long, slow, and hazardous. The route ran north of the Gila River to the Colorado River crossing, and on to San Diego across the California desert. A third route ran south to Chihuahua, but it, too, was slow and dangerous, and little commerce came into the region from that direction. The isolation of the land between the Colorado River and the Rio Grande prevented any substantial commerce with the outside world and made subsistence living a necessity.[9]

War In 1846

The declaration of war in 1846 by the United States against Mexico was soon followed by the appearance of an American army commanded by General Stephen W. Kearny. The army speedily occupied Santa Fe, Albuquerque, and other principal settlements along the Rio Grande. Later the same year, Kearny and his army marched along the Gila River to its junction with the Colorado, crossed that stream, and went on to California. Accompanying him was Lt. W. L. Emory, a topographical engineer, whose notes on the expedition provided the best account of the region available in English up to that time. Enroute he described the trees, animals, and birds in the upper

Gila Valley as he swung south of the mountains seeking a wagon route for the army trains. He concluded that the entire country had the same physical characteristics and that would-be farmers could not rely on rainfall for agriculture but would have to employ carefully controlled irrigation. As he kept to the lower terrain and avoided the mountain slopes, Emory reported that the region was "destitute" of worthwhile forest trees except on the margins of streams. Indian guides and mountain men could have told him that there were millions of acres of pine, fir, and spruce on the mountains. These, apparently, Emory did not see.[10]

The Treaty of Guadalupe-Hidalgo in 1848 transferred the territory between Texas and the Colorado River, as well as California, to the United States. In 1850 the region became the Territory of New Mexico with its eastern border at the present Texas boundary. Arizona became a separate territory in 1863. At once presidents, cabinet members, and members of Congress hastened to propose new routes west over which to build a railroad to the new golden state of California. Among the routes most favored by officials in Washington was a line along the 35th degree of latitude and another along the 32nd degree parallel. Both of these roads would run through the new territory of New Mexico.[11]

Reference Notes

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[1] Edward P. Cliff, Chief, U.S. Forest Service to Regional Foresters, Directors, and Area Directors, April 28, 1971, Region 3, Albuquerque, NM, File 1685.

[2] *Ibid.*; 30 Stat. 34-36; and see Dennis M. Roth, *The Wilderness Movement and the National Forests: 1964–1980*, FS-391 (Washington, DC: USDA Forest Service, 1984), p. 3.

[3] Henry B. Steer, *Lumber Production in the United States, 1799-1946* (Washington, DC: USDA Forest Service, 1948), p.11; Hubert Howe Bancroft, *History of Arizona and New Mexico, 1530–1888* (Albuquerque: Horn & Wallace, 1889), pp.146-283, 533,601; and see Anne E. Harrison, 'The Santa Catalina: A Description and History,' USDA Forest Service, Southwestern Region, Coronado National Forest, Sabino Canyon Visitor Center, pp. 1-14.

[4] *Facts: Southwestern Region, National Forests of Arizona and New Mexico* (Albuquerque: USDA Forest Service, Southwestern Region, 19.58), pp. 3257.

[5] Walter Graves, interview.

[6] Bert M. Fireman, *Arizona: Historic Land* (New York: Alfred Knopf,1982), pp. 17-27,40-42; Erna Ferguson, New Mexico: *A Pageant of Three Peoples* (Albuquerque: University of New Mexico Press, 1.973), pp. 3-14; Quincy Randles, "Pinon Juniper in the Southwest," and C. Otto Lindh, "Ponderosa Pine in the Southwest," in U.S. Department of Agriculture, *Trees: The Yearbook of Agriculture, 1949* (Washington, DC, 1949), pp. 342-346, 347-351.

[7] Thomas Y. Canby, "The Anasazi: Riddles in the Ruins," *National Geographic*, v.162:5 (November 1982), pp. 562-692; Ferguson, *New Mexico*, pp. 19 52; Joseph A. Tainter, "Native American Use of the Cibola National Forest," unpublished manuscript (USDA Forest Service Regional Office, Albuquerque, NM, 1982).

[8] Bancroft, *History of Arizona and New Mexico*, pp. 146-283.

[9] *Ibid.*, pp. 329-343.

[10] Calvin Ross, ed., *Lt. Emory Reports* (Albuquerque: University of New Mexico Press, 1951), pp. 102-103, 154-155.

[11] Bancroft, *Arizona and New Mexico*, pp. 491-493; William H. Goetzman, *Exploration and Empire: The Explorer and the Scientist in the Winning of the American West* (New York Vintage Books, 1966), pp. 265-302.

Chapter 2. The Historical Geography of the Southwest

The Southwest—Arizona, New Mexico, and the grasslands of northwestern Texas and southwestern Oklahoma—offers the view of an and or subhumid region of vast plains that are often desert, interspersed by rugged mountain ranges between which lie even more rugged arroyos or gullies (the classic "badlands"), created by the erosion from wind and water.

When they think of the Southwest, most Americans do not think of forests. W.L. Emory, for example, who conducted perhaps the first "official" American expedition into the Southwest with the Army of General Stephen W. Kearny in 1846, reported that the region through which the column traveled was largely destitute of usable timber and forests.[1] Americans assumed incorrectly from such reports that the entire Southwest was a desolate region. On the contrary, New Mexico, with a total land area of 121,666 square miles, includes approximately ten million acres (15,625 square miles) or about one-eighth of the total of forested lands within the National Forest System. Arizona, with a land area of 113,956 square miles, includes 11,392,000 acres (17,800 square miles) of forests within the National Forest System.[2] Southwestern forests are extensive and are in many respects unique in the United States. The Southwest is, in fact, a land of extraordinary environmental and cultural diversity.[3]

Range in Elevation

One of the most significant natural features of the Southwest is the extreme range in elevation-rising from 141 feet above sea level at Yuma, Arizona, to between 11,500 and 12,000 feet in the White Mountains and at Mount Taylor in the Cebolleta Mountains of New Mexico, and to 12,670 feet in the San Francisco Mountains, with the highest elevation of 13,161 feet at Mt. Wheeler in the Sangre de Cristo Mountains in northern New Mexico. Another major characteristic of the Southwest is the basically arid climate with subhumid rainfall. The region averages 14 inches of rainfall annually, with precipitation less in the lower elevations and greater in the higher elevations. Much of northern Arizona and New Mexico is part of the Colorado Plateau, featuring the mountains and deep river canyons also characteristic of the Rocky Mountain regions of Utah and Colorado. Southern Arizona includes the distinctive Sonoran Desert section, which includes much of northwestern Mexico and southeastern California. The desert is often subdivided into seven regions, two of which lie in Arizona: the Lower Colorado Valley and the Arizona Upland.

In the Lower Colorado Valley, rainfall averages less than 5 inches, and averages 7 to 12 in the more mountainous Arizona Upland. These regions are not forested, except in the high mountains. The distinctive high plains, the Llano Estacado of New Mexico, are also treeless.[4]

River Systems

Additional prominent geophysical features of the Southwest are, of course, the river systems. There are two great river systems that originate outside the region, the Colorado River in Arizona and the Rio Grande in New Mexico. The Grand Canyon was carved through northern Arizona by the turbulent Colorado River. The awesome Rio Grande Gorge in northern New Mexico was created by the Rio Grande River, which traverses the state at an increasingly leisurely pace as the river flows from north to south. The Pecos and Gila rivers originate in the Southwest. One of the Southwest's most scenic areas is the Pecos River Valley, which flows from the Sangre de Cristo Mountains in north central New Mexico southward into the Rio Grande in Texas. The Gila River and its main tributaries drain most of southern Arizona. Arizona and part of New Mexico sit on the

west slope of the Continental Divide and most of New Mexico on the eastern slope. Waters of the Colorado and Gila flow westward to the Pacific, and waters of the Rio Grande and Pecos flow to the Gulf of Mexico.[5] The Southwest is not one vast desert, but a region of great rivers, mountains, and tall forests, juxtaposed with desert and upland plains.

Six Life Zones

Rainfall and altitude differences are the key to the distinctive life zones in the Southwest. There are basically six such zones distinguished variously as the Lower Sonoran, Upper Sonoran, Transition, Canadian, Hudsonian, and Arctic-Alpine. The Lower Sonoran zone is the distinctive desert area of Arizona, with elements in the Rio Grande Valley below Socorro, and in the Pecos Valley. Lizards, kangaroo rats, some mesquite, black grama, creosote brush, and desert plants are predominant life forms. The Upper Sonoran (or Arizona Upland) zone offers slightly higher elevations and greater rainfall and can be characterized by improved grasslands (buffalo grass) and some pinyon and juniper. Where there were formerly buffalo, now mule deer, white-tailed deer, and antelope inhabit the zone.[6]

The Chaparral zone, a belt of closely spaced shrubs, including live oaks, mountain-mahogany and birchleaf mountain-[*cercocarpus*] mahogany, desert *ceanothus*, hollyleaf buckthorn, and manzanita, among others, often provides a transition to the more broadly construed Transition zone. Here elevations run 4,000 to 8,500 feet on the northeastern slopes, and 5,000 to 9,500 feet on the southwestern slopes. This zone is often synonymous with the vast pinyon-juniper type, which comprises 32 percent of the region's total area, and the ponderosa pine type, of which the Southwest has the largest unbroken stands in the world.

At higher elevations, roughly 8,500 to 9,500 feet, is the Canadian zone, of Engelmann spruce and Douglas-fir. Somewhat higher still, the dwarfed spruce and in some areas the bristlecone pine survive along the cold and craggy peaks in the Hudsonian Zone, and finally, the Arctic-Alpine zone is the treeless zone above the timberline, which often retains snow late into summers. There are relatively few such zones or peaks in the Southwest.[7] The timbered areas of the Southwest, most of which are encompassed by the national forests, lie at elevations of 6,000 to 10,000 feet.

Figure 1. Landforms of Arizona (adapted from Historical atlas of Arizona, Henry P. Walker and Don Bufkin. Copyright ©19779 by University of Oklahoma Press.)

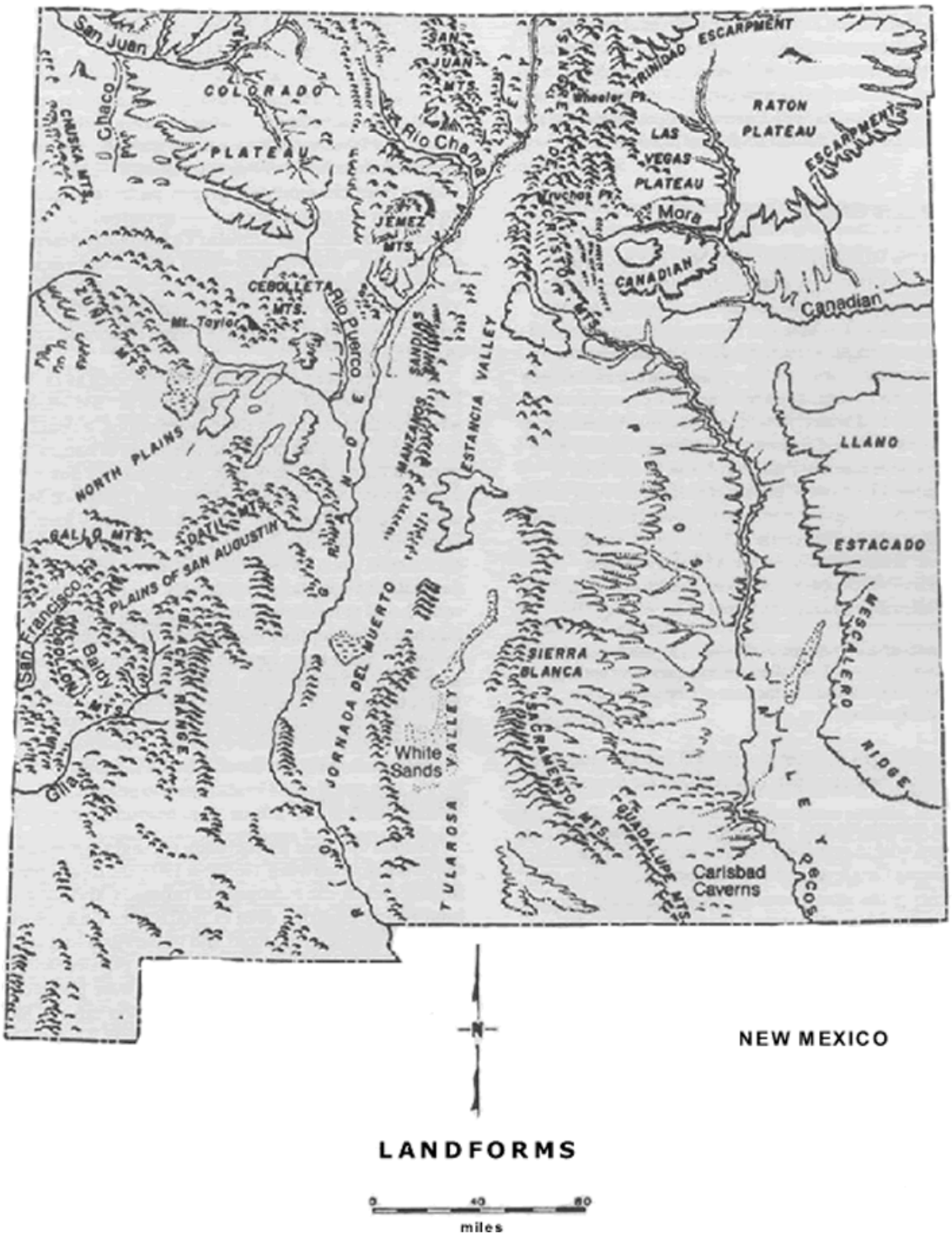

Figure 2. Landforms of New Mexico (adapted from Historical Atlas of New Mexico, by Warren A. Beck and Ynez D. Hase. Copyright ©19779 by University of Oklahoma Press.)

Arroyos of Late Origin

Although the wild and scenic beauty of the Southwest has been noted by many travelers in the distant past and the present, it is clear that the land of the Southwest is not unchanged or unchanging. Many of the rugged arroyos are of late-19th-century origin, caused by declining vegetation cover of the mountainsides and the grasslands, travel routes along the bottoms of drainage areas, and the consequent erosion by wind and water. Droughts have intermittently affected the character and life forces of the region. Many archeologists believe that the Pueblo cultures in the 13th century collapsed because of prolonged drought. And in the late 19th century drought contributed to overgrazing and a severe decline of the range cattle industry. Even the great forests, which seem in many respects to be a timeless heritage of all those peoples who have historically lived in the Southwest, are accounted by some to be young.

> As the forests of the world are reckoned, this great forest of the Southwest is not old; its tallest veteran may have sprung from a cone brushed aside by the boot of Coronado on his adventurous marches.[8]

While the lifespan of a tree may be 300 to 500 years, the forests of which they are a part have existed for thousands of years.

Even the mountains and waterways have themselves been changed within relatively recent times. In her description of the Santa Catalinas, Anne Harrison notes that in the late 19th century the stream courses ceased building flood plains and instead began to trench channels. The depletion of vegetation cover and the substantial elimination of beaver, as well as the development of travel routes in the bottoms, likely contributed to the change. The channeling, in turn, lowered the water table, and streams became intermittent and dry, farm lands washed away, and marshes disappeared with their fish and fowl. Even earthquakes, such as the quake of May 1887, slightly changed the topography of the mountains. Great slices of the mountains gave way and went tumbling into the canyons.[9] The visible consumption of grasslands, timber, and minerals, and appreciation of the scenic beauty of the wilderness, also contributed to the move for conservation. The relatively fragile geophysical and climatic environment of the Southwest has affected the relationship of people to the land.

Although the Southwest is indeed a varied and diverse land, capsule accounts and narratives from the earlier years denote the great beauty, the ruggedness, and often the desolation of the area. Friar Marcos de Niza, in 1539, described the area near the present White Mountain Apache Reservation in Arizona as having “a most plain soyle, without trees or stones . . . where there is no foode.” But he was given “nuttes of Pine trees” or pinyon nuts to eat.[10] A later account of the de Niza expedition describes the large walnut trees, the mountain grapes, partridges, geese, cranes and “other winged creatures”-a terrestrial paradise.[11] Casteneda, a member of Coronado’s expedition, described the country as a “wilderness covered with pine forests,” and having an “oak with sweet acorns of which they make cakes like sugar plums with dried coriander seeds.” Coronado wrote in August of 1540 of the “fresh rivers and grass like that of Castile.”[12]

If the reports of American explorers such as Lt. W.H. Emory in 1846 and Capt. L. Sitgreaves in 1854 were somewhat less enthusiastic in their descriptions, it could well be in part due to the attrition and depletion of natural vegetation and fauna 300 years later. In his journey down the Colorado in 1854, beginning in the San Francisco Mountains, Sitgreaves said that the “whole country from the San Francisco Mountains was barren,” “arable land . . . is greatly encroached upon by extensive flat spurs, hard, gravelly, and destitute of vegetation,” while only “two kinds of

grass were found at rare intervals and in small quantities" and that had a "perceptible incrustation of salt upon the leaves."[13] But if these reports lacked enthusiasm, newspaper accounts and immigration brochures of the 1870s and 1880s waxed eloquent in their descriptions of the natural beauty and riches of Arizona and New Mexico.

Inventories Made

Despite the great immigration of Anglo-Americans into the Southwest between 1865 and 1900, the development of mining camps, the expansion of railroads, and the growth of lumbering industries, even in 1900 the region appeared on the surface to be unchanged and impervious to it all. Between 1902 and 1909 inventories of the physiographic features, birds, vegetation, and mammals were prepared by foresters and scientists E.A. Goldman, Vernon and Florence M. Bailey, James H. Gant, and N. Hollister. They are remarkable for their completeness and the accuracy of the descriptions and scientific identities. Extracts from these documents give a real sense of segments of the country as it was when the national forests came into being. Hollister describes the Wingate Station area, in June 1905:

> Wingate station, on the Santa Fe [Railroad], lies in about the center of the valley of the Rio Puerco, three miles north of Fort Wingate, near the edge of the military reservation. The flat valley at this point is about two miles wide with a gradual raise north and south to the higher hills. The altitude at the station, practically, the lowest point, is about 7,000 feet. Most of the valley is barren of trees, but low ridges, locally known as "hog backs," extending from both sides close to the banks of the Puerco, are covered with good growth of junipers. To the south the junipers become more plenty on the lower foothills between the station and fort, and about the fort, some higher than the river bottom are abundant mixed with many small oaks and the pinon [*Pines edulis*]. Immediately back of the fort, to the south, the mountains suddenly rise, and the pinons, junipers and oaks cover its north slope.[14]

Near the summit, Hollister noted the sudden change of vegetation to yellow [ponderosa] pine. This forest of pine, he said, extended as far to the south as he was able to observe, and by all accounts he gathered the forest continued in every direction west, east, and southeast to the northern point of the Zuni Reservation and into the Zuni Mountains. "The line between what appears to be an Upper Sonoran and the typical Transition zone is well drawn and runs almost exactly east and west." He described characteristic mammals and birds of the Upper Sonoran zone as "*Peridipus, Perognaltus, Neotoma, Lepus psaltriparius, Astragalinius psaltria*, etc.," and in the Transition zone were "*Erethizon, Lynx, Serirus, Entamias, Sixta, Dryobates*, etc."[15] Separate inventories were made of birds and mammals sighted or known to be in the region.

Turkeys Were Common

During the "seasons of plenty" of pinyons and acorns, turkeys were fairly common in the timbered areas, Hollister said. They were never seen about in the summer. The Navajo, he commented, did not bother the turkey for they "never eat any kind of a bird." Swallows were abundant, particularly along the barren cliffs of Mesa Butte, and occasional buzzards, horned owls, swifts, and sparrow hawks were among the some 41 bird specimens he observed. The peccary was a wild pig-like animal reported to be no longer in the region. Mule deer were formerly common but had become less evident. Hollister noted that the Laguna and Acoma Indians formerly hunted deer and

harvested more than a hundred in their annual hunt, but the "new game laws have stopped their practice and very few deer are now brought into Laguna."[16]

Antelope had also disappeared from the region but could be found further south. Squirrels, chipmunks, various varieties of mice, rats (very common), "*Microtus mogollonenses*" (very rare, a kangaroo rat), porcupines, jack rabbits, and cottontails were evident. Mountain lions (Felis) were infrequent, lynx were fairly common, coyotes (*Canis*) were plentiful in the lower mesas, while big wolves (*Canis*) were reported to be seen near Laguna, but rarely. Bear (*Ursus*) were abundant, and many had been killed in the San Mateo Mountains because of their attacks on sheep and livestock. "Only last summer," Hollister said, "a sheep herder was nearly killed by a large bear." Both black and brown bears are reported and stories of silver-tips and grizzlies circulated.[17]

In his inventory of bird life in the Laguna region, Hollister reported a band-tailed pigeon, a few turkeys, an adult goshawk, and one red-tail hawk, and said that golden eagles were seen daily. At one time near Mt. Taylor, four golden eagles were in sight at once.[18] The Laguna region he described as:

> divided between the San Jose Valley and lower mesas and the higher mesas and mountains to the north and northwest. The valley proper and lower mesas are typical arid, sandy Upper Sonoran country, with very little vegetation excepting weeds and junipers, outside of the small plots irrigated by the Laguna Indians, . . . To the south this sort of country stretches for many miles in a succession of gradually rising mesas, covered with junipers and pinons, to the mountains some fifty miles away.[19]

At the base of the San Mateo Mountains a scattering of ponderosa pines began at the 7,500 to 8,000 foot level, and at higher elevations the pines became larger and thicker, until they suddenly gave way to a belt of quaking aspen at about 9,000 feet. The Transition forest, he said, was replaced by a true Canadian zone with no pines of any species [although he may have overlooked the bristlecone and southwestern white pine], but a solid, dark forest of Douglas-fir with little underbrush or grass. The "spruce" extended almost to the summit, where there were "beautiful grassy" plateaus and mountain pastures of considerable area.[20]

Other Wildlife

In 1906, Vernon and Florence Bailey conducted similar surveys of the San Mateo Mountains from Laguna to Acoma. They found many of the same species, but near old Fort Tularosa green-winged teal, sandpipers, killdeer, grouse, and doves lived at lower elevations, which had more abundant ground water. But eagles, hawks, and a burrowing owl were seen there too.[21] In the Manzano Mountains, James Cant found a small number of black-tail deer, pine and rock squirrels, rabbits, prairie dogs, and occasional but elusive panther (*Felis hippolestes*) and lynx were reported. Cant said that until 1898 a large pack of timber wolves inhabited the northern slopes and caused considerable losses to cattle and sheep. Concerted efforts by the herders had thinned the pack considerably, until only isolated specimens were still around.[22]

E.A. Goldman described the Zuni Mountain area as a "high group" along the Continental Divide, separated into a western range or "Bear Ridge" and an eastern range separated from the western by the upper Bluewater and Cottonwood creek valleys. Mt. Sedgwick, at 9,350 feet, was the highest peak, while Round Top Mountain in the eastern range reached about 9,100 feet. On the eastern range, water flowed to the Rio Grande, and on the west, into the Little Colorado. Most of

the forests were of the transition type.[23] His reports on the Socorro describe a country in the Lower Sonoran zone, more arid and with few trees. The region between the Socorro and the Magdalena mountains he described as a gently sloping treeless plain from which the mountains rose abruptly to an elevation as high as 10,000 feet. Unlike other surveyors, Goldman made detailed notes of agricultural practices and possibilities in the areas he surveyed.[24]

North Kaibab Plateau

Perhaps one of the most distinctive areas of the forested areas of the Southwest is the North Kaibab Plateau, located on the north side of the Grand Canyon. And one of the most distinctive and unique inhabitants of the Kaibab Plateau is the Kaibab squirrel, an animal indigenous to the island of ponderosa pine immediately north of the Grand Canyon. Dr. D. Irvin Rasmussen, a noted wildlife biologist, described this unique, large, tassel-eared squirrel in 1941. One noteworthy aspect of the early wildlife inventories was the relative scarcity of deer, a fact duly noted by foresters and wildlife conservationists, and which led to game laws and restocking and a remarkable regeneration of deer herds, the most famous of which became the Kaibab deer. The Kaibab deer herd, as will be seen, becomes a controversial factor in the history of the Forest Service in the Southwest. The 1931 description of the North Kaibab region by Walter G. Mann, former Forest Supervisor of the Kaibab National Forest, provides a useful juxtaposition to the early surveys just reviewed. It also helps create a vivid image of the physical geography of another segment of the Southwest.[25]

Mann described the area sitting on the Kaibab Plateau as a highland peninsula extending from Utah down into the lowlands of Arizona. Elevations ranged from 6,500 to 10,000 feet, with an average elevation of 8,000 feet. The plateau, he said, was 60 miles long from north to south and 15 to 25 miles wide east to west. The northern 50 miles lay within the Kaibab National Forest and the southern 10 miles within the Grand Canyon National Park. Cattle ranged the plateau in the summer and were herded to lower regions for the winter. “The eastern edge of the plateau is marked by steep slopes and escarpments that drop away into the winter ranges of South Canyon and Houserock Valley,” while the western side of the plateau sloped gradually to Kaibab Creek Canyon. The westward slope has “numerous long canyons or draws” running east to west. An area known as the “Sand Rocks” are “slopes and benches” below the rims of the large canyons at elevations of 3,000 to 3,500 feet. The plateau contained natural barriers or effective “fences” for wildlife—Grand Canyon to the east and south, Kanab Creek and Snake Gulch on the west and northwest, and the gradual slope of the plateau to elevations of 6,500 feet on the north, which tended to discourage migration of wildlife.[26]

Mann estimated that there were 1.5 billion board feet of timber in trees 12 inches in diameter or more on the sum mer and fall ranges of the Kaibab. Species included in his estimate were ponderosa pine, Douglas-fir, white fir, blue spruce, and Engelmann spruce. The total tree stand included trees of all ages from seedlings to old trees. Ponderosa pine grew principally at 7,000 to 8,500 feet. At 8,500 to 10,000 feet blue spruce, Engelmann spruce, white fir, and alpine fir dominated. Below 7,000 feet pinyon and juniper grew. Quaking aspen grew in clusters throughout the spruce-fir types, and in part of the ponderosa pine. At higher elevations timber was so thick that forage for wildlife was extremely limited. Most wildlife forage was found in open mountain meadows and along the edge of timbered areas.[27]

As for the climate, Mann noted that summer rains began in July and were frequent in the plateau country. Summer nights were cool. Frosts could occur as early as July. Light snow could be

expected in October. “Snow at the VT Ranch was three to eight feet deep in winter,” he said, and ran two to four feet at Jacob Lake. In the higher ranges a foot of snow could fall at a time during the winter, but temperatures usually remained above zero.[28]

The vegetation in the ranges outside of the Kaibab National Forest was chiefly sagebrush and grama grass, with some juniper. The adjoining ranges discouraged wildlife from migrating from the Kaibab, as did the physiography. Mann described the vegetation on the summer range of the Kaibab Plateau as heavily timbered with conifer trees but with numerous open grassy parks or valleys. Aspen was mixed with the conifers. Underbrush such as snowberry, currant, and locust grew in places, but scrub willow, once abundant, had disappeared.[29]

On the eastern winter range in the lower country and including South Canyon and the slopes bordering Horserock Valley, heavy stands of pinyon and juniper give way to sagebrush and grams grass.

The west side winter range in the lower country from Grand Canyon to Snake Gulch included pinyon, juniper, and oak changing to cliffrose, sagebrush, and grass on the lower slopes.

Mann included notes on the “North End Winter Range,” the “Spring and Fall Range,” and the “Sand Rocks,” where forage consisted primarily of black brush, rabbit brush, and scattered juniper, cowania, oak, grasses, and weeds. A brief historical overview explains the usages of the forests before the advent of the National Forest Service administration in 1905:

> In the early days the Kaibab Plateau was a great Indian hunting ground. There is an old Indian legend that the Kaibab was made especially for Indians and given to them by the Great Spirit, and then, because of something they had done, or not done, it was taken away. Every fall the Indians would gather to a great ceremonial feast and take skins for winter clothing and meat for winter food. Old timers in the Kanab country state that they have seen great numbers of deer carcasses in piles at these Indian camps-as many as a thousand carcasses in one camp. The white men also took great numbers of deer in the days of the early settlement. So great was the quantity of deer skins which actually came off the Kaibab each year that it was known as “Buckskin Mountain.” According to the best information available from old timers, this condition prevailed to a considerable extent up to the creation of the game preserve. There were also large numbers of mountain lions which annually took their toll of deer.
>
> Major Powell, who explored the Grand Canyon in 1870, named the plateau Kaibab for a small almost extinct tribe of Indians of the Pah Ute family who were living in that vicinity. The name Kaibab is of Indian origin and means “mountain lying down.” Uncle Billy Crosby, who speaks the Paiute language and has been adopted into the tribe, states that the word is really “Katbabits.”
>
> The area was withdrawn as a National Forest on February 20,1893, south of parallel 36° 30’, which was extended on August 5,1905, to include the present area. Very little was done toward administration until 1905.[30]

By the turn of the 20th century, human society—Indian, Hispanic, or Anglo—had lived in the Southwest for at least 15,000 years. Elements of more contemporary cultures, particularly the Pueblo and Hispanic, survived and flourished with the new and expanding American society. While the numbers of people and the uses and consumption of the natural resources increased

greatly in the relatively brief tenure of Anglo-American governance, the forests' mineral and water resources remained limited. When the USDA Forest Service assumed responsibility for most of the forested regions of the Southwest, it became a critical element in the historic processes by which a society adapted itself to and was affected by the lands that it inhabited. The Southwestern Region of the Forest Service found itself allocating limited resources, in terms of timber, minerals, water, grasslands, fish and wildlife, and recreational opportunities, to rapidly expanding populations.

Reference Notes

[1] Calvin Ross, ed., *Lt. Emory Reports* (Albuquerque: University of New Mexico Press, 1951), pp. 102-103, 154-155

[2] Henry P. Walker and Dan Bufkin, *Historical Atlas of Arizona* (Norman: University of Oklahoma Press, 1979), parts 1, 54; Warren A. Beck and Ynez D. Haase, *Historical Atlas of New Mexico* (Norman: University of Oklahoma Press, 1979), parts 1, 59.

[3] The point is well-documented in the 'Tour Guide to the Human and Natural Resources Along the Santa Fe/Taos Highways," prepared by William de Buys for the 106th Annual Meeting of the American Forestry Association, October 11-14,1981, Santa Fe, NM.

[4] See Walker and Bufkin, *Historical Atlas of Arizona*, parts 3-8; and Beck and Haase, *Historical Atlas of New Mexico*, parts 2-7.

[5] *Ibid.*

[6] *Ibid.*

[7] *Ibid*., and see Anne E. Harrison, "The Santa Catalinas, " unpublished manuscript (Sabino Canyon Visitor Center, 1972), pp.16-19, 28-32.

[8] Quoted in Mary Ellen Lauver, "A History of the Use and Management of the Forested Lands of Arizona, 1862-1936," master's thesis, University of Arizona, 1983, p. 22.

[9] Harrison, "The Santa Catalinas, " pp. 32-33.

[10] George P. Winship, *The Coronado Expedition*, 1540-42, U.S. Bureau of Ethnology, 14th Annual Report, Part 1, p. 355, cited in Mary E. Lauver, ". . . Forested Lands of Arizona," p.13.

[11] *Ibid.*, pp. 13-14.

[12] *Ibid.*, pp. 14.

[13] Capt. Lorenzo Sitgreaves, *Report of an Expedition Down the Zuni and Colorado Rivers*, pp.13,18, 21-22, quoted in Lauver, ". . . Forested Lands of Arizona," p.16.

[14] N. Hollister, "Physiography, " New Mexico: Wingate, June 18-29,1905, copies in Cibola National Forest.

[15] N. Hollister, "Physiography, " New Mexico: Wingate, June 18-29,1905, copies in Cibola National Forest.

[16] *Ibid*., and Hollister, "Mammals," New Mexico: Laguna, August 7-20,1905, copy in Cibola National Forest.

[17] Hollister, "Mammals."

[18] *Ibid.*, "Birds," August 7-20,1905.

[19] *Ibid.*, "Physiography."

[20] *Ibid.*

[21] Vernon Bailey and Florence M. Bailey, New Mexico: San Mateo Mountains, Laguna to Acoma, September 20-23,1906, copy in Cibola National Forest.

[22] James H. Cant, "Mammals," New Mexico: Manzano Mountains, October 3 to December 22, 1903; E.A. Goldman, New Mexico: Socorro, and New Mexico: Magdalena Mountains, Aug.-Sept. 1909, copies in Cibola National Forest.

[23] *Ibid*., "Physiography.".

[24] *Ibid.*

[25] The following material is quoted from Walter G. Mann, "The Kaibab Deer. A Brief History and the Present Plan of Management, 1931" (amended 1936, 1941), pp. 1-55; Williams, Ariz, Kaibab National

Forest, File 1685; and Federal Records Center, Denver, Acc. No. 095-60D120; and see D. Irvin Rasmussen, 'Biotic Communities of Kaibab Plateau, Arizona, *Ecological Monographs 3* July 1941):229-275.

[26] *Ibid.*, p. 2.

[27] *Ibid.*

[28] *Ibid.*, p. 3.

[29] *Ibid.*, pp. 5-6.

[30] *Ibid.*, p. 7.

Chapter 3. The Land and the People

C. Otto Lindh, while Regional Forester, described the close and sometimes fragile association of man and the land and forests in the Southwest. The local economy, he said, is tied to the land: ". . . farming, both irrigated and dry land, ranching, lumbering, and recreation are mostly dependent on the land or its renewable resources."[1]

> Water is the most precious item of all in the Southwest. Civilization in the Southwest, in the long run, will depend on putting to beneficial use the maximum amount of usable water at the right time and place. Maximum usable water supplies in turn depend on watersheds in good condition. Devegetated lands, eroding lands, silt producing lands and sand-dune farming lands are leading to water shortages, dogged channels, declining water storage capacities and eventually, if not corrected, will lead to despair and financial ruin. *The land must have care and rehabilitation, regardless of ownership, if society is to survive*.[2]

"Wildlife management," Lindh said, "timber harvesting, livestock use, stream fishing and wild land recreation are and will continue to be on the same lands."[3]

Thus, very succinctly, Lindh described the ecosystem that has characterized the Southwest for thousands of years. It is a system that has become increasingly fragile and vulnerable under the growing pressures of use and populations. Usages of the forests and grasslands have been shaped in part by very ancient cultural and economic patterns. Indians and the Spanish-Americans exercised communal rights to the timber, mineral resources, and grasslands. Anglo-American cattlemen expediently believed in the "open range," while the lumber, mining, and railroad industries of the American era advocated private ownership, as did the laws and land practices of the United States. Interestingly, the creation of the national forests in a real way marked a return to practices and land usages unique to the American Southwest, where the principle of "common use" had long existed. Yet, with the advent of Anglo-Americans into the Southwest, the renewable and non-renewable resources of the region faced serious depletion. Lumbering, mining, and cattle raising had become big business, and the Forest Service became central to the allocation of very valuable and culturally important resources. The Forest Service is today an integral part of the social management and preservation of the renewable and nonrenewable resources of the region. It is not the character of southwestern resources that has changed so much as the intensity and complexity of usage.

Early Peoples in the Southwest

During the Pleistocene age, the Southwest was much cooler and wetter than it is today. Vegetation was more abundant, and animals were more diverse, often larger, and more plentiful. Nomadic hunter-gatherers, the Paleo-Indians, were known to have lived in the region some 15,000 years ago, and probably earlier. "Killsites, "where bands killed and butchered bison and mammoths, have been excavated. The Llano culture complex, which thrived in the region, is illustrated by the Folsom and Clovis sites, Sandia Cave near Albuquerque, and Lehner, Naco, and Ventana Caves in Arizona. These Paleo-Indians achieved a high level of proficiency in hunting, marked by the excellence and beauty of the projectile points that have been found. At the end of this period, about 8,000 B.C., the flora and the fauna began to change markedly. The mammoths, giant bison, camels, small horses, ground sloth, and giant carnivores, such as the saber-toothed tiger, disappeared; and with their disappearance the old hunter-gatherer existence declined also. The Paleolithic period was replaced by the Archaic period, and the Desert or Cochise culture. There

was relatively little difference in that the people were still nomadic hunter-gatherers, but the game they hunted and the seed or berries they harvested were of the kind we know today. Deer, elk, buffalo, and antelope had replaced the larger bison and sloth. But there is some evidence that these peoples were not doing as well as their predecessors, and their technology was less proficient.[4]

Sometime before the Spanish era, agriculture was introduced into the Southwest by nomadic tribes who encountered it in central Mexico. Corn culture, for example, is believed to have first developed there in the Tehuacan Valley. Nomadic groups became increasingly less dependent upon wild game, and increasingly dependent upon harvesting first wild, then cultivated, grains and vegetables. Certainly by 250 B.C., corn, beans, cotton, and squash had begun to transform the aboriginal culture of the Southwest, and within 1,000 years the great Pueblo cultures developed.

There were various intermediate stages in this development, as from the cave to the pit house, to the Pueblo, but it is characterized by a sedentary culture, the emergence of art, religion, basketry, and simple, but good, pottery. Baskets, clothing, cotton cloth, and wooden objects have survived from this era. The Cochise culture phase evolved into several cultural groups, including the Mogollons, 300 B.C. to 1100 A.D., who lived in pit houses, made quality pottery, farmed successfully, wove fine cotton fabrics, had a refined religion with burial rituals, and seemed generally to prosper in the upper Gila area of Arizona and New Mexico. Contemporaneous with the Mogollon were the Hohokam peoples, who were concentrated in the lower regions of the Gila and Salt Rivers in Arizona and whose most distinctive contribution was the development of irrigated agriculture. The Hohokam constructed large ceremonial “ball courts,” modeled after those in Mexico, built extensive irrigation ditching systems (which were much later adapted and used by European non-Spanish settlers), and excelled in engineering and in shell and stone artistic work. The Hohokam were by 1,000 A.D. peaceably absorbed by stronger Pueblo cultures; the Pima and Papago Indians of Arizona are their direct descendants.[5]

The Anasazi or “Ancient Ones” evolved on the Four Corners Plateau of Arizona and New Mexico around 2,000 B.C. These Pueblo Indians evolved from an earlier Basketmaker culture with some infusion from the Mogollon and Hohokam tribes. They are represented by some of the greatest Indian archeological sites, Chaco Canyon in New Mexico and Canyon de Chelly in Arizona. There, famous stone apartment complexes draw visitors from around the world. The Anasazi wove fine baskets, created beautiful pottery, elaborate stone houses, and towns, and developed a social and religious structure sophisticated even by contemporary European standards. The Anasazi population peaked between 1200 and 1300 A.D., then declined; perhaps the culture was destroyed by severe droughts. Remnants of the Anasazi met the Spanish conquistadors in the 16th century.[6]

By 1400 A.D. the early Pueblo cultures were being buffeted by intrusions of the more warlike and nomadic Athapascan peoples. When the Spaniards arrived in the 1500s, the great cliff cultures such as the Casa Grande society were becoming memories.

Spanish March into New Mexico

The Spanish Conquistadors, who very profitably occupied Mexico City, soon began probing expeditions along the coasts of South America and, by 1536, began hearing of rich cities to the north. Marcos de Niza, a Franciscan friar, and the Moor Estevanico led the Spanish march into what is now New Mexico in 1539 in search of the legendary “Seven Cities of Cibola.” Estevanico was killed but Friar Marcos glimpsed from a great distance a Zuni pueblo, which he imagined to be a terraced stone city, larger even than Mexico City. His Indian guides assured him that he saw

the smallest of the seven cities, and that many people and great riches lay ahead. Marcos rushed back to Mexico City with the news. Within the year plans were made to send a large expedition into the region.[7]

Led by Francisco Vazquez de Coronado, and privately financed by him and the Viceroy Antonio de Mendoza, the expedition reached the small Zuni stone pueblo of Hawikuh that Marcos had grossly mistaken for far more than the modest and largely impoverished settlement that it was. Moreover, the Zuni resisted Coronado's invitation to peacefully submit to Spanish rule, and a small battle occurred before Coronado drove out the inhabitants. In short order, Coronado or his lieutenants conquered the Hopis, viewed the Grand Canyon, were welcomed into the Acoma fortress, met envoys from 12 Tiwa pueblos, and rode into Taos, Jemez, Zia, and the Pecos Valley. As the long campaign drew out, Coronado began to requisition supplies from the Pueblos and precipitated a war with the Tiwa that resulted in the destruction of many pueblos and the death and captivity of many Indians. Soon Coronado moved eastward out of the region and finally back to Mexico.[8] He left behind a legacy of Spanish rule, and of Indian opposition to that rule. For the next 200 years the Pueblos and other Indian tribes struggled to maintain their old way of life against their new rulers, who brought Christianity, taxes, labor conscription, and some security against the rising threat of raiders from the plains to the west and from the east-the Apaches, Utes, and Navajos. Unknowingly, the Spanish brought something even more formidable and revolutionary than its armies and priests. They brought horses, guns, metal knives, cattle, and sheep-which the Indians of the Southwest had never before possessed. The Apaches, especially, adapted to the horse and expanded their range and their threat to the sedentary and established world of the Pueblos. The Navajos, previously small farmers, became herdsmen and raiders; the Apaches, previously small farmers and occasional scavengers, became even better hunters and warriors. By the mid-17th century, the ancient contest between ordered societies and the roving marauders-or Pueblo versus Apache and Navajos-became the Spanish and the Pueblos versus the Apaches and Navajos, peoples who had become far more efficient and dangerous enemies than before. The Utes, too, flourished and were formidable enemies of them all.[9] The 17th-century Southwest was not a peaceable kingdom.

Pueblo Revolts

The second century of Spanish occupation closed with the great Pueblo revolts of 1680, the reaffirmation of peace with Spain in 1692 and 1693, and fresh rebellions in 1696. Throughout the 1700s, the Pueblos and the Spanish generally remained allied against the Apaches and Navajos. The Pueblos held to the old ways, while adopting and adapting to the new.

> They clung as tenaciously as ever to old pueblo values, but they kept their activities discreetly underground in the kivas and dutifully observed Catholic forms. Friars baptized, married and buried them; they went to Mass as well as kiva.[10]

The Pueblo Indians kept their ancient ways, but with plows and oxen grew more crops. Horses, cattle, and sheep allowed them to eat more meat and to weave fine woolens, as well as cotton cloths. By the time Spanish rule had been replaced by Mexican, most of the Indians of the Southwest and the Spanish settlers had found that their two cultures could coexist in a common cause. There remained, however, distinct differences between the Indian and the Hispanic communities.

Spanish and Mexican laws of land tenure contrasted somewhat with the open-range, common-use system of the Native Americans. In order to encourage settlement, Spain and Mexico made assignments of large tracts of lands, or grants, to private individuals. Ordinarily the grants were made to groups of 20 families or more. Each individual received title to the house in the village, and to the acreage farmed, but the bulk of the grant, the grazing and forest land, was held in common for the use of all, much as was the system of the Pueblo and the Plains Indians.[11]

Anglo-Americans

When the Anglo-Americans first came, they had no system similar to that of the resident Indian and Hispanic populations. By default, that is until it was claimed or sold or given away, the public domain remained open for access. When the forest reserves or National Forest System began, there was in some respects a cultural and historical precedent for them in the Southwest, more so than in other regions of the United States. Common or communal use of the forest resources more closely reflected local custom than did private ownership and use. At the same time, however, those who controlled access to that common grazing and timber land confronted centuries of established practices, customs, and cultural traditions.

Anglo-Americans, when they arrived through war and treaty, constituted the third distinctive cultural component in the Southwest. Beneath the three major cultural groups existed a diverse subcultural pattern, with each subgroup maintaining a remarkable degree of integrity—exemplified by language, religion, art, and occupation. Thus, Southwestern culture is distinctive for its three components: Indian, Spanish-American, and Anglo-American. The three predominant Indian groups are the Pueblo, Navajo, and Apache. Spanish-Americans actually comprised three subgroups: the descendants of the Spanish colonials; Mexican-Americans, whose ancestors came more recently from Mexico; and Mexican nationals. The Anglo-Americans are any recent arrivals, particularly people of northern European origin.[12] Clearly, in the Southwest, the Anglo-Americans were the newcomers and until recent times, a minority, albeit an influential and powerful one. It was the Anglo-Americans who were called upon to, and who did to a remarkable extent, adjust to the prevailing cultural patterns. Southwestern cultures demanded coexistence, not assimilation.

The message was early conveyed to American occupying forces after the Mexican War. In December 1846, groups of Spanish-Americans, supported directly and indirectly by some Pueblos, revolted against the authority of the United States. The rebellion was short-lived, but it signaled the popular resistance of the inhabitants to the new arrivals. After more than 100 years, that resistance has not altogether ceased, but it has been important in maintaining the cultural integrity of the Southwest.

Village Is Basic

According to Margaret Mead, the anthropologist who made a study of it, the basic cultural fact of Spanish-American life in the Southwest is the village. She might have added that the village, or pueblo, was also the basic fact of the dominant Indian and Spanish-American cultures. “These villages,” she said, “belong to people who depend on one another for their livelihoods and their diversions.”

> . . . Work is an accepted and inevitable part of everyday life. Everyone is expected to do his part. Tools are shared. Cooperation on some occasions involves the whole village.[13]

The Anglo-American style of private ownership and individualism stood in sharp contrast to the cultural mores of the region. Fortunately, throughout most of the 19th century, the contrast and conflict were mitigated by the isolation of the country, and the relative paucity of Anglo-Americans.

Anglo-Americans came to the Southwest as conquerors, but offered very lenient and liberal terms to the inhabitants. Mexican-Americans were proffered United States citizenship, but they could retain their Mexican citizenship. Titles to land and possessions were safeguarded. All religious rights were preserved. Treaties and grants recognized by Mexico were to be recognized by the United States. Unlike the Spanish-American residents, the Indians became special wards of the Federal government, and while being granted special protection, were essentially precluded from political life. Tribes retained their lands, pueblos, and communities; they had separate schools and were given little opportunity to participate in the economic life of the other two groups-a condition not entirely unappreciated by the more traditional Indian groups.[14]

Change After Civil War

The presence of the United States, however, was little felt until after the Civil War. Then, the world, and particularly the local economy, began to change. Congressional land grants to railroads, the rising competition from Anglo-American sheep and cattle barons, taxes, court actions, and confusion left many of the Hispanic settlers bereft of land, and the Pueblos and other Indians with depleted reservations. The Southwest became for a time a great cattle and sheep kingdom, supported by great rail networks and timber and mining interests. It was in the last four decades of the 19th century that the Southwest finally became Americanized.

The cowboy and lumberman replaced the herdsman, buffalo hunter, and small village farmer. Since the introduction of cattle and sheep by the Spanish, herding had become a way of life in the Southwest. The Americans made it a business, and the cowboy, in part, became a romantic illusion, whose heyday, in reality, was quite brief.

> There has never before or since been a figure who has captured the imagination or interest of the world like that of the American cowboy. He is idolized and imitated not only in this country but throughout the world. The epitome of the strong, reliable, independent character who is a purveyor of good over evil . . .[15]

To be sure, the American cowboy, the vaquero, and indeed the American cattle industry in the Southwest, reflected an adaptation of an old established native industry. The corral, rodeo, remuda, ganado, and bronco were all part of the Southwest before the Anglo-Americans arrived.

Land-Grant Ranches

Early Spanish land-grant ranches, including the Arivaca, Reventon, Sopori, and Canoa in Arizona, had operated successfully well into the Mexican period, when the weakening of governmental authority allowed the Apaches to drive many of them away. The Apaches subsequently made ranching a far more difficult task in Arizona than in New Mexico until the close of the 19th century, when the last bands of warriors were killed or captured. But the cattlemen persevered, along with the railroads and the lumbermen.

One of the most famous Arizona ranches was the Aztec Land and Cattle Company, a large corporation operated out of Joseph City. The company ranged its cattle, in part, on lands that would become the present Coconino and Apache-Sitgreaves National Forests. The company began in 1883, and ran up to 60,000 head before going bankrupt in 1900.[16] More typical of the ranchers, and illustrating the growing problem of overstocking the ranges and the depletion of the grasslands, is the case of John Cline, who came to the Salt River country in the Tonto basin about 1880.

Cline brought 1,700 head of cattle from California into the Salt River Valley in what is now the Tonto National Forest. "The grass," he said, "was as green as could be. It looked as good as the alfalfa fields do now . . . The grass was so good that our cattle never scattered five miles from the place where we turned them loose, within a year." Cline said there was plenty of feed, and his herd multiplied to 10,000 head, and other cattle came in and made "big herds." "I believe there was 30,000 cattle, horses, goats and sheep on the range that now will only carry 10,000 cattle." After the hard winter of 1898 things got progressively worse. "It seemed," he said, "as if the grass got thinner. You could see bare spots where when I came here the grass had the ground covered."[17]

And so it came to be that by 1900 the "day of the cattleman" had reached its peak and was on the decline. In some respects the preservation of the open range by the forest reserves and then by the Forest Service prolonged and even revitalized the cattle industry in Arizona and New Mexico. That industry continues to be one of the prime preoccupations of the Forest Service in the Southwestern Region. And the romantic legacy of the cowboy lives on. The current Prescott National Forest official map, for example, welcomes the modern visitor to:

> Grief Hill, Yellowjacket Gulch, Lonesome Pocket, Blind Indian Creek, Battle Flat and Horsethief Basin. These formidable names of the Prescott National Forest are a heritage from harsher times. For here, more than a century ago, Arizona Territory was proclaimed in the middle of a wilderness. Trails and camps were made by intrepid frontiersmen, who bet their lives and sometimes lost. Stolen herds once healed fresh brands at Horsethief Basin. Five desperate cowboys held off 150 Indians in a furious gunfight at Battle Flat. Ten faint graves suggest the inspiration for Grief Hill. The colorful names are authentic.[18]

In a 1904 inspection tour of the Prescott Reserve, Inspector Louis A. Barrett tended to confirm the authenticity of the Prescott description of 1984. Barrett remarked that all of the Reserve had been cut over at least once, except in "Horse Thief Canyon" where the only virgin timber stood, and the country was so rough no one could get the timber out.[19]

Mining Ventures

Barrett also called attention to another American expansion of a rather old domestic industry-mining. Hardly had the ink dried on the Gadsden Purchase agreement with Mexico, than Charles Poston and Hermann Ehrenberg, a German mining engineer, headed for the Territory. After brief inspections they raised capital among Cincinnati businessmen for a mining venture and organized the Sonora Exploring and Mining Company, which began operations at Tubac. The mine boomed, with $3,000 per day being taken out, until the removal of Federal troops in 1861, and the resurgence of Apaches forced the closing. Gold was found along the Gila River, and up the Colorado from Yuma; copper had long been mined from the Santa Rita mines near Silver City, NM; where new silver lodes were found. Douglas, Morenci, Prescott, Yuma, and Tombstone, AZ, became major mining towns. Prospectors fanned out through all of the mountain areas in Arizona

and New Mexico and could be found at work well into the 20th century.[20] When the USDA Forest Service acquired the forest reserves in 1905, mining and panning were being carried on in almost all of them.

Inspector Barrett explained that in the Prescott,

> Mining men and prospectors have never been very friendly to the reserve policy, as they are prohibited from cutting and slashing in the timber as they formerly did, and they delight in making life as miserable as possible for the forest officers.[21]

He noted that the total mining claims located in the Prescott Reserve would total 140,000 acres; many of these, he argued, were simply devices for defrauding the government of valuable timber land.

Saloons and Brothels

Other activities closely associated with the American mining and cattle businesses in the late 19th and early 20th centuries were the saloons and brothels. Barrett devoted three pages of his 18-page report on the Prescott to saloons. The saloon and gambling house business, he said, was in as "healthy condition today as it was before the reserve was created." Local authorities, miners, and the cowboys were wholly on the side of the saloon keepers. County officers argued that if the saloons closed up, the county schools would have to close since there would be no tax resources to pay the teachers' salaries. The sheriff received a percentage of the tax collections and had a vested interest in keeping the saloons open. Barrett counted 29 saloons on the Prescott in 1904, the most disreputable being the one at Middleton run by R .J. Schwanbeck and Bernice West. As was this one, most saloons were located on alleged mining claims and often doubled as houses of prostitution. Forest officials were explicitly unwelcome.[22]

Residents of the area around Magdalena were described in 1910 by a Washington inspector as "hard a lot as existed on any Forest of the Nation." Things had tamed somewhat from the "good old days" when cowboys ran their horses on the board sidewalks of Main Street and jumped them off the high end near the Santa Fe branch railroad station, firing a few friendly shots as they rode. In the fall of 1910 over 100,000 head of cattle and sheep passed through the corrals, and one could estimate a proportionate headcount in the saloons and brothels.[23] The Wild West, however, was near its conclusion, but it would leave an indelible imprint

A Comprehensive Survey

In 1851 Captain Lorenzo Sitgreaves explored the region between the Zuni and Colorado Rivers and produced a map of the area that was useful to later expeditions. Two years later Secretary of War Jefferson Davis directed Lt. Amiel Weeks Whipple to make a comprehensive survey from Ft. Smith, AR, to California along the 35th degree latitude with the view of building a railroad to the Pacific along that route. Whipple was an experienced engineer and surveyor and assembled a well-equipped expedition composed of a dozen specialists, including Lt. J.C. Ives, who later explored the Colorado River; J.M. Bigelow, M.D., who served as doctor and botanist; and Heinrich Baldwin Mollhausen, a German artist and writer.[24]

The party traveled with an escort from the 7th Infantry and had a minimum of interference from would-be Indian raiders. After preliminary surveys west from Ft. Smith, the expedition arrived in Albuquerque early in November 1853.

They proceeded westward passing the Zuni Mountains, the Petrified Forest, and Humphrey's Peak, crossing the Colorado River at the Needles. After reaching the Pacific Coast, Whipple prepared his report describing his route in detail. This was published in 1856 as a U.S. Senate Document and became the standard reference work on the region. Included in the report was an essay prepared by Dr. Bigelow on the forest trees of the region. He described the pine, the "Douglas spruce" [Douglas-fir], and spruce that grew in the higher altitudes of the Sandia, Zuni, and San Francisco Mountains. He also mentioned the pinyons and "cedars" [junipers] found on the lower slopes of the mountains. Writing in a clear style and employing the scientific as well as the common names for the principal trees, Bigelow provided the first reliable information for interested Easterners on the forest resources that existed in the New Mexico territory.[25]

Railroads Begun

Sectional controversy and the issue of slavery in the territories prevented any western railroad building during the 1850s despite the favorable reception of the report by Lt. Amiel Whipple. Not until after the end of the Civil War was construction begun along the 42nd degree parallel on the Union Pacific-Central Railroad, the first of the transcontinental railroads. The same year, 1866, Congress chartered the Atlantic and Pacific Railroad (A&P) to build a line along the 35th degree parallel to California. It was capitalized at $100,000,000 and promised a land grant of 40 square-mile sections (in alternate sections) for each mile of track built in the territories. Sponsored initially by John C. Fremont, the A&P built westward slowly and by 1876 sank into bankruptcy. To salvage the potentially valuable land grant, the St. Louis and San Francisco Railroad was organized to take over the properties and continue construction. This company allied itself with the Atcheson, Topeka, and Santa Fe Railway (AT&SF, often called the Santa Fe), which was building west and south through southern Kansas and southeastern Colorado, across Raton Pass, reaching Albuquerque in the spring of 1880. The resulting tripartite agreement brought together the interests of the Santa Fe, the San Francisco, and the A&P railroads to build a railroad across New Mexico and Arizona under the A&P charter and thus earn the land grant.[26]

Essentially, the Santa Fe built the railroad and eventually reaped most of the rewards. Beginning at the town of Isleta, a few miles south of Albuquerque, the engineers mapped out the route roughly along the 35th degree parallel and work crews laid the track, establishing the towns of Gallup, Winslow, Williams, and Ash Fork as they went. The engineers' use of the notes from Lt. Whipple's Survey of 1853-54 speeded their work considerably. They used local forests for construction timbers, ties, and fuel for the campsites. Overcoming all obstacles, including bridging the Diablo Canyon, the crews pushed on to the Colorado and constructed a bridge over that river, linking up with the Southern Pacific Railroad at Needles in early August 1883. Hence, northern New Mexico and Arizona were on the main line of a transcontinental railroad with connections both east and west. Travel time from Chicago to Albuquerque or Flagstaff had been cut from three months to less than five days.[27]

Atlantic & Pacific Receives 14 Million Acres

The Atlantic and Pacific Railroad (St. Louis and San Francisco) received more than 14 million acres of land for building the railroad from Isleta to Needles. Most of this eventually passed into

the hands of the Santa Fe (the A&P went bankrupt again in 1894). Much of the land was low value desert, with only limited ranching use, but some was located in the forested mountains and was much more valuable. Also, the railroad had the right to "lieu lands" in exchange for previously taken private holdings along their right of way. Later there were further land exchanges for historical and scenic sites such as the Grand Canyon Reserve and the Petrified Forest. As a result of these transactions, the Santa Fe Railway had large acreages of timberland to sell. Next to the Federal General Land Office, the Santa Fe Railroad was the largest seller of lands in the New Mexico and Arizona territories.[28]

In the meantime, the Southern Pacific Railroad (a California corporation composed of the same four entrepreneurs who had built the Central Pacific) hastened to construct a line from Yuma across the southern part of the region to meet the federally chartered Texas and Pacific Railroad at El Paso. The engineers of the Southern Pacific benefited from Lt. John J. Parke's survey made in 1854 from Yuma to the Pima villages, and on to Tucson and the Rio Grande. This railroad was completed in 1883 and provided east-west travel for people in the southern part of the territories.[29]

A third railroad figured in the development of the region. Despite the so-called Treaty of Boston, in which the Rio Grande Western Railroad agreed to stay out of Santa Fe, the Colorado-based company built a branch line from Alamosa to Antonito, CO. From there the line dipped down to Chama and Dulce, both in New Mexico, and then on to Durango in southwestern Colorado. It was completed in 1881. The Denver and Rio Grande Western (D&RG) then extended a second branch from Antonito south to Espanola. In 1886 it connected to the Santa Fe by a short line called the Texas, Santa Fe, and Northern. The D&RG in turn bought this line in 1895 to give the "Rebel of the Rockies" a direct link to Santa Fe. All of these lines were narrow-gauge roads and thus did not permit interchange with the AT&SF. But they did provide access to the mines and forests north of Santa Fe and routed the traffic northward to Denver.[30]

Santa Fe Creates Second Route to Pacific

The Santa Fe also built a line south from Isleta to Deming (on the Southern Pacific Railroad) and, under the name of the Sonora Railway, it built from Guaymas, Mexico, on the Gulf of California north to Nogales, Arizona Territory. Then by securing a lease for the use of the Southern Pacific tracks from Deming to Benson and building a short line to the border, the Santa Fe had created another transcontinental route to the Pacific and a possible link with the China trade. However, the route was hardly profitable and its chief value was as a tactical threat for William B. Strong, President of the Santa Fe, to hold over the head of Collis Huntington, President of the Southern Pacific. Eventually, the Santa Fe traded the line from Benson to Guaymas to the Southern Pacific in return for trackage west of Needles in California.[31]

Lumbering Opportunities

With the completion of this major railroad net in Arizona and New Mexico territories, many entrepreneurs became interested in the commercial lumbering opportunities of the region and hastened to plan operations to harvest the virgin pine and Douglas-fir forests on the mountain slopes. Before this time, logging and sawmilling had been pursued only on a modest scale largely for local needs. Sash or Muley mills run by water power or steam had operated in both territories since the 1860s. The reported production in 1869 was only 8 million board feet for the entire Southwest. Ten years later, reported production was about 22 million, divided equally between the

two territories. At this time some 13 sawmills were in operation and the entire cut as reported consisted of ponderosa pine.[32]

As the Santa Fe Railroad began operations in New Mexico, the demand for timbers, ties, and other forest products rose sharply. To meet these needs new mills appeared along the route and existing mills changed their cutting schedules to accommodate the railroad. A group of Mormons, members of the Church of Latter Day Saints, brought a complete sawmill (probably a steam-powered small circular saw) from Utah in 1878 and set it up near Flagstaff. Three years later another group of Mormons were operating a sawmill at Mt. Graham. About the same time (1881) Chicago lumberman Edward E. Ayer erected a larger mill at Flagstaff and purchased timber rights (stumpage) on some 77 sections of land from the A&P Railroad. In 1887 he sold both mill and stumpage rights to the Arizona Lumber Company, which expanded the operation and built a logging railroad to harvest the timber both south of Flagstaff in the Coconino region and north in the Kaibab Plateau. Other major lumber companies in the Flagstaff region included the Saginaw and Manistee Lumber Co. from Michigan, the William M. Cady Lumber Co. from Louisiana, and the Southwest Forest Industries. All of these companies built and operated steam-powered sawmills and logging railroads that climbed to the pine stands of the high Colorado plateau and cut choice timber purchased from the A&P land grant. They shipped the finished products via the AT&SF to markets in California or the Plains states.[33]

Zuni Mountain Railroad

Farther east, the Mitchell Brothers, loggers from Michigan, bought timber rights on 300,000 acres of land in the Zuni Mountains in 1880 from the A&P Railroad. The company built a logging road into the mountains, later called the Zuni Mountain Railroad, and brought out logs to its mill at Mitchell (now Thoreau) on the transcontinental mainline. Eventually this logging railroad had 55 miles of track and spurs covering much of the Zuni Mountain area. Other companies that either took over or shared in this operation included the A.B. McGaffey Co. from Vermont, the McKinley Lumber Co., the George E. Breece Lumber Co. from West Virginia, and the American Lumber Co. Experienced lumbermen logged the region for four decades, getting out the choice trees for timbers, ties, and general building purposes. The Mitchell mill was moved to Albuquerque and enlarged and modernized. The entire operation was closely tied to the A&P Railroad and its forested land grant.[34]

The construction of the narrow-gauge D&RG Railroad in northern New Mexico opened up the fine stands of ponderosa pine in the mountains north of Santa Fe. In 1888, A.T. Sullenberger built a steam-powered mill west of Aztec that was linked with the D&RG mainline by a 6-mile spur. Another spur ran 3 miles south from Chama to Laws Mill. The D&RG extended this line to the Brazos River in 1892 to serve a new mill of the Biggs Lumber Co. Later this road was built to Tierra Amarilla and operated under the name of the Tierra Amarilla Southern Railroad, serving a number of mills in the region, laying down spur track where new operations demanded and taking up track when logging had been completed. These mills featured circular saws that wasted up to a half inch of kerf with each pass of the log through the saw. But the high mountain stands of ponderosa pine, Douglas-fir, and spruce offered fine timber in a seemingly inexhaustible supply. Lumbermen gave little thought to questions of conservation, selective cutting, reforestation—or ownership.[35]

After the Tierra Amarilla region had been cut out, the Biggs mill closed down and the tracks were moved in 1903 to Lumberton on the main line of the D&RG branch to Durango. Here the

Burns/Biggs Lumber Co. built a new mill and extended spur line tracks south to Elvado and Gallina. Burns/Biggs, or its successor, the New Mexico Lumber Co., was alternately laying down and taking up tracks, as stands in the high mountain valleys were cut out, for some 20 years. By the time operations ceased in 1924 the company had laid a total of more than 53 miles of spur tracks in the mountains. Another company, the Pagosa Lumber Co., built a mill at Dulce in 1916 and logged in the same general region as the Burns/Biggs Lumber Co. Its shortline railroad, which extended some 20 miles south, operated under the name of the Rio Grande and Pagosa Springs Railroad.[36]

East of the Chama area, the D&RG built a narrow-gauge branch line south from Antonito, CO, to Espanola that eventually connected with a shortline to Santa Fe. This opened up a new area for logging opportunities. A number of mills sprang up with spur lines providing the motive power for both the logs to the mill and the finished lumber from the mill to the D&RG mainline. The largest operation in this region was the Hallack and Howard Lumber Co., run by two sets of brothers who had engaged in the lumber business in Colorado before moving to New Mexico. They built a large mill at La Madera in 1914 and logged under contract from the Federal forests. They cut out and moved to Idaho in 1926, and the tracks were taken up.[37]

Vermonter A.B. McGaffey organized the Santa Barbara Tie and Pole Co. in 1907 to cut ties and timbers for the Santa Fe Railway. After cutting the timbers in the Santa Barbara grant about 40 miles north of Santa Fe, McGaffey hauled the logs to his mill and in true New England fashion floated the cut ties down the Rio Grande to Boom and then hauled them by rail to the AT&SF tie-treating plant in Albuquerque. In another Santa Fe-related venture, the White Pine Lumber Co. built a branch line north from Bernalillo to San Ysidro and Jemez. This enabled the company to lay down spurs and log the mountain canyons near the present site of Los Alamos. This was a very expensive operation, and the White Pine Lumber Co. went bankrupt during the Great Depression.[38]

El Paso & Northeastern

One of the most impressive lumbering enterprises in the Southwest developed in the Sacramento Mountains in southern New Mexico. To open up this region for timber as well as minerals, Charles B. Eddy and a group of Eastern capitalists organized and built the El Paso and Northeastern Railway (EP&NE) in 1896 to run from the Southern Pacific junction at El Paso, TX, north to Alamogordo and on to a meeting with the Chicago, Rock Island, and Pacific Railroad at Santa Rosa. This line, nominally independent, always had strong ties with the Southern Pacific, which in 1924 took over the EP&NE.[39]

At Alamogordo the same group built a sawmill, bought land and timber, and organized the Alamogordo and Sacramento Mountain Railway (A&SM) to get out the timber to the east. The resulting “cloud-climbing railroad” reached the settlements of Toboggan, Cloudcroft, and Russia by 1903 and laid out a series of logging spurs to reach timber in the high mountain canyons. By a series of spectacular “S” curves, switchbacks, snake-like trestles, and severe 5 to 6 percent grades, small-geared Shay locomotives fought to gain the necessary altitude and bring the logs from the high valleys to the mainline of the A&SM where they could be hauled to the mill at Alamogordo. Though the A&SM run was only 32 miles, it descended from 7,500 feet at Toboggan to 4,300 feet at Alamogordo. The result was an exciting ride that featured a series of sharp curves, steep grades, and a view more spectacular and severe than that of any other narrow-gauge roads in the Rocky

Mountains. As could be expected, the road later attracted numerous tourists for the passenger runs in the summer months.[40]

Lumber Industry Is Modest

By national standards the lumber industry in Arizona and New Mexico was always a modest enterprise, not competing seriously with the companies that cut yellow pine [shortleaf and longleaf pines] in the Gulf South, [eastern] white pine in the Great Lakes States, or Douglas-fir and redwood on the Pacific Coast. Yet, by the 20th century, lumbering in the Southwest had grown into a substantial business, supplying the region with forest products and supporting an export market to the Plains States to the east and north. Production, mostly of ponderosa pine, grew from 22 million board feet in 1880 to 67 million at the turn of the century and 155 million in 1909. In that year the region reported 99 sawmills in operation. To compare with the leading lumber states in the same year, Washington cut almost 4 billion board feet, Louisiana more than 3.5 billion, and Wisconsin more than 2 billion board feet of lumber.[41]

The fine forests of ponderosa pine, Douglas-fir, and white [limber] pine attracted experienced lumbermen from other forested sections of the United States. Their technical knowledge and expertise, learned in more eastern regions, were not always applicable in the Southwest. They were eager to harvest the virgin stands despite the difficult terrain and the hazards of mountain logging. The stands of spruce were also attractive to paper companies, which had largely exhausted the sources of supply in the Northeast.

But the forests of the Southwest were important for grazing, recreation, watershed protection, erosion control, and wildlife habitat. The forests were important to the Indian tribes who had lived for hundreds of years in the region, and to the quality of life for the growing population of Arizona and New Mexico after statehood. To accommodate these varied interests, the forests and grasslands would need supervision and regulation for the public good. The Southwest is a land which, while rich in renewable resources, including water, grasslands, timber, and wildlife, does not easily regenerate those resources. Managing the land for its most productive use for the permanent good of the people would not be an easy mission.

Social and Cultural Patterns

The legacies of the Spanish, Mexican, Indian, mining, and cattle eras are not just romanticism or myth but social and cultural patterns that are very much alive and real. Since World War II, a new dimension has been superimposed on the older social and economic patterns. Arizona and New Mexico have developed modern urban centers, where high-tech and high-style dwell in strangely comfortable juxtaposition with the pueblo, the herding village, the mining town, and the wilderness. The Southwest is a land of startling contrasts and a very real “living history.”

Blue Lake Returned to Indians

This history occasionally awakens, as it did in 1970 when the Taos Pueblo obtained the return of Blue Lake and its 48,000-acre mountain watershed on the grounds of their being ancient sacred religious territory. And history awakened again, when in the 1960s, Reies Tijerina united heirs of the old Spanish land grants into a near-revolutionary Alianza Federal de Mercedes, which proposed to reestablish the ancient communal rights of the Spanish land grant, which he argued never formed any part of the American public domain, as recognized by the Treaty of Guadalupe-

Hidalgo. He insisted that much of the land claimed as part of the national forests should be returned to their "rightful heirs."[42]

Of the ten million acres of National Forest System lands in New Mexico, one million acres included lands of the Spanish communal grants. According to the Alianza, the establishment of the National Forest System in New Mexico removed millions of acres of land from the village ejido lands. Although access to the land continued, that access for farming, woodgathering, and, most significantly, grazing was controlled by the Forest Service, which granted head permits for grazing rights on a fee basis. The Alianza believed that for grazing, timber rights, and employment, the Forest Service gave preference to the Anglo-American businessmen-farmers over small, poor Indo-Hispanic farmers. Awakening old dreams and traditions, the Alianza in the 1960s cast the Forest Service in the role of an authoritarian usurper of the rights of the people.[43]

Trespass Was Common

It was no coincidence that "trespass" was a common affliction in the national forests, that woodgatherers ignored prohibitions, and that sheep herders and cattlemen in many cases underestimated the number of cattle in their herds and overestimated the size of the territory for which they held grazing permits from the Forest Service. The Indians, Spanish Americans, miners, homesteaders, and in some cases the general public truly believed that the lands of the national forests belonged to them. Their history said so. And in a way, so did the American law creating those forests. The problem was how to manage those forests for the best and most permanent use of all the people. It was not an easy assignment, especially given the cultural history of the region, the attitude of the people, and the physical characteristics of the forests. Yet because of that same unique history and culture, people in the Southwest better comprehended the concept of common use of the forest resources than did the American public elsewhere in the United States.

The Southwest Is Unique

The Southwest and the work of the Forest Service in Arizona and New Mexico are unique because of the special heritage of the Southwest. When asked to describe or explain those things that made the Southwestern Region unique, a number of retired foresters who had served there much of their lives and careers identified what they perceived to be the special characteristics of the region.

Dean Cutler, who served as Forest Supervisor in the region, came to the Southwest in 1933 to work in the Coconino as a CCC camp supervisor. Cutler believes that the Spanish land grant, the distinct ethnic groups, and the low average rainfall are controlling factors in making the Southwest a unique region. Rainfall and the waterways historically determine occupations and population dispersion.[44] In the Southwest, unlike most other parts of the country, the arid conditions mean that regeneration of forests and grasslands takes longer, and the ecosystem is simply more fragile.

In similar fashion, but with a slightly different perception, Robert Courtney stressed water usage as the major element in determining the character of the Southwest. Courtney came to Arizona as a CCC camp foreman in 1933 and eventually served as forest supervisor of the Carson and Tonto National Forests. He believes that in the national forests, and throughout the Southwest, keeping the soil in place is essential to assuring adequate water supplies and usage. Courtney also points out that the region has the largest unbroken stand of ponderosa pine in the United States, another unique feature of the Southwest.[45]

Walter L. Graves, who served as supervisor and assistant regional forester, summarizes his view that rainfall and water usage are the critical elements in defining the character of the Southwest by explaining simply, "Here, a scar in the land lasts forever."[46]

Richard S. Johnson, a forest supervisor born in Las Vegas, NM, received his training in animal husbandry. He joined the Forest Service in 1937 and spent many of his years conducting range surveys and working with the cattleherders and sheepherders in the forest. Johnson believed that the special grazing system and the cattle and sheep in industries placed an indelible stamp on Arizona and New Mexico that existed nowhere else.[47] Open range and yearlong grazing, as well as the romantic imprint of the cowboy, are a part of the heritage of the Southwest.

William D. Hurst came from southern Utah and spent much of his forestry career after 1937 in Region 2 and Region 4, Colorado and Utah. Hurst is the son and the grandson of foresters. His grandfather worked under Gifford Pinchot, and his father was a ranger in the Dixie Forest. Hurst arrived in the Southwest in February 1966 as regional forester and has since become a knowledgeable and astute historian of the Southwest. In addition to the Anglo-Indian-Spanish heritage, the critical nature of water to the region, and the grazing/cattle/sheep culture, Hurst suggests other special elements in the Southwestern composite. For one thing, he noted, there are more rich archeological sites and treasures in the Southwest than anywhere else in America. That in itself is a testament of the special cultural heritage of the region. Logging by railroad was a unique achievement, Hurst said, especially in the Coconino, Lincoln, and Zuni forests. Not just water problems, but accomplishments in research on water and water management are marks of unusual distinction, he added. The wildlife and the management of that wildlife, as exemplified by the landmark decision on the Kaibab deer herd, are exceptional features of the Southwest.[48]

Thus, the Southwest has a rich and unique cultural heritage. It is a region where, perhaps more than elsewhere, the natural conditions continue to shape the human condition. Southwesterners are tied to the land. "From the top of the mountain to the last irrigated acre, people are affected by what happens on all the land," explained Otto Lindh.[49] Despite the great diversity of peoples, the tri-cultural ethnic base, the vast climatic changes compressed in relatively short distances, and the other unique aspects of the region, all people and people of all times have shared a common Southwestern heritage—that it is a great land of little water. Management of the forests, of one-eighth of the total land area, where any decision affected the lives and property of most people in the region, would be a difficult assignment.

Although the General Land Law Revision Act of 1891 allowed for the creation of forest reserves, it was not until the approval of the Transfer Act of 1905 that management of the forests and grasslands by the United States Government through the auspices of the Forest Service became a reality. Only after 1908, with the organization of the Southwestern District (Region 3) and the appointment of Arthur C. Ringland as the first district forester, did the Forest Service begin to directly affect life in the Southwest.

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Chapter 4. Establishment of Forest Reserves and Land Status Changes

The General Land Law Revision Act of 1891, commonly called the Creative Act of 1891, provided for the setting aside of forest reserves. The forest reserves, and later the national forests, were proclaimed as soon as they had been surveyed, and the President had become convinced that such action was in the public good. Gifford Pinchot did his share of convincing. Presidential creations came fast and furious in the early days. Twenty-five forest reserves and four national forests were proclaimed in the Southwest Territory from 1892 to 1907 (see table 1).

Table 1. Initial forest reserves and national forests in the Southwest

Name	State	Citation	Date Established	Present National forest
Forest Reserve				
Pecos River	NM	22 stat 998	1/11/1892	Santa Fe
Grand Canyon	AZ	27 stat 1064	2/20/1893	Kaibab & Coconino
Prescott	AZ	30 stat 1771	5/10/1898	Prescott
San Francisco Mtns	AZ	30 stat 1780	8/17/1898	Coconino
Black Mesa	AZ	30 stat 1782	8/17/1896	Coconino & Sitgreaves
Gila River	NM	34 stat 3126	3/2/1899	Gila
Santa Rita	AZ	32 stat 1989	4/11/1902	Coronado
Santa Catalina	AZ	32 stat 2012	7/2/1902	Coronado
Mount Graham	AZ	32 stat 2017	7/22/1902	Coronado
Lincoln	NM	32 stat 2018	7/26/1902	Lincoln
Chiricahua	AZ	32 stat 2019	7/30/1902	Coronado
Pinal Mountains	AZ	34 stat 2991	3/20/1905	Tonto
Tonto	AZ	34 stat 3166	10/3/1905	Tonto
Portales (rev. 1907)	NM	34 stat 3178	10/3/1905	Not NF
Jemez	NM	34 stat 3182	10/12/1905	Santa Fe
Mount Taylor	NM	34 stat 3239	10/5/1906	Cibola
Gallinas	NM	34 stat 3243	11/5/1906	Cibola
Magdalena	NM	34 stat 3245	11/5/1906	Cibola
Peloncillo	NM	34 stat 3248	11/5/1906	Most not NF
San Mateo	NM	34 stat 3249	11/5/1906	Cibola
Baboquivari	AZ	34 stat 3251	11/5/1906	Not NF
Huachuca	AZ	34 stat 3255	11/6/1906	Coronado
Manzano	NM	34 stat 3257	11/6/1906	Cibola
Taos	NM	34 stat 3262	11/7/1906	Carson
Tumacacori	AZ	34 stat 3263	11/7/1906	Coronado
Big Burros	NM	34 stat 3274	2/6/1907	Gila
National Forest				
Guadalupe	NM	35 stat 2124	4/19/1907	Lincoln
Sacramento	NM	35 stat 2127	4/24/1907	Lincoln
Dragoon	AZ	35 stat 2135	5/25/1907	Corondao
Verde	AZ	35 stat 2170	12/30/1907	Tonto, Coconino & Prescott

Source: Establishment and Modification of National Forest Boundaries, A Chronologic Recoil 1891-1985, Lands Staff, USDA Forest Service, Washington, DC (Draft, December 1985).

Gifford Pinchot, in *Breaking New Ground*, refers to the activity of boundary examiners. A.O. Waha, in his memoirs recorded at the request of Gifford Pinchot in 1940, included the following comments on boundary examination in the Southwest:

> 1907 was the year of feverish activity in establishing additional National Forests while President Theodore Roosevelt was still in office and all that was required was a Presidential Proclamation. Fast work was required. Boundary examiners assigned to the southwest, W.H.B. Kent (Whiskey Highball, as we called him) and Stanton G. Smith, got in their "good licks" and it has always been amazing to me how well the boundaries were fixed in view of the extensive character of their examinations.[1]

The forest reserves were usually set aside several years before they were inventoried. Four of the first ten forest reserves proclaimed in the Southwest were inventoried by the USDI Geological Survey under authorization of the Sundry Civil Appropriations Bill, signed by President McKinley on June 4, 1897. The order of these inventories was: the San Francisco Mountains (inventoried in 1901/1902 and published in 1904), the Black Mesa (inventoried in 1902/1903 and published in 1904), the Lincoln (inventoried in 1903/1904 and published in 1904), and the Gila River (inventoried in 1903 and published in 1905). The four publications were works of art, with colorful maps, numerous photographs, and tabulations, and they were printed on fine paper.[2]

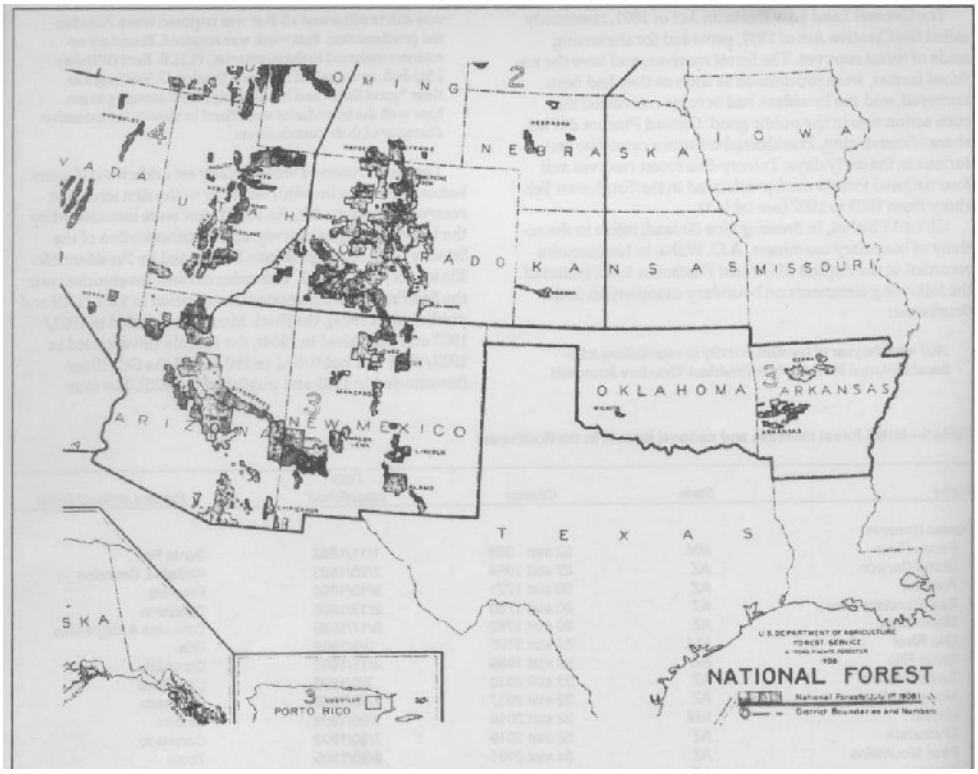

Figure 3. Boundaries of old district 3 (1908).

After the transfer of the forest reserves to the Department of Agriculture and the creation of the Forest Service, the inventories were made by Forest Service personnel. The forest inventories were called reconnaissances. They were not printed, but typewritten, often with pasted-in photographs. The format of each report was quite similar. A section included the history of the survey and an introduction listing the history, location, area, topography, settlements, and

industries within the boundary of the reserve. A forest description followed, including a list of the forest types, and species and stand tables. A chapter on lumbering was followed by one on management. The final section was the timber estimate. Usually there was an appendix.[3]

These reconnaissances became more formal documents by the second decade of the century. The Forest Service established field methods for the reconnaissance studies. A tier of from three to six sections of land, running either north to south or east to west, was assigned to one man for two days' work or to two men for one day's work. The person made one sample per "forty" or quarter quarter-section. All estimates were visual. Essential topographic features were mapped en route. The report included the map, the number of thousand board feet for each species yielding lumber, the stand (in cords) of species not yielding lumber, and the character of the reproduction.[4]

Timber Reconnaissance

In the minutes of an Apache National Forest ranger meeting, held at Springerville, AZ, September 8-14, 1910, Aldo Leopold discussed timber reconnaissance.

> . . . Reconnaissance work consists of making an estimate of all timber and making a map of the country as we go over it to estimate the timber. . . . The method is rough. It consists of going once through each 40-acre subdivision and making an estimate of the timber in that 40 acres. . . . In surveyed ground, the method is to start from one of the section comers. . . . The maps made in the field are of course just a rough sketch. They include the location of all streams, trails, roads, timber lines, fences, etc. . . . and the topography is put in by contours. . . . The surveys in many places are very old, and I think there is a big danger of the corners established becoming obliterated. . . . Area covered by reconnaissance last year was 65,000 acres. Area covered to date, 170,000 acres; 200,000 acres remaining uncovered . . . by the time the work is finished, the cost of the work may be reduced to 1-1/2 cent [per acre]. . . . By the reconnaissance system, a green man can do surprisingly accurate cruising.
>
> The best means of arriving at a reasonably accurate estimate of a forty is to compare it mentally with plots whose stand of timber has been determined by more exact and detailed methods.[5]

During the evening, the day's work was transferred to form 332, the reconnaissance section plat. The form was on fine bond paper so that blueprints could be made. When a township was completed, the forms were sent through the supervisor to the district forester.

Changes in Land Status

Changes of land from or to national forest status have occurred for legal or legislative reasons, and for purposes of more efficient administration. Boundaries of national forests often changed in the early years when surveys were completed. This process was called land classification. During the period 1909-13, for instance, classification work eliminated land in the Rio Grande, Jemez, and Carson National Forests in District 3. National Forest System land in Arizona and New Mexico changed in and out of classification as national forest, national park, national monument, and Indian reservation. There did not seem to be any consistency in how it happened. Highlights of the chronological events in a few national forest land cases show the trend.

In 1909, national forests were enlarged or created by land appropriations from Indian reservations: for instance,]and from the Jicarilla Apache Indian Reservation was added to the Carson National Forest; lands from the Zuni and Navajo Indian Reservations were used to establish the Zuni National Forest; and land from the White Mountain Apache Indian Reservation went to the Apache National Forest. In 1910, presidential proclamations added and eliminated land in many of the national forests in Arizona and New Mexico. In 1912 the lands that were taken from Indian reservations in 1909 were returned.

A limited amount of change in national forest boundaries occurred during 1914-21. The Bandelier National Monument was created from Santa Fe National Forest land in 1916 with the support of the forest supervisor. Land from the Navajo Indian Reservation was added to the Manzano National Forest in 1917. In 1919 the Grand Canyon National Park, comprising 606,720 acres, was carved from the Tusayan National Forest.

Forest Exchange Act

The General Forest Exchange Act (42 Stat. 465), enacted in March 1922, authorized the Forest Service to consolidate forest lands, and authorized exchanges to acquire privately owned forest land lying within the boundaries of national forests for government-owned land or stumpage on any forest in the same state. The Act was amended and extended in 1923, and again in 1926 when it authorized exchange of Arizona timber and land for private lands in San Miguel, Taos, and Mora Counties (the Mora Grant). An amendment in 1928 authorized the use of land and timber to be exchanged for grant lands adjacent to the Carson, Santa Fe, and Manzano Forests in New Mexico. It was also amended in 1929 and 1935. In 1925 another act authorized the acquisition through exchange of parts of the Santa Barbara Grant in New Mexico.

During the 1920s, there were additions and eliminations of land from several of the national forests in the Southwestern District. In 1925 parts of two military reservations were transferred to national forest status. In 1927 lands were exchanged between the Grand Canyon National Park and the Kaibab and Tusayan National Forests. In the 1930s, changes in national forest boundaries continued. The Bandelier National Monument gained over 25,000 acres of land from the Santa Fe National Forest in 1932. In 1935 the Zuni Indian Reservation was awarded land that had been in the Cibola National Forest. In 1937 the Montezuma Castle National Monument received land in a transfer from the Coconino National Forest. The following year, land was transferred from the Coronado National Forest to the Chiricahua National Monument, and administrative control of an area (but not the land) in the Coconino National Forest was conveyed to the Walnut Canyon National Monument. Similarly, many of the areas designated as national parks and monuments were set aside as such but continued to be administered by the Forest Service until the 1930s.

The rate of land transfers slowed during World War II but picked up again at the end of the decade of the 1940s, including more land transferred from the Coconino National Forest to the Montezuma Castle National Monument. The Tonto National Monument and Gila Cliff Dwellings were carved from the Tonto and Gila National Forests.

A highlight of land transactions included a land exchange in Arizona in 1952, when land was taken from the Coronado National Monument. The Luero Mountains in New Mexico were taken from the Gila in July 1953, and the Chupadera Mesa from the Cibola National Forest in June 1954. Region 3 acquired the Rio Grande Grant, the San Diego Grant, the Hondo Tract, and hundreds of acres of State lands in exchanges in the 1950s and 1960s. In April 1968, Mount

Powell and the Shrub Gulch Division were taken from the Cibola National Forest. In 1975 some land was transferred from the Kaibab National Forest to the Havusupai Tribe and some to the Grand Canyon National Park. Thus, national forest boundaries and the supervision of federal lands are in a constant state of change. In the process of change, the size and integrity of the Southwestern forests have generally been enhanced.

In the 1980s the policy has been to "emphasize land exchanges dealing with schools, expanding communities, and those that will result in increased timber production and watershed protection."[6] Of the 12 national forests in the region in 1982, exchanges occurred on nine, purchases occurred on two, and donations of land were made to four, including 100,000 acres to the Carson National Forest (the Villa Videl unit of Vermijo Ranch) by the Pennzoil Corporation in 1982.[7] Land exchanges have kept the Southwestern Region personnel fully occupied since its establishment and have contributed to the need to reorganize the administrative units of the forests.

Ranger Districts Begun

On January 1, 1907, the larger national forests were reorganized by dividing them into north and south divisions. Ranger districts at the time were not well defined and the ranger headquarters was usually where the ranger lived. Not until 1907-09 did the Forest Service begin to build ranger stations and divide the forests into clearly defined ranger districts.[8] Executive orders were issued in July 1908, making important changes in the boundaries of the national forests in New Mexico and Arizona and rearranging the names and the headquarters towns. The explanation was that "the object of the work is to equalize the area of administrative units and to arrange their boundaries in such a manner as to promote the most practical and efficient administration of the Forests.[9] In New Mexico, the following national forests were in place: Alamo, Carson, Datil, Gila, Lincoln, Magdalena, Manzano, and Pecos. In Arizona, the following national forests were in place: Apache, Chiricahua, Coconino, Coronado Crook, Garces, Kaibab, Prescott, Sitgreaves and Tonto.[10] Prior to this time, there had been additional national forests, some quite small.

Another reorganization took place in 1915, consolidating the Jemez and Pecos National Forests into the Santa Fe National Forest. In 1930 there were 14 national forests in the region: the Alamo, Apache, Carson, Coconino, Coronado, Crook, Datil, Gila, Lincoln, Prescott, Santa Fe, Sitgreaves, Tonto, and Tusayan. In 1933, the Kaibab National Forest was transferred from the Intermountain Region to the Southwestern Region and combined with the Tusayan. In 1953 the Crook National Forest was dissolved and its lands were transferred to the Coronado, Tonto, and Gila National Forests.[11]

A major change in 1954 was the transfer of administration of the national grasslands within the Department of Agriculture from the Soil Conservation Service to the Forest Service. Thus, the Region gained 12 national grasslands in New Mexico, Oklahoma, and Texas. Effective July 1, 1958, there were additional changes of divisions and ranger districts from one national forest to another in the region. Land utilization tracts were transferred to the Carson and Santa Fe National Forests in 1962 and given national forest status. The Amarillo Supervisor's Office for the national grasslands was abandoned in the 1970s, consolidating the districts with the Cibola National Forest, thereby leaving the only national forest presence in west Texas at Texline. Two districts were transferred to the Southern Region (region 8).[12]

In 1974 the Apache and Sitgreaves National Forests were merged administratively, to form the Apache-Sitgreaves National Forest. Ten years later a large parcel of land was transferred from the Santa Fe National Forest to the Cochiti Indian Reservation. In 1986, there were 12 national forests in the region: the Apache, Carson, Cibola, Coconino, Coronado, Gila, Kaibab, Lincoln, Prescott, Santa Fe, Sitgreaves, and Tonto. "Interchange" proposals presented early in 1985 could result in additional realignments of national forests in the region.[13]

Special Designations of National Forest Land

Although "multiple use" is the overriding concept of management of National Forest System lands, over the years special uses have proliferated. Quite often, the special use is for a very limited amount of land but requires considerable time to process and administer. Typical early uses included "pastures to be used in connection with homesteads and ranching units, stockmen's cabins used in connection with grazing permits, irrigation ditches, reservoirs, telephone lines, power lines, summer homes, and so forth." Recent visitors to the national forests in Arizona and New Mexico see the tops of peaks being used as electronic transmission sites, an important but not esthetically pleasing use of the land.[14]

Wilderness

Significant special designations for one of the multiple uses, often limiting or prohibiting one or more of the other multiple uses, have taken place in the region as well. "Wilderness" was one of these. The first wilderness area on any national forest in the nation was designated in 1924 on the Gila National Forest, at the urging of Aldo Leopold.[15] By 1945, wilderness designations had been expanded to the following: Mazatzal, Tonto National Forest (established 1933, approved 1940); Superstition, Tonto National Forest (established 1939, approved 1940); and Gila, Gila National Forest, designated in 1924 (established 1933, approved 1935). In addition, by 1957, there had been established three wild areas in Arizona and two in New Mexico, each under 5,000 acres. Here logging was discouraged and range use was continued on some and changed to a more conservative posture on others. Also, six primitive areas, two in New Mexico and four in Arizona, were established during 1932-35.[16]

By 1983 all these areas except the Blue Range Primitive Area had been listed as "Wilderness System"; there were 10 in Arizona (552,784 acres) and 17 in New Mexico (1,410,690 acres). In addition, there are designated "wild and scenic rivers" on the national forests in the Southwestern Region. The Chama River Canyon in New Mexico has already been set aside. During 1983 the Forest Service completed studies of portions of three rivers in Arizona, the Verde, Salt, and San Francisco. The only river designated as wild and scenic in New Mexico is the section of the Rio Grande that passes through and is adjacent to the Carson National Forest.[17]

Wildlife Refuges

Wildlife refuges were designated as portions of national forests where hunting is prohibited. The most famous such refuge in the region was the Grand Canyon Game Preserve, set aside in 1906 by President Theodore Roosevelt. It occupied most of the North Kaibab. Hunting was again permitted after severe habitat damage occurred when the number of animals increased drastically. In addition, several experimental forests have been established for forestry research. The Fort Valley Experimental Forest established on the Coconino National Forest in 1908 was the first in

the United States. Natural areas devoted to scientific research also were established, including the Santa Catalina on the Coronado in 1927 and the West Fork of Oak Creek and San Francisco Peaks on the Coconino, two on the Coronado National Forest, and one on the Santa Fe National Forest in the 1930s. Another, the Gus Pearson Natural Area within the Fort Valley Experimental Forest on the Coconino, was established in the 1950s. Two experimental ranges, independent of any national forest, the Santa Rita in Arizona and the Jornada in New Mexico, have been functioning for many years. The C. Hart Merriam Scenic Area, the first scenic area in the Southwestern Region, was designated on the Coconino National Forest in 1968. The University of New Mexico has maintained a research area of 10,000 acres on the Santa Fe National Forest since 1930.[18] Special uses, of course, limit the Forest Service's practice of multiple use to some extent.

Keeping Track of National Forest Land and Boundaries

Two primary concerns relating to lands have plagued National Forest System administrators in the Southwest: (1) determining and maintaining the legal boundaries of the national forests, and (2) attempting to consolidate the lands into more manageable complete blocks by land exchange or purchase. In the early years, many changes in national forest boundaries occurred as inaccurate land surveys and nebulous descriptions of Mexican and Spanish land grants were cleared up. The national forests in the Southwest have dropped and added lands on a more or less regular basis during the decades. Because of laws and special regulations, arrangements for exchange or purchase of land are quite complicated.[19]

Fortunately, the Southwestern Region had people in charge of lands who were talented and dedicated to their task. As a result, by June 30, 1969, 520 land exchange cases had been processed in the region, "by which the United States has acquired 1,293,109 acres and granted in return 831,219 acres of land and 450,000 bd. ft. of timber." Some of the individuals responsible were Zane Smith (whose father was a ranger in District 3 and whose son became a regional forester), Dean Cutler, Sim Strickland, and Alan Watkins.[20] There have been others, of course, who worked hard and effectively on this difficult and highly successful program.

Of particular concern was the proper survey of land lines, especially those of the Spanish and Mexican land grants. The surveys were often confusing, and "use lines" had changed. A large collection of correspondence and reports is in the files of the Carson National Forest, dating between 1911 and 1921, concerning the Maxwell Grant in northern New Mexico, specifically its western boundary and the eastern boundary of the Carson National Forest. Since the boundary line had never been surveyed, the problem seemed insoluble at that time. It was finally settled in favor of the owners of the neighboring Mora Grant by the United States Supreme Court.

The Forest Service acquired two Spanish grants in northern New Mexico through special legislation passed by Congress in 1922, 1925, and 1928. The prolonged efforts of the Forest Service to obtain the Rancho del Rio Grande Grant in Taos County, New Mexico, comprising 91,813 acres all in one piece, granted in 1795 and patented in 1909, has been less successful. According to Dean Cutler, a deal to acquire the grant in the 1930s and another after World War 11 fell through when small differences in appraised prices and asking prices could not be reconciled. Another try in the 1960s could not be consummated when the new owner of the grant wanted cash rather than other lands and timber. A try at a "third party" to buy the lands and then exchange them also could not be worked out. Finally, the director of the division of lands, Zane Smith, and his staff put together a complicated deal involving 57 landowners, mostly in the area of the Cibola National Forest, to accomplish the exchange of 52,870 acres of the grant (all in one piece) for

National Forest System lands in various parts of New Mexico, including tracts having real estate or development value around communities in the Albuquerque area.[21]

There has been a concentrated effort by Forest Service administrators to consolidate lands within the exterior boundaries of the national forests. The ramifications of exchange have been extensive, especially the legal and appraisal aspects. For instance, detailed calculations are necessary in the appraisal portion of acquisition/exchange in order to satisfy the General Accounting Office that the land being added and the timber or land being relinquished are of equal value. This requires administrators to fix priorities in use of people and funds and in the selection of areas to which available resources for land exchange will be devoted.

One particularly complicated negotiation began at the time of the original proclamation of the forest reserves, as reported by Fred Eldean, a businessman of Scottsdale, AZ, in 1981. This case involved 98,000 acres of land that were proclaimed as part of the old Black Mesa Forest Reserve but that had already been granted to the Atlantic and Pacific Railroad at the time of the proclamation. In 1866 Congress granted a right-of-way through government land to the Atlantic and Pacific Railroad. Since the government had limited funds but large amounts of land, it granted every other section of land for 40 miles on either side of the proposed line of the future railroad. In case there was previous ownership or subsequent Indian and military withdrawals within the strip, the railroad could be awarded “indemnity” lands within an additional 10-mile strip. The land in question lay within the 10-mile strip and was part of one million acres of land that the Atlantic and Pacific Railroad sold to the Aztec Land and Cattle Company at 50 cents per acre. The 98,000 acres, now on the Coconino and Sitgreaves National Forests, were not surveyed and thus could not be selected’. According to Dean Cutler, the tale took a peculiar twist in the late 1930s and in 1940.[22]

> During the late 30s, the land Office finally surveyed the area. Nearly everyone, including the railroad, had forgotten about the 10 mile strip. A lawyer, Cake by name, hadn’t. He had worked for the Department of (the] Interior and remembered the law. He went to the A.T. do S.F. officials and told them about it. He said that he would get the land for them for half of the value involved. The officials formed a company and filed a claim on 98,000 acres of National Forest just before the Act of 1941 was passed which terminated the railroads’ obligation to haul Government freight free or at reduced rates and eliminated their rights to select Federal land as recompense for building primary roads across the Country.[23]

The government claimed that the establishment of the forest reserve nullified this part of the railroad grant but an appeals court ruled its case invalid. In 1952 the U.S. Supreme Court refused to hear an appeal by the government, thus ending the case.

During all the intervening years, these lands had been treated as national forests. Local interest favoring these lands remaining in the national forests was high and a Citizens’ Committee recommended that Congress be asked to appropriate funds to purchase the lands and restore them to the national forests. Senator Hayden proposed such a bill, Senator Goldwater endorsed it, and the Senate approved it, but the House did not, apparently over a difference of $2.00 per acre in appraisals by the Forest Service and the General Accounting Office. Three private companies, Winslow Timber Company, Whiting Bros., and Southwest Lumber Mills, Inc., bought the land and timber from the Aztec Land and Cattle Company for $12.00 per acre, which was considerably more than either earlier federal appraisal. Before negotiations to purchase the land from the timber

companies could be finalized, a California syndicate wanted to buy the 87,000 acres owned by Southwest Forest Industries (the new name of Southwest Lumber Mills, Inc.) for resale as small parcels. Finally, in a series of complicated deals, Eldean purchased the land and traded it to the Forest Service for other lands near Flagstaff and "peripheral areas to Scottsdale and Phoenix."[24] By 1981, some 65,000 acres had been exchanged. In summing up this case, Eldean said:

> Thus a major portion of the U.S. Forest Service's objective in regaining the lands lost by court decision has now been regained. The basic integrity of the Forest has been preserved. The public good has been served. Private enterprise rendered a public service. The National Wildlife Federation presented a Conservation Organization award in the form of a statuette of a bighorn sheep to Page Land & Cattle Company.[25]

The difficult nature of land exchanges is expressed well by Dean Cutler, who wrote, "In lands work, we had many disappointments and I never celebrated until the deeds were all signed, title approved, and recorded. If the deal fell through, well, I had given it my best shot. Forget it and go on to the next case."[26]

Transfers of land from national forests, even for public purposes, have been viewed as disappointments by land administrators in the Southwestern Region. They view the transfer of public lands, long available for general public use and enjoyment, to exclusive use of a certain segment of the population, without offsetting recompense to the public, as contrary to the general public interest. This was the basic question in the transfer of two areas from the Carson National Forest to the Taos Indians, the Blue Lake area during the Kennedy administration, and the Rio Pueblo Drainage during the Nixon administration.[27] This transfer activity set a national precedent for interchange.

In 1985 came the proposed "interchange" between the Forest Service and the Bureau of Land Management, whereby western public lands administered by these agencies would be re-zoned for exclusive management by one of them, in order to effect cost-savings. However, the manner of disclosure-announcement by the Secretaries of Agriculture and the Interior only after the plan was finalized-was a shock to the constituents of each agency. Acceptance of the plan and its effects on the national forests in the Southwest are unknown at this time.

Control of Land Use through Control of Resources on the National Forests

The national forests have held a moderate proportion of the land and a major proportion of the non-agricultural renewable resources of the Southwest since their formation. The national forests in the Southwest affect the entire region, particularly relating to grazing, timber production, mining, recreation, and water resources. Eighty-five percent of land in Arizona and 94 percent of land in New Mexico were deemed suitable for livestock in 1945. In 1983 the National Forest System provided 25 percent of the rangeland grazing in Arizona and 9 percent in New Mexico. However, the influence of the national forests on the cattle industry is far greater than the acreage under national forest control. Since the National Forest System provides much of the summer range and some year-round grazing, regional administrators effectively determine the profitability of livestock industry operations in the Southwest.[28]

The Forest Service strongly influences timber management and timber harvests in the Southwest. In 1945, national forests in Arizona contained 70 percent of the sawtimber, 36 percent of the

cordwood, and 65 percent of the timber land in the State. In the same year in New Mexico, 65 percent of the sawtimber, 40 percent of the cordwood, and 67 percent of the timber land in the State was inside the boundaries of the national forests. Two-thirds of the merchantable timber in Arizona and half of the merchantable timber in New Mexico are today within the national forests.[29] Recreation has been one of the most rapidly growing uses of the national forests.

In 1945 recreational use of the national forests was low, nearly 600,000 visitor-days in Arizona and over 300,000 in New Mexico. By 1983 recreation use had increased drastically to over 15 million visitor-days in Arizona and over 7 million in New Mexico. The National Forest System is the major recreational resource in the Southwest and provides about 40 percent of the total surface water available in the two States.[30]

National forests tend to dominate many aspects of life in Arizona and New Mexico. Considerable influence on the quality of life is exerted through the public ownership and planned management of National Forest System lands. How Forest Service personnel in charge of land and resources handle the ever-increasing—often conflicting—demands for uses, the utilization of timber, forage, and water, mineral and recreational resources, and the always important conservation of watersheds and the basic soil resources, in large measure, determines the contribution of national forests to citizens of the Southwest and of the Nation.

Reference Notes

[1] Edwin A. Tucker unpublished manuscript, Region 3, Albuquerque, NM, p.147.

[2] John B. Leiberg, Theodore F. Rixon, and Arthur Dodwell, *Forest Conditions in the San Francisco Mountains Forest Reserve, Arizona*, Prof. Pap. 22 (Series H, Forestry 7) (Washington, DC: USDI Geological Survey, 1904), 95 pp.; F.G. Plummer, *Forest Conditions in the Black Mesa Forest Reserve*, Arizona, Prof. Pap. 23 (Series H, Forestry 8) (Washington, DC: USDI Geological Survey, 1904), 62 pp.; F.G. Plummer and M.G. Gowsell, *Forest Conditions in the Lincoln Forest Reserve, New Mexico*, Prof. Pap. 33, (Series H, Forestry 11) (Washington, DC: USDI Geological Survey, 1904), 47 pp.; T.F. Rixon, *Forest Conditions in the Gila River Forest Reserve, New Mexico*, Prof. Pap. 39 (Series H, Forestry 13) (Washington, DC: USDI Geological Survey, 1905), 89 pp.

[3] Another source lists streams, dry runs, and ridges as well as areas and forest types

[4] Tucker manuscript, pp. 509-511.

[5] "Outline of Field Methods Used in Reconnaissance Studies," File Prescott-Recon-Studies. USDA, Forest Service, Southwestern Region, Prescott National Forest, p. 2.

[6] *Facts About the National Forest System in the Southwest* (Albuquerque, NM: USDA, Forest Service, Southwestern Region, 1983), p. 3.

[7] *Ibid*., p. 3.

[8] Tucker manuscript, p.199.

[9] *Ibid*., p.117.

[10] See Table 1.

[11] See Table 3.

[12] William D. Hurst, Bosque Farms, NM, letter to Henry C. Dethloff, College Station, TX, January 2, 1986

[13] They are still referred to as being separate forests in literature published by the Southwestern Region; i.e., "The Apache-Sitgreaves National Forests are located in the White Mountains of east-central Arizona." *Facts About the National Forest System in the Southwest* (1983), p.18.

[14] Edwin A. Tucker and George Fitzpatrick, *Men Who Matched the Mountains*: *The Forest Service in the Southwest (*Washington, DC: USDA Forest Service, 1973), p. 242. A reviewer noted that most ditches predated the establishment of national forests and were seldom permitted after the Forest Service assumed control. Another reviewer added that, in addition to telephone lines and power lines, rights-of-way were granted for roads and pipe lines. Later uses include ski areas

[15] The Forest Service has had three types of areas where solitude was the primary activity: primitive, wild, and wilderness. An explanation of these designations has been made by C. Frank Brockman. "The difference between a wilderness and a wild area in the national forests is size. Wilderness areas must contain more than 100,000 acres, wild areas are between 5,000 and 100,000 acres. In a number of USDA Forest Service regions an original classification of primitive area still applies to certain lands although the authority by which such areas were designated (Regulation Ir20) has been rescinded by the Secretary of Agriculture and replaced by the more recent classifications of wilderness area (Regulation U-1) and wild area (Regulation U-2). Primitive areas established and still in existence under the old regulation retain their status until revoked by the Chief Forester." C. Frank Brockman, *Recreational Use of Wild Lands* (New York: McGraw-Hill, 1959), pp. 166-167.

[16] Samuel Trask Dana and Sally K. Fairfax, *Forest and Range Policy* (New York: McGraw-Hi11,1980), p. 382.

[17] *Facts, National Forests of Arizona and New Mexico* (1958), p.10. Tracking whether an area was wilderness, wild area, or primitive area is difficult; the regional "facts" publication in 1945 (p. 39) lists these differently than the 1958 edition. On the renaming of areas set aside, as alluded to in the previous footnote, William D. Hurst wrote this: "It should be noted that the Blue Range Primitive Area which was established early in the Wilderness and Primitive Area designation, was not made a Wilderness with the remainder of the Primitive Area units in New Mexico and Arizona. For political reasons it remains a Primitive Area." William D. Hurst, Bosque Farms, NM, letter to H.C. Dethloff, November 14, 1985, p.1.

[18] *Ibid.*

[19] Frankie McCarty, *Land Grant Problems in New Mexico* (Albuquerque, NM: n.p.1969), reprinted from *Albuquerque Journal*, September 28-October 10, 1969, p.1.

[20] Tucker and Fitzpatrick, *Men Who Matched the Mountains*, p. 242.

[21] *Ibid*., pp. 241-242. According to Rowena Martinez, ed., *Land Grants in Taos Valley* (reprinted in part from Publ. No. 2, Taos County Historical Society, 1968),p. 6.

[22] Dean A. Cutler, letter to H.C. Dethloff and R.D. Baker, May 16,1985, p.1.

[23] *Ibid.*

[24] Fred Eldean, "The Case of the 98,000 Acres," speech to a historical group at the Corral of Scottsdale, Arizona, March 25, 1981, p.13. [In files of Coconino National Forest.]

[25] *Ibid*., p.14.

[26] Dean A. Cutler, letter to H.C. Dethloff and R.D. Baker, May 16,1985, p.1.

[27] *Ibid*., pp. 1-2.

[28] USDA Forest Service, *An Assessment of the Forest and Range Land Situation in the United States*, For. Res. Rep. 22 (Washington, DC: USDA Forest Service, 1981), pp. 1-352; *Facts About the National Forest System in the Southwest* (1983), p.10.

[29] *National Forest Facts, Southwestern Region, Arizona and New Mexico* (Albuquerque, NM, 1945), p.14; USDA Forest Service, *Forest Statistics of the U.S*., 1977 (Washington, DC, 1978), pp. 36, 38.

[30] USDA Forest Service, Southwestern Region, *National Forest Facts*, p. 39; *Facts About the National Forest System*, pp. 28-29.

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.

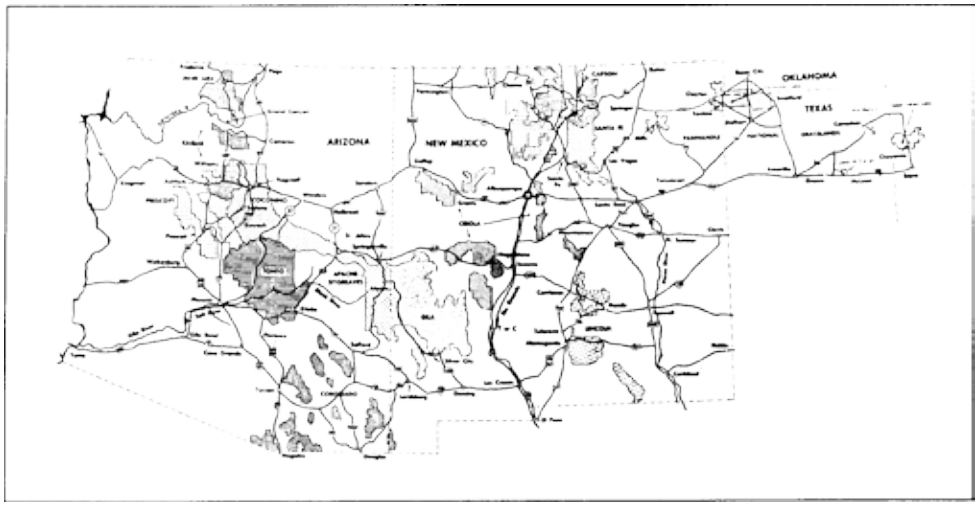

Figure 4. National Forest and Grasslands of the Southwestern Region (region 3).

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 1930s.

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 1960s 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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Chapter 6. The Pioneers-Establishing the Concept of Forestry in the Southwest, 1905–24

Ranching, lumbering, and mining were well established in the Southwest long before the earliest foresters or conservationists made their appearance. Ranchers grazed their cattle and sheep, loggers cut timber and chopped firewood, and prospectors explored for gold, silver, and copper on the public domain, almost as a right with no one disputing their course. The General Land Office of the Department of the Interior, which had jurisdiction over the Federal lands, was primarily interested in selling them. Anyone could buy land, usually at the minimum price of $1.25 per acre, either in large or small quantities. Homestead laws were generous, and settlers could claim 160 acres for each adult member of their family. Various special laws, such as the Timber Culture Act, and even more subterfuges enabled businessmen and corporations to acquire large blocks of land without paying even at the minimum price. Ranchers, accustomed to free use of the range, preferred to retain open access to the resources of the public domain—grass, water, timber, and minerals. They protested bitterly when Federal regulations curbed their frontier attitude.

In like manner, ranchers, loggers, and others also invaded the railroad lands, taking what they wished and giving no thought to the long-range future of the region. The railroads, particularly the Santa Fe and the Southern Pacific, had few men to patrol their lands and found local opinion solidly against them when and if they attempted to prosecute trespassers for misappropriating property. This state of affairs was normal in the territories of Arizona and New Mexico for the last 50 years of the 19th century, from American annexation in 1848 to 1900. During this time the population had increased from an estimated 62,000 inhabitants to about 320,000, and a modern rail system had been built. The Southwest was no longer frontier, and its resources required protection and conservation to prevent their dissipation and exhaustion.

Act of 1891

Recognizing the rapid taking of the public domain by private individuals and the even more rapid depletion of its timber resources, Congress in 1891 passed a General Land Law Revision Act. This gave the President authority to set aside and reserve any part of the public lands, wholly or partly covered with timber, as public reservations. “He shall, by public proclamation, declare the establishment of such reservations and their limits” (26 Stat.1103). Acting on this authority, President Benjamin Harrison established the Pecos River Forest Reserve in 1892 and the next year proclaimed the establishment of the Grand Canyon Forest Reserve. These were the first Federal forest reserves set aside in the Southwest and provided the beginnings of the National Forest System in the region.

During the next ten years, Presidents Cleveland and McKinley set aside additional forest reserves in the Southwest totaling over 10 million acres. The Department of the Interior, which had jurisdiction over forest reserves, appointed John D. Benedict as the first forest superintendent for the Southwestern District in 1897. He was followed by William H. Buntain (1899-1900) and Isaac B. Hanna (1900-05). None of these men, nor the supervisors under them, were trained foresters but rather were political appointees of the Secretary of the Interior. Perhaps typical was Forest Supervisor R.C. McClure who, as described by contemporaries, habitually dressed in a Prince Albert coat, flowing-end black bow tie, gray checked trousers, polished boots, and a broad-

brimmed black felt hat. He was usually found at his office, often with his feet propped on the desk-hardly the image of an active forest supervisor.[1]

Division of Forestry

In the meantime the U.S. Department of Agriculture had created a Division of Forestry (1881) headed by Franklin B. Hough, who was succeeded in 1883 by Nathaniel E. Egleston. In 1886 German-trained forester Bernhard E. Fernow became head. Fernow sought to get authorization for a survey of the forests in the public domain to be followed by Congressional legislation to provide a system to manage and protect the reserves. Cleveland's Secretary of the Interior Hoke Smith appointed the National Academy of Science (NAS) in 1896 to conduct such a survey, which resulted in Cleveland's proclamation in 1897 setting aside an additional 21 million acres of forest reserves. The study led to the Organic Administration Act of 1897 (30 Stat. 34-36), which established standards for the use and protection of the Nation's forest reserves. Cleveland's successor, William McKinley, was friendly to conservationists' goals and issued proclamations setting aside the Prescott, Black Mesa, and Gila River Forest Reserves in the Southwestern District. In 1898 Gifford Pinchot succeeded Fernow as Chief of the Division of Forestry in the U.S. Department of Agriculture.[2]

Pinchot, a prominent leader of the American conservation movement, was the driving force in the development of the Forest Service. It was Pinchot who preached the need for professionally trained foresters to manage the Nation's forest reserves and secured the upgrading in 1901 of the forestry office to the status of bureau.

Pinchot also convinced Theodore Roosevelt that the entire forest reserve system should be transferred to the Bureau of Forestry in the Department of Agriculture. It was irrational, he contended, that the corps of trained foresters should be in the Department of Agriculture but the public lands should remain in the hands of the politically oriented Department of the Interior. After Roosevelt succeeded McKinley as President in September 1901, he accelerated the designation of forest reserves in the Southwest, setting aside Mt. Graham, Santa Rita, Jemez, Mt. Taylor, Lincoln, Magdalena, Apache, and other forest reserves.

Figure 5. Ranger conference camp, Coconino National Forest, about 1910.

The Transfer Act

At Roosevelt's urging, Congress in 1905 passed the act transferring the forest reserves from the Department of the Interior to the Department of Agriculture (33 Stat. 628). The same year the Bureau of Forestry became the Forest Service and Pinchot the Chief Forester. A letter from Secretary of Agriculture James Wilson to Pinchot outlined the President's directives and called for the Forest Service to bear in mind that all land must be devoted to its "most productive use for the permanent good of the whole people," and not for individuals or special interests. The resources should be "wisely used" for the "greatest good of the greatest number" in the long run.[3] Thus began the professional management of the Nation's forests.

Among Pinchot's first appointments to the Southwest was Arthur C. Ringland, who had worked for Pinchot as a student assistant in 1900 and absorbed some of his chief's enthusiasm and ardor for forest conservation. He entered Yale Forestry School in 1903 and graduated with a master's degree in forestry in 1905. Pinchot assigned him to the Lincoln National Forest in New Mexico. The two men frequently consulted concerning forestry needs in the Southwest, and Ringland assisted Pinchot in drafting the details of President Roosevelt's famous "midnight proclamations" (1907), which reserved some 100 million acres of additional forest land in the West, including some in Arizona and New Mexico, before, under duress, Roosevelt signed into law a bill prohibiting further forest reserves in six western States except by an act of Congress.[4]

Ringland Appointed

The next year (1908) Pinchot appointed Ringland to be the district forester for District (later Region) 3, which at that time included not only New Mexico and Arizona but portions of Oklahoma and Arkansas as well. With headquarters in Albuquerque, Ringland assembled an outstanding staff of supervisors and rangers to administer the 18,847,414 acres of national forests for all the people in the southwest (table 3). The forest reserves were renamed national forests in 1907.[5]

It would not be an easy task. Most cattlemen and sheepherders resented any curtailment of their free use of public pasture and doubly resented the fees and restrictions levied by the men of the more efficient Forest Service after 1905. They saw the imposition of fees for grazing in the forest reserves as simply a means "to support a still greater number of 'experts' to travel around the country in Pullman Palace cars—living in opulence and luxury at government expense, while the poor stockman or ranchman is struggling for existence and to make ends meet."[6]

Table 3. Origin of national forests in the Southwest

Dates of establishing proclamations and executive orders	Original and present names
ARIZONA	
Apache-Sitgreaves (other parts are in New Mexico)	
August 17, 1898	Black Mesa Forest Reserve
July 1, 1908	Part of the Black Mesa Forest Reserve became the Apache National Forest

Dates of establishing proclamations and executive orders	Original and present names
Coconino National Forest	
August 17, 1898	San Francisco Mountains Forest Reserve
July 2, 1908	All of the San Francisco Mountains Forest Reserve and parts of the Black Mesa, Tonto, and Grand Canyon Forest Reserves consolidated as the Coconino National Forest
Coronado National Forest (the entire forest in Arizon and New Mexico)	
November 5, 1906	Baboquivari Forest Reserve
November 6, 1906	Huachuca Forest Reserve
November 7, 1906	Tumacacori Forest Reserve
July 2, 1908	Baboquivari, Huachuca, and Tumacacori Forest Reserves consolidated as the Garces National Forest
April 11, 1902	Santa Rita Forest Reserve
July 2, 1902	Santa Catalina Forest Reserve
May 25, 1907	Dragoon National Forest
July 2, 1908	Santa Rita, Santa Catalina, and Dragoon National Forests consolidated as the Coronado National Forest
April 17, 1911	Garces and Coronado National Forests consolidated as the Coronado National Forest
July 30, 1902	Chiricahua Forest Reserve
November 5, 1906	Peloncillo Forest Reserve
July 2, 1908	Chiricahua and Peloncillo Forest Reserves consolidated as the Chiricahua National Forest (portion in New Mexico)
July 6, 1917	Chiricahua and Coronado National Forests consolidated as the Coronado National Forest
Kaibab National Forest	
February 20, 1893	Grand Canyon Forest Reserve
July 2, 1908	All of the San Francisco Mountains and parts of the Black Mesa, Tonto, and Grand Canyon Forest Reserves consolidated as the Coconino National Forest
June 28, 1910	Part of the Coconino National Forest together with certain other land not heretofore reserved became the Tusavan National Forest
May 22, 1908	Dixie National Forest (Arizona)
July 2, 1908	Kaibab National Forest
March 18, 1924	Dixie consolidated with the Kaibab National Forest
August 4, 1934	Tusayan and Kaibab National Forests consolidated as Kaibab National Forest
Prescott National Forest	
May 10, 1898	Prescott Forest Reserve
December 30, 1907	Verde Forest Reserve
July 2, 1908	Prescott and Verde National Forests consolidated as the Prescott National Forest

Dates of establishing proclamations and executive orders	Original and present names
October 22, 1934	249,201 acres transferred from Tusayan to Prescott National Forest
Sitgreaves National Forest	
July 1, 1908	Parts of the Black Mesa and Tonto National Forests consolidated as the Sitgreaves National Forest
Tonto National Forest	
Ocotober 3, 1905	Tonto Forest Reserve
October 22, 1934	Bloody Basin transferred from Prescott to Tonto National Forest (151,285 acres)
NEW MEXICO	
Apache National Forest (other parts are in Arizoina)	
January 23, 1925	A portion of Datil National Forest (originally part of the Magdalena and Gila River Forest Reserves) transferred to Apache National Forest
Carson National Forest	
November 7, 1906	Taos Forest Reserve
July 1, 1908	Taos National Forest and part of Jemez National Forest consolidated as the Carson National Forest
June 16, 1923	63,708 acres in Taos County transferred from Santa Fe National Forest to Carson National Forest
Cibola National Forest	
October 5, 1906	Mt Taylor Forest Reserve
November 5, 1906	San Mateo Forest Reserve, Magdalena Forest Reserve
November 6, 2906	Manzano Forest Reserve
April 16, 1908	Mt Taylor National Forest consolidated with Manzano National Forest
June 18, 1908	Datil National Forest
July 2, 1908	San Mateo National Forest added to Magdalena National Forest
February 23,1909	Magdalena and Dad National Forests consolidated as Datil National Forest
March 2, 1909	Zuni National Forest
September 10, 1914	Zuni National Forest consolidated with Manzano National Forest as Manzano National Forest
December 3, 1931	Name of the Manzano changed to Cibola National Forest and a portion of the Datil transferred to the Cibola
Gila National Forest	
March 2, 1899	Gila River Forest Reserve
February 6, 1907	Big Burros Forest Reserve
June 18, 1908	Big Burros consolidated with Gila National Forest
December 24, 1931	Portion of the Datil transferred to the Gila National Forest
Lincoln National Forest	
July 26, 1902	Lincoln Forest Reserve
November 5, 1906	Gallinas Forest Reserve
April 19, 1907	Guadalupe National Forest
April 24,1907	Sacramento National Forest

Dates of establishing proclamations and executive orders	Original and present names
July 2, 1908	Guadalupe and Sacramento National Forests consolidated as the Alamo National Forest; the Gallinas and Lincoln National Forests consolidated as the Lincoln National Forest
June 6, 1917	Alamo National Forest transferred to Lincoln National Forest (effective July 1)
Santa Fe National Forest	
January 11, 1892	Pecos River Forest Reserve
October 12, 1905	Jemez Forest Reserve
July 1, 1908	Pecos River National Forest changed to Pecos National Forest
July 1, 1915	Jemez and Pecos National Forests consolidated as the Santa Fe National Forest
October 3, 1905	Portales Forest Reserve
March 1907	Portales Forest Reserve restored to the public domain

Source: USDA Forest Service, Division of Engineering, Technical Services Branch, *Establishment and Modification of National Forest Boundaries A Chronological Record, 1891-1959*, 92 pp.

Figure 6. Reconnaissance camp at Three Forks, Kaibab National Forest, 1910.

The facts were, of course, quite different. A ranger's alary was only $75 to $90 per month, out of which he had to buy his uniform, support himself, and maintain a string of at least three horses. The gray uniform with riding breeches, boots, campaign hat, and a double-breasted overcoat was (if bought at all) carefully put away for official occasions. The ranger's daily work outfit consisted of) sombrero, blue shirt, denim jacket, and work pants—"Levi Strausses" as they were called in contrast to the "choke bores" that the ranchers labeled the tailored riding breeches favored by easterners and British visitors.[7] Only slowly did rangers begin to wear Forest Service

uniforms on regular duty. In their personal day-to-day dealing with cattlemen, sheepherders, and loggers, forest rangers preferred not to look too conspicuous. As ranchers came to know the well-qualified and dedicated young rangers, however, public opinion slowly shifted. By the time of World War I (1914), one ranger reported that the people in his area had changed their attitudes from unfriendliness to support and approval of grazing administration and regulation.[8]

The forests, mountains, and plateaus of New Mexico and Arizona in the early 20th century were a horseman's world. A successful ranger had to ride and know how to care for his animals. There were few roads, and most of these were too rough for wagons. The region was too vast for walking, the railroads were several days' distance to the north or south, and there were no automobiles. A good horseman on a good saddle horse was "on top" and in charge of all he surveyed.[9]

Ranger Duties

Ranger duties usually dealt with surveying, grazing leases, timber cutting contracts, fire protection, and inspections. But life was far from dull. Sometimes duties ran from the tragic to the humorous. Two incidents will illustrate the extremes. In 1905 ranger R.L. Neill was helping a local peace officer arrest a Mexican fugitive at Williams. The man suddenly broke away, produced a gun, and began shooting at the officers. Neill drew his own gun and killed the fugitive with one shot. Neill was exonerated. In contrast, ranger Elliot Barker, while on an inspection tour, discovered a pretty 16-year-old girl fishing through the ice, with illegal equipment, out of season, on government property. She could not pay the fine and Barker knew that the judge would not put her in jail, so he continued the case and delayed filing charges on the violation. This called for him to ride out periodically to her father's ranch and within a year Barker married the young woman. As he related, "she has been fishing with me ever since.."[10]

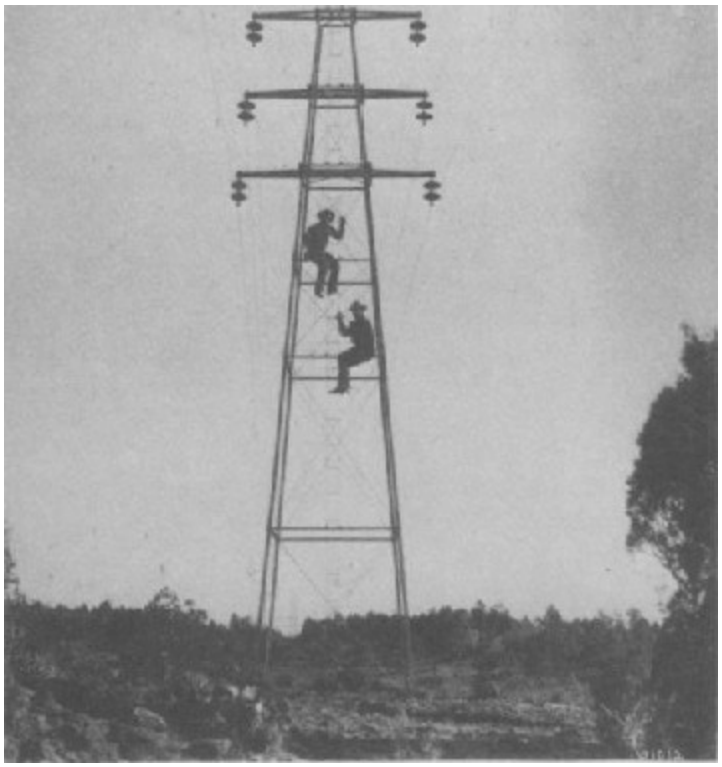

Figure 7. A power line on the Prescott National Forest, about 1910

With the coming of Ringland, there began a systematic appointment of qualified young foresters to key positions in the Southwestern Region. The Yale Forestry School, which was endowed by the Pinchot family and was Ringland's alma mater, was the favored source of new recruits, but graduates of Cornell, Michigan, and Carl Schenck's school at Biltmore, NC, were also appointed (figure 8). As early as 1909, Ringland organized a ranger school at the Fort Valley Experiment Station in Arizona. The program was one month long and was so successful that a second session was held. The first session was run by A.O. Waha, the second by Allan S. Peck. Among the instructors of the Fort Valley Ranger School were some foresters who later became prominent in the profession, including Earle H. Clapp, Bernard Recknagel, and J.H. Allison. Unfortunately, the legal officer of the Department of Agriculture at Washington ruled in 1910 that there was no authority to conduct such a school, so the program was terminated after only one year. This ruling was, apparently, part of the 'legalism' of the Taft administration, which held that an activity was illegal unless it was specifically authorized by Congress. This legalism was, no doubt, related to the Ballinger-Pinchot controversy of 1910, which resulted in Pinchot's ouster as Forest Service Chief."[11]

Ringland set a personal example for the foresters in District (Region) 3. Although small of stature and boyish looking, he enforced service regulations and stood up to wealthy ranchers and politicians alike. He regularly wore the foresters' uniform and insisted that his men do likewise, especially at meetings and formal occasions. To keep better informed about conditions in the several forest areas, he insisted on clear, concise reports sent promptly every month. As he knew that many ranchers did not understand the Forest Service goals, mistrusted all Federal employees, and believed the many rumors that were floating about, he regularly sought means to reassure

them. In 1909 he persuaded Territorial Governor George Curry to invite Pinchot, who was traveling in the West, to come to Santa Fe and address the legislature. The visit was a complete success. Pinchot's crusading enthusiasm for the conservation cause affected and permeated the audience, and his knowledge, integrity, and sense of fair play impressed his listeners. An excerpt from the *Santa Fe New Mexican* of March 15, 1909, bespoke his conquest:

> Mr. Pinchot, when he arose, before he even spoke a word, created a favorable impression that enlisted the sympathy of his audience. Tall and spare, with eyes deep set and thoughtful, hair sprinkled with gray, aquiline nose and clean cut features that betokened a character of force and yet of kindness, he impressed even the casual student of human nature as a man who was bound to make an impress upon whatever cause he would champion. His very mannerisms, such as rapid twitching of his eyelashes and his peculiar motion of the right hand bringing it down two or three times within a few inches of the table and then finally altogether, whenever he emphasized a point, or warmed up to his subject, helped to strengthen the bond of sympathy and interest with his hearers.

Leading Politicians

Not the least of Ringland's problems involved the leading politicians of the territories: Senators Albert B. Fall and Ralph Cameron. Fall, a notorious anti-conservationist, had a ranch that adjoined the Alamo National Forest (which later became part of the Lincoln National Forest). He objected to the regulation of grazing permits in the national forest in the interest of homesteaders and small ranchers and the limitation of his own grazing privileges. He kept up a constant attack against Ringland and the Forest Service and once introduced a bill into the U.S. Senate that would transfer the administration of the forest reserves and the appointment of personnel to the State of New Mexico, which would pay the costs and collect the revenues. This bill, of course, failed to pass. On other occasions he sought to abolish the Forest Service and even the Department of the Interior.[12]

Figure 8. Forest ranger inspecting the range, Cibola National Forest, 1922.

Cameron was a territorial delegate to Congress and then U.S. Senator when Arizona became a State in 1912. just before President Roosevelt declared the Grand Canyon a national monument in 1905, Cameron and his associates filed a series of mining claims along the south rim and down Bright Angel Trail to the bottom of the canyon. The purpose was, of course, not for mining operations but to control the strategic tourist sites as the wonders of the Grand Canyon became known throughout the country and visitors flocked to the region. The Forest Service appointed mining engineer T.T. swift to head a tem to examine Cameron's claims and file a report with the district forester. According to the report, most of the sites showed no valuable minerals at all, and four or five showed only a trace, far less than would justify mining activities. These findings went to Ringland at Albuquerque, who forwarded them and an adverse report to the Forest Service in Washington , which promptly denied Cameron's claims. Cameron was furious but was unable to reverse the decision. Ringland recalled that soon after he met Senator Cameron by chance at a restaurant in Phoenix. The Senator accused Ringland of trying to "ruin him" and smilingly said that he had a notion "to shoot you with a double-barreled shotgun." Although joking about the resort violence, Cameron was dead serious about the rejection his mining claims, and his frustration was apparent.[13]

Timber Inventory

High on the list of projects for the foresters was a systematic inventory of timber stock for the entire region. This directive had come from the Washington headquarters, and Ringland gave it urgency and priority. In a letter of December 1908 to forest supervisors, he stressed "the need to definite data as to the amount and character of timber on the forest of the southwest is imperative [as a basis for a farsighted timber policy]." This was called timber reconnaissance and went on steadily in all of the forests of the region until completed.[14]

It was Ringland's practice to assign new employees to reconnaissance teams to cruise the timber at a given national forest site. In July 1909, Aldo Leopold arrived in Albuquerque fresh from his studies at Yale, where he had earned a master's degree in forestry. His first assignment was to lead a party of six to cruise and map the timber in the Apache National Forest in eastern Arizona. The next year (1910) Yale graduate Raymond E. Marsh also joined the Forest Service and was assigned to the Southwestern Region. He was sent to join Leopold in the Apache National Forest along with other freshmen foresters O.F. Bishop from Yale and R.E. Hopson from Michigan.[15]

The trip was interesting and informative to the three young foresters. They took the Santa Fe train to Holbrook, AZ, where they transferred to a stagecoach (described by Marsh as "something out of the Wild West") bound for Concho. From there they took a lighter one-horse spring wagon to Springerville, arriving the evening of the second day. The ride across the rolling countryside of "magnificent distances" was new and inspiring to Marsh, who had grown up in the East. The next day they boarded a freighter's wagon through the rough country to the reconnaissance camp at the headwaters of the Black River. J. Howard Allison, who had received his master of science from Yale in 1906, was in general charge of timber reconnaissance for the region, and he was on hand to organize and get the Apache party underway. Then he departed for other areas and left the timber cruising team in the hands of Leopold.[16]

As described by Marsh, timber cruising included estimating the volume of timber and describing its character on each 40-acre block. They made sketch maps showing its location, natural features, manmade structures, boundaries, and contours. Each forester carried a Jacob's staff, compass, barometer, and hand counter, as well as his lunch and a canteen. By noting the trees on a sample plot, the forester would estimate the volume of marketable timber on a 40acre tract. Within the sample he counted the number of 16foot logs, the number of logs per 1,000 board feet, and the total board feet. A row of three sections or about 2,000 acres constituted two days' work, and the forester learned by experience to make accurate estimates and appraisals.[17]

In 1911 Aldo Leopold moved to the Carson National Forest as deputy forest supervisor and Marsh soon followed as chief of reconnaissance. The headquarters staff, probably with Leopold's leadership, published a monthly paper called the *Carson Pine Cone* which gave personal news, reports on timber sales and grazing leases, announcements, and on occasion a bit of humor.[18]

Leopold Becomes Supervisor

By March 1912, Leopold became acting supervisor when C.C. Hall left, and before the end of the summer he was formally appointed. Soon afterward, Marsh was promoted to deputy supervisor's desk. The two became a strong team, and the monthly issues of the *Pine Cone* reflected their accomplishments. Marsh paid tribute to Leopold as a hardworking, hard-driving, able, well-liked chief.[19] Leopold was all of these and more. He was the rare intellectual who was also a skilled

outdoorsman, hunter, hiker, and explorer. He was a philosopher who was happiest when he was in the wild back-country. He reveled in his position as forest supervisor, which he considered far and away the best post in the service.[20]

Unfortunately, this association continued only a few months. In April 1913, while trying to settle a range dispute within the national forest, Leopold was caught in a flood and then in a blizzard. He became thoroughly soaked and had to sleep in his wet bedroll. He developed pain and swelling in both knees so severe that he could not ride and could hardly walk. A local doctor diagnosed his illness as rheumatism and prescribed the wrong treatment. Soon his legs were bloated, and he was taken to Santa Fe where a specialist determined that he had acute nephritis.[21]

There followed about 18 months during which Leopold took leave. He spent several months with his family in Iowa and consulted other specialists. Although he retained the title of supervisor, he was unable to return to the Carson National Forest, and Marsh carried on the work and eventually became forest supervisor. In the meantime Leopold read Thoreau, John Burroughs, and other nature writers and began to consider the significance of what he had seen and learned on the Gila River and the upper reaches of the Rio Grande. When he was finally able to return to limited duty in 1915, Ringland brought him to the regional headquarters at Albuquerque and made him acting head of grazing in the office of operations.[22]

Leopold's enforced inactivity gave him time to contemplate the effects of erosion on the fragile, delicately balanced environment of the Southwest, the consequences of the rapidly multiplying deer herds, and the long-range results of the continuing war on predators. Like most young foresters, he had equated a flourishing deer herd with control or even extermination of wolves, mountain lions, and coyotes. He recalled a cruising expedition (probably in 1910 or 1911 in the Apache National Forest) during which he and his companions saw a she-wolf swim across a river and join her cubs on the near side. At once the foresters seized their rifles and pumped lead into the pack until the old wolf was down and the cubs dispersed into the mountain canyons. What happened next was instructive and important to his developing thought.

> We reached the old wolf in time to watch a fierce green fire dying in her eyes. I realized then, and have known ever since, that there was something new to me in those eyes—something known only to her and to the mountain. I was young then, and full of trigger-itch; I thought that because fewer wolves meant more deer, that no wolves would mean hunters' paradise. But after seeing the green fire die, I sensed that neither the wolf nor the mountain agreed with such a view.

Leopold slowly came to the conclusion that while the deer lived in fear of wolves, the mountain lived in fear of its deer, which, when uncontrolled and allowed to multiply without restraints, could destroy a range that might not recover for decades or even centuries.[23]

Too Many Deer

The problem of too many deer was well-illustrated by their spectacular increase in the Kaibab National Forest, north of the Grand Canyon (at this time the Kaibab was not part of the Southwestern Region). There the deer herd rose from 4,000 in 1906 to more than 30,000 by 1924 (later estimates placed the 1924 total at nearer 100,000). Everything was overgrazed, and thousands of deer died of starvation during the winter, including most of the young fawns.[24]

The concept of "thinking like a mountain" intrigued Leopold. The short-range solution would frequently prove disastrous in the long run. Given the fragile balance of the southwestern ecology, Leopold began to realize that decisions made by his generation would greatly affect the options available to the population of the 21st century. He gradually reversed his opinion of wolves and mountain lions. These played their part and were essential to the balance of the southwestern habitat. Control of predators was a reasonable function of conservation, but not campaigns of extirpation. Besides, his great-grandchildren a century hence should not be deprived of seeing these animals.

Wilderness Idea

It was only a step from the idea of preserving the game of the region to the concept of preserving a portion of a national forest as a permanent wilderness. A large area should be left in its wild state, with no paved roads nor human habitations. As early as 1913, Leopold had broached this idea to Elliot Barker and in 1920 made a similar proposal in an article for the *Journal of Forestry*. In 1922, Assistant Regional Forester Leopold, now largely recovered from his near-fatal illness, made an inspection trip to the Gila River headwaters country, near where he had begun his forestry career 13 years before. On his return he proposed to set aside some 500,000 acres of the area to become an official wilderness, without roads and only minimum trails.[25] As one of his colleagues described it:

> A region which contains no permanent inhabitants, possesses no means of mechanical conveyance, and is sufficiently spacious that a person may spend at least a week or two of travel without crossing his own tracks.[26]

Over the opposition of some of his fellow foresters, Leopold persuaded Frank Pooler, then regional forester of the Southwestern Region, to approve the plan. When officially announced in 1924, the Gila Wilderness was the first area formally designated as such and served as a precedent for the creation of other wilderness areas in the West.[27]

Leopold's work to protect the game and preserve the environment had not been easy. Officials in Washington had repeatedly urged him to accept a transfer to an editorial position at the service headquarters, but he refused, preferring to remain in the desert Southwest where he felt he could make a real contribution. Finally, in 1924, Chief Forester Henry S. Graves ordered him to accept the transfer. Leopold responded with a long letter to his friend Ringland, saying that he did not know if he had "twenty days or twenty years" ahead of him but he wanted to accomplish something definite and not end up in a dead end. If he had to choose between a safe job or pursuing his goals, he would leave the Forest Service. Ringland knew his friend and intervened with the Chief. The orders were changed, and Leopold remained in Albuquerque.[28]

Later in 1924, after the Gila Wilderness was established, Leopold accepted a new assignment as associate director of the U.S. Forest Products Laboratory in Madison, WI. Two years later Ray Marsh, then assistant district forester, also left the region. He would eventually rise to assistant chief of the Forest Service. Ringland had departed in 1916 to serve in World War I and carve out a distinguished career in other branches of government. These three, Ringland, Leopold, and Marsh, strongly influenced policies of the region as they related to grazing, fire protection, timber management, and recreation. Of these many uses, grazing dominated the time and attention of foresters in the early years of the Southwest.[29]

Reference Notes

[1] Edwin A. Tucker and George Fitzpatrick, *Men Who Matched the Mountains: The Forest Service in the Southwest* (Washington, DC: USDA Forest Service, 1972), pp. 1-12.
[2] For more on Gifford Pinchot, see his book *Breaking New Ground* (New York: Harcourt, Brace, 1947); Harold T. Pinkett, *Gif ford Pinchot: Private and Public Forester* (Urbana, IL: University of Illinois Press, 1970); Harold K. Steen, *The U.S. Forest Service: A History* (Seattle: University of Washington Press, 1976).
[3] Steen, *U.S. Forest Service*, p. 75; Pinchot, *Breaking New Ground*, pp. 261-262. Pinchot actually wrote the letter for Secretary Wilson's signature.
[4] Steen, *U.S. Forest Service*, p. 84; Pinchot, *Breaking New Ground*, pp. 252-254.
[5] "Ringland, Arthur C. (1882-1981)," *Journal of Forestry* (January 1982). Note: The acreage indicated was achieved by 1920, with minor consolidations and changes between 1908 and 1919.
[6] Edwin A. Tucker, "The Forest Service in the Southwest," unpublished manuscript, pp. 126-127.
[7] *Ibid*, pp. 165-166.
[8] R.R. Hill, "Grazing Administration of the National Forests in Arizona," *American Forestry* 19 (September 1913)-578-585.
[9] Aldo Leopold, *A Sand County Almanac* (New York: Oxford University Press, 1966), pp. 130-137.
[10] Tucker, "The Forest Service in the Southwest," p.128; Elliott Speer Barker, *Beatty's Cabin* (Albuquerque: University of New Mexico Press, 1953), quoted in Tucker and Fitzpatrick, *Men Who Matched the Mountains*, pp. 37-38.
[11] Arthur C. Ringland and Fern Ingersoll, "Pioneering in Southwest Forestry," *Forest History 17* (April 1973): 411.
[12] *Ibid*., pp. 8-9.
[13] *Ibid*., pp. 9-11.
[14] Raymond E. Marsh, 'Timber Cruising on National Forests of the Southwest," *Forest History 10:3* (October 1969).
[15] Susan L. Flader, *Thinking Like a Mountain: Aldo Leopold and the Evolution of an Ecological Attitude Toward Deer, Wolves, and Forests* (Columbia: University of Missouri Press, 1974), pp. 8-9; Marsh, "Timber Cruising," pp. 22-23.
[16] Marsh, "Timber Cruising," pp. 22-23; Allison later became a professor of forestry at the University of Minnesota.
[17] *Ibid*., 24-26; Tucker and Fitzpatrick, *Men Who Matched the Mountains*, pp. 116-120.
[18] *The Carson Pine Cone* (January 1912), p. 5. At this time Pinchot was no longer Chief of the Forest Service, but he enjoyed the humor as much as anyone.
[19] Tucker, 'The Forest Service in the Southwest,' vol. 3, p.1368; *Carson Pine Cone* (March-December 1912); Marsh, 'Timber Cruising,' p. 28.
[20] See Leopold, *A Sand County Almanac*, especially "The Land Ethic,' pp. 237-264; Flader, *Thinking Like a Mountain*, p. 9.
[21] Flader, *Thinking Like a Mountain*, pp. 9-10; Tucker and Fitzpatrick,, *Men Who Matched the Mountains*, pp. 3840.
[22] Flader, *Thinking Like a Mountain*, pp. 9-10; Tucker, 'The Forest Service in the Southwest,' vol. 3, pp. 1341-1343.
[23] Leopold, *A Sand County Almanac*, pp. 137-141.
[24] Flader, *Thinking Like a Mountain*, pp. 84,175-176
[25] Dennis Roth, 'The National Forests and the Campaign for Wilderness Legislation," *Journal of Forest History 28:3* (July 1984):112-125; Leopold, *A Sand County Almanac*, pp. 265-295.
[26] Roderick Nash, "The Strenuous Life of Bob Marshall," *Forest History 10* (October 1966):19-23.
[27] Roth, "The National Forests and the Campaign for Wilderness Legislation," pp. 112-125; Roderick Nash, *Wilderness and the American Mind* (New Haven: Yale University Press, 1973), pp. 187-199.
[28] Flader, *Thinking Like a Mountain*, p.13.
[29] *Ibid*., p.16; Douglas H. Strong, *The Conservationists* (Menlo Park, CA-Addison-Wesley Press, 1971), pp. 139-154.

Chapter 7. The Pooler Era: 1920—45

The years from the end of World War I to the end of World War II saw important changes in the United States, the Southwest, its forests, and the forest products industry there. This period witnessed a post-war slump, an erratic and uneven boom in the 1920s, the Great Depression, another and greater world war, which taxed the Nation's resources to the fullest, and the dawn of the nuclear age. Between 1920 and 1945 six Presidents occupied the White House, and six different chiefs (called "foresters" until 1935) headed the USDA Forest Service. However, in the Southwestern Region during this time of change, one man served as regional forester (district forester until 1930): Frank C.W. Pooler.

Frank Pooler was, in many respects, a survivor. Born in New York City in 1882, he acquired a general education there but without any technical or professional training in forestry. In 1904, at age 22, he came West and took a job as forest ranger in the General Land Office under the Department of the Interior. His first assignment required him to furnish his own horse and equipment and provide his own housing and office—all at a salary of $60 per month.

In 1905 he became supervisor of the Prescott Forest Reserve with headquarters at Prescott, AZ. Later that same year he transferred to the Forest Service when the forest reserves were moved from the Department of the Interior to the Department of Agriculture. As supervisor of the Coconino National Forest in 1908, he oversaw the transfer of smaller forest areas to consolidate the Coconino as a major unit in the National Forest System, with headquarters at Flagstaff. From 1910 to 1919 Pooler served as assistant district forester in charge of lands under Arthur C. Ringland and then Paul G. Redington.

Although not one of "Pinchot's boys" nor a graduate forester, Pooler advanced to district forester in January 1920, a post he was to hold for 25 years. In announcing the appointment, the Washington Office noted that he had "worked his way up through the ranks." His colleagues described him as experienced, friendly, fair, and diplomatic but firm in enforcing Forest Service regulations. During his tenure, Pooler gained recognition as an expert on lands and grazing problems and as a strong conservationist. Apparently a good administrator, he was able to make steady progress in bringing the Southwestern Region up to desired national standards and at the same time maintain an excellent esprit de corps among all ranks of the Forest Service in the region. Thus in a very real sense, this period reflected the goals of Frank Pooler and could be called the 'Pooler Era."[1]

The national forests of the region went through many changes and consolidations during those 25 years. From the welter of forest reserves transferred from the Department of the Interior or later acquired, 12 national forests eventually took shape and have become stabilized: the Apache, Carson, Cibola, Coconino, Coronado, Gila, Kaibab, Lincoln, Prescott, Santa Fe, Sitgreaves, and Tonto National Forests.[2] Collectively, they encompassed more than 22 million acres. The largest of these, the Gila, included some half-million acres of wilderness.

Aldo Leopold, one of the first advocates of extensive wilderness reserves, urged Pooler to set aside a substantial area as wilderness while it still existed. Pooler instructed him to make a personal inspection of the Gila area. From the resulting report, written by Leopold with the assistance of Frederic Winn and Ward Shepard, Pooler officially designated the Gila Wilderness and drafted rules for its use and protection.[3]

Grazing

In most of the Southwestern Region, forest grazing was almost as important as timber and caused as many headaches for the rangers and forest supervisors. The problems centered on overgrazing and overstocking the range and went back to the turn of the century and before, when the public domain was under the control of the General Land Office. Knowing that this problem might prove crucial nationwide and that he would need expert professional help in solving it, Gifford Pinchot persuaded Albert F. Potter, a rancher who had been in the sheep and cattle business in Arizona, to join his newly expanded Forest Service team in Washington in 1905. Potter was given the title of assistant forester for grazing, and he formulated grazing and land policies for the Forest Service. After Pinchot's departure, he continued as associate forester under Henry S. Graves from 1910 to 1920 and did much to instill into Forest Service employees sound principles of grazing regulation.[4]

Most rangers were impatient with controls and hated the paperwork required for grazing permits. From the early settlements there had been range wars between cattlemen and sheepmen, cattlemen and miners, cattlemen and loggers, and, on occasion, cattlemen and the Forest Service. Generally, cattle ranchers hated sheepmen and repeatedly threatened to kill the herders and run the "woolies" over the canyon cliffs. One advertisement for a cowhand in the *Arizona Exchange* illustrated the old attitude: "*Wanted*—A real rough guy—a cow hand who knows cows, not under 35 years of age nor over 50. One who smokes, drinks, swears, tells the truth, and hates sheepherders.[5]

Most ranchers gradually recognized the need for regulations and the limitation of herds on the available pasture. Respect for Potter and fair treatment by the Forest Service encouraged confidence and cooperation. In 1907 the Arizona Cattle Growers Association passed a resolution favoring the Federal regulation policy on the national forests and other public lands.[6] Individual grazing inspectors and forest supervisors often paved the way to better understanding of the necessity of limiting herds and protecting the range.

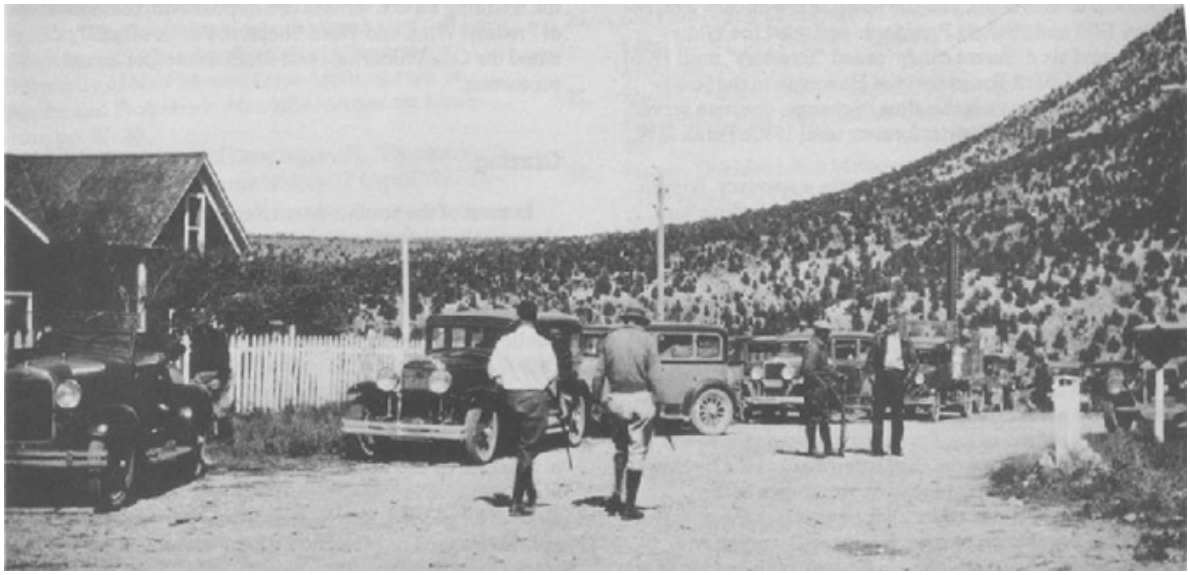

Figure 9. Deer hunters at Ryan Station on opening day in 1929.

One such forester was Paul H. Roberts, who came to the Southwest in 1915 after earning a bachelor of science degree in forestry at the University of Nebraska. He worked on range reconnaissance and, after serving in World War I, returned as grazing inspector for the region. He became supervisor of the Sitgreaves National Forest in 1922, a position he held until 1931. There he divided the available range between cattle and sheep. This proved to work better than having both types on the same range. He followed a policy of fairness and frankness that he credited to John Kerr, his boss when he was grazing inspector in 1918. Kerr laid down only two simple rules for dealing with ranchers:

a. Decide each case on an individual basis; decide what is right and what is wrong. If you can't give him what he wants, tell him so, but in a nice way.
b. Handle everything that comes in and don't have anything waiting in your basket when I come back.[7]

War Puts More Livestock on Forests

The war had caused a rapid increase in livestock as ranchers added to their debts to boost meat production. In cooperation with the war effort, the Forest Service encouraged livestock permittees to put more cattle and sheep on the national forests. This was followed by a fall in prices in 1919 so that ranchers could not sell their animals at a profit. Soon the ranges were overgrazed, and the ranchers were on the verge of bankruptcy. This situation continued during most of the 1920s and resulted in Forest Service personnel having to make temporary concessions and delaying progress toward reducing herds to satisfactory levels on Federal lands.[8]

An interesting and most unusual forester of the same era was Frederic Winn. Born in Madison, WI, of parents who were medical missionaries, Winn studied at Princeton and Rutgers, receiving his bachelor of science degree in 189k). Briefly he became a rancher in Texas and then returned East for further study at Rutgers and the Art Students' League In New York. He became a professional artist and moved to New Mexico where he painted and illustrated western life, He joined the Forest Service in 1907 and served as ranger, assistant supervisor, and supervisor of the Apache, Gila, and finally the Coronado National Forests, where he was in charge from 1925 to 1942. Although not a trained forester, he was a keen observer and learned quickly. When asked why a professional artist would switch to forestry, Winn would reply that he "got tired of painting naked women" Actually, he continued painting as a hobby, and his wife, Ada Pierce Winn, who had been a music student and soloist, regularly enlivened foresters meetings with song. Contemporaries described Winn as tall, spare, and carefully dressed, loyal to the Forest Service, but friendly and diplomatic with the ranchers in his area. He paved the way for harmony between the stockmen and the Forest Service. To many people in southern Arizona, Fred Winn *was* the Forest Service. Col. Bill Greeley and Frank Pooler could not have had a better representative.[9]

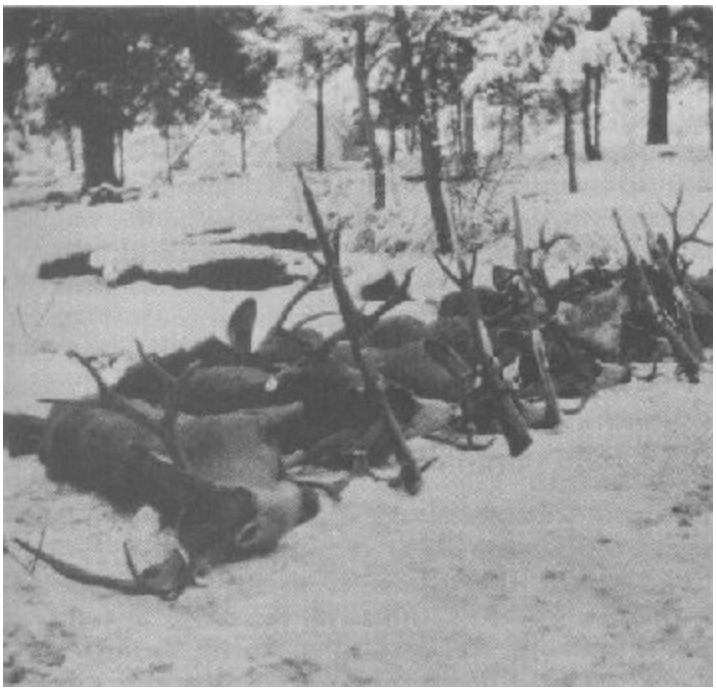

Figure 10. Deer kill on the Kaibab National Forest after overpopulation of herds, early 1930s.

Taylor Grazing Act

A new element entered the grazing picture in 1934 with the passage of the Taylor Grazing Act by Congress. This measure in effect closed the public domain by creating grazing districts on all public lands administered by the Department of the Interior. A division of grazing would administer the Act with the stipulation that 25 percent of grazing fees go to the Federal treasury, 50 percent to the States, and 25 percent to improve the range program.

The Forest Service, which had originally supported a similar measure, opposed the final act as inadequate and without provisions to protect the land against erosion or overgrazing. Nor were there safeguards to prevent the destruction of wildlife. As Arizona and New Mexico each had some 12 million acres of public domain that would be affected by the Taylor Act, the creation of grazing districts under the Department of the Interior would result in two competing jurisdictions, often side by side, with which stockmen would deal. The Forest Service feared, often with good reason that the Department of the Interior would play for the support of cattlemen and sheepmen with lower fees and little concern for the environment. In Washington in 1936, the research branch of the Forest Service produced a massive report, *The Western Range* that set forth the position of the Forest Service and questioned the wisdom of the Taylor Act and its application. In the meantime, the Forest Service continued to administer grazing permits in the national forests in a conservative manner along the principles laid down by Albert Potter, Pinchot, and Greeley. Unfortunately, the issues relating to grazing policy remained unresolved between the two departments and were the cause of much rancor and continued ill-will.[10]

Timber

The southwestern lumber industry expanded at the end of World War I, then suffered a sharp decline during the brief depression of 1920–21. The industry recovered, and through the rest of the decade, mills in the Southwestern Region set new production records, reporting a high of more than 320 million board feet in 1929. The industry was not healthy, however, as prices for ponderosa pine, the principal commercial timber, declined steadily from $37.85 per thousand in 1920 to $24.18 in 1929 (table 4). Also, thanks in part to the excellent interstate connections provided by the two transcontinental railroads, local lumbermen faced ever-increasing competition from California lumber in the urban centers of Albuquerque, Phoenix, and Tucson.[11]

Table 4. Lumber production (thousands of board feet) In Southwestern region (1916-46)

	Production			Average price ponderosa pine per 1,000 bd.ft.
Year	Arizona	New Mexico	Total Region	
1916	98,872	80,406	173,278	$14.65
1920	120,485	109,982	230,477	$37.85
1925	145,609	152,330	297,839	$26.56
1929	174,594	148,287	322,881	$24.18
1930	95,049	142,885	238,382	$24.24
1932	58,162	71,715	129,877	$17.78
1935	100,001	126,394	226,395	$19.99
1940	128,776	112,786	241,562	$24.87
1945	157,984	99,100	257,084	$33.31
1946	240,735	44,214	384,949	--

Source: Henry B. Steer, Lumber Production in the United States, pp. 14-18.

The two old, large, established lumber companies in Arizona, the Arizona Lumber and Timber Company (AL&T) at Flagstaff and the Saginaw and Manistee Lumber Company (Saginaw) at Williams, generally supported Forest Service policies regarding cuffing contracts, grazing permits, and conservation goals. But they disagreed violently with Pooler's policy of open bidding and giving equal consideration to newcomers and small operators. The three Riordan brothers who headed AL&T often spoke for the industry in the Southwest and regularly conferred with the Forest Service on questions of general interest. Dennis M. Riordan, the senior brother, had known and entertained Gifford Pinchot back in 1900 and consequently assumed that he enjoyed a special position with regional forestry officials.[12] As the only two pioneer big mill operators in the region, the owners of AL&T and Saginaw argued that they should have preference in bidding for cutting contracts and stumpage purchases. Indeed, they regarded all new companies as intruders and interlopers.[13]

Such an attitude could only result in added difficulties and headaches for District Forester Pooler. Back in 1919 (when Pooler was still assistant district forester), the Forest Service and the Bureau of Indian Affairs had determined that a large block of mature timber on the Apache Indian Reservation in the White Mountains should be harvested. To justify the construction of a large mill in the area, the Forest Service agreed to include timber located in the Sitgreaves and Apache National Forests in the package presented for bids. The total timber amounted to more than 600 million board feet, much of which was considered of superior quality.[14] To compete for this tract, Flagstaff businessman Thomas E. Pollock and A.B. McGaffey of Albuquerque organized the

Apache Lumber Company (ALC). They successfully won the contract over the protests of Riordan and R.A. Nickerson (Saginaw) who called the new company "unnecessary" and predicted that it "could not succeed."[15]

Pollock constructed a large, electric-powered three-band sawmill capable of producing 175,000 board feet of lumber per day. He also built a company town at Cooley (later renamed McNary) complete with general store, school, hospital, and houses. He arranged with the Santa Fe Railway to build a short-line railroad from Holbrook to the mill at Cooley. All of this plunged Pollock deeply into debt, and the post-war depression wiped him out and the mill closed.

Cady Lumber Company

In 1923, William M. Cady and James C. McNary (both of Louisiana) bought the Apache Lumber Company's assets (known locally as "the big sale") and reorganized the operation as the Cady Lumber Company. McNary purchased additional timber in the Sitgreaves and Coconino National Forests and floated new loans to provide operating capital for expanding production. Despite these efforts the company defaulted in 1930 and the mill again closed.[16]

McNary blamed the Forest Service and the Indian Bureau for his problems. He insisted that declining retail prices would bring reduced stumpage prices. He also argued that much of the timber was overripe and did not produce as much high grade lumber as was predicted. Pooler was much concerned that the White Mountain venture had foundered, but as a question of government policy he would not renegotiate the stumpage contracts. He pointed out that he represented the public and not the lumber business. He believed that competitive bidding was the only fair method of determining value and conducting sales. This system allowed large and small companies to participate in national forest purchases on an equal basis. On the other hand, Mr. Riordan continued to upbraid Pooler for allowing the Apache Lumber Company to exist. He blamed the slump in his company's sales on the competition of the Apache and frequently charged that the "White Mountain outfit" gained accounts by cutrate prices that they could not sustain. In conversations with Pooler and others, he again and again returned to the theme that the established firms (i.e., AL&T and Saginaw) were more dependable and deserved to have the contracts.[17]

The difficulties of the lumber mills of the Southwest during the 1920s were not the result of production problems. New technology and more modem machinery enabled the sawmills to produce more lumber than they could market. In the face of the competition from expanding mills in California and the Pacific Northwest, the operators in the Southwestern Region not only found it difficult to export finished lumber but saw their local markets invaded.[18] This was due, in part, to inequitable freight rates set forth by the Interstate Commerce Commission, but Riordan laid much of the blame on Pooler for his policy of encouraging new companies and giving equal opportunity to small outfits. Nickerson went so far as to charge that the regional forester was conspiring to force Saginaw out of business. Pooler responded that the Forest Service was not in the lumber business and could not guarantee a company a profit. Furthermore, companies that ignored Forest Service regulations concerning seed trees, clear cutting, disposal of tops and branches, and logging camp health standards could ex pert to be penalized, he told them.

In all, Frank Pooler was a staunch defender of Forest Service policies and not overawed by even the most prestigious industrialist. Gradually, Riordan, Nickerson, McNary, and the others came to appreciate his integrity and fair-mindedness. Once they did, relations improved.[19]

The coming of the Great Depression had as bad an effect on the lumber industry in New Mexico and Arizona as it did in other sections of the United States. Mills closed, customers canceled orders, and shipments dropped 75 percent from the 1929 level. In both States, half of the banks closed their doors and the mining industry payroll fell to 11 percent of its pre-depression rate. The AL&T, the oldest and largest company in the region, which had manufactured 38.5 million board feet of lumber in 1929, produced none in 1932 and only 4.4 million board feet in 1933. As T.A. Riordan wrote to Nickerson, "it has been a long hard pull in the lumber game, going on 4 years trying to keep out of the bread lines. And the Lord knows when improvement is going to set in, even with beer and Roosevelt."[20]

The National Industrial Recovery Act

Franklin D. Roosevelt had more plans to aid recovery than merely the legalization of beer and other alcoholic beverages. Soon after his inauguration in March 1933, Congress passed the National Industrial Recovery Act, which set up the National Recovery Administration (NRA). This measure attempted to promote recovery through a program of shorter hours, increased employment, higher wages and prices, fair business practices, and cooperation. Each industry, including the lumber industry, was to draft a code of business practices. Several trade associations (such as the Western Pine Association), the Forest Service, and representatives of the public hammered out a code to be applicable to the different divisions of the lumber industry. In addition to provisions that called for production controls, safety regulations, prohibition of child labor, wage and hour standards, and collective bargaining, the code included an article (X) that committed the lumber industry to conservation, selective cutting, sustained yield, reforestation, and a program to prevent forest fires. In turn the code relaxed antitrust laws that in the past had prevented combinations and uniform pricing.[21]

The Western Pine Association, whose leaders had a role in drafting the code, administered it for the pine industry in the West. The entire Western United States was divided into districts, and District 9 was made up of Arizona, New Mexico, and part of southern Colorado. On the board (officially the Timber Products Association) to administer the code in District 9 were several prominent lumbermen, including Thomas P. Gallagher (New Mexico Land and timber Co.), James McNary (Apache Lumber Co.),J.M. Bedford (Saginaw), and Joseph Dolan (who had recently bought out the Riordan interests in the AL&T). Provisions were also made for representation from the small mills in the district.[22]

At once, controversies and protests occupied much of the time of the board. The Western Pine Association had assumed that the West Coast wage scale of about 42 cents per hour would apply to all of its jurisdiction, but lumbermen in the Southwestern Region had been used to paying approximately the southern wage scale of about 25 cents per hour or $2.00 to $2.50 per day. This was resolved by compromise more or less to the satisfaction of the lumbermen of the Southwestern Region. There was also a question of price differential for Southwestern and Mountain States lumber that McNary personally secured by an appeal to the Western Pine Association headquarters. The larger problem of production quotas was never satisfactorily solved. Although McNary and George E. Breece (Albuquerque) appeared content, Dolan, Gallagher, and Bedford withdrew from the board, and Gallagher appealed directly to NEC head Donald Richberg in Washington. Certainly, after 1934 the lumbermen of Region 3 largely ignored the code and the Timber Products Association. All of the confusion and rancor, however, were swept away in May 1935 when the Supreme Court declared the NRA to be unconstitutional.[23]

This left Article X, the conservation article of the National Industrial Recovery Act. Although it no longer had the force of law, the lumber representatives had drafted its provisions themselves as a standard for sound forestry practices. It was, of course, the same set of measures that the Forest Service had been attempting to persuade lumbermen to adopt for a generation. On National Forest System land these principles were standard operating procedure and had been accepted by the larger mills on their own properties. Article X became the yardstick to measure the performance of all loggers and lumber companies, large or small. Slowly, lumbermen of the Southwest learned that good forestry was also good business.

The Civilian Conservation Corps

One of the most popular and successful New Deal programs was the Civilian Conservation Corps (CCC). Throughout most of his life, Roosevelt had considered the merits of a forest army made up of unemployed young men. As Governor of New York (1929–33), he had put young men to work doing conservation duties in the State's forests with success. Other States, including California and Washington, had also instituted forest conservation work camps for their unemployed young men in 1931 and 1932. But essentially it was FDR's brainchild in which he took the land and the unemployed youth, both largely wasted resources, and tried to save both.[24]

The law establishing the CCC quickly passed Congress in the spring of 1933, and its administration involved the Army, the Department of Labor, the Forest Service, the Soil Conservation Service, and the Department of the Interior. Soon camps sprang up in all the States, and enrollments ran as high as a half-million men at a given time. In the South-western Region, where the population was small but Federal landholdings were large, most CCC enrollees came from further east. The number of camps in the region varied from year to year as crews completed projects and supervisors moved or disbanded the camps. The number of camps on June 30, 1935, would be representative (both in number of camps and in the Southwestern Region proportion to the Nation's total): 22 camps in Arizona; 17 in New Mexico; 39 total in the Southwestern Region; and 2,110 total in the United States. By comparison, the neighboring states of Colorado, Utah, and Nevada had 31, 19, and 14 camps, respectively.[25]

One problem connected with the rapid expansion of CCC personnel was the recruitment of supervisory workers. The normal complement of supervisors, assistants, and rangers assigned to a national forest was totally inadequate to provide direction and leadership for the several hundred untrained CCC young men that would arrive in the summer of 1933. At the Southwestern Region headquarters in Albuquerque, Operations Chief Hugh Calkins quickly grasped the situation and at once wired a dozen forestry schools asking for 80 men. By this quick action Calkins was able to employ an excellent group of young foresters, perhaps better than most other regions. Many foresters who started as supervisors of CCC camps later transferred to the Forest Service and spent their entire careers in the region.[26]

When the plans for the CCC were first announced from Washington, many forest workers and unemployed loggers from the lumber companies in the area protested bitterly that these "eastern city boys" were taking their jobs and "in their forests." Fortunately, the provisions setting up the program called for the employment of "local experienced men" as foremen and section leaders. This took the edge off of the complaints. Before long the local ranchers and lumbermen were as enthusiastic about the CCC as the Forest Service itself.[27]

Many professional foresters began their careers working with CCC enrollees. D.D. Cutler (later supervisor of the Lincoln National Forest) began work in 1933 as technical foreman of the Woods Spring CCC camp in the Coconino National Forest. There he had some 200 enrollees from Texas working on a variety of projects. Some thinned a pole stand of ponderosa pine. Others repaired and rebuilt a telephone line to Flagstaff. He had a small detail that hunted and poisoned porcupines. That fall, they moved to a more permanent camp at Sedona where they constructed check dams to control erosion, built or repaired roads in the forest, and developed campgrounds, complete with tables, benches, fireplaces, and outdoor toilets. They even put in a water system for the neighboring ranger station. The next year, they moved again to the Prescott National Forest where they sought to eradicate twig blight on ponderosa pine. While there, one of Cutler's colleagues made a scientific discovery that advanced the knowledge and treatment of this problem.[28]

Norman E. Johnson (later forest ranger of the Winslow District) had a CCC group at Camp F.-32A, in the Sedona District of the Coconino National Forest. These were young men from the East, mostly the coal mining towns near Scranton, Pennsylvania. Initially they were unskilled and not familiar with the basic tools needed in conservation work As they worked under supervision and became more proficient, they also became more enthusiastic about their camp and the CCC. Johnson recalled that one crew had made a series of rustic signs from blueprints marking out trails, roads, and points of interest on the Coconino. When finished, the crew leader inquired: Who would erect these signs and when? He was told that other enrollees would put them up during the next summer. The crew leader insisted that his group wanted to finish the job and proposed a longer working day so the men could travel to the various locations to put the signs in place. The camp commander approved this change of schedule with the provision that the crew take "camp time" off the next working day. Johnson thought that in addition to useful work, fresh air, and a better diet, this crew had learned a spirit of cooperation and the satisfaction of completing a job that would last a lifetime.[29]

CCC workers performed a variety of tasks and completed some important projects. They plugged a bad leak in Lake Mary in the Coconino. First, they seined out and moved the fish, which they transported to other waters, and then filled the cracks, holes, and faults in the lakebed with clay and concrete. By fall the lake held water again and once more became a favorite camping and fishing site for people from as far away as Flagstaff and Phoenix.

The CCC repaired and improved the rim road that ran west along the Mogollon Rim in central Arizona. General Crook had originally constructed a crude trail along this route in 1873, but it had fallen into disuse. The Forest Service had attempted to repair it in 1908. After the CCC worked on it, the road became an important link in the fire control system as well as a road for campers and vacationists. The CCC also put in a catwalk bridge across Whitewater Canyon, in the Gila National Forest, which opened a popular area for hikers and fishermen.

Many CCC camps continued in the same location for several years with no shortage of conservation work to do. Camp F—43N at La Madera celebrated its sixth birthday on the Carson National Forest. The director declared a holiday for April 30, 1939, and arranged an open house for the area's citizens. The CCC enrollees escorted several hundred visitors through the camp, explaining their work and the functions of the various buildings. There is no doubt that one benefit of camp life was the development of an esprit de corps among the enrollees.[30]

The CCC also provided a program for the young Indians of the Southwest. The reservations for decades had suffered from overgrazing and soil erosion. The forests were urgently in need of management, clearing, thinning, and planting. The operations on the reservations departed from the usual CCC format in that few camps were established, as the young men lived at home. They received the standard cash stipend of $30 per month and benefited from the education and health programs that were a normal part of all CCC camps. On one project the young men built a pipeline from the mountains to the grazing lands and filled a large pool for watering stock and, incidentally, planted and nurtured a grove of shade trees. Some 200 young Indian men worked at erosion control on an old Spanish grant that had been purchased by the Federal government. During the two years of this project, rehabilitation of the youths went hand in hand with restoring the land.[31]

Perhaps most important of all the CCC contributions, the young men provided the manpower to prevent and control forest fires much better than ever before. Thanks to the CCC, fire losses dropped to a new low, and new trails, firetowers, and firebreaks made the Forest Service's firefighting network much more of a reality.

Regulation of Private Cutting

The New Deal years saw a renewal of the push for Federal regulation of private forests and cutting practices. Ferdinand Silcox, Roosevelt's Chief of the Forest Service from 1933 to 1939, was an ardent believer in Federal regulation and control as had been Pinchot, Graves, and others. In contrast, many foresters and most lumbermen strongly supported the Greeley philosophy that education, conciliation, and cooperation had a better chance of bringing improved forestry practices to the forest products industry. The brief experience under NRA with its codes and quotas had convinced most businessmen that Federal controls would bring more problems than they would solve. In the Southwestern Region, however, more than half of all merchantable timber was on Federal lands—national forests, Indian reservations, Bureau of Land Management land, and soil conservation grazing areas. Federal agencies sold stumpage rights under contract with provisions for approved conservation practices to be followed by the loggers. Thus, the question of Federal regulation was never as controversial in the Southwestern Region as it was on the Pacific Coast or in the Gulf South, where most of the large timber holdings were in private hands. As it turned out, Congress again refused to approve Federal regulation of private timber lands, and the Greeley philosophy continued to prevail within the Forest Service. In his efforts to promote regulation, Assistant Chief Earle H. Clapp (who had worked in the Southwestern Region in the early days under Arthur Ringland) alienated President Roosevelt, and this, perhaps, later cost him promotion to Chief of the Forest Service.[32]

Government Reorganization

Another controversy raging in Washington at the same time did intimately affect the Southwestern Region and its entire staff of professional foresters. Secretary of the Interior Harold Ickes, a staunch conservationist and early Roosevelt supporter, proposed that in the general government reorganization, the Department of the Interior be changed to a Department of Conservation with all Federal lands, including the national forests, and the Forest Service included under his jurisdiction.

Most foresters viewed this move as attempted empire-building and recalled the history of the management of public lands under the Department of the Interior as one of laxness, expediency,

and, at times, corruption. They feared that forest conservation, with its concern for wildlife, wilderness, and the balance of nature, would be lost to the appeasement of special interest groups. Foresters already had become concerned over the competition between the conservative grazing policy (designed to restore and preserve the range) pursued by the Forest Service over a quarter of a century and the easier and less stringent grazing rules of the Department of the Interior. Most ranchers, as could be expected, favored lax regulations or none at all, so that they could graze all the cattle, horses, and sheep they wished. This would, of course, result in the rapid destruction of the range. Because ranchers in the Southwest had over 200,000 cattle and almost as many sheep grazing on National Forest System lands, the questions of grazing regulations, allotments, and fees were of prime importance. Congress again rejected the proposed transfer and reorganization, thanks largely to the strong opposition of the Secretary of Agriculture, the Forest Service, and its friends throughout the country. The national forests remained in the Department of Agriculture, and the Ickes conservation empire evaporated.[33]

Working Conditions

Figure 11. Ranger on the trail with packhorse, Carson National Forest, 1939

Work and living conditions did not change very much for forestry personnel in the years between the wars. The roads improved some, and Model T Fords and other cars and trucks began to appear in the region. But most of a ranger's district was over trails, up and down canyons, through ponderosa pine forests, and across trackless grazing areas where a horse was still invaluable. Housing conditions continued to be primitive. For married men (and most rangers were married), it was a task to find a suitable house at a new station. Wood-burning cookstoves, kerosene (oil) lamps, hand-filled water tanks, and outside toilets were the norm except for those few who were fortunate enough to be stationed at a larger town or city. Rangers moved frequently, which added to their difficulties and doubtless was most frustrating to their wives, who would work to make a house livable and attractive only to move the next year. Ranger Zane Smith told of being moved to Alamogordo, first to a substandard house, then to a better apartment, only to be transferred to the regional office in Albuquerque—all within one month.[34]

The typical forest ranger was a man of many talents. He supervised timber sales and frequently had to personally mark trees and scale logs for the logging crews. He had to be knowledgeable about grazing permits and to have the experience needed to see at a glance whether grazing permits were being grossly exceeded. He needed to be an expert on water, watersheds, and erosion. In addition, rangers served as deputy game wardens and, on occasion, arrested and brought to court hunters who killed game out of season or fishermen who took fish illegally. And with everyone, he had to be diplomatic, firm, but controlled, and at all times he had to represent the standards of the Forest Service.[35]

Many forest personnel preferred the outdoor work and were reluctant to accept administrative assignments. Some rangers were content to continue as rangers and sought to remain at one location. Too many, perhaps most, the best job in the Forest Service was that of supervisor of a national forest. There you would be in charge "of your own forest" and be able to spend most of

each month out of doors, too. Aldo Leopold, Frederic Winn, Paul Roberts, Elliott Barker, and many others confirmed that this was the special attraction of the mountain forests of the Southwestern Region. There you could work and live in the clear dry air and enjoy the great distances of the desert Southwest.[36]

Fire Control

Although the Southwestern Region largely escapes the tragic holocausts that periodically devastate the forests of California and the Pacific Northwest, fires were and are frequent in all of the forests in the region. Indeed, the principal responsibility of the ranger in the early days was fire protection and fire control. Fire fighting equipment was simple and relatively primitive. The rangers assembled axes, shovels, mattocks, and rakes in central locations, and distributed them to fire fighting crews whenever a burn broke out. The first rangers, under Arthur Ringland, listened to old-timers tell of the destructive burn along the Mogollon Rim (Sitgreaves National Forest) that raged for days in 1904, with great clouds of smoke darkening the sky. The fire eventually burned itself out.[37]

Rangers organized the fire control work systematically. During the “hot season,” which usually ran from early May until the summer rains began in July, they hired “fire guards” to staff lookout towers located in strategic points and report all smokes or fires. Efforts to connect towers with ranger headquarters by telephone wire were a continuing but not always successful project. Early wireless communication and later two-way radios supplemented phone lines. The region had perhaps the first short-wave radio in the Forest Service, built in 1916 for $75 and installed at Baseline to communicate with Clifton, AZ. Work in the fire tower could be dangerous. In the Lincoln National Forest, lightning struck a lookout tower and temporarily blinded the ranger on duty there.[38]

When a fire call came to the ranger station, the ranger dropped everything and went. Gathering his crew, which included ranch hands from the local cattle outfits, mill workers, Indians from the reservations, and others (most of whom realized the potential danger of unchecked forest fires), the ranger walked or rode to the fire location. Most often they built a fire line to contain the fire and stayed with it until the fire was out. Paul Roberts, supervisor of the Sitgreaves National Forest in the 1920s, recalled that in the “hot season” there could be as many as 35 fires a day. To keep them under control was a full-time job. An important supplement to fire protection work through World War II was the “per diem guard,” a local resident such as a rancher who lived in a strategic location near the forest. He was trained as a fire fighter and given a complete set of tools, including rations, first-aid kit, and lantern. He would, on his own initiative, go to and attempt to suppress area fires, and received pay or “per diem” only when engaged in fire work.[39]

Fires were and are the result of many causes. Lightning, sparks from locomotives, and sawmill explosions all can start fires. Many fires, however, are human-caused, and many are deliberately set by arsonists. The Southwestern Region had its share of “firebugs,” but most fires there, especially in recent years, have been from natural causes. In earlier years some nesters hated the Forest Service and set fires for spite. A few ranchers also set fires to vent their hostility. Supervisor Fred Arthur recalled a fire in 1927 on the Lin coin National Forest in which he suspected a local man who had a previous record of arson. When they approached the man at his house, he opened fire on the ranger, and in the ensuing gun battle both the suspect and an assisting forester were killed. Fortunately, most torch-setters surrendered peacefully when confronted by the sheriff and the forest ranger armed with the evidence.[40]

Fire fighting equipment and techniques improved markedly during the two decades between the wars. The introduction of the bulldozer as a fire fighting tool enabled foresters to move much more rapidly and decisively in containing fires. Rangers also learned to organize and train their available personnel into teams that knew how to tackle a forest fire and contain it and then stamp it out before an untrained group could have begun action. Because the dry climate of the Southwest does not produce an abundance of grasses and bushes in the understory of the forest, the fires are less severe than those in the Northwest. At times Southwestern Region fire fighters went to other regions to assist in containing major fires. Beginning about 1929, trained fire fighting crews regularly flew to Montana, Washington, and Oregon to lend their expertise and experience in containing major conflagrations in the Northwest.[41]

The CCC greatly assisted, as has been discussed earlier, in fighting forest fires, both by their added manpower and their youth and energy. The 1930s witnessed great progress in reducing the fire losses and in promoting a greater public awareness of the responsibility of all citizens to participate in the fire prevention program. From 1935 to 1940, an average of 1,648 fires per year, which burned some 21,162 acres in total, was reported in Arizona. In contrast, during the same period, 86,394 acres burned in Washington and 132,370 in Oregon.[42]

World War II

The Japanese attack on Pearl Harbor on December 7, 1941, and the entrance of the United States into World War II put the forestry and conservation plans of the Forest Service “on hold” for the duration of the conflict. The second global war was much more mechanized than World War I, but it made greater demands on America’s forests and used far more wood products. Where the war effort of 1917–18 had consumed about 6 billion board feet of lumber of all types, the military and related services from 1942 to 1946 used some 8 billion board feet per year. Congress created the War Production Board, which immediately listed lumber as a critical material and froze its sale for civilian use. The Office of Price Administration fixed the price of lumber and wood products, which remained relatively constant from 1943 to the end of the war.[43]

The Forest Service of the Southwestern Region participated fully in the war effort. Many foresters joined the armed forces and fought in the Pacific and in Europe. The CCC camps closed, and those young men marched off to war, leaving forest supervisors to organize volunteer citizen groups for fire protection. Ponderosa pine was in demand for army camps, aviation fields, and other military establishments. The smaller available quantities of Douglas fir, white fir, and spruce went for aircraft and ship construction. The Manhattan (atomic bomb) Project took over a section of the Santa Fe National Forest at Los Alamos and used the adjoining arid grazing lands as a buffer zone.[44]

Paul Roberts (onetime supervisor of Sitgreaves National Forest) had a leading role in a project to develop synthetic rubber from guayule. This desert plant grew well along a belt running from Southern California, Arizona, and New Mexico to west Texas. As early tests were successful, Roberts and his colleagues soon had several guayule nurseries were cultivating more than 200,000 acres of guayule. The project was abandoned in 1945 when sources of natural rubber again became available. But the aborted project demonstrated that this desert plant can be converted into excellent rubber, and probably would have if the war had continued.[45] It is again the subject of research by the Agricultural Research Service of the Department of Agriculture.

The war left the regional forestry staff depleted. Post-war plans had to coordinate improved timber management programs and increased lumber production with greatly expanded demands for recreational facilities in the national forests. Much of this post-war planning fell to Ray Marsh, once supervisor of the Carson National Forest but in 1945 assistant chief in the Washington office.[46]

But these new plans and programs brought their own critiques and problems, and demanded new blood and energy. Frank Pooler was 63 years old and a 41-year veteran of service on the Southwestern Region forests; he was glad to retire and leave post-war problems to Phillip Woodhead, who had been assistant forester for grazing. No other forester in the Southwest has, to date, equaled Pooler in his long tenure as regional forester and in his quiet, conscientious, and firm handling of the problems that beset the region in the generation between the great wars.[47]

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Chapter 8. The Postwar Years: 1945–60

Compared to the activity and excitement of the New Deal years, and the hard work and sacrifice of the war years, the 15 years after World War II were a time of relative tranquility for the Southwestern Region, a period of relatively little change. For the most part, the foresters who were there in the 1920s and 1930s were the foresters who were there in the 1940s and 1950s. And the lifestyle and the work had changed little. Indeed, it seemed to some that the Southwestern Region was a world that time had left behind.

Lean Years

The older foresters, who had tended the forests while the young men went off to war, waited in eager anticipation for the young men to come back. But only a few returned. Many had died in the war; many who came home chose the city or a college education under the GI Bill. Even had they wanted to come to the forests to resume their work, or to begin new careers, there was little opportunity to do so in the first decade after the war because there were very few new jobs with the Forest Service. These were lean years, as they had been during the war, and marked contrast to the surge of activity and accomplishment characteristic of the New Deal years between 1933 and 1940. Postwar inflation and unemployment contributed to lean Federal budgets. The Cold War, and soon the Korean War, made defense again the Nation's spending priority. In a very real sense, the Forest Service in the Southwestern Region and elsewhere served as a caretaker until better times. Even into the closing years of the decade of the 1950s, personnel and facilities in the region were much what they had been in the 1930s.

Pest Control and National Grasslands

This interesting period can be characterized by a number of important events, surrounded by a greater host of lesser things. Probably the two most important happenings were the passage by Congress of the Forest Pest Control Act in 1947, which generated a new emphasis on the control and management of forest insects and diseases, and the transfer in 1954 of the Land Utilization Project lands from the Soil Conservation Service to the Forest Service. By this act, the Southwestern Region assumed management and control of the unique national grasslands of Oklahoma, Texas, and New Mexico. This placid era closes on a note of some new legislative urgency that set the tone of activity, planning, policy, and management for the next several decades. In 1960 Congress approved the Multiple Use-Sustained Yield Act. That act symbolically ended the old era and marked the beginning of the new.

Population Zooms

To be sure, the new era already had begun quietly. The population of New Mexico almost doubled in the decade from 1950 to 1960, while the population of Arizona tripled. By 1960 New Mexico had a population of 951,000, up from 532,000 in 1950, and Arizona had 1.5 million, up from the 500,000 of 1950. The Sunbelt was becoming a reality. But all of that seemed so terribly far away in 1945.

During World War II the Forest Service in the Southwestern Region fought at best a holding action to maintain the level of accomplishment that had been reached in the 1930s. It was extremely difficult, however, to maintain the trails, fire breaks, and facilities, or even to protect the forests against the hazards of fire. The shortage of manpower during the war forced the region

to employ youths as firefighter and maintenance crews. Arthur J. “Crawford” Riggs recalls those days with some affection.

Riggs grew up in New Mexico. His father ranched in the Sacramento Mountains near Roswell, and then in the Magdalena country, southwest of Magdalena. Crawford was sent to Holbrook, AZ, to stay with his brother Alfred while he attended high school. In the summer of 1923, Crawford worked with the Forest Service under a “green” ranger, Landis “Pink” Arnold, whom Crawford got to know very well and who learned from Crawford much of his horsemanship and knowledge of livestock. Paul Roberts was forest supervisor at Holbrook, and was a good friend of Crawford’s brother. In any event, Crawford learned a lot about counting sheep and fighting fires that first summer.[1]

Crawford remembers that his first fire was at Wildcat Canyon. Still in high school, he was sent into Holbrook to recruit a firefighting crew and outfit them with food and supplies. By the time he had finished that first fire, he said, he felt like a “pretty old hand at the business.” In those days, he said, you still did everything on horseback, and carried your McLeod (a hoe-like firefighting tool), an axe, a canteen of water, and emergency rations. He recalls fighting eight lightning fires in one day. There was no way to call for help. “We had to do it ourselves,” he said.[2]

In 1928 Riggs got his first regular job with the Forest Service, scaling logs on the Sitgreaves National Forest near McNary. In February 1930, he received his first appointment as ranger at the Punkin Center Ranger Station on the Tonto National Forest. He then went to the Reynolds Creek District, and from there to work for the experiment station near Tucson. In 1935 he went to the Prescott, then to the North Kaibab, working under Walter Mann, and then, in 1941, to the Mimbres District on the Gila National Forest.[3]

High School Boys Hired

During the war the Forest Service used high school boys for fire lookouts and standby fire crews. One such crew was at the Mimbres. The oldest crew member was 17 and the youngest 14. Clarence Tipton, the old cowboy in charge of the crew, trained and worked them. The boys worked harder than many men, Riggs said. Tipton divided them into groups and had them competing with each other, and according to Riggs, they performed in an outstanding manner. Riggs also remembers that the first smokejumpers ever used in the Southwestern Region were used in 1946 in the Mimbres District.[4] In May 1950, in the Capitan Mountains of the Lincoln National Forest, a crew of firefighters found a badly burned and hungry motherless bear cub. This little cub became “Smokey” and found a permanent home in the National Zoo in Washington, DC.

Zane G. Smith, whose son later became the Pacific Southwest regional forester, was on the Cibola National Forest when the war ended. Shortly thereafter he went to Recreation and Lands in the Regional Office. He recalled that during the war, and for some time thereafter, things had pretty well come to a halt. Gas rationing had stopped the movement of a lot of foresters, and few visitors came. Although visitation began to increase rapidly in 1946, there was no real change in the pace of activity among the Forest Service personnel. Funding remained very lean for some time. Smith recalls that the region had only $28,000 to maintain all recreation facilities, do the necessary clean-up, and haul away the garbage. In 1947 an inspector from the Washington Office was convinced that there really was a serious problem developing, and he called back and got an

additional allocation of $5,000 for recreation in the Southwestern Region.[5] Generally, however, funding for recreation, salaries, and operations remained woefully behind the developing needs.

Meanwhile, a few foresters began returning to their duties after military service. Ed Carr, who had been captured during the Battle of the Bulge and spent his last year as a German prisoner-of-war, returned in January 1946. He was assigned to the North Kaibab, where the snow was still deep. He brought his wife, Fran, and their baby, and there was no place for them to live but in the old Jacob Lake Ranger Station, which had been built in 1907 and had been abandoned for many years. Edward Groesbeck helped him repair the place, close up the cracks, and get moved in. Fran Carr had to melt snow over a fire to get water to bathe the baby.[6] Housing for foresters' families remained notoriously ancient and dilapidated for many years, but the foresters and their families approached the world very matter-of-factly. There was a job to do, and there was no one else to do it, so they did it.

Public Pressures Grow

As people began to move into the Southwest, pressures on recreation, on the land, and on the Forest Service began to grow. At first it was hardly noticeable, but by the mid1950s, they had become almost insurmountable. The small hamlets surrounded by National Forest System lands began to grow and expand. Residents came to the Forest service for special use permits to occupy, develop, and use the national forests. Pressures grew to exchange private lands for public lands in order to round out boundaries, or establish more orderly growth patterns, but the procedures for land exchange were slow and cumbersome, and the personnel few.

The demand for summer homes, resorts, and even subdivisions within and adjacent to national forest land grew. Within the decade after World War II, Zane Smith counted 47 subdivisions going in within the perimeters of the Payson Ranger District on the Tonto National Forest. More roads were needed, and better maintenance of those that existed. Fires became more frequent and hazardous. Power and utility companies needed rights-of-way across public forest lands. Water supplies became more critical. Public lands sometimes became public garbage dumps.[7] The world about them was changing, but the personnel, the activities, and the Forest Service in the Southwestern Region seemed to be changing little, other than to become increasingly mired in a kind of bureaucratic and budgetary malaise.

Personnel Stable

Personnel ranks were remarkably stable in the years from 1945 to 1960. Three regional foresters headed operations in that 15-year period. They were Phillip V. Woodhead, who served from June 1945 through June 1949; C. Otto Lindh, who served from 1949 to late 1955, and Fred Kennedy who served until 1960. Edwin French, who joined the region in 1924, headed the legal affairs office for most of the era. The operations branch was under George Kimball from 1936 to 1950 and Mayhew H. Davis from 1950 to the early 1960s. Dahl J. Kirkpatrick supervised silviculture for the region from 1950 through 1964, except for about four years when C. Otto Lindh was in charge. Grazing was headed by Darrel M. Traugh for a few years, then by Clifford E. McDuff from 1950 through 1963. Erwin A. Schilling headed the lands department, except for a few years after 1957, when it was headed by Zane G. Smith. Howard B. Waha (1937-52) and Earl R. Huber (1952-61) headed engineering. Rex King was in charge of public relations from 1935 to 1950, when it was combined for a time with watershed management, before being reconstituted as information and education in 1961. A. Allen McCutchen was in charge of personnel management

from 1946 through 1957; Wayland G. Koogler (1941-46) and Wilford L. Hansen (1950-60), who was succeeded by Lowell Woods (1960), headed the division of watershed management. The accounting office was under Homer P. Nichols from 1947 through 1952 and Lewis Darby in the years following.[8] The regional office and the forest supervisors' staffs were characterized by continuity and longevity of personnel in the postwar years before 1960.

Robert Ewing was in charge of the Apache National Forest (with headquarters in Springerville) from 1938 through 1951, when he was succeeded by John C. Baird (1951-56) and Kenneth Daniels (1956-59), who was followed by E. Lavelle Thompson. Louis F. Cottam, Walter L. Graves, and Robert E. Courtney each had four-year terms as supervisor of the Carson National Forest, beginning in 1945. Francis J. Monighan, who succeeded W. Ellis Wiltbank as supervisor of the Cibola National Forest in 1949, remained as head until 1963. The Coconino had more rapid turnover in the 1940s and 1950s, with Clifford E. McDuff, Kenneth A. Keeney, and Ralph W. Crawford each serving as supervisor. Clarence Merker supervised the Coronado National Forest from 1942 until 1951. William H. Woods (1951-57) and Norman P. Weeden (1957-61) followed him.[9]

The Crook National Forest, which was parceled up among other forests in 1953, was supervised for ten years by William H. Woods (1941-51) and then by Allan G. Watkins. The Gila was directed by many supervisors with short terms, including Claude McKenzie, Wilson M. Beveridge, Edwin A. Tucker, G. Lee Wang, Russel E. Rea, and Richard C. Johnson, but that kind of turnover was very unusual. After relatively short terms by Leonard R. Lessel (1946-51) and Russel E. Rea (1951-54), the Kaibab was supervised by Floyd M. Hodgin, who remained through 1965. Charles E. Moore supervised the Lincoln from 1938 through 1953, and then was followed by Donald D. Cutler and Everett R. Doman. Jacob C. Nave headed the Prescott from 1935 through 1948, and then was followed by Clifford E. McDuff for one year, Wilson M. Beveridge from 1949 through 1957, and Richard C. Johnson until 1960.[10]

G. Lee Wang directed the Santa Fe National Forest from 1944 to 1947, and was succeeded by Kester D. Flock (194751) and Clarence A. Merker (1951-61). On the Sitgreaves National Forest, with offices in Holbrook, AZ, Francis J. Monighan was supervisor from 1941 to 1949, followed by Kenneth A. Keeney and Frederic N. Newman for short terms before Clarence K. Spaulding assumed the duties and served until 1963. Francis L. Kirby (1935-60), Carlyle J. Lillevig (1946-52), and Fred O. Leftwich (1952-59) provided leadership on the Tonto National Forest, with headquarters in Phoenix, for 25 years.[11]

Supervisors Worked Way Up From Rangers

The forest supervisors most often worked their way up to their posts from the position of ranger. Many of these men began their careers in the Southwestern Region in the 1930s. Many moved to supervisory positions in a number of different national forests within the region, and in and out of staff positions in the regional offices. They were part of a cadre of well-trained, experienced foresters who considered the region their home and who tended to think of themselves as part of one big family. This attitude was generally shared by the rangers, staff, and professional personnel who worked with the Forest Service in the region. Most spent their entire working career with the Forest Service, and most of that career within the Southwestern Region.

In most of the ranger districts, staffs remained very small and included a ranger, an assistant ranger (sometimes), a clerk, and unofficially, the ranger's wife and family. Work and fire crews

were usually hired on a seasonal basis. By the end of the 1950s, staffs were expanding, facilities and housing were improving, and the more primitive ranger stations were being replaced or retired.

Research

One area that did experience a new injection of activity and purpose soon after World War II was silviculture and forest insect and disease research. In 1947 Congress approved the Forest Pest Control Act, which directed and funded new research activity relating to the prevention, control and suppression of forest insect pests and tree diseases.[12] In some respects, the Southwestern Region pioneered in forest research, but most of that early research was related to forest and timber management procedures. In the 1950s and after, under the influence of the 1947 Forest Pest Control Act, greater attention began to be directed to forest insects and diseases.

G.A. "Gus" Pearson, who directed research programs in the region for many years, recalls the creation of the Nation's oldest forest experiment station, the Coconino Experiment Station, established on January 1, 1909. It was soon renamed the Fort Valley Experiment Station, and then became a branch of the Southwestern Forest and Range Experiment Station in the 1930s. Pearson recalls that one of the first projects of the Station was to determine why yellow [ponderosa] pine failed to restock after cutting. Cutting plots were established on 2,000 acres, and there were additional experiments in natural reproduction, planting, nursery work, and slash disposal. Research, however, was not the great concern of the Forest Service in the early years, and even by the close of the 1930s, the Fort Valley Experiment Station rarely operated with more than three or four technical staff people.[13]

Insects and Diseases

Since 1947, impressive developments have occurred in research on forest insects and diseases, within and outside the Southwestern Region. There are many agents that have been destructive to ponderosa pine, other conifers, and aspen in the Southwest over many decades. In the 1920s, mistletoe damage was reported to be severe and widespread over the entire Coconino National Forest, and on the Tusayan, now the Kaibab National Forest, mistletoe damage affected the poorer sites most severely.[14] On the Mount Taylor Division of the Manzano (Cibola) National Forest, tent caterpillars infested a large area of aspen, and mistletoe infection was severe.[15] On the Jemez Division of the Santa Fe, the spruce budworm infestations caused heavy defoliation in Douglas-fir, white fir, and spruce. Epidemics of the Black Hills beetles were intermittent, but severe on the Kaibab between 1920 and 1926.[16]

One of the reasons for greater attention to forest pest and insect control was the success achieved in insect control prior to World War II. With labor plentiful and inexpensive during the Depression, cutting and burning infected trees proved an effective and cost-efficient control practice. As labor became more expensive, ways were sought to control insects through more economical means, such as treatment with chemicals. By the 1950s, insects and environmental factors were recognized as more serious threats to the welfare of the forests than humans and animals. In the 1950s, insect damage seemed to be increasing throughout the forests of the Rocky Mountains and the Southwest. Pine engravers (*Ips pini*) reached epidemic proportions in New Mexico. Pine bark beetles were responsible for a majority of losses in ponderosa pine in New Mexico and Arizona. Fir engravers (*Scolytus ventralis*) were epidemic in white fir stands in the Sandia Mountains on the Cibola National Forest. Western balsam bark beetles (*Dryocoetes*

confusus) were attacking and killing corkbark fir in the alpine timber type in both Arizona and New Mexico. The spruce budworm (*Choristoneura fumiferana*) had reached epidemic status on 870,000 acres of mixed conifer and spruce-fir forests in New Mexico. For the first time, DDT was used with aerial spraying to control the devastation. Even heavy flights of the pine butterfly (*Neophasia menapia*) were reported on the Coconino Plateau in Arizona, the largest concentrations ever reported in the Southwestern Region.[17]

The most successful counterattacks to infestation appeared to be selective cutting and occasional spraying with insecticides in infested areas. Management plans in the various working circles, such as the Sacramento Working Circle, provided for the removal of trees infected with mistletoe, and the conversion of timber stands to even-aged stands in order to discourage infestation in older trees that might spread to younger growth.[18]

Southwestern dwarf mistletoe, which lives on ponderosa pine and Douglas-fir, is a major forest parasite in the Southwestern Region. Eradication of infestations has proven impossible. Research has indicated that the only way to get rid of dwarf mistletoe is to get rid of its host, the ponderosa pine. Living with mistletoe infestation is strongly preferred. However, control through selective cutting and harvesting does produce real economic dividends. Removal of heavily infested trees will slow infestation.[19] In part, because of studies made in the 1950s indicating that forest fires have been effective sanitizers of trees infected with dwarf mistletoe, fires are now regarded as possibly beneficial to forest development.[20] Regional studies of dwarf mistletoe made between 1954 and 1957 have been updated by now region. wide studies conducted in 1984.

Trunk rot, which became a problem of some concern to the 1950s and 1960s, has now been identified as probably the second most injurious disease in timber stands. It particularly affects conifers, especially ponderosa pine. Thinning the older, “overmature” trees assists markedly. In the control of the disease.[21] Western red rot, armillaria root rot, and fomes root rot affect overmature trees and tend to infect younger trees nearby. Selective harvesting and cutting retard infestation.[22]

In the past four or five decades, the western spruce budworm has become one of the most chronic and persistent forest pests, and perhaps one of the most noticeable to the general public. Budworm larvae feed on the new foliage of the Douglas-fir in particular, and within a few years can almost completely defoliate trees and cause growth loss, deformity, and mortality. Cone and seed production are also severely retarded. Foresters and entomologists have tended to credit the serious outbreaks of more recent decades to the “lack of intensive management combined with intensive fire protection programs and past logging practices.”[23]

Records indicate that four major outbreaks of the pest occurred on the Carson National Forest beginning in 1922. The pest was next reported at outbreak levels on the Santa Fe National Forest in 1924 and on the Cibola in 1941. Later, infestations became epidemic on the north rim of the Grand Canyon in 1950. In 1952 and 1953, outbreaks occurred on the Lincoln National Forest and the Apache National Forest. By 1959 budworm infestation in the Southwestern Region covered 619,920 acres and reached a high of 1,029,780 acres in 1961 before it began to decline.[24] A fifth serious outbreak developed throughout much of the susceptible mixed conifer type in the region in the 1980s.

Chemical Pesticides

Chemical pesticides were introduced for bud worm control in the 1950s. DDT was used in 1950,1953-56,1958, 1962, 1963, and 1966. Experiments with DDT and dimethoate were made in 1963, and in 1966 malathion wag introduced. In recent years, use of these chemicals has met with widespread public disfavor. (All uses of DDT, except for public health emergencies, were banned January l, 1973.) Selective harvesting and timber management practices minimize the occurrence of and the impacts resulting from budworm outbreaks. Most recently, biological pesticides have been introduced, such as "Bt," the bacterium Bacillus thuringiensis, which infects and kills many insect pests. Results have thus far been mixed. Some of the highest and some of the lowest control efficiencies have been recorded. Silvicultural practices, such as planting resistant conifers, thinning, and removal of host overstories to favor even-aged management, still seem to be the most effective means of managing the budworm.[25] Fortunately, not all insects and pathogens are as destructive as the budworm.

The spruce beetle (*Dendroctonus rufipennis*) is one of the most notorious forest pests in the Southwest. The spruce mortality reported in 1904 in the White Mountains of Arizona was likely caused by the spruce beetle, but a positive recording in the area was not made until 1948. Heavy infestations in the White Mountains caused timber losses between 1948 and 1953, but spruce beetle activity declined significantly thereafter until new outbreaks developed between 1967 and 1971. Interspersed spruce beetle infestations occurred in different areas of most of the national forests in the 1950s and 1960s. Suppression efforts included many instances of selective logging and slash disposal. In the early 1960s and afterwards, cutting combined with treatment of infestations using solutions of ethylene dibromide in fuel oil improved suppression efforts.[26]

Infestations of the white fir needleminer (*Epinotia meritana*), which was most noticeable in the area around Alpine and Nutrioso, AZ, sometimes resulted in heavy defoliation, often up to 50 percent, but caused little permanent damage. Losses of less than 3 percent in infected timber are now estimated. No control actions are recommended, despite the superficial appearances that the white fir needleminer causes defoliation and damage comparable to the budworm.

Porcupines, deer, chipmunks, mice, rats, and ground squirrels can cause damage, but ordinarily no controls are pursued. Metal bands on trees in tree orchards or high-value stands can usually discourage porcupines, which can be highly destructive to timber stands.[27]

Reseeding Grasslands and Reforestation

One of the most effective management practices that has derived in good part from the research work of people like Gus Pearson has been in the area of reseeding grasslands and reforestation. Such work was particularly effective in the Southwestern Region during the 1950s. The Loveridge Cliff General Integrating Inspection report of 1945 advised reseeding and revegetation of large areas of the region." It is our feeling that the Region has underestimated reseeding possibilities in making its postwar plans," the report stated. But by 1948 considerable progress had been made. A general integrating inspection completed on the Santa Fe National Forest in June 1948 by A.A. McCutchen and C.E. McDuff noted that the Santa Fe was pushing for reseeding work on a project basis and that a "good job is being done."[28]

The region developed an ambitious program to eradicate the various species of juniper on large areas of the Kaibab National Forest in 1953. Junipers were removed and grasses reseeded

simultaneously on a tract of approximately 15,000 acres. Inspectors recommended that the program be continued on up to 200,000 acres, from which it was believed that junipers could economically be harvested, and the land reseeded. Similar projects were recommended for the Gila National Forest, but the areas involved were much smaller.[29] It is in the nature of forestry that much of the work of the 1950s can only now be clearly evaluated. Indications are that these programs were very successful, and have provided incentive and evidence for the reforestation programs on the Tonto, Apache, and Carson National Forests, among others, in the 1970s and 1980s.

Watershed Management

Watershed management and vegetative management to enhance water yield is another area of activity and inquiry that began in the Southwestern Region in the postwar era. The Loveridge-Cliff inspection of 1945 urged increased concern for and attention to erosion control and watershed management. The inspectors noted that a 1940 study indicated that 4.8 million of the 20.5 million acres of land in the region were in a serious state of erosion. The region, the report said, “is faced with a watershed rehabilitation job of major proportions.” Too many forest officers demonstrated too little concern over erosion, or assumed that nothing could be done about it. Moreover, many of the approximately 137,000 erosion control dams installed in the region by the CCC in the 1930s had been lost because of the failure to control livestock in the areas around them. Despite these problems, the report stated that “stream improvement work in Region 3 is the best observed in any Region.”[30]

William D. Hurst, who arrived in 1966 to assume the job of regional forester, attributes improvements in water quality and the enhancement of water quantities in the Southwest to close cooperation between National Forest System managers and Forest Service researchers working in the area of watershed management.[31] One of the earliest investigations into watershed management developed under the USDA’s plan of work for 1913, which specified that forest investigations should be conducted to “determine the effect of forest cover on run-off and erosion.”[32] In 1932, the first major watershed management research was begun on the Tonto National Forest, where the Sierra Ancha experimental watersheds were established.[33] In the postwar era, the growing demand for agricultural water supplies from the Central Arizona watersheds stimulated renewed study of methods to increase the water supply from forest lands, which supplied most of the region’s water.[34]

About 1955, major experiments were conducted on 4.2 million acres of ponderosa pine lands in Arizona to investigate the effects of vegetative changes on water yield, soil, forage, wildlife, and recreation. The studies also proposed to examine the effect that such vegetative changes had on the risk from fire, insects, and disease. Four treatments were pursued: (1) clearcutting, (2) three-quarter thinning, (3) one-quarter thinning, and (4) one-third stripcutting and thinning. Using these applications, mean winter streamflow was found to increase by 34, 22, 16, and 21 percent, respectively. It meant a water supply sufficient to irrigate 6,500 more acres of cotton per year, or to support the domestic use of 32,600 additional families. Side benefits were determined to be a stimulation of timber growth despite reduced density and improved habitat for deer and elk.[35]

Figure 12. Field officers checking on watershed conditions in Pecos Wilderness, Santa Fe National Forest, 1954.

Although studies indicate that the application of intensive forest management practices to mixed conifer forests, and vegetative manipulation in chaparral, pinyon-juniper, ponderosa pine, and mixed conifer and riparian stands can increase water yields, the economic returns and the physical volume of water resulting can vary widely with forest types and rainfall. Moreover, multiple use considerations do not encourage devotion to the single purpose of watershed enhancement.[36] Symbolically, the 1950s did mark a period in the development of insect and disease control, as well as in the concern over regional water supplies and ecological systems.

National Grasslands

One new responsibility that focused the region's attention on concerns relating to water supply, vegetative manipulation, reseeding, and land renewal was the assumption of control over the Land Utilization Project Lands located in New Mexico, western Oklahoma, and the Texas Panhandle from the Soil Conservation Service. An administrative unit, known as the Panhandle National Grasslands, with headquarters in Amarillo, TX, administered the grasslands until 1970. Except for the Cado and Cross Timber units, which were transferred to the Southern Region, the lands were placed under the administrative control of the Cibola National Forest in 1970, and have since been established as a distinct administrative unit with ranger districts under the authority of the Cibola, styled the national grasslands.

These lands were acquired by the Soil Conservation Service from the Resettlement Administration under the authority of the Bankhead-Jones Farm Tenant Act, which provided funds and programs for the removal of submarginal farmland from cultivation during the Depression. Perhaps no lands had become so submarginal as those of the Texas-Oklahoma dust bowl of the late 1920s and early 1930s. Farm families suffered heavily in the droughts and slowly starved. Under the Bankhead Jones Act, the Federal government purchased their lands and advanced the families money to move to irrigated lands south of Lubbock at Ropesville, Texas.[37]

Although the Soil Conservation Service made good progress in land leveling and reseeding, the outbreak of World War II virtually halted efforts to rehabilitate the area, which had historically

been rich natural grasslands before farmers had moved into it in the 1920s. During World War II, thousands of acres were made available to the military for bombing practice. Walter J. Caserta, who had been a supervisor of the lands for the Soil Conservation Service, indicated that, even in the 1950s, machine gun bullets and occasionally a 3-inch recoilless rifle shell could be found in the Kiowa District of the grasslands.[38]

Curiously, the rains hit this former dust-bowl area in 1941, and the region harvested one of its best-ever wheat crops. Rains continued in 1945,1946, and again in 1951, and many of the reservoir and lake projects constructed by the Soil Conservation Service were washed away. Caserta recalls that when talk developed about turning the grasslands over to the Forest Service, he was one of those who was given the option of remaining with the Soil Conservation Service, or with the land. He chose to follow the land. As a result, in 1954 Caserta was welcomed into the Forest Service, retaining his position and title as supervisor of the Panhandle National Grasslands.[39] Caserta is one of many who believes that the work of the Soil Conservation Service, and of the Forest Service, has stabilized what he described as "wild lands." It now boasts fine grasslands, reservoirs, and farmlands. Lands that were once virtually useless have now become useful for a variety of purposes, such as recreation, grazing, hunting, fishing, and cultivation.

Multiple Use-Sustained Yield Act

Just as the grasslands became increasingly useful for a variety of purposes, so the Forest Service came to the greater awareness in the 1950s that its business went far beyond growing and harvesting timber and nurturing the Nation's forests. Those forested lands were for the use of the people, and the uses that were being imposed upon the forests had become far more diverse and intensive in the 1950s, especially so in the Southwestern Region.

Figure 13. Ranger checking operations on a pumice mining claim, Santa Fe National Forest, 1957.

Only a few decades earlier, the forests were primarily used for grazing, timber cutting, and wood gathering by neighboring residents as well as on an intensive scale in same areas (the Prescott National Forest near Jerome and the Carson National Forest near Red River). As Zane Smith indicated, the national forests by the 1950s were encountering a new level of use, and there was growing competition among users for the allocation of their resources. It was not so much that the kinds of uses had changed, but that the intensity of use had increased markedly since pre-World War II days. Although the intensity of use had increased most heavily In the Southwestern Region, the conditions were much the same throughout the National Forest System. In part,

because of the recognition of this increased demand, Congress in 1960 passed the Multiple Use-Sustained Yield Act.

The act authorized and directed the Secretary of Agriculture to develop and administer the renewable resources of the national forests, including outdoor recreation, watershed, range, timber, and wildlife and fish resources, in such a way that they would be available in perpetuity. It meant that no one demand should take precedence over another. The forests are not exclusively for the growing and harvesting of timber, nor for the use of recreationists, nor as habitat for wildlife, nor for cattle grazing, nor for watershed development. All of these factors and interests should be considered concurrently, and presumably a fair and equitable allocation of the resources should be made so that the resources were always available. In some respects, the Multiple Use-Sustained Yield Act facilitated the work of the Forest Service in arbitrating or allocating the uses of the forests. In other respects, it imposed difficult, if not sometimes impossible, demands upon the Forest Service in justifying its allocation of resources.

The Multiple Use-Sustained Yield Act ended the traditional Forest Service role of concentrating on the production and preservation of forest products, and imposed upon the Service the obligation to balance the many competing interests against each other. In one sense, it made the work of the Forest Service easier, in creating definitions that could be used to allocate resources among users. In other respects, it made the work of the Forest Service enormously more difficult in theoretically making each interest of equal value. Thus, recreation had co-equal value with timber harvesting, grazing, and watershed development. Watersheds could not be developed without consideration of the impact that such development might have on timber production, grazing, or recreation. To be sure, all of these things had previously entered into consideration in the allocation of forest resources, only now such considerations were legislatively mandated.

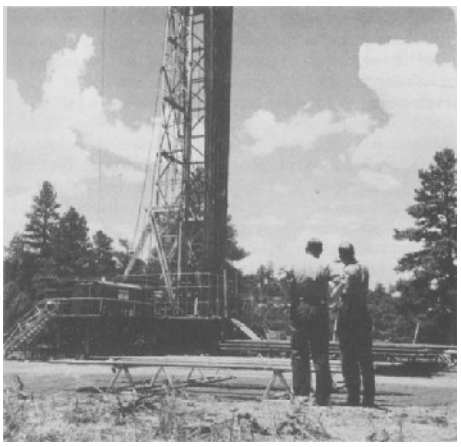

Figure 14. Forest officers inspecting an oil well drilling operation, Carson National Forest, 1960.

Although the years between 1945 and 1960 had been quiet years, they had in many ways been very constructive ones. The Southwestern Region was learning to handle the problems imposed by modern urban life. Real advances were made in silviculture practices, in pest and disease control, and in watershed improvement, utilization, and development. The acquisition and development of the national grasslands created a new dimension in the operations and activities of the Forest Service in the region. Meanwhile, despite all of this, the lifestyle and the work of the typical forester, whether ranger, forest supervisor, or staff, had changed little, and in some respects this

was comfortable and good. For those who worked there, despite the sometimes decaying facilities and the thin budgets, life was truly good. A fierce loyalty and sense of community characterized the personnel of the Southwestern Region in the postwar years. The people of the Southwest approved of their lifestyle, and Forest Service personnel could feel tremendous satisfaction in the knowledge that they were working and living in harmony with their neighbors and the community. Effective management of the national forests meant cooperating with other interests, governments, and agencies. Of necessity, effective management sometimes involved conflict.

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Chapter 9. The Southwestern Region and the Environmental Revolution: 1960-86

The enactment of the Multiple Use-Sustained Yield Act in 1960 reflected the growing urbanization of America and the recognition by a wide spectrum of the public and the Congress of the need for balanced and diverse uses of forest resources. Both these trends were especially evident in the Southwest, where a warm climate, dry clear air, and 300 days of sunshine per year attracted ever-increasing numbers of people from the north and east. By 1960, Phoenix had a population of 440,000, and both Tucson and Albuquerque had populations of more than 200,000. This trend continued over the next 20 years. By 1980, Phoenix had a population of more than 750,000, and Tucson and Albuquerque each had more than 330,000. The newcomers joined the older residents in the region in taking advantage of the recreational, game, fish, wildlife, and wilderness resources available in the national forests.

The Forest Service had sponsored and encouraged the Multiple Use Act in the belief that it would provide the framework for the next decade and satisfy the various users of national forest resources. It has served this purpose well. The concept of multiple-use, however, became involved in the environmental revolution that characterized the 1960s and the 1970s.

The roots of the environmental revolution can be traced back to John Muir and the Sierra Club, which he founded in 1892.[1] By the 1960s, this organization had expanded to become a national organization and, led by the energetic David Brower, sought to involve itself in all matters concerning the physical geography of the United States. The National Wildlife Federation also expanded its scope of interest and lobbied for a variety of public causes. The Audubon Society and The Wilderness Society (founded by forester Bob Marshall) likewise greatly increased their memberships and became active advocates of the environment and its protection. Historically, conservation organizations had supported the Forest Service policies and had favored the acquisition of additional lands to be managed by the Forest Service. They had also favored the proposals of Chiefs Pinchot, Graves, and Silcox to regulate cutting practices on industrial forest lands. In the 1960s, these same groups became the vocal critics of the Forest Service on certain issues.

Silent Spring

Rachel Carson, a trained marine biologist and experienced writer, published *Silent Spring* in the summer of 1962. It was, perhaps, the catalyst that set off the environmental revolution. *Silent Spring* was an argument against the excessive use of the new hydrocarbon pesticides, such as DDT, which threatened to “kill everything in sight.” She pointed to the incidental damage to nontarget insects, birds, small animals, and eventually humans by the large-scale spraying with ever-more-powerful insecticides. She demanded a halt to indiscriminate spraying, which she termed inhuman, undemocratic and probably unconstitutional.[2] Beyond these specifics was a philosophical protest against humans’ arrogant interference with nature and the tendency to “overkill” anything that stands in the way. In this she echoed Aldo Leopold’s viewpoint that the whole earth is an intricate, interrelated, interdependent fabric, and that you destroy any part of it at your peril.[3]

The impact of *Silent Spring* throughout the country was tremendous. Students in schools and universities rallied and protested against real or fancied crimes against the environment. They held sit-ins and celebrated “Earth Day” at parks, forests, and campuses. Organizations such as the Sierra Club assumed leadership roles in a crusade against excessive tampering with nature. Many

popular writers, including Barry Commoner, Paul Ehrlich, and Richard C. Lillard, expanded the indictment of sins against nature to include topics ranging from detergents in lake water to hasty urban developments built to accommodate the rapid urban population growth. Many of these writers also protested the further testing of atomic weapons and the peaceful use of nuclear energy.[4]

Protests, Confrontations, and Lawsuits

The Southwest, and the Forest Service in the region, experienced protests, confrontations, and lawsuits similar to those taking place in other parts of the country. In June 1969, the Forest Service used helicopters to spray a section of the Tonto National Forest near the town of Globe, AZ, with silvex, or 245—TP, to thin chaparral as a means of decreasing the fire hazard, improving water yield, and increasing forage yield. Sparked by the concerns of Billee Shoecraft of Globe, whose husband owned and operated a radio station, there were numerous protests from residents of Globe that the spraying had contaminated their water, damaged crops, and made livestock ill. People of the town complained of vomiting and dizziness. Residents filed suits totaling $4.5 million, and the Federal courts eventually enjoined the Forest Service from using any of a number of herbicides.[5]

Somewhat farther north, the Forest Service had earlier encouraged Southwestern Forest Industries to construct a pulp and paper mill at Snowflake near the Sitgreaves and Apache National Forests. This plant utilized ponderosa pine thinnings and chips from local sawmills and provided employment for several dozen workers. Residents then welcomed the new industry and praised the foresight that had brought a new and profitable business to a region that previously lacked an adequate industrial base. By the late 1960s, however, environmentalists demanded that the mill "clean up its act," that is, eliminate smoke and fumes in the air and recycle the water to remove pollutants before returning it to a dead stream bed that could release pollutants into the Little Colorado River. Under threat of a court order, the paper company did so at a cost of several million dollars.[6]

New Regional Forester

The 1960s also saw a change in leadership for the Southwestern Region. Fred H. Kennedy had served as regional forester since 1955 and had dealings with the early environmentalists. After his retirement in 1966, William D. Hurst from the Intermountain Region became chief officer of the Southwestern Region. Hurst had grown up in southern Utah, in or near Panguitch. He had the unusual distinction of being a third generation forester, as his grandfather had served under Gifford Pinchot as supervisor of Beaver National Forest and his father had been a ranger on the Dixie National Forest (both in Utah). After completing his general and professional education at Utah State University, Hurst joined the Forest Service in 1937. He worked his way up from his first assignment on the Wasatch National Forest and came to the Southwestern Region as regional forester in February 1966. Hurst brought not only a keen mind and almost 30 years' experience but also a pride in the history and traditions of the Forest Service and a genuine concern for the well-being the people and the forests—his new responsibility.[7]

The new environmentalists placed a high value on areas of untrammeled wilderness and sought an immediate act of Congress formally setting aside substantial areas to remain in their wild state. They sought to provide means to add other acreage to those so designated. The Forest Service had been involved in the protection of wilderness for at least 40 years and had set aside numerous

wilderness areas by administrative directive. Indeed, you will recall that the Southwestern Region had designated the first official wilderness. In the pantheon of environmental pioneer Aldo Leopold, Arthur H. Carhart, and Bob Marshall are considered founders of the wilderness movement.[8]

To the environmentalists of the 1960s, this was not sufficient. Pointing to reports that the Forest Service had reduced the size of the Gila Wilderness to 433,000 acres (largely during the administration of Regional Forester A. Otto Lindh in the late 1950s), they demanded that Congress pass a law that would establish wilderness areas and thus take away from the Forest Service the authority to create, reduce, or eliminate wilderness areas.

As William D. Hurst explained:

> The Gila Wilderness was not reduced to 433,000 aces as stated. This is what happened: The original Gila Wilderness of approximately 732,000 acres was created in 1924 by administrative action, as you have pointed out. Later, all of the original Wildernesses and Primitive areas were subjected to a study to determine their wilderness suitability. That part of each area that qualified under the criteria then in use was classified as Wilderness under the authority of the Secretary of Agriculture. (Later this classification was made by the President.)Those parts which did not qualify for Wilderness were reserved as Primitive Areas. The result of this action on the Gila National Forest was the creation of the 438,626-acre Gila Wilderness, the 137,388-acre Gila Primitive Area and the 182,216-acre Black Range Primitive Area, for a total of 735,000 acres. These three units constituted the original Gila Wilderness. At about the time this classification took place, and during the public discussion, a road was constructed through the full length of the Gila Primitive Area, roughly from Roberts Lake on the south to Beaverhead on the north. To accommodate this road a very narrow corridor was removed from Primitive Area status. So, in reality the size of the Gila Wilderness was not reduced appreciably as some allege. Today, both the Gila Primitive Area and the Black Range Primitive Area (now the Aldo Leopold Wilderness) have been classified as Wilderness. These, along with the Gila Wilderness have a combined acreage of 760,000 acres which is greater than the original Gila Wilderness.[9]

1964 Wilderness Act Passed

Under the leadership of Senator Clinton P. Anderson (D, New Mexico), Congress passed the Wilderness Act of 1964. It directed the Secretary of Agriculture to establish guidelines for wilderness. The Forest Service was to define and administer 54 wilderness areas, plus other “primitive areas” that were to be studied and, if suitable, later might be added to the wilderness system.[10] Within the Southwestern Region in 1964, there were 11 wilderness areas totaling more than 1,100,000 acres. In addition, there were six primitive areas of some 580,000 acres that were to be further studied to determine their suitability for classification as wilderness.[11] Thus, a misunderstanding contributed in some part to public pressures for new wilderness preservation legislation.

The word *wilderness* means many things to different people. To Aldo Leopold, wilderness had been both a condition of geography and a state of mind. There, he frequently recounted, man could exist with nature in all of its “infinite variety.” Bob Marshall defined wilderness as having no permanent human inhabitants and no means of mechanical conveyance. It should be

"sufficiently spacious that a person could spend a week or two of travel without crossing his own tracks."[12] Richard E. McArdle, Chief of the Forest Service from 1952 to 1962, pointed out that the establishment 14 million acres of wilderness was not just for some 450,000 people who would backpack in wilderness areas but looked ahead 50 or 100 years when the number will be multiplied. "If we are to have wilderness at all," he counseled, "you cannot have wilderness with a few acres. It takes large areas. That is inherent in the nature of wilderness."[13]

The enthusiasm for wilderness brought about a major confrontation between the Forest Service and environmentalists regarding the Santa Fe National Forest. In 1963, Regional Forester Fred Kennedy, officials in the State government, and local citizens decided that it was desirable to build a highway from Las Vegas along the southern slope of Elk Mountain, through a portion of the Santa Fe National Forest, and on to the west end of the Pecos River Road in Pecos Canyon. Described as a "scenic drive," it would open up a spectacular section of country and provide access to potential new ski slopes on 11,600-foot Elk Mountain. The road would also make it feasible to let cutting contracts on about 60 million board feet of mature, old-growth ponderosa pine and Douglas-fir, which would provide employment for several hundred residents of northern New Mexico, one of the poorer sections of the State. The officials in Washington approved the project as did Governor David Cargo, who promised to raise the necessary 20 percent matching funds for a combined Federal-State highway project. His successor, Governor Bruce King, also supported the project. Both New Mexico senators favored the project, as did most local residents.

Conservationists Oppose Highway

Conservation groups, however, announced their opposition to the proposed highway and formed the Upper Pecos Association (UPA) to fight it in the courts. Calling the region south of Elk Mountain a "de facto" wilderness, James B. Alley, attorney and spokesman for the UPA, charged that the real purpose of the road was to open up the region for the lumber companies who were eager to get to the prime ponderosa pine and Douglas-fir timber. He said everything else was merely window dressing. If the road went through, he predicted this area would suffer a blight of paper plates, soft drink cans, pop tops, and lines of chemical toilets. Furthermore, the paved highway would damage the Pecos Wilderness, which lay just to the north. The New Mexico Conservation Coordinating Council (NMCCC) joined in opposing the road. Their combined members were able to exert considerable pressure on the State government. The UPA filed a suit in Federal court against Robert Peterson of the Economic Development Administration, which had agreed to fund the project. By this time, Congress had passed the Environmental Policy Act (1969), and the Forest Service had to provide an environmental impact study statement, thus further delaying the beginning of construction. Eventually, the Forest Service and State of New Mexico abandoned the entire proposal, and the Elk Mountain road was not built.[14]

Throughout the country, environmental groups used protests, confrontations, and Federal lawsuits to prevent the Forest Service from awarding timber contracts, building fire lanes, and cutting diseased stands of pine. They were especially adamant in their opposition to clearcutting a stand and then replanting to secure an even-aged forest. Many of these cases, though in other regions, directly or indirectly affected the national forests in the Southwestern Region. In north-central Colorado, the Forest Service planned to log an area some nine miles north of the ski resort town of Vail and build an access road. Wilderness advocates sought to prevent any logging and sought an injunction until Congress could consider the merits of adding this area to the wilderness reserve in Colorado. Plaintiffs kept this case in the courts from 1964 until 1970 when the Federal

court at last enjoined the Forest Service from cutting any timber in the disputed area. Known as the Parker Case, this decision had to be borne in mind whenever the Forest Service wished to utilize the resources on any land that was contiguous to a wilderness or primitive region. In a similar case in Montana, the "Lincoln-Scapegoat" controversy had nationwide importance. This rugged region of forest land, popular with hunters, fishermen, and backpackers, lay south of the Bob Marshall Wilderness. The Forest Service planned to develop the forest region, build a road into the back country that would facilitate entry by a variety of recreational groups, and advertise several stands of mature timber for sale. Led by Cecil Garland, a sporting goods merchant at Lincoln, the local conservation group opposed the scheme and appealed to their representative to stop the roadbuilding until a further analysis could be made. The national Wilderness Society soon became involved and successfully stalled all action until the Forest Service was directed to "take another look." Eventually, environmental-minded friends in Congress pushed through a Scapegoat Wilderness Act in 1972. Thus a "de facto" wilderness moved into the national wilderness system.[15]

In the East, the famous "Monongahela" decision (1973) in West Virginia prohibited all clearcutting and intensive timber harvesting as contrary to the Organic Forestry Act of 1897. This decision, if applied nationwide, would have severely limited or prevented the Forest Service from managing the national forests for "wise use," as had been its policy and goal for more than 70 years.[16]

Somewhat later, in 1981, a controversy arose in the Lincoln National Forest over the leasing of some 9,000 acres, including a part of the El Capitan Wilderness, for oil and gas exploration. Despite the insistence of Interior Secretary James Watt that the explorations go forward (approved with conditions by the Bureau of Land Management and the Forest Service), a congressional committee first stalled and then the oil company modified its application to exclude that portion of the lease within the wilderness.[17]

Forest Service Freedom Reduced

These and other cases severely reduced the Forest Service's freedom to manage the national forests according to the multiple use-sustained yield philosophy. Wilderness groups lobbied tirelessly to add additional lands to wilderness classification. The constant agitation effectively prevented the Forest Service from developing or following a long-range management program for the forests under their care and direction. It was as Chief McArdle said, "some enthusiasts want to put a fence around every acre of federal land and call the whole thing wilderness."[18] It is not surprising that forestry officials bemoaned that they had "lost control and leadership of wilderness philosophy." Local merchants, environmentalist lawyers, and popular writers were making decisions and drawing boundaries that the Forest Service, with its experience and training, should have been doing. Indeed, the Forest Service seemed trapped between the preservationists and the users of renewable resources.[19]

All of the Federal agencies in the Southwest were involved and affected by the proposal to build two new dams on the Colorado River within the Grand Canyon as part of the Pacific Southwest Water Plan. Earlier, the Federal government had constructed the Hoover Dam below the Grand Canyon and in 1956 had authorized the Glen Canyon Dam above the park. In 1963, the Bureau of Land Management outlined a project to build Marble Canyon Dam and Bridge Canyon Dam (later renamed Hualapai) within the Grand Canyon National Park. The Kaibab National Forest lay directly north and south of the lake sites and would be directly affected by the dam itself and

pipelines and towers that would be constructed to convey the water and electric power generated by the projects. Presidents Kennedy and Johnson both supported the planned development, and Interior Secretary Stewart Udall (from Arizona) outlined the proposal to Congress and recommended its approval.

Dam Projects Opposed

Immediately, most national conservation groups and societies joined in stoutly opposing the project. The Sierra Club ran advertisements in the New York and Washington papers urging concerned citizens to write their senators and representatives, expressing their views and protesting any construction in Grand Canyon National Park. When the Internal Revenue Service threatened to take away the Sierra Club's tax-exempt status for lobbying regarding a proposed act of Congress, many additional thousands of citizens were outraged. Environmentalists quoted John Muir's protests back in 1915 against the Hetch Hetchy Dam in Yosemite National Park and repeated Aldo Leopold's philosophical comments about humanity's tendency to destroy the very things that have made life on the earth worthwhile.

In the midst of a great nationwide outpouring of protests by conservationists—everyone knew about the Grand Canyon; many had visited it; and most others had admired its magnificent vistas on film or picture—Congress held hearings on the project in the spring of 1967. Congressman Morris Udall (D-Arizona), brother of the Secretary, sought to find a compromise that would permit at least one relatively low-level dam to be built. To this, Brower of the Sierra Club and other environmentalists were adamant: "No dams! Leave the Colorado as a free-flowing river through the Grand Canyon."

Faced with united opposition from all sides, the Johnson Administration put the canyon dams "on hold." Later that year, Secretary Udall and his family took a raft trip through the Grand Canyon, imitating John Wesley Powell's pioneer exploration a century earlier. Returning from this tremendous experience, Udall announced that he had been mistaken about dams in the canyon and had changed his mind; he now opposed any such project. Although power and water advocates continued their efforts, the mood of Congress definitely turned against any obstructions within the Grand Canyon. The Congressional Act of 1968 funding the Central Arizona Project specifically prohibited dams within the Grand Canyon.[20]

Wild and Scenic River Act

The same year (1968), Congress passed the National Wild and Scenic River Act providing for the protection of certain rivers to remain in their "free-flowing" natural state. Of the initially designated eight "wild and scenic" rivers, one lay in the Southwestern Region, the Upper Rio Grande. Beginning at the Colorado border, this river flows south through rugged country, skirting the Carson National Forest and the Pueblo de Taos Reservation almost 50 miles to the vicinity of the town of Taos. This stretch of "white water" adds to the recreational attractions offered by the facilities of the Carson, Wheeler Peak Wilderness, and the ski and hiking properties of the Red River resort.[21]

As regional forester, Bill Hurst inherited a particularly troublesome problem in northern New Mexico involving parts of the Carson and Santa Fe National Forests. Although there had been old Spanish land grant claims and counter-claims, and litigation concerning land titles for more than a century (certainly since 1848), the Forest Service and the native population, Indian, Hispanic, and

Anglo, had gotten along well, and there had been good cooperation on all sides in previous years. Hurst and his immediate predecessors had made a practice of appointing rangers and fire guards to the Carson and Santa Fe who could speak Spanish as well as English and could relate to the local farmers and ranchers. Elliott Barker, one of the bilingual rangers, explained his experience: "four-fifths of our dealings were with Spanish-speaking people. They would listen to a person who could talk their language, . . .but if it was done in English or through an interpreter, you could never put it over at all."[22] Some rangers who had Spanish-American heritage, such as Chris Zamora, Joe Rodriquez, and Paul Martinez, knew the region well and were friends of the residents.

The Alianza Federal

This cooperative atmosphere changed completely with the rise of the Indo-hispanic orator and leader Reies Lopez Tijerina in the middle and late 1960s and the formation of the Allanza Federal de Los Pueblos Libres (the Federal Alliance of Free City States). Tijerina and his followers were determined to take over National Forest System lands that they claimed were part of their early land grants, regardless of Federal court decisions dating back to the last century.[23]

In October 1966, Reies Tijerina, his brother Cristobal, and several hundred followers drove into Echo Amphitheater, a Forest Service picnic ground in the Carson National Forest. This picnic ground was located on land that was once a part of the San Joaquin del Rio de Chama Land Grant. They ignored requests from the rangers on duty for the regular $1.00 daily use fee and swarmed into the central area. They then roughed up and threatened the rangers (Phil Smith, Chris Zamora, and Walt Taylor). Tijerina proclaimed the new state of San Joaquin del Rio de Chama, declared that court was in session, and proceeded to try two of the rangers for trespassing, disorderly conduct, and public nuisance. Tijerina had publicized this adventure well in advance, and his party had been accompanied by television and news cameramen who recorded his speeches and the "take over" of part of the Carson National Forest. The rangers were eventually rescued by the State police. The next day, forestry officials swore out warrants against Reies Tijerina, his brother, and other leaders who were arrested and then released on bond. The leader proclaimed that he was satisfied with the publicity his brief occupation had produced and predicted that his case would go to the Supreme Court.[24]

Courthouse Raid

The next year (1967), Reies Tijerina and his followers made a raid on the courthouse at Tierra Amarilla where arraignment proceedings for the previous seizure were scheduled and where several Alliance members, including Cristobal Tijerina, were incarcerated. Alianza members roughed up court employees and shot and wounded a State policeman and two sheriff's deputies. They also seized and disarmed the sheriff, kidnapped several officials, and held them as hostages. During this disorder, the mob shot up parked police cars, broke windows, and destroyed other property. Needless to say, they thoroughly disrupted the court. Tijerina talked about making "citizens' arrests" of Governor Cargo and 10th Federal Circuit Judge Warren Burger (who later became Chief Justice of the U.S. Supreme Court), but he never carried out these threats. During all this time, he basked in the publicity that accompanied his every move. Eventually, when the court convicted and sentenced Tijerina and the other leaders for the Echo Camp disorders, their attorney appealed to the U.S. Circuit Court, and, pending appeal, the court released them on bond.[25]

In the ensuing months, someone murdered a Tierra Amarilla deputy sheriff, and a mob burned signs and destroyed other property on the Carson National Forest. This resulted in the Federal judge revoking the bond for Tijerina and other leaders and placing them in prison. After more than a year of legal maneuvering, the court eventually found Reies Tijerina guilty of three counts: assaulting a police officer, destroying government property, and assaulting Forest Service rangers. The judge sentenced him to three years in prison on each count. Later, in 1969, the court also convicted the other leaders and sentenced each to prison terms.[26]

During all of this turmoil, confrontation, and litigation, Regional Forester Bill Hurst sought to maintain the region on an even keel and keep the morale of the foresters high. He urged supervisors, rangers, and guards to become active citizens in the communities where they lived and to get to know the local citizens and their problems. Although it was a "bureaucratic" agency, the Forest Service was fortunate to have "on-the-ground salesmen" who could create a favorable, positive image of the Forest Service. He suggested that foresters do more with newspaper items and television and radio appearances to accent the many desirable and favorable things that come from the Forest Service and play down the negatives and the no's that they had to hand out on occasion. Hurst stressed "traditional values" of the Forest Service, such as professionalism, pride in the Forest Service, its history and traditions, high standards of integrity, honesty, and hard work by all employees, a deep concern for the individual people who were dependent on the national forests, and a strong bond of "family" among the Forest Service members for each other. He also stressed the important role the Spanish-Americans had played in the management and development of the Forest Service in the Southwest, both as members of the organization and as users of the resources of the National Forests.[27] In 1972, Region 3 adopted the Northern New Mexico Policy with directives that the uniqueness and value of Spanish-American and Indian cultures must be recognized and preserved.

Land Exchange Problems

One of the continuing problems of the Forest Service in the region was land exchange. In 1960, D.D. Cutler returned to the region from service in the Washington Office and took charge of land classification and adjustments. He continued in this capacity during much of the Hurst era until his retirement in 1973. In Arizona and New Mexico, the problem of land exchange was especially critical and troublesome because of the large-scale "checkerboard" pattern of Federal land grants in mile-square sections that were awarded to the Atchison, Topeka and Santa Fe and other railroads in the late 19th century. Cutler worked out a number of important land exchanges, including the Rio Grande and Hondo grants on the Carson, the Ghost Ranch exchange on the Carson and Santa Fe, the Zuni on the Cibola, and the Coconino exchange in Arizona. Looking back at the land tangle in the Southwest from the vantage of a century of hindsight, it is apparent that neither the government, the railroads, nor the settlers were well-served by the alternate section system of selling or granting public lands in the West. What would have been a large family farm east of the Mississippi was a totally inadequate parcel of land in the arid West. All parties had to resort to exchanges, additional purchases, or diverse schemes or subterfuges to acquire a block of land usable for ranching, lumbering, development, or other purposes. It was a classic example of eastern lawmakers drawing up legislation affecting western lands that they knew nothing about and most had never seen.[28]

In 1976, Jean Hassell, who had been forest supervisor on the Carson during many of the Tijerina disturbances, succeeded William D. Hurst as regional forester. Hurst had managed well during a

difficult and turbulent time of rapid change. In turn, Hassell, who was young and robust, accepted the challenge and the prospect of further change in stride. In a message to the region's foresters in 1984, he set forth his philosophy as manager of the region's forests.

> Change is the stock in trade of the professional manager and more is on the way. We have advances in technology, changes in organization and in the way we do our work, but the biggest change, and the one that concerns me most, is the burgeoning public interest in almost everything the Forest Service does.
>
> The region is doing outstanding work. Our accomplishments are admirable in many fields. Yet there seem to be more and more people who challenge our judgment, appeal decisions, and at times haul the Forest Service into court. Much of the concern comes from people who are new to the Southwest and the number of newcomers grows daily. Many of them come from cities in the East and Midwest and getting their first exposure to the "outdoors." . . . What we must do is get acquainted; make them believe that we are trustworthy and competent and that what we do is not destructive or contrary to the people's best interests.
>
> We also must not forget that new people bring new ideas that may very well offer new ways to deal with problems.
>
> To keep up with the times we can build on the traditional values of honesty, hard work, dedication and professionalism. Our professionalism, however, must be demonstrated by a willingness to accept new concepts and to generate a good share from within the organization.
>
> Change will continue at a growing pace as we move through the 1980s. Our challenge is to manage change to our advantage. These are exciting times that I feel we are ready to meet head on. There have never been greater opportunities to make our mark and to show that the Forest Service is the best resource management organization in the world.[29]

Despite the changes that have occurred, the history of Region 3 has a certain timelessness and continuity that over-rides the changing time and technology. Today's work is built upon the foundations laid by such men as Arthur C. Ringland and Aldo Leopold, and perpetuated by the countless foresters, administrators, specialists, and just plain people who followed in their footsteps. Today's foresters do much the same work that was done over a half-century ago, and much of the timber that they protect and that is cut by modern lumbermen is there because of what the people who worked in the Southwestern Region did long ago. The deer, the squirrels, the fish and the fresh water, and the artifacts and ruins of ancient cultures are still there because of the continuing work of the Forest Service. The conservation of the natural and cultural resources of the Southwest through preservation and wise use is an unending task.

In retrospect, Forest Service personnel in the Southwestern Region have been unusually dedicated and hardworking men and women. There has been a distinctive sense of loyalty to the Southwest, as much as to the Forest Service. People who came to work in the Southwest most often stayed there, and if they left, many came back to retire there. Those people have developed in the Southwest a tradition of public service that has extended to personal community involvement as well as professional services. Working with the Forest Service in the Southwestern Region tended to be an "extended family' experience. Although the traditional values of the Forest Service are clearly under the stresses and strains of modern society and modern technology, those values and

the mission and dedication of the Forest Service are, with the distinctive cultural and natural resources, a vital part of the timeless heritage of the Southwest.

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[8] Nash, *Wilderness*, pp. 182-187.
[9] William D. Hurst, Bosque Farms, NM, to Henry C. Dethloff, College Station, TX, April 8, 1986.
[10] USDA Forest Service, *Search for Solitude, Our Wilderness Heritage* (Washington, DC: USDA Forest Service, 1971), pp. 8-9.
[11] These were the Chiricahua, Galiuro, Mazatzal, Mount Baldy, Sierra Ancha, Superstition, Gila, Pecos, San Pedro Parks, Wheeler Peak, and White Mountain Wildernesses. The primitive areas listed were Blue Range, Pine Mountain, Sycamore Canyon, Gila, Black Range, and Blue Range (NM). Forest Service, *Search for Solitude*, pp. 28-29.
[12] Leopold, *Sand County Almanac*, pp. 265-279; Roderick Nash, "The Strenuous Life of Bob Marshall," *Journal of Forest History*, 10 (October 1966): 19-23.
[13] Richard F. McArdle and Elwood R. Maunder, "Wilderness Politics: Legislation and Forest Service Policy," *Journal of Forestry History 19* (October 1975): 166-179.
[14] Shepherd, *The Forest Killers*, pp. 182–210.
[15] Dennis M. Roth, *The Wilderness Movement and the National Forests: 1964-1980* (Washington, DC: USDA Forest Service, 1984), pp. 19-22, 25-34.
[16] *Isaak Walton vs. Butz*, 376 F. Supp., (N.D., W. Va., 1973). This decision led to the enactment of the National Forest Management Act of 1976, which restored some measure of control and discretion to the Forest Service but provided stricter guidelines. See Thomas R. Cox, Robert S. Maxwell, Philip Drennon Thomas, and Joseph J. Malone, *This Well-Wooded Land: Americans and Their Forests From Colonial Times to the Present* (Lincoln: University of Nebraska Press, 1985), pp. 256–257.
[17] Michael Frome, *The Forest Service*, (Boulder, CO: Westview Press, 1984), pp.296-297.
[18] McArdle, *"Wilderness Politics,"* p. 176.
[19] Roth, *The Wilderness Movement*, p. 32.
[20] Nash, *Wilderness*, pp.227-254.
[21] Frome, *The Forest Service*, p. 141.
[22] Edwin A. Tucker and George Fitzpatrick, *Men Who Matched the Mountains: The Forest Service in the Southwest* (Washington, DC: USDA Forest Service, 1972), P. 289.
[23] *Ibid*., pp.276-277.
[24] "Summary of Alianza Activities," Forest Service Archives, October 21, 1969, Regional Office, Albuquerque; Tucker and Fitzpatrick, *Men Who Matched the Mountains*, pp. 276–288.
[25] *Ibid*.
[26] *Ibid*.
[27] William D. Hurst, Paper to R-3 Staff Officers and Forest Supervisors, April 1, 1969; William D. Hurst, Speech, "Traditional Forest Service Values," 1984 (USDA Forest Service, Regional Office, Albuquerque, NM).

[28] D.D. Cutler, letter to Henry C. Dethloff, March 21, 1985; USDA Forest Service, "Land Exchange in the National Forest System," USDA Forest Service, Regional Office, Albuquerque, NM; William S. Creever, *Arid Domain: The Santa Fe Railway and Its Western Land Grant* (Stanford, CA: Stanford University Press, 1954), passim.

[29] Jean Hassell, "Change Management Essential," from *Southwestern Region Administrative Bulletin*, December 1984.

Chapter 10. Timber Management

The resources of the national forests, and especially those of the Southwest in Region 3, have always been managed for multiple uses. Watershed and timber were the first stated management goals for national forests. These two resources, plus grazing, mining, wildlife, and recreation, have been the most significant uses of the national forests in the Southwest. The primary business of the Forest Service from its inception has been regarded as the protection, preservation, and harvest of the timber resources of the national forests. In fact, timber production was probably never the primary business of the Southwestern Region, but many foresters believed it to be so. Timber certainly retains a prominent place in the role and scope of the Forest Service in the region.

G.A. Pearson reflected the changing perception of the role of the Forest Service in the Southwestern Region, and elsewhere, when he observed in *The Journal of Forestry* in 1940 that "foresters no longer believe that every acre of land that can be made to grow timber must be used for that purpose."[1] Thus, long before the approval of the Multiple Use Sustained Yield Act of 1960, the Forest Service accepted responsibility for a variety of forest resource uses. Timber management is only one, albeit major, function of the Forest Service in the Southwestern Region. There, foresters spent most of their time and much energy on grazing, fire protection, timber management, and watershed protection, in that order of priority. Mining occupied considerable attention and, by the 1920s and 1930s, recreation began to intrude as a major new use of the forest resources.

Timber management involves largely the gathering of information through inventories and reconnaissance and planning for the growth and utilization of the forests. Although the technology and expertise of timber management have changed somewhat since those early years, today's foresters in the Southwest are doing much the same work when it comes to timber management that was being done when the region was first organized.

As previously described, southwestern National Forest System lands included commercial timber in the forests at higher elevations, woodlands with little commercial timber value in the mid-elevations, and open grazing lands and grasslands in the lower elevations. In these elevational ranges, there are several forest types or characteristic differences in species composition tied in with differences in habitat. The spruce or spruce-fir type is found in the higher altitudes over 9,000 feet. These forests include pure stands of Engelmann spruce, or spruce interspersed with subalpine fir, corkbark fir, limber pine, bristlecone pine, Douglas-fir, white fir, or aspen. Between roughly 7,000 and 10,000 feet, fir and transition type forests with blue spruce, white fir, limber pine, bristlecone pine, Douglas-fir, aspen, and some ponderosa pine are found—depending on the particular habitat type. At lower elevations, generally from 7,000 to 7,800 feet, but sometimes lower or higher, ponderosa pine predominates. Alligator juniper and Gambel oak might be present within the zone at lower elevations, while white fir, limber pine, Douglas-fir, aspen, and occasionally Engelmann spruce grow at the upper limits. Lower still are the woodland type forests that include combinations of pinyon pine, alligator juniper, Utah juniper, Rocky Mountain juniper, and oneseed juniper. Just above the pinyon-juniper type may be found the chaparral areas composed of scrub oak, mountain-mahogany, yucca, and cacti. The woodland and brush areas have potential for commercial fuelwood production, but none for lumber.

Early Timber Evaluation

One of the earliest "professional" timber evaluations of Southwestern forests appeared in the 1897-98 report of the U.S. Department of the Interior, Geological Survey. The report briefly noted that "in New Mexico the high mountain ranges and plateaus are timbered, but nowhere densely. . . . In Arizona the principal body of timber is the San Francisco Forest . . . and upon the high plateau of both sides to the Grand Canyon of the Colorado south of the Colorado Plateau . . ."[2] Forty years later, inventory and reconnaissance work had made the timber descriptions a little more precise.

According to the *General Selling Prospectus of National Forest Timber, Arizona and New Mexico*, prepared in 1939, the three principal regions for prime commercial timber in the Southwest are: (1) the Northern Arizona or Colorado Plateau region (at that time including the Coconino, Sitgreaves, and Tusayan National Forests), (2) the Rio Grande region of New Mexico (at that time including parts of the Carson, Jemez, and Pecos National Forests), and (3) the Datil-Gila region (at that time including parts of the Datil, Gila, and Apache National Forests). Eighty percent of the commercial timber in these three important divisions of the Southwestern Region is ponderosa pine, and the remainder includes Douglas-fir, white fir, and associated species.[3] Estimates made in 1939 indicated that the Southwestern Region national forests contained 34 percent commercial sawtimber, 35 percent noncommercial woodlands, and 31 percent nontimbered areas.[4]

There was no reliable estimate of the amount of timber on each forest reserve/national forest in Arizona and New Mexico at the time of their proclamation, or for several decades thereafter. Early methods of inventory and reconnaissance were necessarily extensive and lacked the precision possible today. Tables 5 and 6, compiled from a variety of Forest Service reports, provide a very sketchy summary of estimated sawtimber volumes on the Carson, Coconino, Coronado, Crook, and Kaibab National Forests.[5]

Table 5. Estimated sawtimber volumes on selected national forests

Forest reserve or national forest	Year	Sawtimber volume (thousand board feet)
Carson	1909	1,500,000
	1911	1,248,508
Coconino	1901-02	2,743,558
	1910	3,193,507
	1920	4,092,098
	1923	4,476,864
	1927	4,333,611
	1934	4,224,167
Coronado	1934	204,000
	1974	207,199
Crook (Mt. Graham Division)	1910	280,000
	1911	294,664
Kaibab	1910	1,362,130
	1953	1,436,000

Cutting timber on the public lands in the early days was illegal, but the law was rarely enforced. In 1902, according to Harold K. Steen, the Department of the Interior prepared a manual of procedures and policies to apply on the forest reserves, including regulations governing the free

use of timber. Such free use of public domain timber "for legitimate petitioners" had been traditional. Corporations, sawmills, and other large entities could purchase timber, but had to locate and describe the timber they wanted. A sale was prepared, and then the original locator and any other interested parties could bid for the sale. Any other taking of timber, especially without approval for free use or by sale, was considered timber trespass, but the penalty was only the price of the timber-hardly the stiff penalty of "triple damages" we have today. Trespass continued to be a problem, both on the original forest reserves and then on the national forests.[6] Free use continued for many years and still occurs in a very limited way.

Unauthorized Timber Cutting

According to Gilbert Schubert, timber was cut commercially in Arizona and New Mexico when the transcontinental railroad was constructed in the 1870s and 1880s. Demand for bridge timber, railroad ties, mine props, and lumber grew, and by 1890, a lumber business flourished. Unauthorized cutting of timber in the public domain appeared to be rampant. There is no way to determine the actual extent of timber theft on that part of the public domain in Arizona and New Mexico that eventually became national forests. There are numerous reports of prior cutting, but only a few well-informed estimates of acreages cut or the extent of the cutting damage. These depredations indicate the nature of the problem the Forest Service inherited when it assumed management of these lands.[7]

Table 6. Sawtimber volume (millions of board feet) on national forests, Southwestern Region, by State[s]

Year	Arizona	New Mexico
1909	6,500	11,200
1939	14,489	11,253
1943	14,489	11,253
1952	14,870	12,639
1962	15,141	13,295
1970	14,270	12,645
1977	15,401	12,936
1979	15,401	12,986

Although unauthorized cutting was occurring, prosecution for trespass rarely followed. Then, in early 1888, the Riordan family, which had a large sawmill at Flagstaff, was charged with cutting timber on the public domain. The matter dragged on for some time, but was finally settled in the family's favor.[8]

On two of the four forest reserves inventoried by the USDI Geological Survey in 1897-98, serious depredations occurred; on the other two, little was reported. On the San Francisco Mountains Forest Reserve, Leiberg, Rixon, and Dodwell reported that 148,845 acres had been cut over. Over 100,000 of them had 60 percent or more of the stand removed in building the Atlantic and Pacific Railroad prior to the establishment of the reserve. Recent cutting was reported to have removed the entire timber of "marketable value."[9] On the Gila River Forest Reserve, Rixon reported that "logging operations have been carried on in a desultory manner for some years in different parts of the reserve."[10] He also reported that most of the damage occurred in and near the creek bottoms and that only two small sawmills remained. On the Lincoln and Black Mesa Forest Reserves, the report made no mention of logging in the early years; instead, it just commented that better lumber could be imported. Little early logging was reported on the Black Mesa

Reserve, and that was for mining purposes."[11] Vernon J. Glover's book, *Logging Railroads of the Lincoln National Forest, New Mexico*, depicts the early expansion of railroading and lumbering in the region.

On the other reserves and forests, there was evidence of unauthorized timber cutting. In 1901, Frank R. Stewart, Forest Supervisor, reported to the Commissioner of the General Land Office the recent timber harvesting activity on the Prescott Forest Reserve. He mentioned that millions of board feet of timber had been cut on the reserve during the previous 5 years, but only about a tenth of it was used by people in or near the reserve. He objected to most of the timber having been shipped to Jerome or to the United Verde Mines. In the Graham Mountains, Forester Kellogg, reported that "a great deal of cutting has been done." Ringland, in 1909, noted that most of the accessible areas of pine on the North Slope Block of the Lincoln National Forest were culled from 1886 to 1896 by portable mills.[12]

George Bard reported in 1908 that most of the timber and in the Manzano National Forest had been cut over for ties and other railroad material, with most of the cutting from three townships. These kinds of depredations did not occur everywhere on the public timberlands of the Southwest. For instance, the Sitgreaves National Forest had not been logged over when the Forest Service assumed its management, since the people living there were raising stock and had little use for forest products. By 1911, the lumber industry had not harvested on the Mogollon Division of the Gila National Forest. Lang and Stewart, in their reconnaissance report of the Kaibab National Forest, mentioned that lumbering there had been negligible.[13]

Authorized Timber Sales Began in 1897

Authorized sales of timber from national forests began in 1897 before the creation of all but one of the national forests in the Southwestern Region. Cutting under "public timber permits," without charge, had been allowed beginning in 1891, with the creation of the forest reserves, but the amount was limited to $100 worth of timber per year. The first such cuts were made in fiscal year 1893.[14] In addition, the Organic Act of 1897 allowed the disposal through sale or free use of dead or mature timber, but in an orderly and planned manner. This legislation set the stage for the timbered portion of the forest reserves in the Southwest to be harvested in amounts not to exceed their long-term growth.

The technical language of the Organic Act [official name: The Sundry Civil Act], approved June 4, 1897, prescribed the following policy for timber sales:

> For the purpose of preserving the living and growing timber and promoting the younger growth on forest reservations, the Secretary of the Interior, under such rules and regulations as he shall prescribe, may cause to be designated and appraised so much of the dead, matured, or large growth of trees found upon such forest reservations as may be compatible with the appraised value in such quantities to each purchaser as he shall prescribe, to be used in the State or Territory in which such timber reservation may be situated, respectively, but not for export there from. . . . Such timber before being sold, shall be marked and designated, and shall be cut and removed under the supervision of some person appointed for that purpose by the Secretary of the Interior, nor interested in the purchase or removal of such timber nor in the employment of the purchaser thereof . . .[15]

Figure 15. Big-wheel logging, Coconino National Forest, 1903.

Many of the same regulations remained in use by the Forest Service after 1907.

The Forest Service recognized, in the words of Gifford Pinchot, that "all the resources of forest reserves are for use, and this use must be brought about in a thoroughly prompt and business like manner.. ."[16] The regional administrators early on accepted an aggressive timber sale policy in the Southwest:

> The Forest Service first began to sell timber from National Forests in Arizona and New Mexico in 1905. For the fiscal year 1906 the receipts were $40,476.84; 1908, $106,417.78; 1910, $123,421.67; and for 1913, $227,550.82. A steady increase in the business, such as is indicated by these figures, clearly proves that the purchase of National Forest Stumpage is profitable to the operator.[17]

Overcutting in Places

The amount and location of timber sold in the Southwestern District should have revolved around the sustained yield capacity of the forest types and the age and condition of the timber stands in these types, balanced against the demand for timber in the region and for export to other regions. Initially, however, demand for timber by sawmills and nearby landowners dictated what was made available to them. Demand for timber, therefore, was matched to supplies only in a cursory manner. This concerned the silviculturists and timber managers, who, by 1907, were already beginning to worry that timber harvesting was exceeding the sustained yield capacity of the national forests where timber demand was heavy. Theodore Woolsey, for example, was concerned that at Flagstaff the cut in 1907 would probably be between 20 and 40 million board feet, or about twice the cutting rate that would sustain the forests in the long run. Two years later, Arthur Recknagel expressed the same concern by noting that few managers realized how serious overcutting had become.[18]

By 1910, the Southwestern District had developed a policy for making timber sales and had produced mimeographed instructions for handling them. Sections on policy, marking, stumpage rates, scaling, and administration were included.[19] In 1911, the Forest Service published *The National Forest Manual* to supplement the *Use Book*. A section of the Manual treated timber sales and contained regulations, such as regulation S-8, dealing with advance cutting. The manual also contained harvest procedures and instructions and established limitations on annual cuts.[20]

Figure 16. Felling old-growth timber, Coconino National Forest, about 1910.

Timber appraisal guidelines have usually been separated from timber sales guidelines. By 1914, a timber appraisal section of *The National Forest Manual*, separately bound, was issued. It presented, in detail, how timber appraisals would be made. The appraisal manual was revised in 1922 and several times since. It once was part of *The Forest Service Handbook* series during the 1950s and 1960s and is now in *The Forest Service Manual*.[21]

Timber Marking Rules

To ensure that timber stands would be perpetuated and not overcut, the Southwestern District, by 1916, had developed timber marking rules. Cutting in the yellow [ponderosa] pine type followed procedures outlined by Woolsey in Forest Service Bulletin 101, published in 1911. Improvement cutting was performed by removing mature and defective trees, thinning in "black jack" (young, thrifty ponderosa pine) stands, and cutting enough timber so the operator could log and mill profitably. At least 2,000 board feet per acre were to be left, if possible. In the pinyon juniper type, marking was to improve the stands by removing dead and dying trees and to cut overtopping trees to free shaded seedlings. In the Douglas-fir type, where little cruising had taken place, the rule was to mark only very large, overmature, or defective trees.[22]

But marking rules are difficult to follow. During the period from 1921 to 1924, several memoranda indicated that the rules were not specific enough, that too much control was being exerted at the district [regional] level and not enough at the national forest level, and that the volume of work was creating severe pressures on foresters.[23]

In these formative years, the district staffs planned timber sales, as well as timber production. The district forester, in his report to the supervisors in 1922, mentioned that timber sales policy statements were in effect for all or parts of ten of the 14 national forests in the region. He also stated that the Sitgreaves management plan was encouraging the development of another large timber operation started on the western part of the forest. "This is quite different from merely following the purchasers' lead in our timber sale work but is exactly what management plans make possible."[24] The Southwestern Region was not noted for large timber sales, but several sales

were much larger than most. In his book, *The Development of Governmental Forest Control in the United States*, Jenks Cameron mentions a sale of ". . . eighty million board feet of western yellow (ponderosa] pine on twenty-eight thousand acres" on the Coconino National Forest.[25] The backbone of national forest administration has always been careful planning of different segments of the work and a careful development of plans. Timber management plans evolved through this philosophy.

Use Book Did Not Give Timber Guidelines

The *Use Book*, first published in 1905, did not contain guidelines for planning the management of national forest timber. It discussed general policy, which was to provide as much timber for use as demanded as long as the environment was not seriously damaged. The 1918 edition of the *Use Book* contained an entire part on "Timber Sales, Free Use, Timber Settlement, Administrative Use of Timber, Forest Planting, Timber Trespass" but nothing on timber management or timber management planning. In 1928, Inman F. "Cap" Eldredge, Sr., who had worked in the Southwestern Region, published *Management Plans: With Special Reference to the National Forests*, while he held the position of forest inspector in the Forest Management Branch of the Chief's Office. The publication, in guideline format, covered the topics of management plans in general, preparation of management plans, organization of the working circle, collection of data, objects of management, silvicultural treatment, regulation (including calculation of allowable cut), the management-plan report, and control and application of management plans. Eldredge's suggestions for the management-plan report were quite formalized and in three parts. He used the phrase "it has become customary in the Forest Service, . . ." indicating the recognition that standardized timber management plans were necessary in the decentralized National Forest System.

Figure 17. Skidding ponderosa pine with horses, Coconino National Forest, 1924.

The Forest Service's *Timber Management Plans on the National Forests*, 1950, outlines the topics of planning, management plans, the working circle (the major forest operating and planning unit), the management plan (including regulation of the cut), and working the plan. The crucial statement in the publication is:

> Many management plan outlines have been written. There is no Service-wide required form or outline for timber management plans for national forest working circles. The Forest Service Manual lists essential requirements and specifies that each plan shall include standard opening pages. Beyond that, regional specifications and outlines will govern.[26]

The *Forest Service Manual* has contained, as does the Handbook, sections on timber management and timber management plans. The Forest Service Chief's Office and the Regional Office timber management staffs provide guidance for their counterparts at the national forest level regarding the form and format of timber management plans. One such format was prepared in 1962 for the Southwestern Region. The 27-page document is quite thorough.

How much timber to harvest and still perpetuate national forest timber stands is an important part of all timber management plans. In the long run, no more timber can be harvested from an area than the long-run growth of timber in the area. This is the basis of sustained yield. However, in understocked forests, the annual harvest must be less than the annual increment if the growing stock is to be built up to reasonable levels. In old-growth forests, on the other hand, it is often desirable to harvest more than growth to allow a new stand to begin. There are many different methods of calculating the allowable annual cut (now called potential yield). Historically, the process of determining the allowable cut is called "forest regulation." Allowable cut calculations have long been a central part of timber management planning on the national forests.

Working Circles

On the national forests of the Southwestern Region, the preliminary timber policy statements planned how to divide the forest into *working circles*. These working circles were defined before large-scale timber sales and harvesting activities were begun. The next planning document was the *management plan* (now called the *timber management plan*) for controlling logging and silvicultural operations on each working circle. These documents defined such things as the timber types and their volumes, the allowable annual cut, the selection of the rotation (age of stand at which time it is finally harvested), the silvicultural system to employ, the determination of where/when logging should take place, and timber sales policy. Finally, a *working plan* was also developed, dealing with such things as planting, protection, grazing, improvements, and administration.[27]

A subsection of the section on "regulation" of the bulletin *Management Plans: With Special Reference to the National Forests* (1928) recognized accessibility, timber quality, and public service as elements of "timber-sale policy." The management plan for the Rio Pueblo Working Circle, Carson National Forest, in the appendix of the bulletin, contained three paragraphs devoted to "sales policy," and contained the observation that large firms could best do the logging required for the harvest of hewn cross ties. Some national forest working circles did not open up until railroads were built into them. For instance, the Mogollon Working Circle on the Sitgreaves National Forest in Arizona was not tapped until a standard-gauge railroad 10 miles long was built in 1928. When this happened, long-term timber sales operations—estimated at 75 years in this instance—could take place and large permanent mills could be constructed.[28]

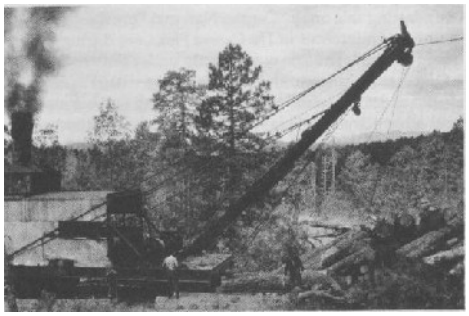

Figure 18. Railroad crane in action, Coconino National Forest, 1924.

Figure 19. Forest officer scaling timber, Coconino National Forest, 1924.

Mill-scale studies determine the probable yield of lumber from logs and trees of stated species, dimensions, and quality. If these are not done, timber appraisal can yield incorrect estimates of the sales value of lumber produced from national forest timber offered for sale. The first such studies undertaken in the Southwestern Region were in 1937 at Rock Top to determine the overrun and in 1957 at Flagstaff to determine value.[29]

Meeting the Specifications

Another important aspect of the timber sales work in the National Forest System is to administer logging and see that all specifications in the timber sale contract are met. This requires constant inspection and, on large timber sales in the early years of the Southwestern District, called for staff persons—not just scalers—to be on the sale area constantly. A long-lasting sale on the Carson National Forest received numerous references in The *Carson Pine Cone* during the years 1913-20. The sale was directly under the supervision of the district rangers, and staff persons assisted in such duties as scaling, checking on brush piling and burning, and other activities. This was contrary to the method used today in which timber management staff personnel, in cooperation with the district ranger, handle timber sale appraisal, supervision, and administration.

In 1954, forester Albert W. Sump inspected the timber sale work of the Southwestern Region. He noted that timber quality had not been adequately considered in preparing timber sale appraisals, stating that a mill-scale study would be necessary. The region had been employing the high-risk or “must” tree concept of marking, which called for harvesting all trees that, in the estimation of the marker, would not live for 10 years, as the California Region had done in the early 1950s.

Sump suggested that in areas where the advance stand (such as seedlings and saplings along with a mature overstory stand) was good, the region might consider harvest cuts of mature timber there, along with high-risk cutting on all the other areas.[30]

Although not as rich in timber resources as the Pacific Northwest, Pacific Southwest, or Alaska Regions, the Southwestern Region has harvested its timber in an excellent fashion. The larger sales received the most attention; however, there were few large sawmills. Therefore, small sales made up a large portion of the total timber sale volume. Sales volume started slowly; there was none in fiscal year 1900 and only a modest 9,800 board feet in fiscal year 1904. Most of the receipts from the national forests in the region in the early years were from grazing. In fact, during fiscal year 1907, only the San Francisco Mountains and the Prescott, the Chiricahua, and the Pecos River National Forests had greater than half their receipts from timber.[31] In the following years, however, timber sales volume increased swiftly. As noted earlier, receipts increased from over $40,000 in fiscal year 1906 to nearly $228,000 in fiscal year 1913. Annual timber harvest did not exceed 100 million board feet until calendar year 1927; the cut reached 300 million in calendar year 1958 and 500 million in calendar year 1965.

Large Early Offering on the Coconino

One of the largest early offerings of timber in the region was on the Coconino National Forest in 1907, for 90 million board feet of ponderosa pine. Logs were brought out on railroads and big wheel skidders in summer and big sleds in winter. Another early large-volume sale was the sale of 75 million board feet on the Tusayan National Forest in 1909 to the Saginaw & Manistee Lumber Company. Constant wrangling over appraised prices ensued, ending only when the mill was sold. The Marking Board, which oversaw that enough young trees or seed trees were left on timber sale areas to allow the forest to regenerate, was called upon to act on this sale. In 1911, the region announced plans for a 600-million-board-foot sale on the Sitgreaves National Forest. The final sale, awarded to the Navaho Lumber & Timber Company, was only for half that volume. In the same year, the Mt. Graham Lumber Company applied for 50 million board feet at $2 per thousand. The largest timber sale in the region, on the Carson National Forest, was to the Halleck and Howard Lumber Company, for 160 million feet, on the Vallecitos District. Halleck and Howard logged over 100,000 acres during an 8- to 10-year period, with close supervision by the Forest Service.[32]

A timber sale on the Deer Springs unit of the Sitgreaves National Forest was made to the Cady Lumber Corporation in 1925. Cutting lasted for 25 years, but involved a number of reappraisals of the stumpage price. The original appraisal for 287 million feet at $2.75 per thousand board feet was still appraised at this price when recontracted in 1941, then increased to $3.30. In 1947, a reappraisal raised the price to $5.65 per thousand.

Figure 20. Four-horse team hauling logs, Coconino National Forest, 1924.

Most of the significant timber sales in the region have been for sawtimber, but the Snowflake Unit Sale, for pulpwood, stands out in the historical annals of the region. Southwest Lumber Mills, building a pulp mill at Snowflake, had applied for a pulpwood sale. A 6-million-cord sale was prepared, but the appraisal was difficult because of the lack of "comparables" for price data. The agreement was drawn up February 28, 1957, and the contract signed December 1, 1959, with stumpage and other costs bringing the cost to the purchaser to $1.00 per cord; another reappraisal was made in 1971 and all costs adjusted to $1.65 per cord.[33]

In fiscal year 1912 the national forest in the district with the largest cut was the Coconino, by a wide margin, with over 35 million board feet. After the region developed, just three of the national forests (four before consolidation of the Apache and the Sitgreaves) contributed most of the timber cut in the region. Seventy-three percent of the timber cut in commercial sales in fiscal year 1938 and 65 percent in calendar year 1958 came from the Apache, Coconino, Kaibab, and Sitgreaves National Forests. In fiscal year 1982, they contributed 57 percent of the sawtimber cut.[34]

Table 7 presents the amount of timber cut in selected years to show the trend.[35]

Table 7. Timber cut (thousands of board feet) In commercial sales In the Southwestern Region.[35]

Year	Arizona	New Mexico
1900 (FY)	0	0
1904 (FY)	5.8	4
1906 (FY)	27.6	1
1907 (FY)	110.9	59.1
1909 (CY)	29,029	12,834
1916 (FY)	74,274	46,834
1926 (CY)	30,761	16,032

Year	Arizona	New Mexico
1929 (CY)	143,575	33,161
1931 (CY)	80,862	14,864
1937 (CY)	91,902	50,631
1944 (CY)	113,269	40,544
1952 (CY)	175,501	60,002
1956 (CY)	102,911	96,916
1965 (CY)	307,287	91,916
1972 (FY)	249,684	141,141
1980 (FY)	263,167	102,257
1984 (FY)	248,781	120,692

CY = calendar year, FY = fiscal year.

The Federal Sustained Yield Units

An original intent of the Forest Service was to sustain local communities. Stories are numerous of ghost towns of the West, built around once-plentiful ore or timber supplies that had played out. When the mines and sawmills folded, the town was passed by. By regulating the flow of national forest timber for sale and preparing sales to fit the ability of local mills to contract for, log, and pay for the timber, the Forest Service has helped maintain communities near national forests. To help local communities, the Sustained Yield Unit Act of 1944 (P.L. 273) allowed the Forest Service or Bureau of Land Management to enter into exclusive contracts for local mills to obtain timber under noncompetitive circumstances. Five of these Federal Sustained Yield Units were established by the Forest Service.[36]

Two of these units were in the Southwestern Region: the Vallecitos Unit on the Carson National Forest and the Flagstaff Unit on the Coconino National Forest. The Vallecitos Unit was established on January 21, 1948, and contained 74,000 acres with an annual allowable cut of 33 million board feet. The 1951 Timber Management Plan called for an annual allowable cut of 4.2 million board feet. The Flagstaff Unit was established on May 6, 1949, and contained 900,000 acres with an annual allowable cut of 56.8 million board feet. The total regulated harvest on the Flagstaff Working Circle, within the unit, and on the Kaibab National Forest portion of the unit was 68.583 million board feet annually, in 1979.[37] Thus, it can be seen that not only did the concept of the Federal Sustained Yield Unit work in the Southwestern Region, but the allowable cut had increased since the two units were established. The Flagstaff Federal Sustained Yield Act is in the process of being dissolved and, although not final, it probably will be.

Multiple Use

Things began to change for timber management in the Forest Service after World War 11. In the late 1940s and early 1950s, the agency responded to the expansion of the forest industry and its need for government timber in the Western States, where industrial ownership was limited. Those interested in the protection of the environment-for whatever reasons, both selfish and altruistic—began to pressure the Forest Service to put more effort on non-consumptive use of the forests it managed and less effort on consumptive use.

Figure 21. Sighting the direction of the fall, after chopping the notch end before using the crosscut saw, Coconino National Forest, 1924.

Multiple use has been a concept long fostered by the Forest Service. The first recorded concern for visual effects of timber harvest was for State-owned timber on the Lincoln National Forest in 1929. The Southwestern Region required protection of scenic and watershed values as early as 1940.[38] Only in recent years, since the approval of the Multiple Use-Sustained Yield Act of 1960, has multiple use received widespread public attention. The act spelled out consideration for all uses of National Forest System land and resources. Timber and range were no longer the dominant uses they had once been. What has happened since passage of this act and subsequent acts, and in the aftermath of court decisions, has had a profound effect on the manner in which the Forest Service manages timber.

Passage of the Multiple Use-Sustained Yield Act began a period in which the many uses of national forest land were officially recognized and had to be specifically considered in management planning. According to Steen:

> The Multiple Use Act stated that "the national forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purpose" . . . To McArdle [then Chef of the Forest Service) and supporters of the new law, the Forest Service had long practiced multiple use. Now it was the law of the land.[39]

Steen further noted that after World War 11, the public came to the national forests and saw logging operations and areas that had been logged, as well as uncut areas, and they preferred the latter. The Sierra Club opposed the multiple use bill because it wanted a wilderness act to be passed that would ban timber harvest in certain areas. Representatives of the Forest Service and the Sierra Club met in 1960, and the club agreed not to oppose the bill if timber management would not dominate when the Multiple Use-Sustained Yield Act took effect.[40] So, from 1960 on, timber management no longer held a sacrosanct position in the use and management of the national forests.

Figure 22. Logging camp, Kaibab National Forest, 1947.

In 1959, even before passage of the Multiple Use-Sustained Yield Act, the Southwestern Region published guidelines for operating under the concept of multiple use. These contained the following sections: summary; introduction; management direction; coordination requirements with other resource uses and activities; and appendix. Each national forest was to produce a multiple-use management plan for at least one ranger district by July 1960. The "Summary of Management Direction" in the guidelines said that good timberland sites would be managed primarily for timber production, unless they are in special areas of high public use, such as designated recreation areas, roadside zones, waterfront zones, or scenic strips.[41] This really implied that the management concept used in the Southwestern Region stressed priority use rather than multiple use.

The 1967 *Multiple Use Management Guide* included a section on timber management with a list of management objectives:

1. Protect, develop, and utilize the timber resource so it will contribute its greatest social and economic benefits on a sustained yield basis in harmony with protection, development, and use of other National Forest System resources and activities.
2. Improve timber stands through application of sound silvicultural practices.
3. Reforest nonstocked or poorly stocked lands, including timber sale cutover areas, burns, and productive areas occupied by noncommercial species.
4. Maintain proper stocking and growing conditions in young stands through timely timber stand improvement measures.
5. Reduce fire, wind, insect, and disease losses through proper harvesting methods and direct control.
6. Manage National Forest System timber stands so they serve as a demonstration for management of other commercial forest lands in the Southwest.[42]

A timber management plan for the Flagstaff Working Circle, Sixth Revision, was prepared in 1964-65. The 82 page document was formulated around the format of plans prescribed for application with the multiple use management act. In forwarding the plan to the division of timber management in the Washington Office of the Forest Service, L.G. Woods, assistant regional forester, stated that "this is one of the best Working Circle Plans I have received. It sets forth clear and concise management direction, including technical standards for harvesting and managing the timber stands on a multiple use coordination basis. "[43] The plan contained sections on problems, management prescription, management controls, timber disposal policy, forest development,

insect and disease control, and maps. Even-aged management was the silvicultural method to be employed. The annual allowable cut was 65.229 million board feet.[44]

Figure 23. Felling ponderosa pine with a chain saw, Coconino National Forest, 1959.

Functional Inspection In 1965

In the fall of 1965, M.B. Bruce, assistant director of timber management in the Washington Office, made a general functional inspection of timber management in the region. He evaluated the regeneration activities as improving, the harvest level as too low because of too little thinning, and that grazing and recreation activity, rather than timber management, was being emphasized. He stated that management planning was at about 85 percent of regional objectives. Bruce recommended terminating the Vallecitos Sustained Yield Unit, but this never happened.[45]

In 1969, Federal legislation in the form of the National Environmental Policy Act again affected the ways the Forest Service planned its timber management and sales. This was followed in the 1970s by the Resource Planning Act and the National Forest Management Act, each calling for considerably more effort in planning, care in cutting, and more consideration of other resources. Timber growing and harvest no longer dominated over recreation and watershed values in the commercial timber stands of the national forests in the Southwest. Timber management now requires exhaustive reporting and planning.

Figure 24. Caterpillar tractor and logging arch skidding ponderosa pine sawlogs to loading site, Apache National Forest, 1960.

Each national forest in the region is required to prepare a preliminary and a final environmental impact statement for its timber management program. As an illustration of a proposed timber management plan, the Coconino National Forest in 1972 prepared a 60-page draft environmental impact statement of its plan. A proposed plan and five alternatives were presented. The chosen plan was the Seventh Ten-Year Timber Management Plan for the Coconino National Forest and covered the period of July 1, 1973, through June 30, 1983. It proposed an allowable cut for sawtimber of 70.335 million board feet and for pulpwood of 60,700 cords per year.[46]

Figure 25. Loading ponderosa pine logs on flatcars, Coconino National Forest, 1959

In January 1976, the Prescott National Forest prepared a 71-page draft environmental impact statement of its timber management plan comprising four alternative programs, and in July of that year, it issued the final statement (89 pages) essentially with the same wording as the draft statement. The third alternative, that the timber resource would be managed primarily for amenity values, was chosen. The total operable area would be 22,733 acres with an annual allowable harvest of 1.834 million board feet (3,263 cords). [47] This alternative was favorable to the Sierra Club and other environmental groups. Because only 7 percent of the forest had commercial timber stands, this decision-to forego commercial production as a forest priority—was reasonable.

Timber management plans were supposed to be in accordance with Regional and National Forest Land Use Guides. As a reader examines the land use guides and timber management plans, aside from a little more zoning of areas planned for timber growth and harvest, the timber management plans prepared during the 1970s are quite similar to the ones of the previous two decades. On the

Prescott National Forest in 1976, for example, the procedures for land use and timber management plans were expressed this way:

> The Southwestern Region has developed a Land Use Planning System that is an integral part of all Forest Service activities. Development of Management Zones, with broad Regional direction, gives uniformity to decisions made for similar areas throughout the Southwest. . . . The Prescott National Forest has a Multiple Use Guide which classifies the various zones and provides multiple use guidelines for the District Rangers. The Multiple Use Guide is also utilized during the Land Use Planning process on Units throughout the Forest. The Timber Management Plan will prescribe management action, but must be prepared in the Multiple Use Guide.[48]

Environmental Statements and Forest Plans

Currently, each national forest in the region has been going through the procedure of preparing environmental impact statements and national forest plans. These are sizable documents, but contain generalized information that is difficult to follow. The planners are perhaps unduly burdened with having to send out their draft statements to a myriad of individuals, organizations and firms, and state and federal agencies. They are also obliged to include all written responses from those who have reviewed the documents and the written responses of the Forest Service.[49] A typically involved reason explaining why these are prepared has been found in the Cibola National Forest plan:

> The EIS is required by the National Environmental Policy Act (NEPA) of 1969, Council on Environmental Quality (CEQ) Regulations [40 Code of Federal Regulations (CFR) 15001 and the implementing regulations for NFMA Regulations [36 CFR 219]. The EIS is prepared in the format established in CEQ regulations [40 CFR 1502.10]. The Proposed Action is the Cibola National Forest's Land and Resource Management Plan (Forest Plan), which is a separate document. Preparation of the Forest Plan is required by the Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974, as amended by the National Forest Management Act (NFMA) of 1976. For purposes of NEPA disclosure, the EIS and Plan are treated as combined documents [40 CFR 1506.41][50]

Study of these documents shows that timber (and including fuelwood on some national forests) is considered a resource element along with (depending on the national forest) air quality, cultural resources, diversity, facilities, insects and disease, land line location, lands and special uses, law enforcement, major utility corridors, minerals, protection, range, riparian sectors, recreation, research natural areas, soil and water, transportation system, visual resources, wild and scenic rivers, wilderness, and wildlife and fish. Timber cutting and these other elements are considered as affecting the environment and as having environmental consequences. Planners pose several alternatives and select a preferred alternative.

Figure 26. Ranger inspecting load of logs, Carson National Forest, 1960.

Timber production will differ considerably, depending on the alternative chosen by the management planning teams. For instance, on the Carson National Forest, the annual sawtimber harvest would vary from 23.9 to 47.6 million board feet among the seven alternatives for the first decade of the proposed plan.[51] On the Cibola National Forest, the annual sawtimber harvest would vary from 6.9 to 18.4 million board feet among the seven alternatives for the first decade. On the Gila National Forest, the annual sawtimber harvest would vary from 13.8 to 53.1 million board feet for the seven alternatives for the first decade.[52]

Evaluation

Timber management in the Southwestern District (Region) has had a rich heritage. Timber management planning in the district received perhaps the best consideration by the early timber management foresters of any of the western districts. Barrington Moore, Arthur Recknagel, Theodore Woolsey, Quincy Randles, and others led a brigade of conscientious foresters in laying the groundwork for stopping depredations, and then bringing back the timber resources of the national forests of the Southwest. The harvests have increased dramatically while improving timber quality, and the volumetric base speaks well for the type of timber management planning that has continuously served the Forest Service well in Arizona and New Mexico.[53] If planning for timber production and the environmental impacts of other forest uses and amenities is not unduly restricted by regulation or conflict, timber production will continue to serve the needs of the citizens of the Southwest for decades to come.

Reference Notes

[1] G.A. Pearson, "Forest Land Use," *Journal of Forestry*, 38 (9) (September 1940): 262.

[2] *Nineteenth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1897-98*, Part V.—Forest Reserves (Washington, DC: USDI Geological Survey, 1899), p. 24.

[3] USDA Forest Service, District Forester, Albuquerque, NM, "General Selling Prospectus of National Forest Timber, Arizona and New Mexico" (n.p.,1914), 23 pp. (Filed at the Gila National Forest.)

[4] Southwestern Region, *Statistics, Southwestern Region, Arizona and New Mexico, March 1, 1939* (Albuquerque, NM: USDA Forest Service, 1939), p.17. (Filed at the Tonto National Forest.)

[5] R.S. Kellogg, *The Timber Supply of the United States*, Circ.166 (Washington, DC: USDA Forest Service, 1909), table 4, p.13; USDA Forest Service, Southwestern Region, *Statistics, Southwestern Region*, p.17; Southwestern Region, *National Forest Facts, Southwestern Region, Arizona and New Mexico*, 1953-54 (Albuquerque, NM: USDA Forest Service, 1954), p.14; USDA Forest Service, *The Outlook for Timber in*

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[6] Harold K. Steen, *The Forest Service, A History* (Seattle: University of Washington Press, 1976), pp. 58-59; Gilbert H. Schubert, *Silviculture of Southwestern Ponderosa Pine: The Status of Our Knowledge*, Res. Pap. RM-123 (Fort Collins, CO: USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, 1974), p. 2.

[7] *Ibid.*

[8] Platt Cline, *They Came to the Mountain: The Story of Flagstaff's Beginnings* (Flagstaff, AZ: Northland Press, 1976), p. 200.

[9] Just what you see today after clear-cutting takes place. Clear cutting, per se, is neutral; what follows it is important-reforestation afterwards is a normal silvicultural practice and an economically efficient system. Doing nothing, as was the pattern in the early days, was the problem. John G. Leiberg, Theodore R. Rixon, and Arthur Dodwell, *Forest Conditions in the San Francisco Mountains Forest Reserve, Arizona*, Prof. Pap. 22 (Series H, Forestry 7) (Washington, DC: USDI Geological Survey, 1904), pp. 24-25.

[10] T.F. Rixon, *Forest Conditions in the Gila River Forest Reserve, New Mexico*, Prof Pap. 39 (Series H, Forestry 13) (Washington DC: USDI Geological Survey, 1905), pp. 15-16.

[11] F.G. Plummer and M.G. Gowsell, *Forest Conditions in the Lincoln Forest Reserve, New Mexico*, Prof. Pap. 33 (Series H, Forestry 11) (Washington, DC: USDI Geological Survey, 1904), p.11; F.G. Plummer, *Forest Conditions in the Black Mesa Forest Reserve, Arizona*, Prof. Pap. 23 (Series H, Forestry 8) (Washington, DC: USDI Geological Survey, 1904), p.14.

[12] Frank R. Stewart, Forest Supervisor, Letter to Honorable Commissioner General Land Office, Washington, DC (Prescott, Arizona Territory), March 29,1901, p. 4. Federal Records Center, Denver, 095-57A0179; Royal S. Kellogg, "Report on an Examination of the Graham Mountains in Arizona," n.p. [1902], p.10. (Filed at the Coronado National Forest, 1685); Arthur C. Ringland, "Report on the Resources and Needs of the Lincoln Forest Reserve" ([Capitan, New Mexico]),1905, p. 15. Federal Records Center, Denver, 095-57A0179.

[13] George Philip Bard, "The Working Plan Report for the Manzano National Forest" (Albuquerque, NM: 1908), p. 5. Federal Records Center, Denver, 09557A0179; Daniel W. Adams, Forest Supervisor, "Twenty-Five Year Working Plan for the Sitgreaves National Forest," n.p., n.d., pp. 7-8. Federal Records Center, Denver, 095-6000814. This is actually a reconnaissance report made in 1910 when Mr. Adams was a lumberman on the Sitgreaves National Forest. Apparently, later, when he was supervisor, Adams was in the process of revising the report to make the management plan, since the copy includes much editing. Barrington Moore, "A Working Plan for the Mogollon Division of the Gila National Forest," n.p., n.d. [at least 19111, p.12. (Filed at the Coronado National Forest); D.M. Lang, and S.S. Stewart, "Reconnaissance of the Kaibab National Forest," n.p., [19091, p. 5. (Filed at the Kaibab National Forest.)

[14] Alfred A. Weiner, *The Forest Service Timber Appraisal System: A Historical Perspective, 1891-1981* (Washington, DC: USDA Forest Service, 1982), pp. 1-2.

[15] *Nineteenth Annual Report of the United States Geological Survey to the Secretary of the Interior, 1897-98*, Part I. Director's Report, including Triangulation and Spirit Leveling (Washington, DC: USDI Geological Survey, 1898), p.17.

[16] James Wilson, Secretary of Agriculture, Letter to "The Forester, Forest Service" (Washington, DC), February 1, 1905, p. 4. (Filed at the USDA Forest Service, 1685, Regional Office, Albuquerque, NM.)

[17] USDA Forest Service, District Forester, Albuquerque, NM, *General Selling Prospectus of National Forest Timber, Arizona and New Mexico*, 1914, p. 5.

[18] Theodore S. Woolsey, Jr., "Some Governmental Timber Sales in the Southwest from the Practical and Technical Standpoint," *Proceedings, Society of American Foresters*, VII (July, 1907), pp. 115-129; Arthur Bernard Recknagel, 'The New Reconnaissance-Working Plans That Work," *Proceedings, Society of American Foresters*, IV (January 1919), pp. 1-21.

[19] W.H. Goddard, Forest Supervisor, Letter to Forest Officers (Magdalena, New Mexico), March 3,1910, p.1; and see Theodore S. Woolsey, Jr., "Timber Sales" (Albuquerque, NM: n.p.,1910), pp. 1-5.

[20] *The National Forest Manual. Timber Sales. Administrative Use. Timber Settlement. Free Use* (Washington, DC: USDA Forest Service, 1911), pp. 1-90.

[21] See *Instructions for Appraising Stumpage on National Forests* (Washington, DC: USDA Forest Service, 1914), pp. 1-70.

[22] Theodore S. Woolsey, Jr., *Western Yellow Pine in Arizona and New Mexico*, Bull. 101(Washington, DC: USDA Forest Service, 1911), p. 49; District Forester, District 3, *Silviculture Handbook* (Albuquerque, NM: USDA Forest Service, 1916), pp. 1-58.

[23] John F. Preston, Forest Inspector, "General Memorandum Covering Trip in D-3," n.p, January 26,1921 (S, Supervision), pp. 1-2; R.G. Marsh, Assistant District Forester, "Memorandum for Mr. Pooler," n.p.,January 31, 1921 (S, Supervision), pp. 1-3; John F. Preston, "Memorandum for District Forester," pp. 13, Federal Records Center, Denver, 095-61A0504.

[24] Generally, *policy statements*, as the term was used in the district, referred to timber sales policy, but they often included other elements, such as how to handle the timber resource not just by building up or maintaining the growing stock, but for its watershed protection potential or to be cognizant of the recreational features of the forest. Supervisor Goddard, "Tonto National Forest Policy Statement," n.p,1920, p. 2; Frank C.W. Pooler, "Opening Address," District 3 Supervisors' Meeting, 192Z Federal Records Center, Denver, 095-6000084.

[25] Jenks Cameron, *The Development of Governmental Forest Control in the United States* (Baltimore: Johns Hopkins Press, 1929), p. 357.

[26] L.S. Gross, *Timber Management Plans on the National Forests* (Alameda, CA: USDA Forest Service, 1950), p. 28; and see Cameron, *The Development of Governmental Forest Control in the United States*, p. 236; Herbert Kaufman, *The Forest Ranger, A Study in Administrative Behavior* (Baltimore: Johns Hopkins Press, 1960), p.101; Harold K. Steen, *The Forest Service, A History*, p. 79; *The Use Book* (Washington, DC: USDA Forest Service, 1918), pp. 34-71; Inman F. Eldredge, *Management Plans: With Special Reference to the National Forests*, Misc. Publ.11(Washington, DC: USDA Forest Service, 1928), pp. 19,144.

[27] Eldredge, *Management Plans: With Special Reference to the National Forests*, pp. 1-84; "Mogollon Working Circle in Arizona Tapped," *The Forest Worker 4* (September 1928):11.

[28] *Ibid.*

[29] Alfred A. Wiener, *The Forest Service Timber Appraisal System: A Historical Perspective, 1891-1981* (Washington, DC: USDA Forest Service, 1982), p.100.

[30] Albert W. Sump, Forester, Memorandum to Ira J. Mason, Chief, Division of Timber Management (Washington, DC), December 10, 1954 (S-Inspection, R-43, September 27 to October 9,1954), 8 pp. Federal Records Center, Denver, 095-62A0421.

[31] USDA Forest Service, Office of Geography, *Forest Service Atlas*, 1907 (Washington, DC: USDI Geological Survey, 1908), p.11.

[32] Weiner, *Forest Service Timber Appraisal System*, pp. 4445, 135; *The Carson Pine Cone* (December 1913), p. 9.

[33] Weiner, *Forest Service Timber Appraisal System*, pp. 45-46, 79-50,137. Timber cut has been used as the yardstick of annual timber sales activity in the region, since it better balances timber sold and stumpage payments. The 1971 reappraised stumpage price was furnished by a reviewer of this chapter.

[34] *Ibid.*

[35] The following sources were used for these data: 1900-1907—Weiner, *Forest Service Timber Appraisal System*, table 2, p. 4 and table 4, p. 7;1909-1918—*Report of the Forester for 19—* (Washington, DC: USDA Forest Service, 1909-1925);1926-1937—USDA Forest Service, Southwestern Region, *Statistics, Southwestern Region, Arizona and New Mexico*, March 1, 1939, p. 20;1944—Southwestern Region, *National Forest Facts, Southwestern Region, Arizona and New Mexico*, 1945 (Albuquerque, NM: USDA Forest Service, 1945), p.17; 1952—Southwestern Region, *Facts, National Forests of Arizona and New Mexico*, 1945 (Albuquerque, NM: USDA Forest Service, 1958), p. 3;1956-1964—Southwestern Region, *Multiple Use Management Guide* (Albuquerque, NM: USDA Forest Service, 1967), 414.4-1. 1972—*Report of the Chief, Forest Service, 19—*(Washington, DC: USDA Forest Service, 1969-1975). 1980-1984—*Report of the Forest Service, Fiscal Year 19—*(Washington, DC: USDA Forest Service, 1980-date).

[36] *National Forest Facts, Southwestern Region, Arizona and New Mexico*, 1945 (Albuquerque, NM: USDA Forest Service, Southwestern Region, 1945), p.17; *Facts, National Forests of Arizona and New Mexico* (1958), p. 3; *Multiple Use Management Guide* (Albuquerque, NM: USDA Forest Service, Southwestern Region, 1967), pp. 414.4-1. Another type was the Cooperative Sustained Yield Unit where land of the participating mill was included with Federal timberland. One such unit has been established, but it has been controversial from its inception.

[37] True D. Morse, Acting Secretary of Agriculture, Letter to Honorable James E. Murray, Chairman, Senate Committee on Interior and Insular Affairs (Washington, DC: Government Printing Office, 1984), p. 52; *Periodic Reanalysis, Flagstaff Federal Sustained Yield Unit, 1979* (Flagstaff, AZ: USDA Forest Service, Southwestern Region, Coconino National Forest, 1979), pp. 16-17.

[38] Vernon J. Glover, *Logging Railroads of the Lincoln National Forest, New Mexico* Cultural Res. Mgmt. Rep. 4 (Albuquerque, NM: USDA Forest Service, Southwestern Region, 1986), pp. 24-28.

[39] Steen, *The Forest Service, A History*, p. 298.

[40] Ibid., pp. 308-311, 314-317.

[41] Southwestern Region, *Multiple Use Management Guide for National Forest Administration* (Albuquerque, NM: USDA Forest Service, 1959), pp. 1-10; some of these plans were: Lincoln National Forest-Smokey Bear District, Cloudcroft District, Mayhill District, Weed District; Gila National Forest-Beaverhead District, Black Range District, Frisco District, Glenwood District, Mimbres District, Reserve District, Silver City District, Wilderness District; Tonto National Forest–Payson District, Coconino National Forest—*Multiple Use Plans, Ranger District*.

[42] Southwestern Region, *Multiple Use Management Guide*, Forest Service Handbook, FSH 2121.4 (Albuquerque, NM: USDA Forest Service, 1967), various pagination. The guide has been used in the offerings of a course in forest management.

[43] L.G. Woods, Assistant Regional Forester, Memorandum to Division of Timber Management, Albuquerque, NM, December 4,1964, 1 p. (Coconino National Forest).

[44] Southwestern Region, Coconino National Forest, “Timber Management Plan, Flagstaff Working Circle, Coconino National Forest, Region 3, Sixth Revision, July 1, 1963 through June 30,1972" (Flagstaff, AZ: USDA Forest Service, 1965), 82 pp. (Filed at the Coconino National Forest.) Even-aged management had been recommended by Ira J. Mason after a 1960 inspection of timber management activities in the region.

[45] M.B. Bruce, Assistant Director, Timber Management, "General Functional Inspection, Timber Management, Region 3, October 10-29,1965" (Washington, DC: 1965), pp. l-7.

[46] Southwestern Region, *Draft Environmental Impact Statement, A Proposed Timber Management Plan for the Coconino National Forest* (Flagstaff, AZ: USDA Forest Service, 1972), p.i.

[47] Southwestern Region, *Draft Environmental Impact Statement, Timber Management Program, Prescott National Forest* (Prescott, AZ: USDA Forest Service, 1976), pp. 1-71; Southwestern Region, *Final Environmental Impact Statement, Prescott National Forest, Timber Management Plan* (Prescott, AZ: USDA Forest Service, 1976), p. iv.

[48] Southwestern Region, *Draft Environmental Impact Statement, Timber Management Program, Prescott National Forest* (Prescott, AZ: USDA Forest Service, 1976), p. 52.

[49] Where all this will lead is unknown. It is current events and will grace the pages of future histories.

[50] Southwestern Region, *Cibola National Forest Land and Resource Management Plan*, (Albuquerque, NM: USDA Forest Service, 1983), p.1.

[51] Southwestern Region, *Draft Environmental Impact Statement, Proposed Carson National Forest Plan* (Albuquerque, NM: USDA Forest Service, 1984), p. 37.

[52] Southwestern Region, *Draft Environmental Impact Statement, Proposed Cibola National Forest Plan* (Albuquerque, NM: USDA Forest Service, 1984), p. xviii; Southwestern Region, *Draft Environmental Impact Statement, Proposed Gila National Forest Plan* (Albuquerque, NM: USDA Forest Service, 1985), p. 27.

[53] A reviewer of this chapter believed that the author slighted the cultural practices and philosophies in the region that resulted in improved timber quality. He suggested that pruning of trees was done extensively from the mid-1950s until 1967. When a typical management plan of the years following World War II was consulted, the following comment was found: "The guides and practices set forth in Part III, R-3 Timber Management Handbook will be followed in this working circle in ponderosa pine types. In

general crop trees of 4 to 11 inches d.b.h.. . . will be pruned. Worthless 'wolf' trees will either be felled during general cutting operations or poisoned at the time crop trees are pruned." Merle A. Gee, District Ranger, and Edward C. Groesbeck, Forest Staffman, “Timber Management Plan, North Kaibab Working Circle, Kaibab National Forest, Arizona,” n.p., 1948, p. 28.

Chapter 11. Grazing: Controlling Use to Maintain Productivity

Grazing sheep and cattle in the Southwest was introduced by the Spanish in the late 16th century. Pueblos and Spanish-American villages early adopted pastoral practices, including year-long grazing. The tradition of an open range endured for several hundred years before Anglo-Americans arrived in the Southwest, and when they came, the new arrivals expanded the traditional pastoral practices into modern range-cattle and sheep industries. In the Southwest, the national forests were of equal or greater importance to the people for their range resources as they were significant for timber, watershed, or mineral resources. Those newly arrived foresters in the Southwest soon found themselves preoccupied with grazing rights, grasslands, and range management.

Juan de Onate, a Spanish colonizer, brought sheep to the pueblos along the Rio Grande in 1598. Cattle, horses, and goats were also brought in early. Spanish-Americans had developed large cattle herds in New Mexico by the early 1800s.[1] The Navajo Indians owned extensive herds of cattle and sheep when the United States acquired the territory from Mexico. Americans were latecomers to the southwestern cattle industry. According to Charles F. Cooper, there were only three small herds of cattle owned by Anglo-Americans in Arizona in 1870.[2] However, the range cattle industry expanded greatly in New Mexico and Arizona after 1870. Estimates of livestock on the ranges of the Southwest vary widely. *The Western Range* estimated that in 1870 there were about 30,000 cattle on Arizona ranges, in 1880 about 142,000, and by 1886 over 502,000. On New Mexican ranges, there were an estimated 158,000 cattle in 1870, 545,000 in 1880, and 1,065,000 in 1886.[3] The number of cattle herds rose dramatically between 1870 and 1890 as Texas longhorn cattle flooded the Arizona and New Mexico ranges. By 1890 the ranges were overpopulated.

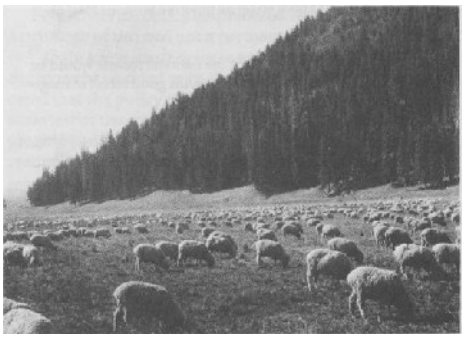

Figure 27. Sheep grazing on the Santa Fe National Forest, 1903.

As the number of livestock increased, the range deteriorated, and the deterioration was aggravated by drought and harsh winters. Thousands of cattle starved following a severe drought in 1886. Drought, deterioration of the range, and competition for grazing lands led to the fencing of private ranges and the end of open-range grazing on all but Federal lands. The last appreciable number of fat open-range cattle were sold in 1896. Thereafter, livestock production was concentrated on sheep and on steers sold as feeders. By the turn of the century, there were so many livestock grazing the public lands in both times of adequate and inadequate forage that signs of range deterioration began to appear even in “good” years.[4] Establishment of the forest reserves provided the opportunity for implementation of a range management program for the western livestock industry.

The factors that tend to control unmanaged populations of wildlife over long periods did not operate then for livestock. The numbers of livestock on a range after a particularly wet season often exceeded the carrying capacity of the range the following season. In addition, overgrazed ranges were susceptible to soil erosion, which further reduced their carrying capacity when periods of heavy rainfall or windstorms occurred. Management of the range and the allocation of livestock grazing rights had to be based on the occasional dry season and not for the typical season.

Range Depletion

Numerous articles and books describe the changing rangelands in the Southwest. *The Western Range* indicated that by 1880 overgrazing was causing range depletion.[5] Thomas Farish, writing on the San Francisco Mountains, said, "In this mountain range are found fine valleys, formerly covered with a growth of wild rye which has been replaced by other grasses."[6] In 1893, the Governor of Arizona mentioned, "In nearly all districts, owing to overstocking, many weeds have taken the place of the best grasses."[7] Similarly, in 1901, overstocking of sheep on the southwestern forest ranges caused natural reproduction to come to a standstill. The forest floor in some places was "as bare and compact as a road bed."[8]

Theodore Rixon, one of the first foresters in the Southwest, observed that "grazing, the most important of the industries in this region, requires careful attention and supervision to prevent the almost inevitable result—the total destruction of the grass roots by overstocking."[9] By 1912, livestock pressures had penetrated the most remote timbered and mountainous areas:

> At the beginning the mountains and heavily timbered areas were used but little, but as the situation grew more acute in the more accessible regions the use of these areas became more general and in course of time conditions within them were even more grave than elsewhere, for experience had demonstrated that they were the choice ranges and they were in strong demand. The mountains were denuded of their vegetative cover, forest reproduction was damaged or destroyed, the slopes were seamed with deep erosion gullies, and the water-conserving power of the drainage basins became seriously impaired. Flocks passed each other on the trails, one rushing in to secure what the other had just abandoned as worthless, feed was deliberately wasted to prevent its utilization by others, the ranges were occupied before the snow had left them. Transient sheepmen roamed the country robbing the resident stockmen of forage that was justly theirs.[10]

For the two or three decades prior to the creation of the forest reserves, ranchers had free, unregulated use of these lands for summer range, just as they did on all of the public domain. There was extreme competition for grass between the big sheep and cattle outfits and the homesteaders. Quick profits were legend, but losses often were heavy, too. There was little incentive for careful management of a business when the major resources of the business, the public lands, were external to the control of the livestock industry. Indeed, some "public land policies forced overgrazing upon the stockman and homesteader."[11] The livestock associations by the late 1890s began agitating for some effective control of the public domain. Political lobbying by the livestock industry may have contributed to the establishment of the forest reserves in the Southwest. However, after the Forest Service replaced the Department of the Interior as the managers of the reserves, free access and use by cattlemen was proscribed.

By the time the first forest reserves were proclaimed in 1891, the free use of public lands by cattlemen and sheepmen had become a way of life. They knew nothing of grazing capacity and there was no fund of technical knowledge about forage management to rely on. Overgrazing could not readily be recognized until in an advanced stage. Thus, when the Forest Service came into being February 1, 1905, the most complex problems facing southwestern foresters related to grazing rights and range management. Instructions to foresters in the *Use Book* regarding grazing responsibilities were very simple: "Inform yourself as to what sheep and cattle men graze their stock upon your district, the number he actually owns, and whether or not he confines himself to the range described in his permit."[12]

Early forest rangers were forced to change a way of life by allocating the use of range resources on the public lands. It was wise that the rangers selected were people from the very area where they were called upon to administer new laws and regulations to govern livestock use on the forest reserves. This did not eliminate the friction between the livestock people and the Federal employees, but it did prevent a "range war."

Two Types of Foresters

There were two types of foresters in the early days of the Forest Service: the trained foresters, schooled in the East, who knew little of the West of that day, and the untrained westerners, who knew the land and the people. Albert F. Potter, an Arizona stockman, became the chief architect of Forest Service grazing policies and regulations of the Southwest, and elsewhere. Potter came to Arizona for his health and entered the sheep business, but he sold his sheep in 1900. He accepted work with the Bureau of Forestry when Gifford Pinchot asked for his services. Pinchot had met him while investigating sheep grazing in Arizona. Potter was appointed "grazing expert" on October 17, 1901. Potter obtained assistance from such people as W.C. Clos, who only had a short tenure with the Forest Service but made significant contributions. Secretary of Agriculture James Wilson had personal knowledge of the history of range use and helped frame early grazing policies. Leon F. Kneipp assisted, as did Will C. Barnes, also an Arizona stockman. Barnes joined the staff in 1907, moved to Washington, DC, and soon became chief of the Office of Grazing Control. Arthur Ringland recognized, in addition, the contributions of John Kerr, who later became supervisor of the Lincoln National Forest, and Jose Campbell, a range staff officer, to the development of range management programs.[13]

Potter set to work with the Secretary of Agriculture and the western livestock growers to help develop basic principles of range management, which were incorporated into the bill transferring the forest reserves from the Department of the Interior to the Department of Agriculture. These included:

1) that priority in the use of the range would be recognized and the grazing privileges in the beginning allowed those who were already using the range;
2) that any changes found necessary either in the number of stock grazed or the methods of handling them would be made gradually after due notice had been given;
3) that small owners would be given preference in the allotment of permits and be exempted from reduction in numbers of stock;
4) that checking of damage to and improvement of the forest would be brought about so far as possible without total exclusion of the stock;
5) that the forage resources of the national forests would be used to the fullest extent consistent with good forest management; and

6) that the stockmen would be given a voice in the making of rules for the management of their stock upon the range.[14]

Grazing Control

The grazing control system placed in operation by the Forest Service in 1905 was a remarkably advanced administrative and land management system, given the time and state of technical knowledge. In 1906, the era of free use of the forage resources of the forest reserves (which were renamed national forests the following year) came to an end. The new system required users to pay a fee for each animal grazed for a specific unit of time. The fundamental features of the system have remained unchanged up to the present, although there have been changes in detail and the method of calculating grazing fees.

The ranger districts of a national forest (based on its several uses) are divided for grazing purposes into allotments, which are the basic unit areas of forest grazing administration. Allotment boundaries are commonly drawn in conformance with physical features of the area. Each allotment is surveyed to determine approximately the quantity of forage produced annually and the period during which the allotment should be grazed. Initially, the allotments were very rapidly and sketchily surveyed, but today they are resurveyed frequently to observe changes or trends in such factors as vegetation growth and condition, intrusions of noxious weeds and poisonous plants, and evidence of accelerated erosion. The estimated annual production of forage on an allotment is reduced by an amount that is estimated for wildlife use and the baseline amount needed to maintain soil stability and watershed health, and sometimes an additional amount "required to maintain a pleasing environment."[15] Since grazing by permit and fee discourages denuding an allotment, forage is more often available for grazing lease by range livestock ranchers.

From the beginning, the intent was to establish first priority for grazing permits for local residents. The grazing permit system favored the small operator. Required reductions in the stock grazed in any national forest would first be borne by the large cattle companies rather than the small operators. The Forest Service required that for those national forests with no year-long grazing available, livestock owners needed to have land for their livestock to graze on during the times they were not on the National Forest System lands. Thus, local permanent settlers could use grazing in the national forests to their benefit, and large cattle companies that did not own land near the national forest could not. As a result, the small settlers and their families became some of the best friends of the Forest Service.[16]

Forest Service policy emphasized that grazing was a privilege of use and not a permanent right to the property.[17] Only a few court cases tested the system and the decisions have sided with the Forest Service.[18] This has indicated that the policy was likely to be upheld should a large-scale test of the current system be attempted. In addition, grazing permits have not been assignable except at the discretion of the Forest Service. As Pinchot explained in *Breaking New Ground*:

> In those [early] days grazing was a far more important question on the reserves than lumbering, and nowhere was the central idea of use better applied. The *Use Book* said "The Forest Service will allow the use of the forage crop of the reserves as full as the proper care and protection of the forests and the water supply permit. Every effort will be made to assist the stock owners to a satisfactory distribution of stock on the range in order to secure greater harmony among citizens, to reduce the waste of forage by

> tramping in unnecessary movement of stock, and to obtain a more permanent, judicious, and profitable use of the range. On the other hand, the Forest Service expects the full and earnest cooperation of the stock owners to carry out the regulations."[19]

According to Pinchot, grazing regulations were first put forth in 1907 in the *Use Book* and were very detailed, which was essential in organizing the control of a great industry which had hitherto run wild."[20]

Early grazing control on the forest reserves, according to Pinchot, was to achieve three results: 'The protection and conservative use of all forest reserve land adapted for grazing; the best permanent good of the livestock industry through proper care and improvement of the grazing lands; and the protection of the settler and home builder against unfair competition in the use of the range."[21] The Forest Service had made it immediately clear that most national crests had been overgrazed and that grazing pressure could be reduced. Reductions, however, were made gradually.[22] Sometimes overgrazing continued on many national forests in the early years because of the extensive image from past overgrazing and overestimates of grazing capacity by the Forest Service.

Debate About Sheep Grazing

A great debate about grazing sheep occurred during the early days of the forest reserves and continued into the era when the Forest Service assumed management of the national forests. The Act of March 3, 1891, did not provide for [ministration of the forest reserves. This was corrected by the Act of June 4, 1897, which prescribed detailed principles r administration of the reserves. Secretary of the Interior Hitchcock, on June 30, 1897, issued a regulation that provided in part: 'The pasturing of livestock on public lands in forest reserves will not be interfered with, as long it appears that injury is not being done to the forest growth, and the rights of others are not thereby jeopardized. The pasturing of sheep is, however, prohibited in all forest reserves except those in the states of Oregon and Washington."[23] E.S. Gosney, Secretary of the Arizona Sheep Breeders and Wool Growers Association, obtained a suspension of the order for 1899 and lobbied for an on-site study of the situation.

A commission formed in 1900 to investigate the sheep grazing situation in Arizona included Gifford Pinchot, Chief of the Bureau of Forestry in the Department of Agriculture, Albert Potter, and Frederick Coville, a USDA botanist. After six weeks of travel and many conferences, Pinchot and Coville (who had made the examination of the cascade Mountain Reserve in Oregon) recommended that sheep grazing should be allowed, but that it needed to be controlled. As things in Federal bureaus often go, the situation had not been clarified by 1902. At the last moment, Pinchot intervened with President Roosevelt, who ordered that sheep grazing be allowed on the forest reserves in the Southwest, as stated in a letter to the Secretary of the Interior: "From information which has just reached me, it is my opinion that sheep should not be excluded from grazing on the San Francisco Mountains Forest Reserve."[24] In 1902, the Secretary of the Interior announced that over a million sheep were to be allowed in the reserves. A cooperative plan published in 1902 under the name of Supervisor F.S. Breen of the San Francisco Reserve stipulated that sheepherders would have exclusive rights to 5-year permits, that residents were to have preference over owners from other States, that local cases were to be decided on local grounds, and that the government policy was based on regulation rather than prohibition.[25]

Cattlemen Endorse Grazing Controls

Cattle owners also realized that grazing controls were needed. Federal control of grazing on the public domain was supported by a resolution of the Executive Committee of the National Live Stock Association, at its annual convention in Chicago in 1902. The resolution read in part, "Resolved, that this association approves and endorses the general policy for the regulation of grazing within the national forest reserves . . ."[26] Considerable discourse about the restriction of grazing on the forest reserves occurred in their early years. Much of this discussion took place in the pages of the *Williams News*, which reported that "by 1907 both parties generally recognized the value of the government's grazing policy,. . . and the hostile criticism on the part of the stockmen—against both the government and each other—had subsided." [27]

The *Southwestern Stockman, Farmer and Feeder* championed the cause of both the cattlemen and the sheepmen ever the right to use the ranges on the forest reserves in opposition to the Forest Service plans to regulate stock numbers. But in the long run, the policy was supported. When one of the attempts to turn the National Forests over to the States occurred, an editorial in the edition of March 15, 1913, stated:

> . . . We can conceive of no plan that would embody destructive statesmanship more than this. As a business proposition . . . decentralization of control of the immense timber and grazing wealth of the country would almost certainly result in decreased returns and increased costs, from these resources. . . . Turn the forests over to the individual states and the present feeling of security and permanency will disappear . . . the movement is fathered by the big timber and land grabbers.[28]

When it was first announced that grazing fees would be initiated, stockmen were visibly upset. Several of them were quoted in the Prescott, AZ, *Weekly Herald* in August 1905, saying that it would result in their losing money. Comments such as 'There is little but oak brush on the reserves and to make us pay 35 cents a head for running our cattle there will be a pretty big burden," or 'The cattle men can't pay 35 to 50 cents a head for grazing their stock on the reserve and make any money out of it."[29]

Figure 28. Cattle grazing on the Apache National Forest, 1960.

There were no accurate records of the numbers of livestock using the new forest reserves. The rangers, who were local people, knew reasonably well what stock each rancher had, but since

livestock numbers were used as the basis of *ad valorem* tax appraisals, the ranchers were not inclined to acknowledge more cattle than they were being assessed. Attempts to discover the number of cattle or sheep being grazed on the forests only generated hostility. However, between 1911 and 1913, comments in the *Carson Pine Cone*, a newsletter of the Carson National Forest, indicated that counting corrals had been constructed and that herd roundups had been made. In this manner, accurate counts could be made, using tally counters for the stockman and the forester both to witness.

Grazing Trespass Difficult to Control

Grazing trespass, that is, grazing without paying for the livestock use, was difficult to control during the early days of the southwestern national forests. Since most reserves did not have surveyed and marked boundaries, it was often futile to try to make a grazing trespass case hold up in court. One method of handling livestock trespass on the forest reserves was for the ranger to round up the offending livestock and drive them off the forest. Rangers had no power to make arrests, so this procedure just resulted in livestock being driven back on by the herders. Prompt and vigorous action in trespass cases reduced their number but did not eliminate them. When police powers were granted, the number of trespass cases was again reduced. Until the 1930s, there were no fences on the national forests, and this made it difficult to make a trespass case stick. Fencing only began in Arizona in the 1930s with the advent of the Civilian Conservation Corps.[30]

Grazing fees began to increase during the decade of 1910. By 1916, the annual rate was 48 cents per head of cattle (3.9 cents per month) and 12 cents per head of sheep (1.4 cents per month). Cattlemen demanded that the national forests be taken out of Federal control and put under State control. World War I intervened. Late in 1917, the Chief of the Forest Service announced that there would be no further increases in grazing fees. However, in 1919, the minimum fees for cattle went to 60 cents per year and the maximum to $1.50.[31]

From time to time, the Forest Service was called upon to compare prices of goods and services sold from the national forests with those charged in the private market. In 1920, there was agitation in Congress to triple grazing fees, but the efforts were defeated. However, in the wake of this, a study was approved to evaluate grazing fees for the national forests on the basis of rentals for similar lands. It was published in 1924 and reported that on national forests grazing fees were about half what owners of comparable ranges were charging. It was recommended that fees for allotments be gauged according to accessibility, forage quality, water availability, and other factors. The report was criticized by livestock interests, and because of a slump in livestock prices, no increases in grazing fees were effected. Cattlemen wanted fees set at “the cost of administration.”[32]

After years of friction between livestock interests and the administrators of grazing on the national forests, the situation was addressed by Congress in 1925. A subcommittee composed entirely of Republicans seemed to side with the cattlemen. A bill—the Stanfield Bill (Senate Bill No. 2584)—would have given the livestock industry vested rights on the forests. The bill was designed to give more development, protection, and utilization of grazing resources on the national forests than any other use. The debate and the infighting were furious. Supporters of the Stanfield Bill even attacked the validity of range research that had been carried out, including the findings of the 1926 report by the Southwestern Forest and Range Experiment Station concerning damage done to young trees by livestock. Attempts were made to suppress the published results.

The Stanfield Bill was eventually defeated, but during the fight, the Forest Service's credibility had been threatened.[33]

Crisis in 1925

In 1925, there was a local crisis in Arizona national forests. Cuts of 6.5 to 30 percent in numbers of animals grazing on the Tusayan, Coconino, and Sitgreaves National Forests were planned. Seventy percent of the cuts were to be for the protection of forage and the stability of the industry and the remainder to protect young trees. District Forester Frank Pooler spoke to the Arizona Wool Growers Association in January and to the Arizona Cattle Growers Association in February to explain why the cuts were necessary. These associations, as well as the National Forest Permittees Association, were not pleased with the proposals and threatened political action. Forest Chief William Greeley wrote to Pooler on May 30, 1925, stating that applications by new permittees would not be allowed for the next 10 years and that, if new range became available, it would be accrued to the existing permittees.[34] In this case, as in so many instances, the original Forest Service stance on an issue was tempered by local action.

During the Depression, there was pressure to reduce grazing fees on the national forests, and they were reduced by 50 percent. Late in 1933 the Forest Service announced a new basis for computing grazing fees—indexing fees to livestock prices. This base for the computation of grazing fees was used into the 1960s, when pressure began to develop calling for the establishment of fair market values for grazing fees. In 1961, in response to President John F. Kennedy's message to Congress on natural resources, the Forest Service developed a statement of principles of its fee structures, including grazing fees, and in 1966, began a study of grazing fees in cooperation with the USDI Bureau of Land Management, as well as the USDA Statistical Reporting Service and Economic Research Service, and other agencies. The study resulted in the Secretary of Agriculture issuing regulations in 1969 calling for grazing fees on the national forests to be gradually increased to fair market value during a 10-year adjustment period.[35] Another effort to substantially increase grazing fees was begun in 1985.[36]

Reducing Livestock Numbers

The Forest Service rangers readily observed the deterioration of the open range, but could not alter overnight what had been an unfortunate byproduct of a way of life for so long. The first forest experiment station in the United States was at Fort Valley near Flagstaff, and the timber management researchers there (notably G.A. Pearson) observed a deterioration of pine reproduction that was apparently caused by too heavy grazing. Since lumbering was also a vital industry in the Southwest, what happened to the timber resource concerned Forest Service personnel as much as what happened to the grazing resource. Research at Fort Valley demonstrated that overgrazing destroyed ponderosa pine seedlings. Therefore, around 1923, grazing was severely reduced on parts of national forests where ponderosa pine was the cash crop. A gradual reduction in the numbers of livestock along with fencing to separate sheep from cattle was planned, as was demonstration of the effects of overgrazing to farmers. In a few years, it was found that the sheep ranges were recovering faster than the cattle ranges, because the intensity of sheep grazing could be controlled easily by changing the length of stay of a sheep camp at one location.[37]

Each national forest had its own problems and met them in unique ways. The Carson National Forest was once one of the great sheep-raising areas of the West. When Aldo Leopold was

supervisor of the forest before World War I, the first steps were taken to reduce the number of sheep because of heavy overgrazing. Large numbers of sheep were allowed during the war, but the flocks were reduced significantly thereafter. Abolishing grazing in high-impact areas such as Taos Canyon had a compound effect on recovery of the range, because erosion was also controlled.

The first phase of grazing administration on the national forests (1905-11) were devoted to establishing order and, in the beginning, to improving use of the range and increasing its value. The second phase of administration (1912-20), except for expanded use of the national forests for livestock in 1917 as a response to the war emergency, was a time of better allocation of livestock to match the quantity and quality of the range resource. Original estimates of grazing capacities, however, proved overly optimistic. Downward adjustment of animal numbers was necessary, requiring many meetings with livestock associations, groups, and individuals. Range forage management studies continued during the latter half of the 1920s.[38]

Range investigations and studies were by then producing results that aided in administering the range resource. These results became part of detailed "unit management plans" for grazing allotments. Data for starting grazing in ach season were based on studies of "vegetative readiness," prepared by altitudinal or life zones. Many of the ranges in Arizona and New Mexico were grazed yearlong, so other rules to regulate numbers had to be formulated n these range types.[39]

Range research and reconnaissance led to downward revisions in grazing capacity, both reducing the animal numbers allowed and the number of months in which the ranges of the region should be grazed. The needed reductions were not accomplished on most national forest ranges by eliminating grazing entirely, but by gradually reducing grazing intensity while at the same time using common sense and tact and building up a region-wide system of sound range management. According to one functional inspection report:

> Excellent progress is being made in adjusting stocking rates to rapacity without creating a "cause celebre." This has been brought about by approaching the adjustment actions on a case by case basis. . . . Much of this success must be directly attributed to the efforts of Supervisors . . . and Staffmen . . . with the Rangers following the leadership of these individuals.[40]

Ever so slowly, the number of livestock grazing the forests in the Southwestern Region decreased. In 1909, 1,449,538 head of cattle, horses, sheep, and goats grazed the national forests of the region. The total was reduced to 1,397,618 by 1919 and to 830,485 by 1931.[41] The March 28, 1923, *Carson Pine Cone* stated that in 1912 one ranger district grazed as many sheep as would be on the entire forest in 1923. Also in this issue were two related statements: "The reduction of 110,000 sheep in ten years, according to local sheepmen, is due to the lack of winter range. Where sagebrush grew in thickets now we have the barren Rio Grande flats—overgrazed or deserted homestead." Since 1923, grazing on the national forests has continued to decline. Grazing use has been the most difficult activity the Forest Service has had to administer, and one can rightly conclude that there is no permanent or wholly correct solution.

Grazing Capacity: Its impact

Without knowledge of grazing capacity, it was difficult for the early rangers to do much about limiting livestock numbers on the grazing allotments. Management of the forested ranges in the region began to take shape during the second decade of the century. In the early years, at the end of each grazing season, the supervisor was required to go over the grazing grounds, to examine the effect of grazing, end to make a full report to the forester (i.e., the Chief). According to Pinchot, "guesswork was out "[42] The range surveys were rather informal arrangements at first—rangers would go on horseback to make notes on forage conditions, kinds of vegetation, herbage, water conditions, topography, and other items. They would put their information onto maps during the winter and then plan the grazing allotments for the next grazing season.

Grazing reconnaissance began in the Southwestern District (later Region) in 1910 on the Coconino National Forest.[43] For example, in 1912, Ranger Loveless on the Jicarilla District of the Carson National Forest prepared a grazing map of the district, which indicated the proper system of allotment. In a January 2, 1913, letter from District (Region) Forester Ringland to the Supervisor of the Datil National Forest, 6 of the 21 pages were devoted to range reconnaissance. Ringland urged the forest supervisor to undertake a study of the ranges to determine their "carrying capacity, proper season of use, class of stock to which each portion is best adapted, and the need of development."[44] Another letter from Ringland, dated December 12, 1913, stated that he was "glad to learn that a beginning has been made on the Datil in this work."[45] In the September 20, 1913, issue of the *Carson Pine Cone*, it is stated that further progress in range reconnaissance depended upon a systematic study of the grazing resources. This was needed to determine the class of stock to which each unit of range was best adapted, the period during which each unit could be grazed without injury to the range, forest, or watershed, and the number of stock each unit would carry. Four meetings were held during the summer of 1913 to familiarize the forest supervisors with the need for and the techniques of grazing reconnaissance.[46]

By 1913, the need for improved grazing maps for the Carson National Forest was recognized, and by March 1914, a forest-wide grazing map was being compiled. In 1916, when Paul Roberts was in charge of grazing in the region, he performed a range reconnaissance on the Sitgreaves National Forest that led to a grazing plan for each allotment.[47] Grazing reconnaissance was taking place on the Carson National Forest by 1920, and surveys were made during 1922 and 1923 on the Santa Fe National Forest. From surveys like these merged systematic analyses of grazing capacity and the development of plans to match livestock numbers with range capacity. By the 1920s, range surveys were a regular part of the work on the national forests; they led to developing long-term range management plans. One forester believed that when biologists replaced mathematicians, the southwestern forest ranges showed improvement.[48]

With the assistance of the Forest Service, and its concentration on scientific principles in the management of livestock and forest ranges, the livestock owners improved their herds and their condition. On February 6, 1925, the *Carson Pine Cone* observed that sheepmen in Taos and Rio Arriba Counties were investing in improved stock. "They seemed to be perfectly satisfied with their common scrubs, but that is now past history and Taos County in particular had made a fair start in the direction of improved animals. No doubt the influence of the Forest Service has done a great deal in bringing about this change, and our activity with Forest Stock Associations will be capable of still greater results." By 1928, stock associations were very active on the Carson National Forest. They typically assessed their members to purchase salt for livestock, just as they

had done for several years. They have continued to work with the Forest Service on problems of common interest.[49]

Range analysis began to produce better range conditions. One ranger cited the case of an area along the road from Grand Canyon to Cameron, along the Rim. He remembered that in the early 1920s it was seriously overgrazed and that later it was in good shape. In addition, he claimed that the earliest data on palatability were too high and that too many head of livestock were allowed on the forest ranges. The presence of a browse line (or highline), showing where vegetation has been cropped by livestock, is another indicator of overgrazing. One former ranger remembered that in 1937 there was a decided browse line on the North Kaibab Plateau and that 5 years later it was hardly noticeable, indicating that the range can recuperate when animal numbers are reduced.[50]

The Range Management Work Load

The work load involved in managing the grazing resource on the national forests of the Southwest was a significant proportion of the total work. Processing time for grazing permits was shortened when the region adopted 5-year grazing permits in 1909 and eventually adopted 10-year permits. However, time-savings were still not optimal because many permits were still processed on an annual basis. By 1929, for instance, there were 922 10-year permits for 140,068 cattle and horses issued in the region, bringing the cumulative total to 2,951 permits and 275,175 head. In addition, 165 10-year permits had been issued for 399,626 sheep and goats, bringing these totals to 417 permits and 656,049 head. By 1934, 154,534 cattle and horses (51 percent of such animals under permit) and 265,890 sheep and goats (57 percent of such animals under permit) were under the long-term permit system.[51]

Figure 29. Sheep grazing on the Apache National Forest, 1960.

The percentage of time it took to monitor and administer the range work load on the forests did not change much over the decades, although it varied between forests. One report in 1911 on the disposition of time on the forest indicated that the range work load by the 13 men on the "statutory roll" was 25 percent of the total work load. A General Integrating Inspection (GII) report of the entire region, issued in 1954, indicated that 22 percent of the staff work load was range-related and that 33 percent of the rangers' work load was devoted to range activities. A GII report of the Coronado National Forest in 1964 included the comment that "even now more than half the management effort is directed toward this [range management] activity." A tabulation prepared for the GII report of the Santa Fe National Forest in the same year indicated that 34 percent of the hours worked during fiscal year 1964 was in range management.[52]

Adding to the work load was the activity of moving livestock through the national forests back and forth between their winter and summer ranges. Sheep driveways were developed on the forest reserves. The cattlemen went along with the plan because they knew that the sheep would not wander off onto the open range. Table 8 highlights the use of grazing leases on the national forests in the region in selected years.

Table 8. Yearly livestock grazing leases and numbers of livestock (selected years, 1909-58)

Year	Cattle and Horses			Sheep and Goats		
	Permits	Arizona	New Mexico	Permits	Arizona	New Mexico
1909	3,376	235,946	131,621	943	512,130	569,841
1914	3,321	270,623	98,758	662	398,134	444,222
1919	3,590	366,520	180,288	736	371,457	479,353
1924	3,032	279,529	107,766	466	262,492	263,875
1929	-	183,076	84,425	-	352,618	254,936
1934	3,170	189,299	94,471	371	245,189	208,238
1939	-	171,976	91,148	-	199,886	173,199
1944	-	153,217	90,904	-	113,504	158,590
1949	-	-	76,529	-	-	107,431
1958	2,538	145,247	78,166	166	75,217	66,559

Compiled from range management reports from Southwestern Region, 1909-1958.

Range Types and Their Management

Each vegetation type has its own environmental and physiological requirements. These requirements must be understood and provided for in using the type for livestock grazing and maintaining the quality of other resources. A combination of range research on the two experimental forests in Arizona and New Mexico, together with research work and empirical studies conducted on the national forests of the Southwestern Region, has resulted in the evolution of “typical” management scenarios, or grazing systems, for these vegetative types. Even designating and defining the vegetative types themselves have had an evolutionary development. *The Western Range* lists ten types of virgin range; of these, the following were indicated on maps of Arizona and New Mexico: grass types-short grass, semidesert grass; shrub types—sagebrush-grass, southern desert shrub; forest types—pinyon-juniper and open forest.[53]

These evolved into different categories as time passed. For instance, the Prescott National Forest, Arizona, in 1983, listed seven vegetative types: high chaparral, low chaparral, desert shrub, pine and mixed conifer, riparian, juniper, pinyon-juniper, and wilderness. In 1984, the Carson National Forest in New Mexico listed nine vegetative types: conifer, aspen, pinyon-juniper, revegetated grassland, native grassland, sagebrush, oak/shrub, riparian, and wilderness conifer.[54]

Information about several range types in the Southwestern Region and the best method of utilizing them for livestock grazing are available in a series of reports:[55] As an example, the following information summarizes the situation in the pinyon-juniper range type. The type occurs from about 4,500 feet up to about 7,500 feet elevation, and occupies 32 percent of forest lands in New Mexico, with 46 percent of the Cibola National Forest being composed of the type. Grazing in this vegetation type has taken place yearlong during the past 400 years, and about half of the area of this type being grazed on the National Forests in the region is still grazed yearlong. Only in more recent years has rotation or deferred grazing been practiced in the type. The most notable successional change in the type has been the invasion of grassland communities by junipers. Due

to the combination of overgrazing and absence of fires, trees not only encroached on the grasslands, but the original stands of trees became more dense. As a result, the average annual grazing requirement for this type is about 70 acres per cow compared to about 29 acres per cow when the type is in virgin condition.[56] The Southwestern Region provides general guidelines for judging vegetative and range types and for evaluating management procedures.

Much has been written about the condition of the vegetation on the ponderosa pine ranges, especially that of the pine reproduction after heavy grazing. Supervisor William M. Drake reported this as early as 1910. It has been reported also as late as 1973 with the comment, "regeneration areas may require fencing or change in management practices to provide protection from livestock for a few years."[57] It is now known that grazing and timber production are compatible in this vegetation type if grazing pressure is regulated. Large reductions in numbers of livestock were made in the ponderosa pine type on the Coconino and Tusayan National Forests in 1926 and 1927. A noticeable decrease in damage to pine seedlings followed the reduction in stocking. This was an early indication of the theory that is held today that in this range type, over concentration in grazing may both reduce long-term animal production and contribute to range deterioration. Rotational grazing and the complete removal of cattle for given time periods are now recommended for this ecosystem.

Range Reconnaissance, Inspection, and Research

Effective range management requires reliable information. Reconnaissance, inspections, inventories, and research provide the necessary impact for management decisions. Range reconnaissance, or inventory, dates to the earliest days in the Southwestern Region, closely following the institution of timber reconnaissance. The first grazing reconnaissance party to take the field gathered at Flagstaff, AZ, in the summer of 1911 and worked on the Coconino National Forest. The reconnaissance mission is to prepare a map classifying the area examined into grazing types and to show for each type the location, acreage, topography, amount, and character of vegetation, the condition of the range, available watering places, and cultural features.[58] Range inspection, on the other hand, is less intensive than range reconnaissance. It provides a general evaluation of the utilization and fitness of the range. The inspection report evaluates the suitability of the type of stock being grazed to that best suited to the area, compares the intensity of grazing on different range units, and estimates maximum capacity. The inspection also assesses the adequacy of salting plans, damage by grazing to tree reproduction and erosion potential, and areas where more intensive reconnaissance is needed.[59] Inspections made late in the grazing season yielded better conceptions of utilization of forage and distribution of livestock, while early inspections had to rely on evidences remaining from the previous grazing season.

Range research began in the Southwestern Region at the Santa Rita Range near Tucson. In 1915, the Santa Rita Range Reserve and the Jornada Range Reserve were transferred to the Southwestern Region from the USDA Bureau of Plant Industry. According to Raymond Price:

> An office of Grazing Studies in the Washington Office was established in 1910 with James T. Jardine in charge. In 1911, Regional Offices of Grazing Studies were established in Districts 2 and 3. The offices had three main assignments, namely, range reconnaissance and management plan development for areas covered, technical range administration, and grazing studies.

> Chief Forester Henry S. Grave's Service Order 41, of January 2, 1912, set up a plan for Organization of Investigative Work. This Service Order created a Central Investigative Committee and District Investigative Committees. The Central Investigative Committee consisted of . . . James T. Jardine, representing the Branch of Grazing . . .
>
> The District (now Region) Committees consisted of the District (Regional) Forester as chairman; . . . Heads or Chiefs of the several Resources Offices or Divisions. . . . The Committee met annually.[60]

Grazing investigations began early in the Southwestern Region and were administered by the Office of Grazing Studies. According to Raymond Price, they included plant identification, revegetation and reseeding, and evaluations of grazing damage, uses of salt water, shrub ranges, and utilization studies.[61] Finally, in 1928, the McSweeney-McNary Forest Research Act authorized experiments in range management. The passage of this act marked the ending of the first period of range research and the beginning of a new epoch.

The Southwestern Forest and Range Experiment Station was established August 1, 1930. In range research, it was "to add and improve upon existing knowledge" and "to furnish answers to technical and practical problems arising in the administration of National Forests in Region 3. . ." The new experiment station coordinated the range research work already underway on several national forests and at the Santa Rita and Jornado Range Reserves in southern Arizona and New Mexico, respectively. The station initiated cooperative range utilization standards studies and shrub invasion control research in 1937. Scientists completed the Western Range Survey in 1938 and, in 1940, began collecting essential range resource data on range study plots throughout the region. Range research continued during the war years and in 1947 research was begun on noxious plants. Consolidation of the Southwestern Forest and Range Experiment Station with the Rocky Mountain Station with headquarters at Fort Collins, CO, took place in 1953.[62] Range research has continued in Arizona and New Mexico under this organization.

The Three-Step Method

Kenneth W. Parker, a range conservationist (in research) explained the complex interrelationships that exist in determining range conditions and trends. "We are dealing," he said, "not only with the influence of livestock, but with a complex set of factors relating to the vegetation, soil, and native animals both large and small and even micro fauna, especially in the soil, which are constantly changing from one growing season to the next." Parker advised using a three-step method that had been heartily endorsed by the region's administrative staffs. As defined by Parker, this method operates as follows:

> The three-step method incorporates the best features of several measurement methods—reduced to as simple a record as practicable for the purpose of measuring trend. As the name implies it consists of three major steps. Step one is concerned mainly with the establishment on the range of permanently marked transects and the collection of the basic field data from these transects and from the site within which they are located. Step Two consists of the field analysis of these data, classification of condition at time of record and estimation of current range trend. Step Three is concerned with a permanent photographic record of range conditions on the site that is sampled . . . all three steps are repeated and the results compared step by step in any subsequent examination in later years.[63]

In 1973, Reppert and Francis, of the Rocky Mountain Forest and Range Experiment Station staff, expanded on the Parker method by reporting on the development of a five-phase approach to interpret trends in range condition.[64]

The three-step method and other recommended procedures for managing the range resources of the Southwest evolved with the aid of range research. Other studies and recommendations have shown that an abrupt decrease in the amount of photosynthetic activity of leaves, as occurs with overgrazing, causes a corresponding slowing down in root growth, which finally results in the death of the plant. Livestock graze selectively, because some plants are more palatable than others. Unwise grazing practices are not always apparent to the observer of range conditions; only by continued misuse will obvious changes in the plant community appear. Range administrators and range ecologists alike note that prolonged heavy grazing results in inferior forage plants replacing good forage plants. Forest Service researchers have also established reliable indicators of range conditions. Erosion, indicator species, plant vigor, presence of animals such as rabbits (the more rabbits, the worse the range), and past history of use are useful guides to the administrators who must determine grazing use. Forest Service Chief Lyle Watts, in a 1946 memo, wrote, “let the record stand for itself” that Forest Service personnel are qualified to judge range conditions. “The Forest Service,” he said, “has 40 years’ experience in managing range lands and its actions are guided by the findings of years of painstaking research.”[65] Range reconnaissance, inspection, and research made it possible for effective range management planning.

Range Management Plans

In the early years, forest supervisors filed an annual report to the Chiefs office, and these reports eventually developed into annual grazing plans for their forests. At first, the supervisor’s grazing report included such items as numbers and category of stock admitted to the forest, their time of entrance and departure, and comments on the attitude of stockmen and their organizations toward the grazing program.

> In subsequent years supervisors submitted a grazing plan for their forests. The plan was required to show grazing areas, the category of stock to be permitted, access trails to the open grazing area, and any trails across the forest to private grazing lands. Range divisions reflected proposed stock use. Sheep allotment areas, especially, had to be designated.. .
>
> All things considered, the grazing plan was an effort at land classification representing an early land-use plan for the forest.[66]

Figure 30. Assistant ranger talking to a grazing permittee, Cibola National Forest, 1960.

Periodically, for almost 70 years, each national forest and ranger district has prepared a range management plan. *The Western Range* in 1936 outlined the range management planning process, stating that the basic planning unit was the individual allotment, although general plans were prepared at the national forest and ranger district level. As much of the information as is possible is shown on maps, including "grazing capacity, period of use, movements of the stock on the range, location of salt grounds, present and needed range improvements, and deferred and rotation grazing systems." Range management plans also contain information on (a) the grazing system, (b) grazing capacity, (c) season of use, (d) distribution of stock, (e) the need for special rehabilitation measures, and (f) any special provisions needed for watershed protection, wildlife, or recreational use.[67]

The Loveridge-Cliff Gil report on the Southwestern Region in 1945 mentioned that the region was placing emphasis on preparing comprehensive range management plans for each ranger district—15 up to that time. The current ones were judged to be good; earlier ones, prepared in 1939 and 1940, needed revision.[68] The 1953 plan for the Williams District of the Kaibab National Forest was eight pages. It had written sections of introduction, history of use, distribution of grazing privileges, permit turnover, and correlation of range use with other uses, along with tabular sections on actual use, range improvements, schedule of making an allotment analysis and permittee plans, and an actual use record. On the Coronado National Forest during the late 1960s, the rangers were given guidelines to prepare range management plans every 3 to 6 years.[69]

In addition to range management plans, the new National Forest Plans being prepared on each national forest in the region contain range management sections. The *Proposed Coronado National Forest Plan*, for example, includes all the uses of the national forest. Those sections of the forest plan dealing with the range resource include segments on supply and demand, goals, projected program outputs and costs, management prescriptions by management area, and a monitoring plan. Some of these are prepared on an annual basis and others at 5-year intervals. The companion document, the *Draft Environmental Impact Statement, Proposed Coronado National Forest Plan*, also dated 1982, has four sections on the range resource: purpose and need (including a list of public issues related to range), alternatives including the proposed action (with the range resource included in separate listings), affected environment (with a separate section on

range), and environmental consequences (also with a separate section on range).[70] These EIS plans are quite general, but offer a significant data base.

Grazing Inspections

Reviewing reports of functional and general integrating inspections is a good means for evaluating the progress of administration of the multiple uses of the national forests. We examined several reports from the 1920s to the 1960s. The evidence is that reconnaissance reports, inspections, and research recommendations are incorporated into field management practices. For example, in answering the response to a 1924 inspection of the Apache National Forest, Quincy Randles, District Forest Inspector, indicated that, to get satisfactory reseeding in advance of timber cutting, sheep would have to be excluded from a timber sale area. He further advised that the ranger work with the advisory board the following winter to make the exclusion work and to indicate good faith in view of the pending 10-year permitting system. Subsequently, reducing the number of sheep was noted as effective in ending damage to virgin timber.[71]

On the Coconino Plateau, in a 1926 memorandum for District Forester Pooler, Assistant Forester E.E. Carter expressed encouragement over the prospective savings of tree seedlings on the plateau by setting up drift fencing, because he observed that the fencing had resulted in protection of reproduction.[72] In an inspection report of the Gila National Forest, for an inspection made August 8-12, 1932, Assistant Regional Forester Hugh G. Calkins mentioned the great improvement in grass, herbs, alders, and willows along stream courses in four areas of the Gila because of programs that reduced stocking and removed cattle from the sheep range.[73]

In the Loveridge-Cliff report of the 1945 regional GII inspection, one-fourth of the total pages contained some critical statements or recommendations regarding range management in the region. The inspectors traveled across more than 100 grazing allotments and got a good cross-sectional view of most of the major range types. They concluded that the region “is falling far short of meeting its responsibility to the public for properly managing national-forest forage and watershed resources.” They mentioned that a large majority of the allotments sampled were in unsatisfactory condition and many still were deteriorating. Sheet erosion was still taking its toll, erosion gullies were conspicuous, and many stream channels and water courses were choked with erosion debris. Their observations from the Carson to the Coconino Plateau were that the cattle ranges were in worse shape than the sheep ranges. Some allotments were observed to be improving, including those on the Lincoln, Coronado, Tonto, Coconino, Sitgreaves, and Santa Fe National Forests. In their report, they particularly cited ranges on the Greer District of the Apache National Forest as being the best. Loveridge and Cliff recommended immediate reductions in grazing use. Overstocking and overgrazing were, in their view, thought to completely mask the relationship of weather cycles and variation in annual and seasonal rainfall in the region to the quality of the range resource.[74]

Their recommendations for corrective action were numerous and heavy-handed. The most telling was that the rangers and foresters had not reduced the grazing load enough in the past and were called upon to make those changes no matter how difficult the choices of whose stock numbers would be limited. A pithy comment like “. . . we left the Region with a strong conviction that the field organization as a whole is still not sufficiently realistic in sizing up range conditions” was followed with a list of reasons why the comments were made. Topics hit were fencing, yearlong versus seasonal grazing, ranger district and allotment management plans, salting, nonuse, excess stock policy, private land permits, inspections, reseeding, and range research. ‘Range-inspection

effort has been inadequate at all levels from the Regional office down to the Ranger District . . .”[75] is a typical comment.

A GII report of the Santa Fe National Forest, inspected on June 1-25, 1948, included 4 days at the supervisor’s office and visits of from 1½ to 4½ days to each ranger district. The conditions of most ranges on the Santa Fe were unsatisfactory, brought on by very heavy demands on the national forest for summer forage and a lack of fencing for control. In fact, the inspection team estimated that 91 miles of fence were needed to control erosion and 180 miles to control dual use, at an estimated cost of $500,000. Although several actions were needed, the report indicated that good work was being done in a large number of trespass cases and in range reseeding on a project basis.[76]

The estimated grazing capacity in 1947 was 37,000 cow-months, a reduction of 80 percent from the 189,000 cow-months estimated after the 1922-23 range reconnaissance on the forest. During the same period, the actual use had been reduced from 91,000 to 64,000 cow-months, or 30 percent. It was obvious, the inspectors stated, that in 1947 the capacity was being exceeded by 73 percent. An additional criticism was that new allotment plans had not been made and that the old plans had not been kept current. This inspection report mentioned that in addition to the large population of flocks and herds dependent on forage on the Santa Fe National Forest, demand on the national forest ranges was greater because two local timber companies no longer allowed grazing on their lands. It also reported on the livestock associations, there being ten local ones on the Santa Fe in 1948, and the positive nature of the close cooperation of the associations and the Forest Service personnel.[77]

A lengthy GII report for the Kaibab National Forest, June 8-24, 1953, indicated past overgrazing and evidence that some ranges were improving. Range management plans were current on the national forest. A good report on the percent reduction of livestock during the period from 1943 to 1952 was cited. Like Loveridge and Cliff, the inspectors found that range inspections and followup by district rangers were inadequate. Range reseeding and juniper eradication measures were discussed.[78] The following year, a GII report for the Gila National Forest had much the same comments as the Kaibab inspection report. The pace of allotment analysis had lagged. Reductions in range livestock use had been at a slower rate than reductions in estimated grazing capacity. The inspection team recommended developing cooperation with livestock growers. Fencing needs were also cited, and the cost of fence construction was mentioned.[79]

A general integrating inspection of the Coronado National Forest was made in 1964. The inspectors took the national forest staff to task for not directing enough of their effort in range management toward people management. More public relations, in their estimation, was necessary, especially in publicizing the role of the range resource in multiple-use management. The inspectors contrasted the Forest Service Experimental Range, which was managed at 40 percent utilization under a rest/rotation system, with the Coronado ranges, which were grazed as high as 80 percent. The forest officers were given good marks, however, in cooperation with range permittees.[80]

The report of the 1964 GII of the Santa Fe National Forest noted that livestock were overstocked by 20 percent. Recommendations to correct the problem included dividing the national forest into logical management areas, requesting increased funds for range improvement and revegetation, and a program to increase per-cow return.[81] A GII report of the Lincoln National Forest, issued in 1965, praised the forest for good progress in range management, especially in developing a

positive attitude through cooperative work with range permittees to improve the quality of the range on the forest. In contrast to what the inspectors found on the Coronado National Forest, 38 percent of the allotments as of the end of 1964 employed rest and rotation grazing practices, and plans were in place to increase this to 70 percent within 5 years. Additional improvement was needed in reducing permitted use, in trespass control, and in prepayment of grazing fees.[82]

The Coronado National Forest was the site of a. general functional inspection made in 1967 and 1968. The inspectors noted the "very satisfactory job" being done in range activities, such as adjusting permitted use to the carrying capacity of the ranges. They noted, however, that many areas of the national forest were in unsatisfactory condition. Range analysis work was lagging, they noted, adding that the "mechanics of producing the analysis and plans maps on the Forest is apparently not good." In the maintenance of range allotment management plans, the record also was unsatisfactory; less than a third of the allotments had satisfactory management plans. By 1970, the forest had corrected or was making progress in correcting most of these insufficiencies.[83]

Recent Range Administration

During the decades of the 1970s and 1980s, range management on the national forests in the Southwestern Region has evolved into an attempt to balance plant communities, livestock numbers, and season of use. Much more regulation and administrative control appear to be needed before range deterioration can be allayed, and greater effort still before the ranges can be restored to optimum productivity. While challenges to range management policies and personnel were great in the past, future challenges are greater still in this time of intense scrutiny of the land and resource management policies of the Forest Service and its sister agencies.

Now, by the mid-point of the eighth decade of the century, demand for outdoor recreation is putting a dampening effect on the use of the national forests of the Southwest for grazing. Moreover, increases in timber density and area of timber under management plan have reduced the land base available for grazing. Demands by the expanding urban population of the two States for more and higher quality water may also conflict with future grazing use. Once more, the battle lines to abolish or severely limit the granting of grazing privileges are being drawn. Evidence of this was the call (in a special view column in the *Journal of Forestry* in 1984) to abolish grazing on all public lands.[84] Renewed concern from some quarters about the claimed "below cost" prices of the marketed resources of the national forests, including grass, is being heard in 1986. Grazing privileges are a rich heritage in the Southwest. Sound planning and efficient management are necessary for the traditional livestock industry of the Southwest to retain its historic social and economic role in the years ahead.

Reference Notes

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[1] *The Western Range: A Great But Neglected Natural Resource* 74th Congress, 2nd Sess., Senate Doc.199 (Washington, DC: Government Printing Office, 1936), p.11; and Paul H. Roberts, *Hoofprints on Forest Ranges* (San Antonio: Naylor, 1982), p.13.

[2] Charles F. Cooper, "Vegetation Changes in Southwestern Pine Forests Since White Settlement," Ph.D. dissertation, University of Florida, Tallahassee, 1959, p. 27.

[3] *The Western Range*, p.11.

[4] Roberts, in *Hoofprints on Forest Ranges*, p.13, states: "The nester, mostly coming from the Central and Prairie States, attacked the heart of the range lands. First they 'took up' the arable, productive bottoms

along stream courses, and in the draws, and next the flats. In so doing they captured the best grass lands and many of the best watering places of the large outfits." See also Lowell A. Harrison, "The Cattle-Sheep Wars," in *American History Illustrated* 3(6) (1968): 20-27.

[5] *The Western Range*, p.16.

[6] For additional information on grazing and the range cattle industry, see Thomas S. Farish, *History of Arizona* (8 volumes) (1915).

[7] Arizona, *Report of the Governor* (1893).

[8] J.W. Tourney, "Our Forest Reservations," *Popular Science* 59 (1901):128.

[9] Theodore F. Rixon, *Forest Conditions in the Gila River Forest Reserve, New Mexico* (Washington, DC: USDI Geological Survey, 1905), pp. 14-15.

[10] Roberts, *Hoofprints on Forest Ranges*, p.15.

[11] Phillip O. Foss, *Conservation in the United States: A Documentary History* (New York: Chelsea Publishers, 1971), p.11.

[12] USDA Forest Service, *The Use Book* (Washington, DC: USDA Forest Service, 1907).

[13] See Roberts, *Hoofprints on Forest Ranges*, pp. 1-44; William Rowley, *U.S. Forest Service Grazing and Rangelands: A History* (College Station, TX: Texas A&M University Press, 1985), pp. 1-70; and Arthur C. Ringland, "Conserving Human and Natural Resources," an interview conducted by Amelia R. Fry, Edith Mezirow, Fern Ingersoll, and Thelma Dreis (Berkeley, CA: Resources for the Future, 1970), pp. 36-37.

[14] Roberts, *Hoofprints on Forest Ranges*, p. 44.

[15] See R.M. DeNio, "Principles Governing Grazing Fee Determination on Lands Administered by the U.S. Forest Service," *Proceedings, Society of American Foresters* (1962), p. 80; and letter to author from William D. Hurst, Bosque Farms, NM, August 21,1985.

[16] William D. Hurst added these observations in his letter of August 21,1985: “Pinchot once said, ‘Better help a poor man make a living for his family than help a rich man get richer still.’ He further stated that the foregoing statement is ‘our battle cry and our rule of life.’”

[17] Lyle F. Watts, Chief of the Forest Service, Memorandum to the Secretary of Agriculture, "National Forest Range Administration," Washington, DC, January 7, 1946, p.1, Federal Records Center, Denver, 095-57A, 0093.

[18] Two early cases were the Fred Light case in Colorado in 1909 over both grazing fees and fencing issues and a case in California in 1907 over nonpayment of fees claimed to be administered by the Secretary of Agriculture as the administrative agent, rather than by Congress, the lawful entity. On May 1, 1911, the U.S. Supreme Court ruled for the government in these two cases. For a more complete report of these cases, see Rowley, *U.S. Forest Service Grazing and Rangelands: A History*, pp. 66-68. This was upheld in *Osborne vs. The United States*, 145 (2nd), 892, November 24,1944, Federal Records Center, Denver, 095-57A0093.

[19] It is interesting to contrast this with a statement in Will C. Barnes, *Apaches and Longhorns* (Tucson, AZ: University of Arizona Press, 1982), p. 206, where, at the end of his career he wrote, ". . . and I will admit, also that the cattle industry must be secondary to the primary purpose for which the Forests were created—the production of timber and the protection of the great watersheds of the west"; Gifford Pinchot, *Breaking New Ground* (New York: Harcourt Brace, 1947), p. 269.

[20] *Ibid*., p. 269.

[21] *Ibid*., p. 269.

[22] *Ibid*., p. 269.

[23] Roberts, *Hoofprints on Forest Ranges*, p. 30.

[24] *Ibid*., p. 30.

[25] *Annual Report of the Secretary of Interior*, 1902, 57th Congress, 2nd Sess.,1902-1903, House Doc. 5, vol. 18, p. 22; Roberts, *Hoofprints on Forest Ranges*, pp. 30-32.

[26] Roberts, *Hoofprints on Forest Ranges*, p. 32.

[27] *Williams News*, Williams, Arizona, 1907.

[28] *Southwestern Stockman, Farmer and Feeder*, March 15, 1913.

[29] Edwin A. Tucker manuscript, Regional Archives, Albuquerque, NM, p.124.

[30] Roberts, *Hoofprints on Forest Ranges*, p.128-130; see DeNio, "Principles Governing Grazing Fee Determination," p. 80.
[31] *Ibid.*
[32] "Grazing of National Forest Lands in New Mexico," typescript, Federal Records Center, Denver, 09562A421, Box 1.
[33] Grazing files and memoranda, Federal Records Center, Denver, 095-57A0093, Boxes 1-3, and 09557A0090, Boxes 3 and 4.
[34] *Ibid*.
[35] Roberts, *Hoofprints on Forest Ranges*, p.130; DeNio, "Principles Governing Grazing Fee Determination," pp. 81-82; W.L. Dutton, "History of Forest Service Grazing Fees," *Journal of Range Management* 6:6 (November 1953): 396; Edward P. Cliff, *Grazing Policies on Forest Lands-A Look at the Next 20 Years* (1967), p. 9 (also in *Congressional Record* 113 (75) (May 15,1967): S6816-18); and see Rowley, *U.S. Forest Service Grazing and Rangelands*, p. 242.
[36] *Albuquerque Journal*, Editorial, May 10, 1985.
[37] Rowley stated the following in his study: "To protect the range Potter's instructions provided that sheep should be kept moving and not bedded down in the same place too long. The sheep camp should move every two to three days; otherwise severe damage occurred to the forage and young trees in the vicinity." Rowley, *U.S. Forest Service Grazing and Rangelands, p. 70.*
[38] In April 1917, Will C. Barnes recommended to District Foresters that temporary grazing permits be issued to allow livestock owners to have additional stock on national forests to minimize financial losses under expanded wartime production goals. Will C. Barnes, Letter to District Foresters, All Districts, n.p., April 17, 1917,1 p. (in the personal files of William D. Hurst); and see Roberts, *Hoofprints on Forest Ranges*, p.115.
[39] Memoranda and reports relative to appraisal of ranges and descriptions of range capacities, Federal Records Center, Denver, 095-57A00900, Boxes 3 and 4.
[40] Frank J. Smith and Dale A. Jones, "Report on Functional Inspection-Range and Wildlife Management, Coronado National Forest, March 17-19,1967 and April 29-May 3,1968," n.p.,1968, pp. 2, 7, Federal Records Center, Fort Worth, 095-74A0044.
[41] USDA Forest Service, *Annual Report*s, 1909-1931.
[42] Pinchot, *Breaking New Ground*, p. 270.
[43] Cliff, *Grazing Policies on Forest Lands*, p. 2.
[44] Rosedale Ranger Station early-day files at the Cibola National Forest headquarters, page 1 of letter.
[45] *Ibid*., page 1 of letter.
[46] The files of the *Carson Pine Cone* are in Carson National Forest Archives.
[47] Edwin A. Tucker and George Fitzgerald, *Men Who Matched the Mountains*: *The Forest Service in the Southwest* (Washington, DC: USDA Forest Service, 1973), p. 107.
[48] Federal Records Center, Denver, 095-57A0090, Box 3.
[49] There were 800 advisory groups in 1944 in the United States, Federal Records Center, Denver, 095-57A0093, Box 3.
[50] *Ibid.*
[51] *Ibid.*
[52] *Ibid*.; J. Morgan Smith and Ernest H. Taylor, "General Integrating Inspection Report, Coronado National Forest, April 13-24,1964," n.p.,1964, p.11; and Fred H. Kennedy, Regional Forester, Memorandum to Division Chiefs and Supervisor, Santa Fe National Forest, "Inspection-Santa Fe GII," Albuquerque, New Mexico, November 19,1964, Appendix Table VIII, Federal Records Center, Fort Worth, 095-74A0044.
[53] *The Western Range*, pp. 72-108.
[54] USDA Forest Service, Southwestern Region, Prescott National Forest, *Analysis of the Management Situation, Prescott National Forest*, n.p.,1983, p. 88; USDA Forest Service, Carson National Forest, "Draft Environmental Impact Statement, Proposed Carson National Forest Plan," Albuquerque, NM, 1984, p. 98.
[55] Warren P. Clary, *Range Management and Its Ecological Basis in the Ponderosa Pine Type of Arizona: The Status of Our Knowledge*, Res. Pap. RM-158 (Fort Collins, CO: USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, 1975), 35 pp.; S. Clark Martin, *Ecology and Management of Southwestern Semidesert Grass-Shrub Ranges: The Status of Our Knowledge*, Res. Pap.

RM-156 (Fort Collins, CO: USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, 1975), 39 pp.; H.W. Springfield, *Characteristics and Management of Southwestern Pinon Juniper Ranges: The Status of Our Knowledge*, Res. Pap. RM-160 (Fort Collins, CO: USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, 1976), 32 pp.

[56] Springfield, *Characteristics and Management of Southwestern Pinon Juniper Ranges*, pp. 1-32; and comparative data from *The Western Range*, p.102.

[57] William M. Drake, "A Report on the Coconino National Forest," Flagstaff, Arizona, n.p., 1910, pp. 26-27, Federal Records Center, Denver, 095-74A0044; USDA Forest Service, Southwestern Region, Coconino National Forest, "A Draft Environmental Statement: A Proposed Timber Management Plan for the Coconino National Forest,' n.p., 1972, p. 22, Coconino National Forest.

[58] James T. Jardine and Mark Anderson, *Range Management on the National Forests*, Bull. 790 (Washington, DC: USDA Forest Service, 1919), p. 75.

[59] *Ibid*., p. 79.

[60] Raymond Price, *History of Forest Service Research in the Central and Southern Rocky Mountains Regions*, 1908–1975, Gen. Tech. Rep. RM-27 (Fort Collins, CO: USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, 1976), pp. 7-8.

[61] *Ibid*., p. 20; and see *Annual Report on Progress in Research for Calendar Year 1935 and Recommended Program of Research for Fiscal Year 1936-37* (Tucson, AZ: USDA Forest Service, Southwestern Forest and Range Experiment Station, 1936), pp. 1-105.

[62] *Ibid*., pp. 16, 22, 27-33, 50.

[63] Kenneth W. Parker, Range Conservationist, *A Method for Measuring Trend in Range Condition on National Forest Ranges* (Washington, DC: USDA Forest Service, 1951), pp. 1-26, 3.

[64] Jack N. Reppert and Richard E. Francis, *Interpretation of Trend in Range Condition from 3-Step D*ata, Res. Pap. RM-103 (Fort Collins, CO: USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, 1973), pp. 14-15.

[65] *Ibid*.; Lyle F. Watts, Memorandum to the Secretary of Agriculture, p.1.

[66] Rowley, MIU.S. Forest Service Grazing and Rangelands, p. 74. Included in Rowley's book is an outline of a supervisor's Annual Range Working Plan on pages 76-77. Rowley cites the 1909 Grazing Report for Region 3 in a footnote on page 77. Jardine and Anderson's USDA Bulletin 790 does not mention national forest range management plans.

[67] *The Western Range*, pp. 263, 513.

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Chapter 12. The Forests and Fire

Although intensive grazing practices contributed to the deterioration of forest rangelands before the turn of the century, and range management occupied a great portion of the time and attention of the Forest Service in the Southwestern Region, forest fire control and prevention seemed no less critical to the protection and management of the southwestern forests and to the welfare of the region. Early foresters, as did the general public, believed fire to be the preeminent threat to forest resources. Fire was the most sudden, obvious, and radical cause of forest deterioration. The newly created national forests of the Southwest bore mute testimony of the lasting damage or alteration caused by fire. As time passed, fire prevention and control became so effective that the growth and development of southwestern forests became as markedly affected by the *absence* of fire as they had previously been affected by fires of earlier centuries.

Damage from range and forest fires incurred in the times of the Indians and Spanish or Anglo-American settlers and before the establishment of the first forest reserves was in some areas extensive and long-lasting. In other areas, fire damage had been minimal, and ancient fires may have fostered maintenance of the subclimax pine forests. There is evidence that fires that burned in the pre-Columbian, Spanish colonial, and Mexican eras were more widespread and destructive than those of modern times. For example, about 200 years ago, a fire in the region of the San Francisco peaks in northern Arizona burned approximately 18,000 acres. It destroyed a heavily stocked stand of Engelmann spruce and Arizona fir and destroyed 60 percent or more of all vegetation on about 7,000 acres. Similarly, a fire in the 1880s in the mountains above Santa Fe, NM, "raged for weeks."[1] Many of these early fires had been set intentionally or had expanded when small fires were not put out promptly. Nature also contributed to the fires. Dry lightning storms, annual events in the Southwest, set many fires.

Aspen Comes in After Fire

There is evidence of ancient burns on the Black Range, where growth of quaking aspen had replaced former vegetation and grown so thickly and so rapidly as to crowd out all other species. On the Kaibab National Forest, a survey by Lang and Stewart in 1909 reported extensive early damage from fire. "Vast denuded areas, charred stubs and fallen trunks and the general prevalence of blackened poles seem to indicate their frequency and severity long before this country was explored by the white men," they reported. Observers believed that most of the ancient fires were caused by lightning, but that many had been set by Indians during their hunting forays.[2] Forest inventories indicated varying evidence of ancient fire damage.

Sixty-six thousand acres of the Grand Canyon Division of the Tusayan National Forest were inventoried in 1910 by J.H. Allison. Allison said that in heavy timber, with trees of 12-inch diameter or more at breast height, there was little evidence of old fire damage and few scars at the bases of trees. But large areas in the Carson National Forest had been burned, he said, and there were extensive areas where the major stands of Douglas-fir had been completely destroyed by fire years ago. There were, he noted, occasional pockets of Douglas-fir or white fir that had escaped fire. Almost all of the burns identified occurred on the Douglas-fir and white fir and subalpine types. In these areas, he said, fires frequently crowned and would kill an entire stand. "But even the largest burns will in all probability be restocked with a coniferous stand in the course of time," he believed.[3]

Damage to mature timber is in some respects less critical than damage to the site, which may reduce its growing capacity. The 1922 management plan for the Mount Graham Division of the

Crook National Forest indicated that ground fires were second only to grazing in the destruction of seedlings. Evidence existed of numerous ground fires over the larger portion of the forest. In altitudes above 8,000 feet, where older timber stands had been destroyed, ash had filled in. Fires in the Jemez Division of the Santa Fe National Forest had impaired site values, and the size and quality of timber had been diminished. Once fire had been eliminated or controlled, young growth of the transition type grew in excellent stands.[4]

The management plan for the Mount Graham Division in 1925 suggested that the absence of fire damage in the fir types was due to the heavier precipitation and the late snow. The absence of "areas burned to the point of devastation" before fire protection in the forests began indicated that extra high standards of fire prevention would be unnecessary. But on the lower slopes, the forests dried earlier and conditions were conducive to fire.[5]

Figure 31. Fire burning on the Gila National Forest, 1951.

Fires Follow Cutting

Timber cutting and fire hazard were also related. A 1926 memorandum to the district forester noted that the fire hazard was extreme in the cutover areas of the national forests of the Southwest. The fire hazard was believed to be five times as great on timber sale areas of the Coconino and Tusayan National Forests as on all other lands.[6] Logging damage from cuts in the late 19th century were substantial and lasting, usually because of the destructive fires that followed cutting. "Some areas were laid to waste, and huge amounts of slash accumulated which led to some disastrous fires. . . . During the early railroad logging days, large clearcuts covered several townships south and west of Flagstaff, Arizona. All failed to regenerate."[7]

Prior to the time that the Forest Service acquired the reserves, substantial cutting had occurred on some of them in the Southwest. Logging operations had been conducted on an estimated 148,846 acres of the San Francisco Mountain Forest Reserve. Much of the cut took 95 to 100 percent of the timber. Little cutting, however, had occurred on the Black Mesa Forest Reserve, and what was described as "desultory" cutting had been carried on in the Gila River Forest Reserve. But on what became the Manzano National Forest, logging had been very heavy. The forests had been "culled for ties and other railroad construction material," and in some ranges there were insufficient trees left standing to reseed the area. Less than 1,000 acres had been cut in "small and scattered" areas of the Sitgreaves National Forest. Cutting had declined considerably on the Gila National Forest because the mines were "turning to oil for fuel." The Tusayan, however, suffered

from overcutting, and harvest on the Carson National Forest had been heavy in some places, particularly trees "cut in trespass prior to the creation of the Forest "[8]

Grazing Damage Exceeds That of Fire

Aldo Leopold believed that damage from grazing exceeded that from fire. Leopold said that even the severe fires of presettlement days failed to destroy the equilibrium of the watershed:

> Heavy local damage to all kinds of resources has taken place since the 16th century, but the country is still there. This does not mean that damage leaves no scars. On the contrary it produces radical changes—the history of three centuries is boldly inscribed in soil and vegetation of the west side above Santa Fe. The point is that *when one equilibrium is upset there is another ready to take its place*. This is the characteristic of resistant countries the world over. They change but do not dissolve. The true Southwest, on the other hand, does change. It is either conserved or in process of dissolution.[9]

Leopold believed that damage from fire was not comparable "to what grazing has done since."[10] It was reported that a flock of 2,000 sheep would destroy 50 to 100 percent of the aspen seedlings in a tract of land through which they ranged, although after young pines had reached the age of 3 or 4 years, the danger of destruction from grazing was small.[11]

Similar grazing damage was noted on the three other forest reserves in Arizona and New Mexico that had been inventoried by the USDI Geological Survey. It was reported in 1904 that an "animal cannot get a bite for miles around." Roots of the grasses were so thoroughly destroyed that it was doubtful that any reproduction could occur naturally. The lower slopes, below the 7,000-foot contours, had been irreparably damaged by overgrazing. Fully half of a township in New Mexico (T9S, R15W) that had been given over to stock grazing was "a barren desert, [without] a blade of grass being seen and even the roots being entirely destroyed."[12]

On the national forests, grazing damage was severe in many areas, but was lessening under Forest Service control. By 1909, the condition of the range was better. Improvements were attributed to Forest Service management. Overgrazing, however, still occurred near the small Hispanic towns and in the vicinity of ranch houses. The lands in and about the Sitgreaves National Forest, for example, were recognized at one time as one of the "finest summer and winter ranges in the Southwest." The range had been much abused, however, and had degenerated seriously under the drought conditions and overgrazing that prevailed between 1898 and 1906. By 1910, Daniel W. Adams could report that the portion of the grasslands under Forest Service regulation was much improved, but not as much so as the White Mountain Indian Reservation, where sheep grazing had been prohibited. In 1923, Quincy Randles reported that sheep grazing was still the greatest factor contributing to the destruction of yellow [ponderosa] pine reproduction on the Tusayan National Forest. He advised halting sheep grazing "prior to cutting and after cutting until the area is fully stocked with young growth three feet in height "[13]

Fred Croxon suggested at the Tonto Grazing Conference in Phoenix, on November 5, 1926, that not only overgrazing but erosion and site deterioration attributed to overgrazing, as well as excessive cutting and burning, made reforestation and revival virtually impossible. Brush and gravel had replaced grasslands and timber in some areas:

> Florence C. Packard, probably the oldest living man to settle in Tonto Basin, came to the Salt River Valley in 1874. . . . He tells of Blackfoot and Crowfoot Grama grass that touched one's stirrups when riding through it, where no Grama grass grows at present. . . . There were perennial grasses on the mesas along Tonto Creek where only brush grows at the present time. Mr. Packard says that Tonto Creek was timbered with the local creek bottom type of timber from bluff to bluff. . .
>
> E.M. (Chub) Watkins, whose father, Captain K.C. Watkins, settled on Tonto Creek in 1882 . . . tells about the same story of early conditions as Mr. Packard. He says Curley Mesquite grass covered the foothills but did not extend to so low an elevation as at present, these lower elevations having been covered by Grama and other grasses now gone. . . . There were no washes at all in those days, where at present arroyos many feet deep are found and at places cannot be crossed.[14]

Thus, fire was a contributing, but not exclusive, factor in the deterioration of the forests. Fire, however, occurred all too frequently.

The Early Efforts at Fire Control

Fires seemed to be frequent and often large, according to old-time rangers such as Richard F. Hanna, an early forest officer on the Santa Fe National Forest. Hanna began his ranger duties in 1899 and moved to Santa Fe on June 30, 1900. He recalled a fire in the summer of 1900 that covered 40,000 acres. Rangers, he said, were hired for the summer during fire season and laid off in October. Fires were "unusually prevalent" and required hundreds of men to fight them.[15]

Figure 32. Fighting fire, Gila National Forest, 1951.

Fred S. Breen assumed duties as supervisor of the Black Mesa Forest Reserve early in the century and organized fire control work. Early in his administration (June 6, 1902), Supervisor Breen drew up what he termed "General Instructions to Rangers." Those items in the instructions that pertain to fire control are listed below and offer good insights into early methods of fire control:

> 3. Rangers are expected to remain strictly upon their own districts unless otherwise ordered by the Supervisor or, in case of fire, on an adjoining district.
>
> 4. Rangers are expected to go to a fire at once wherever one is discovered within a reasonable distance of his district. . .
>
> 10. Post fire warnings along all roads, trails, and at springs or other camping places frequented by campers. Nail them up securely and plentifully over all your District. Warn all persons of the penalty of leaving camp fires unextinguished. . .

> 12. Report all fires no matter how small that you extinguish, giving location of same, and whether caused by locomotive, sheep-herder, camper, cattleman, or others. Use due diligence in ascertaining who the guilty ones are, and report all facts in the case, so that he may be punished for his neglect.
>
> Printed blank fire reports are furnished you as a sample, covering all classes of fires and the information concerning each, upon which you are required to report. Keep this and make reports on blank paper covering all points requested in the case.
>
> In case of fire assuming too great proportions to be handled by a ranger, you will communicate with the Supervisor immediately in the quickest manner possible, giving him the locality, extent of fire, and such other information necessary for him to act intelligently upon. Only in exceptional cases of great emergency are rangers to hire help in putting out fires, and then only when they cannot reach the Supervisor for instructions. Rangers are not to guarantee the pay of persons found fighting fire or any other persons who are helping to save their own private property. The Supervisor will pass upon all claims of this kind and decide whether or not they are entitled to compensation. . .
>
> 14. Monthly fire reports should be made out on separate sheets, giving cause of fines, location, extent, etc. . . .
>
> 18. Rangers are expected to pile and bum brush in most dangerous places along roads and trails where fires are most liable to get started, to burn fireguards when possible without danger of fire spreading, . . . [The Ranger should] find the most exposed places and remove the debris to protect the forest from fires . . .[16]

Forest fires had headlines in area newspapers. Other damage to the national forests, except severe floods, did not attract public attention as much as fires did. The July 5, 1907, issue of the *Albuquerque Morning Journal* reported that a large area of timberland was burned over and that flames were still going on the Gila National Forest, with a big force of rangers in the reserve fighting the fire. Three days later, the paper reported that fires in Arizona "started in the upper fork of Montezuma Canyon . . . due to carelessness of campers . . . blamed on excessive high temperature during the past week.”[17]

Loggers Had to Pile and Burn Slash

Forests being logged also tended to attract fires. Because of the fire hazard on logged areas, the Forest Service required loggers to pile and burn slash in order to reduce the fire hazard. Assistant District Forester A.O. Waha felt that simply lopping the branches and scattering them would work just as well, especially where soils were thin, and this would help build up the humus on the forest floor. Waha suggested that the proper change in instructions should be made, and in 1909, the district forester approved the suggestions.[18]

The October 9, 1907, edition of the *Albuquerque Morning Journal* reported an address by E.S. Gosney before the Wool Growers, in which he questioned the abilities of forest rangers to cover large areas and attacked the policy of preserving nonforest areas. "These forests," he said, "can never be protected by forest rangers." Thousands of fires are started by lightning and campers and in other ways, and extinguished by stockmen, he said. "I have known stockmen to fight fires for days and extinguish them without ever seeing a ranger!" And Gosney was correct. In the fiscal year ending 1907, some rangers had to patrol more than 200,000 acres.[19] Fire control required both organization and more personnel.

The first program for increased forest fire protection for the Southwestern District (Region) was developed by the first district forester, Arthur C. Ringland, in 1908. He wrote to the forest supervisors in the district and advised "a careful study of the conditions of the Forests and the adoption and use of a definite fire plan." Ringland urged that the rangers develop a deep interest in preparing fire plans. He suggested several things: building lookout stations on peaks, constructing telephone lines from the peaks to the ranger's or supervisor's offices, building trails and roads to move firefighters, putting tool boxes in strategic places, and hiring firefighters or organizing volunteers.[20]

Correspondence on the Datil National Forest in 1909 indicated that the foresters acted on Ringland's suggestions. Supervisor W.F. Goddard asked his foresters to report on their method of handling and extinguishing fires. He wanted to know the types of tools and personnel used and methods of organizing the crews, the supplies requested, and where they were obtained and how they were delivered to the fire areas. Two weeks later, the ranger near Santa Fe responded to Goddard. He said he was getting good support from local stockmen and permittees who were anxious to protect the ranges from fire. He suggested that permittees be used whenever possible on fire protection, in preference to hiring laborers. He also noted that the only equipment needed in his district were axes and shovels.[21] Ringland required that all national forests have fire plans. In inspection reports the fire plan always seemed to be an item that was either in good order or in bad order; rarely was it deemed average.

Bad Fire Years

In some years, and especially in 1917, 1918, and 1921, fires seemed to be particularly bad. The *Arizona Gazette* reported on one forest fire that started in Mexico and came across the border into the Coronado National Forest in June 1917. It burned over 4,600 acres before being brought under control. Similarly, the *Carson Fine Cone* reported several fires in 1917 and 1918:

> So far as we know, the champion-sized fire that has ever occurred on the Carson came off on the Taos District between November 8th and 14th. All the factors for a large and exceedingly difficult fire to fight were present: extreme dryness, high winds, and almost inaccessible country. The fire was on the high, rough ridges on the east slope of Pueblo Peak, about twelve miles from Taos. Difficulty in securing men for the first two days prevented a successful attack of the fire until the sheriff of the county was appealed to and sent out a large force of men who were practically deputized for the work. Supervisor Barker was in direct charge of the fire and was assisted by Ranger Dwire in directing the work. Approximately 560 acres were burned over and the cost of fighting the fire will be something over $400.[22]

The 1917 fire season began "very badly" on the Carson. There were high winds and an exceedingly dry spring. Forest officers were advised that most of their work should be devoted to fire protection. They were reminded that leaving a campfire without completely extinguishing it constituted trespass and under the Act of June 4, 1897, was punishable by a $500 fine or 12 months' imprisonment, or both. The Act of March 4, 1909, raised the fine to a possible $1,000. Forestry personnel were also advised to know the rules of trespass and to follow instructions for brush disposal very carefully.[23]

Drought and high winds in 1921 contributed to an extremely bad fire season in Arizona and New Mexico. In 1922, the Agricultural Appropriations Act made the first appropriation specifically for

the improvement of public campgrounds in national forests, with special reference to the protection of the public health and prevention of forest fires. A 1923 agreement between the State land commissioner of New Mexico and the Forest Service provided for forest fire control by the Forest Service on State holdings within the boundaries of the Carson National Forest.[24] Although public use of the forests rose markedly in the 1920s, local residents rather than tourists seemed to be most responsible for forest fires.

Fires From Carelessness

Assistant District Forester Hugh G. Calkins said in 1926 that only 26 of 202 fires during 1925 were caused by tourists. He blamed the "home folks" for carelessness. By 1927, the incidence of fire on the Coconino National Forest was rising. Over the period 1913-26, inclusive, the number of fires each year varied from 74 to 350, and the acreage burned from 393 to 9,346 acres. The number of class C fires—those covering 10.00 to 99.99 acres—varied annually from a low of 3 to a high of 82. Fires in western yellow [ponderosa] pine forests seemed to occur more often in areas where timber cutting was taking place. Timber sale contracts included fire protection requirements, including the necessity to pile and burn brush in cutover areas.[25] Fire prevention, fire planning, and fire fighting demanded an enormous amount of administrative and physical energy. The excitement of fighting a forest fire, as well as the fact that such work produced sizable overtime wages or seasonal bonuses, generated a broad-based enthusiasm for fire protection work. Fire fighting is what many of the old timers remember best.

Fire Towers

The first Forest Service fire towers were simple platforms on high ground with an open view of the surrounding forest, or trees cleared of their limbs and topped with a crude platform. The platform might eventually be covered, and about 1915, the first wooden tower was constructed. In the 1920s and 1930s, wood continued to be used for most fire towers, but the structures were more elaborate.[26] Steel began to be used in a few towers before World War II, but construction was so expensive that few were built. After the war, greater dependence on air surveillance reduced the need for fire towers. All but a relatively small number of towers have now been removed, and those remaining seem to be permanent fixtures in the fire control operations of the Southwestern Region.[27]

There is a stereotype picture from the past of the "lonely ranger," living an isolated existence in a rustic log cabin, perhaps with his family, climbing the tall ladder to enter the tower, and peering patiently across the endless forests for signs of smoke. This is largely a thing of the past. In the early years, most of these posts were operated on a seasonal basis, and often by temporary employees. As early as 1909, lookouts were connected to ranger district offices by telephone, and today telephones and radios relay fire messages from airplanes and watchtowers to fire control crews.[28]

The Southwestern Region now operates 82 permanent lookouts in New Mexico and Arizona rather than the several hundred that existed before 1940. There are 50 permanent lookout towers in Arizona, with 11 of these on the Coconino National Forest. They are strategically placed to afford a maximum surveillance. Towers on the Coconino tend to run in a northerly direction, while those on the Sitgreaves are aligned in a westerly line along the Mogollon Rim. Most of the towers are reached over dirt or primitive roads. The tower with perhaps the most difficult access is the Escudilla Tower on the Apache National Forest, which can be reached by hiking in from a

primitive road. Bill Williams Tower, on the Kaibab, can be reached by an isolated dirt road with innumerable switchbacks.

New Mexico has 32 permanent lookouts in operation. Some lie along major highways; others in isolated areas of the Sierra Blanca on the Lincoln National Forest. One of the most difficult to reach, on the San Mateo Peak in the San Mateo Mountains, requires a 5-mile trail hike from a primitive road. The Gila National Forest operates 12 towers, more than any other of the national forests in the region.

Fire Fighting Reminiscences

The Southwestern Region, as all the Forest Service regions in the Western United States, has a long and noteworthy history of forest fire protection and control. Since tales of fire fighting are more interesting and colorful than tales of timber inventory, timber sale appraisal, road and trail construction, and posting changes to the Forest Service Manual, it is only natural that fire fighting and range work are the best documented of the lore of the early days in the Southwestern Region. A few synopses of fire recollections recapture the human drama associated with forest fires in the Southwestern Region.

Tom Stewart started his assignment on the Pecos Reserve in 1903. The day he started, he saw smoke from two sources from the top of the mountains where he had ridden. On the first fire, he was assisted by ranchers who were gathering their tools when he found them. After putting out the first, he obtained the assistance of 15 to 20 men from the village of Agua Negra to deal with the second fire, and in so doing he made friends with the *alcalde* (mayor), who from then on cooperated with the Forest Service.

Roscoe Willson told about seeing Halley's Comet in 1910 while on a fire under the Mogollon Rim upslope from Roosevelt, AZ.

Ed Oldham, ranger on the Flagstaff District, had organized the settlers into fire crews. These people would head for a fire without having to be notified-the smoke was their beacon.

Henry Woodrow was assigned as fire guard in 1909. "All the instruction I had was to go up there and look out for fires—and put them out." On one fire, when he reached the scene, an old-timer—prospector—had already started to fight the fire.

Ed Ancona remembered a time when he was on the Crown King Ranger District of the Prescott National Forest. Just when he was ready to eat ice cream he had made from collected cream and a shipment of ice, a fire was reported to him. According to his story, "The call to duty was stronger than that of the ice cream."

Paul Roberts, better known for his books on range aspects of the Southwestern Region, remembered the time in the Pinedale District when a fellow smoked out some bees but let the fire get away. He later admitted that he was responsible, but also said, “There ain't no law against lyin' a little to keep out of trouble, is there?"[29]

Fires sometimes involved lawlessness and violence. Stephen J. Pyne, in his book *Fire in America*, recites the following:

> During 1927 in Lincoln County, New Mexico, the scene of bitter frontier range wars in the nineteenth century, incendiary fires were constantly being set around a certain ranch. . . . When firefighters were indeed met with rifle shots, the sheriff and local forest supervisor set out after the unrepentant incendiarist. In the ensuing shootout an innocent Forest Service clerk, commandeered as a driver, was killed along with the rancher.[30]

Tucker and Fitzpatrick go into considerably more detail with the story, indicating that the man shot was an executive assistant, who had been a former ranger and had been threatened several times by the incendiarist while serving in this position.

In the early days in the district, the rangers were directed to go wherever they were needed to put out fires, or to other districts to help with fire camp organization on very large fires. When called to a fire, rangers came from remote distances, as far away as the Rockies.[31] One forester, called to fire duty from the Kaibab, rode his horse overnight to his home in Fredonia, got food and fresh horses, and then rode for another day to catch a train that could get him to the fire location.[32]

Fire Innovation In the Southwestern Region

The region had a log of firsts when it came to fire fighting, but was slow in some areas, such as in adapting to the use of the radio. Perhaps one of the most interesting innovations of the early days was the placing of cast iron "fire finders" in the forests for public use. "When a traveler spotted a fire, he could take a reading on it from one of the fire finders mounted at lookout or vista points along various roads, and phone the reading to the forest ranger:”[33]

"The Vermont State Forestry Department first used the radio to report forest fires in June 1909. The first use of radio (or "wireless" as it was first called) in fire control within the Forest Service was on the Apache National Forest, when Ranger William R. Warner successfully used a radio on November 26,1916. The Southwestern District requested either telephone or wireless on the Prescott National Forest in 1923, but the USDA Forest Service Chief of Operations vetoed both ideas, principally because of cost factors. Until World War II, the region did little innovative work with radio. Foresters there were just gathering to witness radio communication demonstrations in late 1937.[34]

Automobiles were first introduced on the Coronado in 1916. The completion of the Control Road from Oracle in 1920 greatly improved fire protection abilities. Men, supplies, and equipment could be transported swiftly to a fire. The first aerial fire patrol flew over the Catalinas in 1921. Forest Supervisor Hugh Calkins flew fire patrol in an army plane during the big Alder Canyon-Summerhaven fire of that year. Crawler tractors-were used on the national forests of the Southwestern Region as early as 1928 to build a fireline. Two or more fair-sized logs were hooked to the tractor and pulled along the route of the fireline on less sloping land, and the tractors without the logs whipped from side to side on steeper slopes.[35] Perhaps one of the most interesting innovations or adaptations was the Hula Dozer.

The Hula Dozer

Henry Mullin, Regional Equipment Engineer, who worked in the Southwestern Region from 1932 to 1964, developed the Hula Dozer, a bulldozer equipped with teeth on the blade, for ripping. Mullin described its use on the Gila:

> [On] a major fire in the wilderness area on the Gila National Forest several years ago. . . men walked 15 or more miles into the fire camp area as there were no roads. . . . Management recognized the need to construct a mountain road in order to make it possible to haul the remaining supplies and men out of the area after the fire was controlled. . . . A D8 cat which . . . attempted to penetrate the sandstone resulted only in a mere scratch. . . . Marshall Wright, the road construction foreman, sent . . . an old D7 with a hula dozer . . . to be driven to where the new road started. The D7 arrived late that evening and the next morning started constructing the road where the D8 scratched the sandstone. That evening a suitable road was completed.[36]

Smokey Bear

The Southwest made a memorable contribution to the public's national image of the Forest Service. The National Advertising Council, an outgrowth of the War Advertising Council, developed and supported "Smokey Bear" as a symbol for forest fire protection, beginning in 1945. In 1950, the Ad Council suggested that a real bear would be an asset to the program.[37] “That summer, following a large fire on the Lincoln National Forest in New Mexico, an orphaned bear cub was discovered on the burn.”[38] Fred H. Miller, who received his first Forest Service appointment on the Santa Fe National Forest in 1916, and who had spent many years in the Southwestern Region, remembers Smokey's reception in Washington, DC. He was in Washington when Smokey Bear was brought by air from Santa Fe. He remembered that "a group of us from the Chief's Office went out to the Zoo in Rock Creek Park to welcome the little cub. [Chief] Lyle Watts was there, and Senator Chavez was also there, so that bear was quite a sight, and one of the attractions at the Zoo." Miller credited Kay Flock, Supervisor of the Santa Fe National Forest, with the idea of sending the cub to Washington, DC. William D. Hurst mentioned that Elliott Barker and Ray Bell of the New Mexico Game and Fish Department should be given credit for initiating and pushing the program to completion.[39] In time, Smokey Bear became synonymous with forest fire protection.

Figure 33. Smokey Bear as a young cub with his adopted sister, Judy Bell. Smokey was rescued after being badly burned in a forest fire on the Lincoln National Forest in 1950. (Forest Service Collection, National Agriculture Library).

Benefits of Fire

The Southwestern Region in the early years devoted every effort to control wild fires as soon as possible. The role that fire had played in the maintenance of the pine forests, its use to control brush, and the other presently recognized beneficial aspects of fire as a management tool to control fuels buildup received little attention until recent decades:[40] Aldo Leopold, however, was one of those who realized the often critical role of fire in the development of forests. He wrote in 1924:

> The removal of the grass relieved the brush species of root competition and of fire damage and therefore caused them to spread and "take the country." The removal of grass-root competition and of fire damage brought in the reproduction. In brief, the climax type is and always has been woodland. The thick grass and thin brush of pre-settlement days represents a temporary type. The substitution of grazing for fire brought

> on a transition of thin grass and thick brush. This transition type is now reverting to the climax type—woodland.[41]

In 1921, Inspector Emanuel Kelly reviewed fire control improvements in District 3. He discussed such hazards as the natural condition of forest cover and the type of forest. His report reviewed two forest types: the yellow [ponderosa] pine type and the composite type. For the ponderosa pine type, he noted that areas "covered with a heavy growth of coarse bunch grass, interspersed with scattered stands of reproduction" had high fire hazard, while "open park-like areas practically devoid of grasses and weeds and supporting but little reproduction" had low hazard. He disagreed with the accepted wisdom that the hazard in the composite type was high because of evidence of many previous fires. He believed that the composite-type forest was not unusually flammable, but that low-grade fires had smoldered for weeks before growing large. The scars were the result of neglected fires, he believed.[42]

Aldo Leopold, in the position of Assistant District Forester, inspected the national forests in the Southwestern District during 1919 to 1923. All of his inspections contained a section of detailed comments concerning fire control organization and activities. Leopold found the fire organization good and personnel adequate to good on most national forests. He expressed some concern for guards who might tend to incendiarism for "wages" or other reasons and recommended that they should be identified and not hired on the suppression force. A few fire plans had shortcomings, Leopold said. Fire fighting equipment was found to be in good shape, but its distribution was spotty. Leopold recommended that tools be placed where the firefighters were. Most lookout towers were in good condition, but he questioned the need for all of them. Plans for evaluating their location were lacking. Phone lines were in good condition, although on several forests there was at least one line in need of repair. Agreements with outside organizations for fire protection assistance were noted in several of the inspection reports. Leopold stressed the need for active prosecution of fire trespass on several of the forests. Educational work concerning fire prevention was deficient on the national forests he inspected. A few had done some work with the schools, had held a few public meetings, but most, he said, had done nothing but put up fire prevention posters.[43]

CCC Aids Fire Control

Although the region's fire control work appeared adequate in the 1920s, impressive gains were made in the 1930s. The financial disasters of the depression era resulted in the Forest Service having an abundance of personnel for fire protection work, mostly the men in the Civilian Conservation Corps (CCC). Fire control was in good hands during the era of the CCC. Most national forests had the situation well in hand, but the Flagstaff Working Circle of the Coconino National Forest had a poor fire record. But in the decade 1933-42, managers of the forest resources generally succeeded in getting fire losses under control.[44] On the Black River Working Circle of the Apache-Sitgreaves National Forest in 1937, the fire situation was clearly in control. "The present protective system during the past decade has held fire losses to an extremely low point" in the Black River Working Circle.[45] This seemed to be true elsewhere in the Southwestern Region. In 1938, for instance, the region reported 1,529 fires, but only 42 of them exceeded 10 acres. In 1939, of the 2,011 fires reported, only 54 exceeded 10 acres.[46]

The insightful Loveridge-Cliff General Integrating Inspection (GII) report (1945) devoted just over two pages to fire control (as opposed to nearly nine for range management). The reason was simple. The record of fire control in the Southwestern Region ". . . is a fine record; so much so

that it is commented on in more detail in the *Journal of Forestry*."[47] The low rates charged for fire protection on cooperator lands were favorably reported. Two negative observations were mentioned: the condition of the lookout equipment was lower than in most regions and, in general, fire danger meters were being used unskillfully. The 1948 McCutchen-McDuff GII report on the Santa Fe National Forest devoted six pages to fire control. Inspectors commented on the need for an "aggressive fire prevention campaign." They found the maintenance of lookout towers "a discredit to the Forest Service. . . . There is only one satisfactory pair of binoculars on the forest." In the "haven't-we-heard-this-before department," the inspectors found the 328 miles of telephone lines in need of overhauling. Good points were cited in training, transportation and fire-fighting equipment, cooperative fire agreements under the Clark-McNary Act, and successful slash handling after cutting to minimize fire hazard. During 1938-47, the annual fire record fluctuated widely. One year, over 2,000 acres burned; in another, over 1,000 acres burned; and in yet another, only 14.23 acres burned.[48]

The McCutchen-Darby Gil report of the Kaibab National Forest (1953) devoted five pages to fire control. The forestwide and district fire plans seemed to be complete. The need for a better job in fire prevention was cited, because approximately one of every four fires during the previous 10-year period was caused by humans. The inspectors noted an apparent difference of opinion of how much piling and burning of logging slash should take place; the actual area was to be only along the rights-of-way of important roads. The fire control organization seemed to be adequate. Fire tool caches were deemed adequate. Five lookouts that were inspected were in good condition except for deficiencies in safety precautions'.[49] Fire prevention in the forests proved so effective that in the post-World War II era, the absence of forest fires had begun to affect the equilibrium and appearance of the forests.

Some foresters, such as Aldo Leopold and C.K. Collins, began to recognize the contribution of fire in the maintenance of grass and pine forests in the Southwest and were aware of the positive results of the burning habits of the Indians, which had contributed to the evolution of the high-quality forests that the Anglo-Americans found. In their reports, both Leopold and Collins mentioned the importance of fire in the silvicultural system used by nature.[50]

Figure 34. Native American firefighters putting out a stump blaze, Sitgreaves National Forest, 1956.

Indians Become Fire Fighters

How ironic it was, then, when the Southwestern Indians, who had used fire so effectively, became fighters of forest fires. The Forest Service, shortly after World War II, turned outside the bureau for some of its forest fire fighters. In some respects, the efforts paid handsome dividends.

> In 1948 the Bureau of Indian Affairs organized a 25-man crew of Mescalero Apaches in New Mexico. The next year the crew assisted the Forest Service on a fire on the Lincoln National Forest. The Forest Service was impressed and decided to supervise a larger program of crews manned from local reservations. Thus was born the Southwest Forest Fire Fighters (SWFFF) program. Originally restricted to the Indian tribes of the Southwest, the program expanded in 1953 to include Hispanic crews from northern New Mexico. . . . The 215-man SWFFF crews were specially trained and in strong demand throughout the West.[51]

C. William Harrison, in *Forest Fire Fighters and What They Do*, devoted considerable attention, and attached great significance, to the work of the Tribal Council and the Indians of the Mescalero Apache Reservation. Harrison noted that modern Indians were peerless fighters of forest fires. Since the introduction of Indian fire crews in the Southwest, he said, there has been an ever-increasing demand for their services "from Montana to Southern California." Crews were being organized each year after 1949 among the Zuni, Hopi, Taos, Cochiti, Santo Domingo, Navajo, and Mescalero Apache tribes.[52]

In a letter dated July 29, 1968, from Don R. Webb to Lynn Biddison, relating to suppression, the following tribes are listed as having had crews in the period before 1953: Zuni, Taos, Jemez, Santo Domingo, Zia, Navajo, Hopi, and Mescalero Apache. In 1953, the Hispanic-Americans on the Carson National Forest had a crew. In 1962, the Papago Indians organized a crew on the Coronado National Forest, and in 1968, the Jicarilla-Apaches established a crew. The Utes in the Four-Corners area also formed a fire crew in 1968. Webb stated that some of the crews had no real organizational structure but were a body of volunteers, whereas others, such as the crew of the Santo Domingo Pueblo, were well-organized. Between 40 and 45 Southwest fire fighting crews in 1968 were maintained in cooperation with the USDI Bureau of Land Management, the USDI National Park Service, the New Mexico Department of State Forests, and the USDA Forest Service.[53] Fire prevention and suppression continued to have the highest priority in the Southwestern Region into the 1970s, when a perceptible change in fire policy and attitude became apparent.

More Houses on National Forests

Fire plans during the 1950s, such as that of the Kaibab National Forest, called for "prompt and aggressive suppression of all fires. . . . Fire suppression takes priority over all other work." The rising number of visitors to the Kaibab, and indeed to all the national forests, would seem to more than justify the region's constant vigilance and devotion to fire suppression. The buildup in housing density on private (patented) lands within national forest boundaries presented a growing fire hazard. The Lincoln National Forest, for example, contained 184,000 acres of patented lands and had become very attractive for vacation home builders and permanent residents. In the Santa Rita Mountains, public access had become heavy, and burned areas seemed to be growing larger. Inspectors advised establishing fixed and permanent detection stations. On the Santa Fe National Forest, on the other hand, the more rugged or "blind" terrain made fire detection from fixed

locations more difficult. Mobile fire patrol networks were advised, and foresters began to learn to rely upon air patrols and reports from local aircraft. State and local authorities were also involved in cooperative fire suppression arrangements with the USDA Forest Service.[54] Nevertheless, for a time, fires once again appeared to be getting out of hand as they had in the earliest decades of Forest Service administration in the Southwest.

The regional policy concerning fire prevention and suppression was succinctly presented in the *Multiple Use Management Guide*, released in 1967. The need to control wildfire as basic to the protection of nearly all national forest resources was reiterated. Increasing fuel hazards were recognized. High fire danger was noted in the chaparral, timber, and grass regions and in areas with concentrations of logging slash. The expanding transportation system was credited with making fire control easier. Air operations were listed as the primary support activity to fire protection. Assumptions and management objectives in fire control and management were listed. A shift in emphasis toward damage prevention rather than controlling minimum burned acres had developed. However, the first management objective was to keep a 1,500-acre minimum on fires in commercial timber stands in the Southwestern Region. Another objective was to be even more aggressive in fire prevention and suppression activities.[55]

Prescribed Fire

In some respects, 1967 marked a watershed in the region's fire policy. Fire suppression began to be replaced by fire *control* as a major policy objective. The change from the view of fire being only an enemy to fire being both an enemy (wildfire) and a friend (prescribed fire) was slow to take hold within the Forest Service and within the Southwestern region. The shift took place slowly, perhaps only over the last 20 to 30 years. C.K. Collins, in 1967, blessed with hindsight, questioned existing fire suppression policy when he wrote:

> Forest plans, records and maps, dating back to 1911, show some of the trends toward complete fire protection, which has us in trouble today. . . . The 1911-1920 yearly average of fires in the Southwestern Region of the Forest Service was 1,479 fires, of which 1,220 were caused by lightning and 259 were man-caused. This is in contrast to the yearly average of 2,253 fires for the period 1957-1966. Of this number, 1,938 were caused by lightning and 315 were man-caused. . . . Fire played a major role in the silviculture system used by nature.[56]

Collins and others had discovered that the great achievements in fire suppression since the 1930s had begun to make the national forests a veritable tinderbox. The absence of fire had also begun to change the character of forest vegetation as well as the beauty of the forests.

Even as these conditions began to be recognized, fire policy began to change. In 1967, the region’s *Multiple Use Management Guide* included a policy of management use of fire:

> Under atmospheric conditions favoring smoke dispersal, fire is often the only feasible tool available to help Forest officers meet land management objectives. Fire is applied by prescription to convert or modify vegetative types, to break up large fuel concentrations, to reduce fire hazards, and to enhance natural beauty. Adequate safeguards to protect other resources are essential in preparing and executing prescribed fire projects.

> The Tonto National Forest has demonstrated that chaparral types can be burned successfully during portions of the year under narrowly defined conditions. . . .[57]

From its preoccupation with immediate control of *all* fires, the region and indeed the Forest Service have come to a more reasonable approach toward fire. A broadened concept of the role of fire in the management of vegetation in the national forests of the Southwest has been accepted. The *1985 Proposed Lincoln National Forest Plan* divided the forest into five fire suppression zones, with a policy for each zone:

A. suppress all fires at 10 acres or less where there is a threat to life or property in developed areas.
B. analyze the probabilities of fire spreading and select a suppression tactic that is cost effective and has the least impact on the land.
C. analyze the probabilities of fire spread and manage as prescribed fire when flame height is less than two feet, but keep to less than 1,000 acres.
D. same as C, except keep to 10 acres or less.
E. same as C, but apply in wilderness areas if flame height of three feet or less, and minimize impact on other resources.[58]

Mechanized fire-fighting equipment, including airplanes, helicopters, and chemical dispensers of various kinds, has reduced the drama and danger of the old firefighting techniques. New information and ideas about fire have changed the emphasis from absolute fire prevention to fire control. This has been accomplished even though the risk of resource loss through wildfire remains high. Finally, the public has been educated, thanks in good measure to Smokey Bear, of the need to safeguard the Nation's forest resources from fire, as well as from other natural and human depredations.

Reference Notes

[1] Whether the type is climax or subclimax is debatable. Brown and Davis state "Ponderosa Pine, though an intolerant species, forms a stable type over a large part of its range in western North America. . . . The role of fire in maintaining the type is important, but not all interrelationships have yet become clearly established. . . . A part of the pure type and the mixed type may be classed as subclimax, but relationships can best be examined separately for each of these categories." Arthur A. Brown and Kenneth P. Davis, *Forest Fire Control and Use*, 2nd ed. (New York: McGraw-Hill Book Company, 1973), p. 32; John B. Leiberg, Theodore F. Rixon, and Arthur Dodwell, *Forest Conditions in the San Francisco Mountains Forest Reserve, Arizona*, Prof. Pap. 22 (Series H, Forestry 7) (Washington, DC: USDI Geological Survey, 1904), pp. 26-27; Edwin A. Tucker and George Fitzpatrick, *Men Who Matched the Mountains*: *The Forest Service in the Southwest* (Washington, DC: USDA Forest Service, 1973), p. 49.

[2] T.F. Rixon, *Forest Conditions in the Gila River Forest Reserve, New Mexico*, Prof. Pap. 39 (Series H, Forestry 13) (Washington, DC: USDI Geological Survey, 1905), pp. 15-16; D.M. Lang and S.S. Stewart, “Reconnaissance of the Kaibab National Forest,” n.p., c.1909, pp. 17, 19 (filed at the Kaibab National Forest, 1685).

[3] J.H. Allison, “A Working Plan for Grand Canyon Division of the Tusayan National Forest,” 1910, p. 14 (filed at the Kaibab National Forest, 1680); C. Loveridge, “Policy for Handling Timber, Carson National Forest,” 1921, p.11, Federal Records Center, Denver, 095-60BC314, Box 1; Hermann Krauch, *Management of Douglas fir Timberland in the Southwest*, Sta. Pap. 21 (Fort Collins, CO: USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, 1956), pp. 7, 47; Barrington Moore, “A

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[6] E.E. Carter, "Memorandum for District Forester Pooler," June 11, 1926, p.12, Federal Records Center, Denver, 095-61A0504, Box 14.

[7] Gilbert H. Schubert, *Silviculture of Southwestern Ponderosa Pine*: *The Status of Our Knowledge*, Res. Pap. RM-123 (Fort Collins, CO: USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, 1974), pp. 2-3.

[8] Krauch, *Management of Douglas fir Timberland in the Southwest*, p. 5; Leiberg, Rixon, and Dodwell, Forest Conditions in the San Francisco Mountains Forest Reserve, Arizona, p. 24; F.G. Plummer, *Forest Conditions in the Black Mesa Forest Reserve, Arizona*, Prof. Pap. 23 (Series H, Forestry 8) (Washington, DC: USDI Geological Survey, 1904), p. 14; Rixon, *Forest Conditions in the Gila River Forest Reserv*e, p.15; George Philip Bard, "The Working Plan Report for the Manzano National Forest," 1909, p. 5, Federal Records Center, Denver, 095 57AOI79, Box 6; Adams, "Twenty-Five Year Working Plan," p.16; Moore, "A Working Plan for the Mogollon Division of the Gila National Forest," pp. 13, 23; Quincy Randles, "Management Plan Report for the Saw Timber Type on the Tusayan National Forest," 1923, p. 8; Loveridge, "Policy for Handling Timber, Carson," pp. 7,11.

[9] Aldo Leopold, "General Appraisal of Santa Fe Forest," July 31, 1923, p.1, Federal Records Center, 095-60C0314, Box 2.

[10] Leopold, "General Inspection Report, Tonto National Forest, August 1923," p.1, Federal Records Center, 095-60C0314, Box 2.

[11] Leiberg, Rixon, and Dodwell, *Forest Conditions in the San Francisco Mountains*, pp. 2519626.

[12] Plummer, *Forest Conditions in the Black Mesa Forest Reserve*, p.14; F.G. Plummer and M.G. Goswell, *Forest Conditions in the Lincoln Forest Reserve, New Mexico*, Prof Pap. 33 (Series H, Forestry 11) (Washington, DC: USDI Geological Survey, 1904), p.18; Rixon, *Forest Conditions in the Gila River Forest Reserve*, p.15.

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[15] Tucker and Fitzpatrick, *Men Who Matched the Mountains*, pp. 49, 262-263.

[16] *Ibid*., pp. 208-212.

[17] *Albuquerque Morning Journal* (July 5,1907), p. 8; Tucker, manuscript, p.187.

[18] Tucker, manuscript, pp. 141-142, 186-187.

[19] *Albuquerque Morning Journal* (October 9, 1907), p. 2.

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[27] Interview with Floyd A. Thompson, Albuquerque, NM, August 20,1985; and see Gary C. Gray, *Radio for the Fireline: A History of Electronic Communication in the Forest Service, 1905-1976* (Washington, DC: USDA Forest Service, 1982).

[28] Interview with Alfred D. Folweiler, November 13, 1985.

[29] Tucker and Fitzpatrick, *Men Who Matched the Mountains*, p. 52; and see Tucker manuscript, various selections.

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[31] Pyne, *Fire in America*, p. 243.

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[37] Brown and Davis, *Forest Fire Control and Use*, p. 290.

[38] Tucker, manuscript, p. 770.

[39] *Ibid*., p. 770; Brown and Davis, *Forest Fire Control and Use*, p. 290; William D. Hurst, letter to Henry C. Dethloff, December 21, 1985, p. 2.

[40] Stephen J. Pyne refers to this subject in section 2 of his book *Fire in America*, titled "Paiute Forestry: A History of the Light-Burning Controversy." It is an interesting commentary on two schools of thought: absolute control of all wildfire and cumulative effects of light burning. Two sentences of his book summarize the situation quite well: "In the early years the consensus among foresters was that forests would suffer if surface fires were tolerated. By the 1970s it was asserted with equal conviction that forestry and land management would be impossible if prescribed surface fires were excluded." Pyne, *Fire in America*, p.121.

[41] Aldo Leopold, "Grass, Brush, Timber. and Fire in Southern Arizona," *Journal of Forestry* 22 (October 1924):1-10 (see p. 2).

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[49] A. Allen McCutchen and Lewis W. Darby, "General Integrating Inspection Report, Kaibab National Forest, June 8-24, 1953," 1953, various pagination, Federal Records Center, Denver, 095-62A0421, Box 1.
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[51] Pyne, *Fire in America*, pp. 47,142,378; see the discrepancy regarding the first crew on the Mescalero Apache Reservation in 1948.
[52] C. William Harrison, *Forest Fire Fighters and What They Do* (New York: Franklin Watts, 1962), pp. 133-142.
[53] Don R. Webb to Lynn Biddison, July 29, 1968; and see Federal Records Center, Denver, 095-59A0040.
[54] USDA Forest Service, Southwestern Region, Kaibab National Forest, *Fire Plan*, 1956, p.1 (in the files of the Kaibab National Forest); Morgan J. Smith and Ernest H. Taylor, “General Integrating Inspection Report, Coronado National Forest, April 13-24,1964,” p. 8; M.C. Galbraith, Assistant Regional Forester, Division of Timber Management, and J.A. Hundley, Budget Officer, Division of Operation, “General Integrating Inspection Report, Santa Fe National Forest, October-December 1964,” n.p.,1965, pp. 18-19; Orlo M. Jackson, Assistant Regional Forester, and Chandler P. St. John, Assistant Chief, Division of I&E, “General Integrating Inspection Report, Lincoln National Forest, March 29—April 2,1965,” n.p., 1965, pp. 12-13, in Federal Records Center, Fort Worth, 095-74A0044.
[55] USDA Forest Service, Southwestern Region, *Multiple Use Management Guide*, 1967,131.1-1, 2,131.3-1, 2, in Robert D. Baker's personal files.
[56] Collins, "Fire and Forest Management in the Southwest," p. 8, and see pp. 1-52; and see C.K. Collins, Inspector, "Report of General Functional Inspection—Fire Control, Apache National Forest, June 26-30, 1967," Albuquerque, NM, 1967, pp. 1-9; William D. Hurst, Regional Forester, Memorandum to Forest Supervisor, Apache National Forest, "Inspection (GFI, C.K. Collins, 6/26-30/67)," Albuquerque, NM, October 19,1967, 2 pp., in Federal Records Center, Fort Worth, 095-74A0044.
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Chapter 13. Recreation

Recreation in the national forests, in terms of numbers of people participating, diversity of activities, and accommodation by the Forest Service, is largely a post-World War II phenomenon. Although the Organic Act of 1897 advocated public use of the national forests, recreation was not generally perceived as a significant use of forest resources. Certainly in the Southwestern Region, foresters and the public were generally preoccupied with timber, grazing, and mining. Recreation became a factor in national forest use in the 1920s, when automobiles made the forests more accessible. Roads, recreation facilities, and opportunities expanded significantly in the 1930s, with assistance from the Civilian Conservation Corps and other New Deal agencies. Recreation became a major factor after World War II, often exceeding timber, grazing, or mining in economic impact upon the Southwest. It has become the major area of Forest Service involvement with the public.

Sunbelt residents and people from all over-the Nation have become aware of and interested in the welfare of the southwestern forests. The forested lands are important, not only for the traditional uses of timber, grazing and mining, but as watersheds, wildlife habitat, and recreational areas. People use the forests for year-round experiences, for relief from the summer heat, and for physical and scenic alternatives to the urban lifestyle. Phoenix and Albuquerque are among the fastest-growing metropolitan areas of the United States, and the national forests have become their summer retreat and their winter playground. For example, 1.5 million people visit the Cibola National Forest, near Albuquerque, in an average year, and the Tonto National Forest, adjacent to Phoenix, receives 25 percent of the total visitors to national forests in the region.[1] Efforts to accommodate this unparalleled use have been difficult, but in good measure successful.

Camping is available in highly developed campsites with all of the amenities of civilization, or in the raw and untrafficked wilderness. There are highly developed, modern resorts at Red River, Ruidoso, and Taos for downhill skiing and quiet and remote trails for cross-country skiing. There are great pine forests in the uplands and saguaro cactus in the Upper Sonoran Desert. Paved highways provide access to at least the periphery of every national forest in the region, and designated off-road vehicle ways and foot trails provide access to the interior areas. Major recreational activities in order of use in the Southwestern Region are recreational travel, camping, picnicking, hunting, fishing, hiking, viewing scenery, gathering forest products for pleasure, winter sports, swimming, interpretive services, cabins, boating, organization camping, horseback riding, hotel and resort use, nature study, and water sports.[2] Table 9 briefly reviews developed recreation sites in the region.

Greater population pressures have also generated an increased need for the preservation of additional wilderness areas. Over 2.7 million acres have been set aside in the Southwestern Region for wilderness management. Indeed, it was in the Southwestern Region, under the direction of Aldo Leopold, that legally designated wilderness areas became a reality. The establishment of the 750,000-acre Gila Wilderness in 1924 gave birth to the National Wilderness Preservation System, which nationwide comprises 257 areas and 79 million acres of public lands.[3] A number of new wilderness areas, totaling 903,000 acres, were established on the national forests of the Southwestern Region in the 1980s. Before then, there were 1.8 million acres in the wilderness preservation system in the region. Management of the wilderness areas is provided for under the authority of the Wilderness Act of 1964.[4]

Table 9. Developed recreational sites In Region 3 (1983)1/

Site	No.	People at one time	Visitor-days
Campgrounds			
Family	252	24,646	3,812.3
Group	20	1,985	166.1
Picnic grounds			
Family	112	9,323	1,063.3
Group	8	665	20.9
Hotels, lodges, & resorts			
Forest Service	2	250	72.2
Private	14	2,597	250.6
Boating Sites	40	6,924	656.3
Swimming Sites	4	800	158.8
Winter sports			
Snowplay areas	6	1,565	33.2
Ski areas	9	17,475	548.3
Recreation residences	1,325	6,711	417.4
Organization sites (private)	39	8,295	576.4
Interpretive sites	88	3,749	184.9
Developed cultural resources	11	105	5.1

1/The Southwestern Region had over 20,000 inventoried cultural resources in 1986.

Before 1920 in the Southwest, the public and the Forest Service perception of forest recreation generally included hunting, fishing, hiking, camping, picnicking, and sightseeing. Forest recreation was regarded as primitive, individualistic, and very personal. The attitude is reflected in a 1937 recreation study, which explained:

> We should contribute information in regard to everything that has to do with forest recreation, that is, with the dose contact between people and the quiet, restful spots of the natural forest where they lives and see themselves in the correct relation to both civilization and nature.[5]

Figure 35. Camping out on the old Manzano (now Cibola) National Forest, early 1920s.

Interestingly, this perception of recreation is very similar to views held today by Sierra Club and Wilderness Society members. As Sigurd F. Olson, then president of the Wilderness Society, wrote in 1970:

> Wilderness does things to people. I have watched its magic all my life, how it penetrates sophistication with its silence and beauty, sweeping away the myth of unlimited material progress. Under the impact of wilderness people change, become more intuitive, alive, and aware. They sense man's long past; they become more tolerant, humble, more humane.[6]

The contemporary emphasis by the Forest Service in many areas on dispersed recreation, as opposed to developed recreation, stresses restful solitude, freedom from noise, natural scenery, and uncrowded forests and wilderness. The foresters' problem, of course, has been that "progress"—in the form of automobiles, railroads, snowmobiles, lodges, summer homes, ski lifts, off-road vehicles, bicycles, motorcycles, recreational vehicles, and electric generators—has strongly intruded upon the silence and beauty of the national forests in the Southwest and elsewhere.

Ambivalence to Recreation

There was some apathy, or ambivalence, if not antipathy in the Forest Service in the Southwest at first toward recreation as a legitimate use of forest resources. Some foresters contended that areas subject to heavy applications for recreational or camp use should be eliminated from the National Forest System. Others began to believe that the Forest Service must accommodate urban visitors, in improved campgrounds or other facilities, as a means of controlling ingress into the wilderness and thereby protecting the natural environment. Aldo Leopold fought for the dedication of the

Gila as a permanent wilderness hunting ground, and he advised establishing a policy of no roads in at least one area of forest in each of the Rocky Mountain States. Still others, including Arthur Ringland, first Southwestern District (Region) Forester, saw that efforts by the Forest Service to accommodate tourists and visitors would be an important way to inform the public of the work of the Forest Service and to "win friends and influence people."[7]

Figure 36. Summer house, Santa Fe National Forest, early 1920s.

The Forest Service's understanding of what recreation is and its response to public needs have necessarily changed over time. The Southwestern Region has generally been highly responsive to public recreational needs, initiating programs and building facilities for recreational use. The region is richly endowed in its range of recreational natural resources, including snow-capped peaks, deep wooded forests, wilderness, scenic waterways and vistas, canyons, and desert.

The Southern Pacific Railroad, among others, recognized the special beauty of the Southwest and capitalized upon it by promoting tourism, particularly along the so-called Apache Trail running from Phoenix to the Roosevelt Dam. William Bass began promoting tourism along the South Rim of the Grand Canyon in the 1890s. He built a primitive road from Ashfork to the rim in 1890 and began constructing another from Williams in 1891. He built a nine-room guest house on the newly completed rail line to the Grand Canyon at "Bass Siding" about 1901; from there, he guided visitors and hunters into the Grand Canyon and to the North Rim. Bass's "white house" continued in intermittent use into the 1960s, when it was razed by the Forest Service. The Atlantic & Pacific Railroad began to operate a stage line from the rail line in Flagstaff to the Grand Canyon in 1892. The first stage left Flagstaff on May 26, 1892, and arrived at the site of what became the Grandview Hotel 12 uncomfortable hours later. Stage service closed in 1901, when the railroad reached the Grand Canyon.[8]

Figure 37. Moquitch Hunting Camp, with tents and stoves for rent.

Figure 38. Hunters checking in at the ranger station in Ryan, AZ, the day before hunting season opens, early 1930s.

Arthur Ringland, who was keenly aware of the public attractiveness of such areas as the Grand Canyon, provided fire protection services at the Grand Canyon Monument in 1909, erected sign boards with descriptive information at the El Tovar Hotel, and had guide maps printed for distribution to the thousands of tourists who visited the Grand Canyon.[9] In 1910, *Harper's Weekly* heralded the developing profile of recreation in the national forests and noted that there was a concentration of activity and attention in the West and Southwest. The approximately 406,775 visitors to the national forests in 1909 trade it clear that national forests are "fast becoming great national playgrounds for the people."[10] Although remote from large population centers, southwestern forests attracted many visitors.

Figure 39. The summer resort town of Red River, NM, near the Carson National Forest, 1939.

"The 21,000 persons who went into the Coconino Forest, Arizona, during 1909 went to camp or enjoy the scenery. . ." explained the editors. Among the great attractions of the Southwest, the article noted the Gila Cliff Dwellings, "an extensive remains of a prehistoric race in New Mexico, . . . the unsurpassed Grand Canyon of the Colorado in Arizona . . . and . . . a group of prehistoric ruins in the Tonto Forest in Arizona." The recreational role of the forest rangers is alluded to as being to "point out the best site for a camper and the easiest route." And the dramatic conclusion was that "the day of the wilderness, of the savage, of the pioneer is passing" and the day of the "National Forests as productive resources and as National Parks" is approaching.[11]

Recognition of Recreation Came Slowly

The approach of recreation as a significant factor in the administration of the national forests came slowly. The first congressional recognition of the role of recreation in or adjacent to the forest reserves came in 1899, when the Secretary of the Interior received authorization to rent or lease forest reserve grounds adjacent to "mineral, medicinal, or other springs" for sanitariums or hotels "where the public is accustomed or desires to frequent, for health or pleasure."[12] In 1906, "An Act for the Preservation of American Antiquities" provided for the protection of sites and ruins on public lands, but there was no appropriated funding for that purpose. In 1907, in a

backhanded recognition of the recreational function of the national forests, Congress provided for the collection and deposit of fees for hunting, fishing, or camping on National Forest System lands.[13]

Figure 40. Patio of Rancho Real, a guest ranch at Jemez Springs, N M , adjoining the Santa Fe National Forest, about 1940.

At the prodding of Theodore Roosevelt, Congress designated the Grand Canyon as a national monument in 1905, and subsequent Congressional bills and public interest proposed establishing the Grand Canyon as a national park. The recreational benefits of such a park were primary considerations for its establishment, and although the Grand Canyon was not transferred to the Department of the Interior until 1919, bills recommending such action appeared in Congress as early as 1910. On February 26, 1919, the act creating the Grand Canyon National Park was approved. More than 650,000 acres were transferred from the Kaibab and Tusayan National Forests to the park.[14] It seems that the transfer had the approval of Southwestern Region personnel, who, as was true with Forest Service personnel elsewhere, remained uncomfortable with the idea that recreation was an important or primary use of national forest resources.

Trail Development

With the establishment of the forest reserves, the Forest Service undertook an ambitious trail development program aimed at meeting its administrative needs. Hiking trails developed inadvertently within the forests when the public began to use fire-breaks and administrative trails as hiking paths. By 1911, however, several ranger districts had begun to mark trails for the public, particularly in the area of the Grand Canyon. In areas adjacent to cities, such as Tucson, Flagstaff, Taos, and Albuquerque, the Forest Service made serious efforts to accommodate the interests of local citizens in having access to and using nearby forest areas for hiking, fishing, and camping. For example, the *Arizona Democrat* announced in 1909 that the Forest Service had "set aside" an area comprising the canyon running from Schulz's Pass to the county road, and including timber country west of Eldon and east of Flagstaff, "for the benefit of the residents of Flagstaff, Arizona, and in order to provide a small scenic or recreation forest in the vicinity." [15] For the Coronado, a joint effort in 1911 between the Forest Service and the Tucson Chamber of Commerce (each contributing $500) produced a hiking trail

> which branches off the old Sabino trail at Pinchot Park and Pillows Pine Ridge, connecting with the old Soldiers Trail in the vicinity of Burned Cabin. The trail is about

> six miles in length and will be known as Pine Ridge Trail. The object of this trail is to make the attractive camping spots in which the Catalinas abound, more accessible to residents of Tucson.[16]

In 1913, the year after Arizona and New Mexico were admitted as States to the Union, the Southwestern Region established an area known as the Oak Creek Public Use Area on the Coconino National Forest, with specifications and plans for recreational use and development. The following year, the Secretary of Agriculture set aside 17,670 acres in the Oak Creek area as a special project for "scenic, fishing, and other recreation values."[17] Also, in 1913, the Southwestern Region cooperated with the State game and fish departments of Arizona and New Mexico in preparing and distributing pocket-sized cards with game laws and rules for fire protection. Six of the forests in the region also cooperated with the respective State game and fish departments in restocking trout streams.[18]

Bandelier National Monument

In July 1915, Arthur Ringland joined Will Barnes, chief of grazing of the Forest Service, and Don Johnson, forest supervisor of the Santa Fe National Forest, in an inspection of the Jemez Division on the upper Rio Grande. They particularly examined the canyon of the Rito del los Frijoles, which holds the remarkable pre-historic cliff dwellings, the more modern Tyuonyi and Cochiti pueblos (which were abandoned only in the 16th century), the stone lions of the Cochiti, and the Painted Caves. They recommended that the entire canyon area, comprising some 27,000 acres, be declared a national monument under the authority of the American Antiquities Act of June 3,1906. Barnes and Judge Abbot of Santa Fe, who had the only cabin in the canyon, advised naming the monument for Adolph F. Bandelier, who had died March 18,1914. Bandelier, who was born in Switzerland, came to New Mexico as the first fellow of the Archaeological Institute of America and spent 5 years exploring New Mexico and Arizona. His publications became the foundation for subsequent archeological and ethnological studies of the region. The Bandelier National Monument was established by presidential proclamation on February 11, 1916.[19]

Figure 41. A family enjoying an all-day ride into the Pecos Wilderness Area, Santa Fe National Forest, 1957.

Figure 42. A family camping out at Whitewater Canyon, Gila National Forest.

It is clear that in the early years the Forest Service in the Southwestern Region was generally responsive to the recreational needs of local inhabitants, but it is also clear that those needs were minimal and that well into the 1920s recreation was considered by the region as strictly a "secondary function."

At the advent of World War I, the forests of the Southwest were relatively remote and inaccessible except to local inhabitants. Tourism had really not begun; the automobile and paved roads were virtually nonexistent in the region, and urban growth was quite modest. The total population of New Mexico in 1910 was 122,000, and Arizona boasted 113,000, with most of the population native Hispanic and Indian, and largely rural. The later increase in recreational uses of the national forests in the Southwest derived from the increase in urban populations, the advent of the automobile, and, most especially after World War II, the improvement of roads and the construction of interstate highways, making the region accessible to the general American public.

Portending this development, a New Mexico author, Ralph Twichell, wrote in 1917:

> In addition to the purely economic resources of the New Mexico forests, they have a large and increasing value in the attractions which they offer to travelers, sportsmen, and health-seekers and in their increasing popularity with the people of New Mexico and adjacent states as a location for summer homes. This value for travel, sport, and recreation is largely dependent on a proper preservation of their scenic beauty, the development of roads and trails to make them accessible to the public, the protection of their historical and archaeological monuments and ruins, and the conservation of their fish and game. It is the definite aim of the forest service to accomplish these ends, and to encourage the full use of forests for purposes of recreation and public health. Few people are aware of the delightful climate, the extraordinary scenery, the wealth of historical and archaeological interest, and the facilities for sport, rest, and recreation which are offered them in the mountains of New Mexico. In fact, many people who have seen New Mexico only from the transcontinental trains have the impression that it is largely desert and quite without forests of any description. This is because the railroads, in order to avoid grades, naturally avoid the mountain ranges and seek the lowest elevations.

Figure 43. Picnickers at the Doc Long Picnic Ground shelter, Cibola National Forest, 1960.

> The future will see a greater appreciation of the possibilities of the New Mexico forests as a summer playground, and together with their steadily developing economic resources, will enable them to contribute an increasing share of the well-being and prosperity of the State. The Alamo, Gila, Datil, Manzano, Carson, and Chiricahua comprise the national forests of New Mexico.[20]

Figure 44. Entrance sign for a nature trail, Coronado National Forest.

Twichell perhaps did not foresee the enormous impact of the automobile and the advent of winter sports, especially skiing.

Private entrepreneurs like J.W. Weatherford became aware early of opportunities created by the automobile. In 1916, Weatherford secured a permit to build a private road from Flagstaff northward near the San Francisco Peaks toward the Grand Canyon. A second permit issued in 1920 to Weatherford's San Francisco Mountain Scenic Boulevard Company provided that 15 years from that date, or at intervals of 5 years thereafter, the road should be surrendered back to the U.S. Department of Agriculture, if demanded, upon payment for the physical improvements. Construction began about 1919, and the road was completed in 1926. It operated as a toll road until 1934, when it was forced to suspend maintenance because of declining revenues. After extended study and negotiations, the toll road permit was terminated by the Forest Service in 1938 upon payment of $15,500 to Mrs. Flora Finne, Weatherford's sister and acting president of the San Francisco Mountain Scenic Boulevard Company. The toll house, built in 1929, continued in private use under special permit fees as a residence until the house passed into the private ownership of Dr. and Mrs. M.M. Zack in 1959. Although a financial failure, Weatherford's venture indicated very early the recreation potential of the region made available by the automobile.[21]

Recreational Planning Begins

Post-World War I prosperity expanded the travel and recreational horizons of Americans tremendously. In the 1920s, planning for recreational use became a part of the comprehensive plan for each forest in the Southwestern Region. Recreational objectives announced by the regional office in 1921 encouraged each forester to assist community authorities in locating, planning, and developing municipal playgrounds and parks, and also to improve campgrounds in designated areas. Recreational plans also were established to encourage the allocation of suitable forest areas for summer cottages, camping areas, hotels, and voluntary agency camps. Authority for this derived from a 1915 act of Congress that specified such uses for recreation, public convenience, or safety.[22]

Figure 45. Sabino Canyon Visitor Center, with exhibits explaining the vegetation types in the surrounding mountains, Coronado National Forest.

The region prepared public information folders entitled "Recreation in the Southwest" and "Sunshine Recreation of a Nation." The Carson National Forest made a concerted effort to promote public interest and awareness of the recreation potential of the forest through public lectures and the preparation of road and trail maps. The Coconino foresters developed camp sites along Highway 66 and built improved camping areas at Oak Creek, Twin Springs, and Mormon Lake. Public information programs were also developed in the Crook, Gila, and Lincoln National Forests.[23] Perhaps indicative of the new recreation consciousness, the Forest Service began keeping data and counts on recreational uses and visits to the national forests in 1924. Also that year, foresters, particularly Arthur C. Ringland, began participating in the National Conference on Outdoor Recreation.

Ringland had just completed service with President Herbert Hoover's relief administrations. President Calvin Coolidge called the National Conference on Outdoor Recreation into session upon the advice of his cabinet to formulate national outdoor recreation policies. On May 22, 1924, 309 delegates, representing 128 organizations, opened the conference in Washington, DC. Leon Kneipp served as executive secretary, and in 1925, he invited Ringland to take over the post

so that he (Kneipp) could return to his regular duties with the Forest Service. The conference initiated comprehensive surveys of recreational facilities and resources of the nation, including the Federal lands. Legislative initiatives included an act allowing States, counties, and municipalities to acquire public lands for recreation and park purposes, a migratory bird bill, the Woodruff-McNary Bill for forest acquisition, and the McSweeney-McNary Bill for forest and biological research.[24]

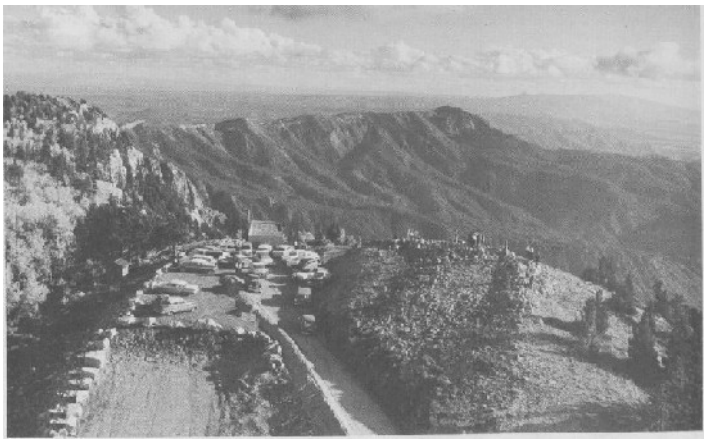

Figure 46. Sandia Crest lookout, Cibola National Forest, late 1950s.

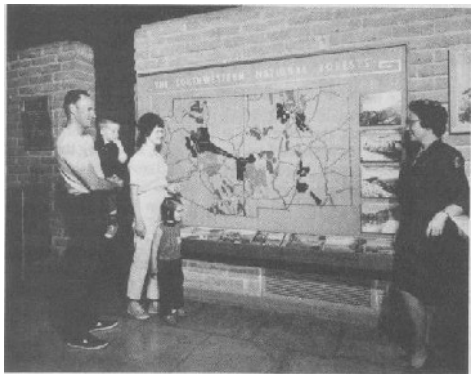

Figure 47. Map of the National Forest System in the Southwest, Coronado National Forest

The conference was dissolved in 1929 but had far-reaching impacts on the management of recreational resources throughout the Nation, as well as in the Southwestern Region. A meeting of New Mexico State and Federal officials in Santa Fe in August 1929 considered future recreational developments on a broad statewide basis. The stock market crash of 1929 and the ensuing depression put these activities, along with most leisure-recreation usages of the national forests in the Southwest, on temporary hold. Curiously, by the mid-1930s, the Great Depression also brought new opportunities to expand recreational programs and facilities. Under New Deal programs, the number of dollars spent on recreational improvements in the Southwestern Region increased substantially, while the number of visitors doubled.

CCC Improves Recreational Facilities

Franklin Delano Roosevelt inaugurated his New Deal for America on March 4, 1933. The New Deal increased public expenditures for public services, welfare programs, and public construction, and provided government-insured loans to agriculture and business. Unemployment rose to 23.6 percent of the labor force in 1932 and to a high of 24.9 percent in 1933. Congress approved and Roosevelt implemented the Agricultural Adjustment Act, the Public Works Administration, the Federal Emergency Relief Administration, the National Industrial Recovery Act, and, perhaps of most importance to the Southwestern Region, the Bankhead Jones Farm Tenant Act and the Civilian Conservation Corps (CCC).[25] The Bankhead Jones Act provided the authority for the acquisition of the national grasslands in Oklahoma and Texas, and the CCC became the primary agent in the improvement of recreational facilities and access to the forests of the Southwest.

The CCC provided employment opportunities for unemployed young men between the ages of 17 and 23 within a loose framework of military discipline under the direction of the U.S. Army. Most of that labor was assigned to work projects in the State and national forests and parks, under the authority of the forest and park supervisors. Young foresters, themselves unemployed or potentially unemployed college graduates, directed CCC crews in the construction and development of camp and picnic grounds, trails, access roads, ski areas, lakes, group shelters, and other special recreation facilities, many of which are in use today.

Figure 48. Hikers on a wilderness trail in Mt. Baldy Primitive Area, Apache National Forest

Between 1933 and 1938, the Sabino Canyon Recreation Area on the Coronado National Forest was developed by CCC labor groups and occasional WPA (Works Progress Administration) crews. Workers extended the road that had terminated at the Lowell Ranger Station into the canyon and built nine bridges in the process. Picnic units were established with wooden tables, which apparently began to be used by visitors for firewood, whereupon the Forest Service began installing concrete tables. By 1940, tables, restrooms, garbage cans, swings, and visitor registers were available for the almost 100,000 annual visitors. Ten years earlier, visitors had been few. A dam and lake were also built on the lower Sabino, which attracted many fishermen. Located only 13 miles from downtown Tucson, the Sabino Canyon facilities are extremely important to the quality of life for city residents. Although additional recreation areas have been provided in the Santa Catalina District, of which the Sabino Canyon is a part, projected population growth of

Tucson to 1.3 million by the year 2000 forebodes enormous pressures on neighboring recreational resources.[26]

Figure 49. Campers at Sheep's Crossing Forest Camp, Apache National Forest, 1960

Recreational Planning Takes Precedence

The regional forester reported in 1934 that for the first time, recreational planning and development took precedence over all other Southwestern Region programs. The "Recreation Improvement Handbook," developed by the region in 1933 and updated in following years, urged concentrated efforts in developing proven and more important campgrounds and emphasized providing sanitation facilities, tables, benches, and fireplaces. Planning and construction was to emphasize natural beauty and the use of native materials. Substantial recreational improvements were made on the Gila National Forest, on the Sabino of the Coronado, on Sandia Crest and the Juan Tabo picnic area in the Sandia Mountains, and at White Horse Lake on the Kaibab. Planning and construction also began for a winter sports area, the Agua Piedra, on the Carson National Forest.[27] All forests reported some improvements in recreation facilities, with those closest to population centers being given the greatest priority.

Many ranger stations and supporting facilities were built by CCC labor in the 1930s, and some remain in use. These administrative units characteristically included an office, parking area, flagpole, service court (garage and fuel storage), a warehouse for general and fire equipment storage, a machine and blacksmith shop, and a barn and corral. Residences and dormitories were sometimes built for rangers and crews. Road building, which had great recreational impact, also was a major occupation of the CCC crews, as were shelters, picnic grounds, and overnight campgrounds. Extant examples of CCC construction include the Monjeau Lookout Tower, the Mesa barn, and the Cedar Creek picnic shelter on the Lincoln National Forest.[28]

The 1941 inspection report, "Recreation and Lands Activities," of the Apache National Forest, praised the work of the CCC:

> While on the Apache, we saw campgrounds on South Fork, those near Creer, Sheep Crossing, Buffalo Crossing, Big Lake, East Fork, and those on the Blue. All of them were dean. In talking with the Apache personnel, including the Supervisor, Voight, Henry McDaniels, and several of the CCC foremen, I got the impression that the entire force was trying conscientiously to keep the recreation areas sanitary and presentable.[29]

Tremendous improvement had occurred since the 1939 unfavorable report of John Sieker, assistant recreation chief from the Washington office, and the inspectors believed that the

"Apache [National Forest] has taken full advantage of CCC and of other resources in maintaining these areas."[30]

CCC roads and facilities were used by increasing numbers of visitors, despite the continuing depression. In fact, perhaps because of the depression and the relatively low cost of forest recreation, recreational uses of the national forests expanded rapidly. Nationally, total recreation visits surged from 6.9 million in 1930 to 18 million in 1941. (See table 10.) An interesting indicator of the surge in recreation visits to the national forests is the report by Osborn Brown, the lookout at the Jacob Lookout Tower on the north Kaibab. This is an area not easily accessible even today. Brown reported that 1,271 visitors registered at the tower during the period May 5 to August 28, 1940, that most of them climbed the 100-foot tower, and that another 100 or so probably visited without registering. In order of origin, the most visitors came from Utah, then California, Arizona, Illinois, and Nebraska. Brown distributed 700 descriptive folders of the Kaibab to the visitors.[31] This rather obscure information produced some very significant conclusions for Forest Service policymakers.

As Walter G. Mann, then Forest Supervisor, explained:

> This is a very interesting report, and shows the public contacts and opportunities of putting across Forest Service policies and objectives for the traveling public at stations of contact like this.
>
> When we consider that 1,271 traveling people from 38 states, the District of Columbia and 6 foreign countries, went to the trouble to climb a 100-foot tower to look at our country, and then have the lookout give them a talk on our work, we should feel flattered.[32]

Mann was enormously impressed with the potential for "selling" the national forest idea, and he also was concerned that wherever the public gathers in the national forests, there should be adequate improvements—"two-room guard cabin, garage, and toilets" instead of no toilets and a lookout living in a tent with his car parked under a tree.[33]

Table 10. Nationwide recreation use of the National Forest System

Calendar Year	Campgrounds	Winter Sports Sites	Other Special Use	Other Developed Sites	Wilderness / Primitive	Other Dispersed	Total
Visits (thousands) per calendar year (1924-1964)							
1924	1,588.5	--	1,200.3	1,871.5	--	--	4,660.3
1934	2,343.1	--	1,627.5	4,610.2	--	--	8,580.8
1944	1,246.8	287.4	1,262.5	2,051.1	50.0	2,254.2	7,152.0
1954	5,806.1	2,362.4	4,490.8	11,467.8	395.8	15,781.0	40,303.9
1964	14,152.1	7,911.8	8,185.3	11,476.9	973.8	81,062.4	133,762.3
Visitor-days* (thousands) per calendar year (1974-1984)							
1974	35,677.9	7,722.0	17,103.4	9,455.0	6,473.2	116,214.3	195,915.8
1984	55,454.0	13,900.4	16,755.6	9,392.4	10,209.3	135,085.5	227,553.9

*Recreational use of National Forest land and water which aggregates 12 person-hours. May entail 1 person for 12 hours, 12 persons for 1 hour, or any equivalent combination of individual or group use, either continuous or intermittent. "Other special use" denotes hotels, resorts, and recreational residences.
Source: Director of recreation, Southwestern Region.

War Slows Recreation Activity

The growing activity and interest in recreation collapsed with the attack on Pearl Harbor and American entry into World War II. Forestry personnel volunteered or were drafted for military service, and naturally, visitors to the forests nationwide declined from 18 million in 1941 to 6 and 7 million in 1943 and 1944, respectively. Among other things, an effort to conserve personnel in the forests produced a "streamlined" recreation report. The old form 833 gave way to the new form 446, with adverse results. Acting Regional Forester George W. Kimball explained that although "the Recreation Visits report has been streamlined for the duration," the correct preparation of the new form 446 "took considerably more time and care than it did when we were using the 'old' form."[34] Thus the base data and the time involved in counting became different and more cumbersome. That, of course, was only the beginning of the new "paper war" that was waged ever more intently in future decades as new copy, typing, and reproduction technology were developed.

Many things changed after the war, and recreation changed substantially. By 1946, recreation visits to the national forests nationwide had recovered to the 1941 prewar levels of 18 million, and by 1961, exceeded 100 million—a fivefold increase in 15 years. (See table 11.)

Postwar Increase in Recreation

In a very real sense, the advent of modern recreation in the national forests, and certainly in the Southwestern Region, dates from the post-World War II era. The Southwestern Region, for example, had more than 12 million recreation visits in 1963, as compared to a few hundred thousand in 1941 (tables 12 and 13). The surge of tourists and recreationists in the postwar era was distinctly a mixed blessing for the Forest Service, which in the Southwestern Region and elsewhere was generally unable to cope. Inflation, demobilization, and economic uncertainties in the decade after the war resulted in fewer dollars available to the forests for recreation. By 1%1, CCC-constructed facilities and campgrounds had become painfully inadequate. Opportunities in private industry distracted a generation of foresters from public service, and the more conservative fiscal policies of the Eisenhower years (1952-60) discouraged the renewal of CCC-type programs that had so benefited forestry work. Booming economic conditions and the continuance of the military draft would have likely prevented such programs from working, even had they been funded by Congress.

As pressures from the growing ranks of visitors mounted in the Southwest, Forest Service personnel worked with limited resources to meet the growing demands. Staffers began placing winter sports areas under special use permits, began thinking in terms of landscape design for buildings, campgrounds, and vista points, and sought new sources of revenue for recreation projects. Pima County, AZ, placed $25,000 in a cooperative fund with the Forest Service for development of recreation areas in the Santa Catalina Mountains adjacent to Tucson. The Federal Bureau of Prisons agreed to provide prison camp labor to the Forest Service in the Santa Catalinas for recreation improvements. Although not the CCC, the program did provide much-needed workers. And for the first time, the Forest Service in the 1950s began to think of having recreational specialists for the forests and to charge fees to recreational users.[35]

Although pressures on public forest recreation areas in the Southwestern Region did not become as great in the early 1950s as they had in other regions, such as the Pacific Southwestern, Rocky Mountain, and Intermountain Regions, two major developments in the Southwestern Region

presaged a time of rapid change. The first intimations of the growing migration into the "sunbelt" were becoming clear, and the development of winter sports began creating whole new dimensions in recreation activities in the national forests. All of the potential ski areas in Arizona and New Mexico were in or adjacent to national forest land. Even as these changes were occurring, the condition of recreational resources in the southwestern forests seemed to be worsening.

Table 11. Nationwide recreation visits to the national forests (1946-61)

Calendar year	Camp-grounds	Picnic sites	Winter sports sites	Hotels and resorts	Recreation residences	Other forest areas	Total
1946	3,055,114	4,458,748	1,249,200	2,286,107	713,380	6,478,128	18,240,677
1947	3,518,147	5,262,600	1,725,675	2,110,406	535,978	8,177,945	21,330,751
1948	3,424,088	6,682,158	2,284,943	1,928,756	572,499	9,118,520	24,010,964
1949	3,837,010	7,659,234	1,712,607	1,929,597	615,242	10,326,565	26,080,255
1950	3,858,845	7,577,565	1,504,575	1,902,140	627,481	11,897,181	27,367,797
1951	4,140,866	8,669,234	1,929,270	2,133,674	636,173	12,440,928	29,950,252
1952	4,527,979	9,515,926	1,758,073	2,500,196	670,632	14,034,079	33,006,885
1953	4,810,341	10,335,910	1,944,193	2,564,219	758,493	14,989,894	35,403,050
1954	5,806,130	11,467,849	2,362,420	2,990,264	864,568	15,812,806	40,304,037
1955	6,796,706	12,418,342	2,977,220	3,230,860	863,332	19,426,408	45,712,868
1956	7,204,986	14,667,226	3,040,513	4,128,912	851,474	22,662,973	52,556,084
1957	8,352,360	16,138,508	3,158,675	4,211,682	828,550	28,267,498	60,957,273
1958	9,324,700	17,845,200	4,127,000	4,117,300	850,400	32,184,900	68,449,500
1959	9,944,800	19,283,300	4,184,100	4,597,400	896,300	42,605,100	81,521,000
1960	10,878,000	19,800,800	4,706,800	4,575,500	1,114,200	51,519,200	92,594,500
1961	11,835,100	20,456,800	4,478,300	5,309,900	1,175,600	58,656,800	101,912,500

Source: Director of recreation, Southwestern Region.

Development Lags

In 1954, the General Inspection Report of the Gila National Forest noted that facilities on the Gila were those developed by CCC labor and had not grown in pace with the increasing recreational load. "They, in fact, have gone in the opposite direction."[36] Moreover, while the inspectors believed that the staff spent their limited amount of money advantageously, very little staff time actually went to recreation. Staffers spent 10 percent of their time, rangers 35 percent, and assistant rangers and district guards 4 percent on recreational, wildlife, and land-use activities.[37]

Similarly, on the Coconino in 1958, inspectors found few recreation sites in acceptable condition from the standpoint of sanitation, maintenance, and area administration. "Coconino public recreation areas were not in creditable condition when inspected," the report concluded. Specifically, at Lake View, although fully occupied by tents and trailers, there were three or four tables for 15 family units and two "single-dual toilets" in poor condition. Fill dirt had eroded from the base of one unit, and nearby garbage cans were foul smelling and maggot-infested. The trailer that housed the concession operator seemed permanently placed with a drainline spilling onto the grounds. The report detailed unsatisfactory conditions at every public campground.[38] These were not very pretty pictures. Southwestern Region foresters had a serious recreation problem and a growing public relations problem on their hands.

Edward P. Cliff, then assistant chief of the Forest Service, informed the 47th Annual Conference of the International Association of Game, Fish, and Conservation Commissioners in Las Vegas, Nevada, on September 10, 1957, that from 1940 to 1957 recreation visits to the national forests rose from 16 million to 52.5 million. In the previous 2 years, he said, recreation visits increased from 40 million to 52.5 million. "As you know," he continued, "most of the campground, picnic area, and other recreational facilities on the national forests were installed in the 30s by the Civilian Conservation Corps. There has been little expansion since."[39] In January, he said, the U.S. Department of Agriculture released a 5-year National Forest Recreation Program—Part I of "Operation Outdoors" (table 14). Operation Outdoors was intended, he said, to provide forest-type recreation opportunities, which he defined as camping, picnicking, swimming, skiing, hiking, riding, wilderness travel, mountain climbing, hunting, and fishing. The Forest Service intended to keep facilities "simple and appropriate to the environment," and not to "conduct tours, give lectures, nor sponsor organized sports." Operation Outdoors was budgeted for $85 million, with over half going to restoration and new facilities.[40]

Table 12. Total recreational use of national forests in Arizona

Year	Apache-Sitgreaves*	Coconino	Coronado	Kaibab	Prescott	Tonto	Total Arizona	Total region
Visits (thousands) per calendar year (1939-1964)								
1939	20.6/15.5	66.5	123.6	41.4	70.9	90.4	428.9	817.8
1940	31.5/19.8	269.8	153.1	50.9	210.9	89.7	825.7	1,336.4
1941	42.9/22.7	207.0	189.9	93.5	465.0	107.8	1,128.8	1,696.4
1942	35.8/17.0	294.0	112.1	65.4	208.5	54.9	787.7	1,177.3
1943	39.4/22.7	222.5	96.2	32.6	130.5	58.1	602.0	888.6
1944	36.2/11.8	175.1	98.1	34.8	125.2	64.6	545.8	842.9
1945	32.1/11.1	218.9	110.5	62.5	164.5	107.8	707.4	1,033.0
1946	32.5/10.3	610.0	136.3	154.7	211.1	104.9	1,259.8	1,716.9
1947	27.5/11.0	903.8	192.8	897.2	215.7	238.0	2,486.0	3,037.0
1948	27.9/11.9	985.0	421.8	860.7	229.6	256.5	2,793.4	3,479.6
1949	30.1/25.3	1,234.5	429.2	229.6	247.2	324.5	2,520.4	3,348.8
1950	35.1/27.3	1,322.9	4,122.2	248.0	273.1	334.6	6,363.2	8,208.1
1951	52.2/27.9	1,461.1	453.7	260.6	277.2	354.3	2,887.0	4,381.4
1952	51.1/36.7	2,049.0	491.3	279.5	2,198.4	378.4	5,484.4	8,744.6
1953	45.9/38.8	2,122.1	589.8	286.8	1,199.2	1,373.3	5,655.4	7,630.4
1954	552.9/37.9	2,860.6	607.2	2,023.6	1,223.5	1,516.0	8,821.7	12,318.2
1955	600.3/242.9	4,439.3	660.7	279.0	2,500.4	1,726.6	10,449.2	14,080.8
1956	536.0/234.0	4,959.0	907.0	1,132.0	1,810.0	1,859.0	11,437.0	15,366.7
1957	558.0/948.4	5,245.7	993.8	1,179.9	2,100.2	2,016.5	13,042.5	17,744.4
1958	197.6/71.2	424.3	790.3	139.3	438.9	1,411.5	3,472.1	5,638.0
1959	281.7/118.8	449.6	1,156.4	183.1	479.6	2,043.0	4,712.2	7,751.2
1960	285.2/128.5	584.3	1,274.7	210.5	501.1	2,019.0	5,003.3	8,194.2
1961	310.1/157.9	612.9	1,386.9	199.9	514.4	2,011.2	5,193.3	8,585.9
1962	341.0/173.5	1,313.7	1,568.5	299.4	506.2	2,103.5	6,305.8	10,188.2
1963	502.3/236.7	1,700.1	1,675.1	412.8	550.9	2,388.6	7,466.5	12,399.1
1964	491.5/301.9	1,860.0	1,463.9	680.0	578.9	2,361.0	7,737.2	13,495.4
Visitor-days (thousands) per calendar year (1965-1984)								

Year	Apache-Sitgreaves*	Coconino	Coronado	Kaibab	Prescott	Tonto	Total Arizona	Total region
1965	604.9/486.7	1,369.5	77.7	997.8	468.3	2,372.2	6,377.1	8,797.1
1966	618.0/225.4	1,369.5	927.0	906.7	433.8	1,984.3	6,464.7	9,061.9
1967	624.9/259.5	874.8	926.9	906.4	456.6	1,966.6	6,015.7	7,995.8
1968	611.5/290.8	922.2	919.0	900.6	645.9	2,005.9	6,295.9	8,742.7
1969	729.1/359.6	966.4	1,119.7	979.0	629.5	2,033.6	6,816.9	9,829.1
1970	920.7/699.6	1,167.3	1,397.0	1,123.7	715.2	1,914.2	7,937.7	11,300.8
1971	1,536.7	1,046.1	1,432.2	1,146.9	642.5	2,500.9	8,305.3	11,677.9
1972	1,514.3	1,304.9	1,425.6	1,197.7	743.9	2,708.9	8,895.3	12,402.9
1973	1,883.5	1,849.7	1,723.8	1,195.7	802.6	2,955.1	10,412.4	14,169.3
1974	2,016.3	1,708.7	1,606.6	1,328.7	729.9	3,116.1	10,506.3	14,538.1
1975	1,858.0	1,742.6	1,879.7	1,254.2	781.0	3,931.5	11,447.0	15,729.8
1976	1,878.3	1,884.5	2,116.8	1,297.6	689.9	4,016.9	11,884.0	16,481.2
1977	2,133.6	1,906.8	2,059.4	1,255.9	837.5	4,641.7	12,834.9	18,233.3
1978	2,230.7	1,787.6	2,075.3	1,078.9	854.6	3,789.3	11,816.4	18,072.5
1979	2,604.7	2,623.2	2,315.2	1,071.1	1,042.9	4,186.3	13,843.4	19,505.8
1980	2,771.1	3,721.1	2,489.6	1,141.5	1,063.7	6,564.5	17,751.5	23,704.8
1981	2,485.5	4,957.3	2,584.2	1,106.8	1,034.1	5,669.7	17,837.6	24,115.4
1982	2,208.2	4,863.4	2,155.3	1,171.4	1,005.6	5,528.5	16,932.4	23,635.8
1983	1,886.5	4,248.2	2,299.6	1,090.0	1042.7	6,018.3	16,585.3	23,596.6
1984	1,795.5	4,003.7	2,214.7	963.0	954.0	6,450.3	16,381.2	22,943.4

*Two forests now administered by one supervisor.
Source: Director of recreation, Southwestern Region.

Table 13. Total recreational use of national forests in New Mexico

Year	Carson	Cibola	Gila	Lincoln	Santa Fe	Total New Mexico	Total region
Visits (thousands) per calendar year (1939-1964)							
1939	62.0	116.6	29.7	93.9	86.7	388.9	817.8
1940	69.3	202.4	41.5	115.2	182.3	510.7	1,336.4
1941	50.4	221.2	81.2	140.1	74.7	567.6	1,696.4
1942	43.9	154.2	58.9	80.7	51.9	389.6	1,177.3
1943	32.5	76.5	58.7	74.6	44.3	286.6	888.6
1944	33.7	105.4	31.2	81.4	45.4	297.1	842.9
1945	39.4	114.6	30.7	92.7	48.2	325.6	1,033.0
1946	56.6	157.4	34.8	140.2	68.1	457.1	1,716.9
1947	81.0	198.1	36.5	157.2	78.2	551.0	3,037.0
1948	87.3	245.2	42.1	183.3	128.3	686.2	3,479.6
1949	179.6	278.1	41.7	182.4	146.6	828.4	3,348.8
1950	179.7	1,190.4	39.8	284.0	151.0	1,844.9	8,208.1
1951	322.8	590.1	40.1	403.1	138.3	1,494.4	4,381.4
1952	329.6	942.7	46.2	1,768.7	173.0	3,260.2	8,744.6
1953	333.2	1,110.9	63.6	187.3	280.0	1,975.0	7,630.4
1954	419.4	853.4	60.4	1,921.0	242.3	3,496.5	12,318.2
1955	450.1	913.2	70.6	1,937.6	260.1	3,671.6	14,080.8
1956	526.0	983.0	76.7	2,020.0	324.0	3,929.7	15,366.7
1957	807.0	1,112.3	137.5	2,221.9	423.2	4,701.9	17,744.4
1958	313.4	946.8	50.0	462.9	411.8	2,184.9	5,638.0

Year	Carson	Cibola	Gila	Lincoln	Santa Fe	Total New Mexico	Total region
1959	377.3	1,053.5	63.2	887.8	663.2	3,045.0	7,751.2
1960	417.9	1,065.4	108.7	900.4	698.5	3,190.9	8,194.2
1961	394.2	1,084.5	133.3	1,035.8	744.8	3,392.6	8,585.9
1962	450.1	1,178.3	174.7	1,115.6	963.7	3,882.4	10,188.2
1963	760.9	1,419.9	246.6	1,365.1	1,138.1	4,930.6	12,399.1
1964	796.9	1,562.6	323.0	1,866.4	1,209.3	5,758.2	13,495.4
Visitor-days (thousands) per calendar year (1965-1984)							
1965	345.9	985.7	469.3	483.6	135.5	2,420.0	8,797.1
1966	363.1	1,153.7	382.0	510.7	187.7	2,597.2	9,061.9
1967	305.5	976.9	231.3	324.4	142.1	1,980.2	7,995.8
1968	488.1	1,051.9	275.3	440.4	191.1	2,446.8	8,742.7
1969	640.3	1,446.7	286.7	425.7	212.8	3,012.2	9,829.1
1970	765.8	1,398.8	384.8	565.3	248.4	3,303.4	11,300.8
1971	635.3	685.4	370.9	1,069.8	611.2	3,372.6	11,677.9
1972	617.3	697.2	406.5	938.7	847.9	3,507.6	12,402.9
1973	678.2	727.2	451.9	895.8	1,003.8	3,756.9	14,169.3
1974	631.0	813.1	539.3	1,079.6	968.8	4,031.8	14,538.1
1975	582.0	839.8	653.1	843.7	1,364.2	4,282.8	15,729.8
1976	639.8	920.6	713.7	966.1	1,357.0	4,597.2	16,481.2
1977	689.4	1,110.9	972.9	1,059.0	1,566.2	5,398.4	18,233.3
1978	1,371.1	1,118.5	906.7	1,164.9	1,694.9	6,256.1	18,072.5
1979	899.1	1,008.6	943.3	1,057.4	1,754.0	5,662.4	19,505.8
1980	946.3	1,020.2	797.7	1,119.5	2,069.6	5,953.3	23,704.8
1981	961.6	1,114.9	855.9	1,094.4	2,251.0	6,277.8	24,115.4
1982	1,072.5	1,190.1	949.9	1,237.8	2,252.3	6,702.6	23,655.8
1983	1,348.7	1,283.3	857.6	1,137.4	2,384.3	7,011.3	23,596.6
1984	1,116.0	1,285.5	1,172.1	1,120.7	1,867.9	6,562.2	22,943.4

Source: Director of recreation, Southwestern Region.

Unfortunately, realities often interfere with aspirations, as was true in the case of Operation Outdoors. Appropriations failed to match budget plans. For fiscal year 1958, recreation land-use budgets for the Forest Service were scaled down from $115 million projected in the President's budget to $8.7 million approved by Congress. The Southwestern Region's appropriation was $830,000. Despite the cut, real appropriations to recreation exceeded by two and a half times the funds available in 1957. Operation Outdoors would begin, "but at a little slower pace."[41]

Recreation Specialists Appointed

For the first time since the 1930s, this meant that, in the Southwestern Region and elsewhere, recreation specialists could be appointed for national forests with heavy recreation use, new data could be gathered from visitor questionnaires, landscape architects could be hired and trained, areas and facilities could be rehabilitated, and new forest recreation plans could be developed.[42] In August, $49,700 of the recreation funds appropriated to the Southwestern Region were withdrawn, as was a comparable amount from the road funds, which also had an impact on recreation.[43]

Despite these fiscal impediments, there was clear progress in Forest Service recreational planning and development, which inadvertently triggered conflicts of interest between the Forest Service

and the National Park Service. In a lengthy memorandum in September 1957 to the Secretary of the Interior, Secretary of Agriculture Ezra Taft Benson addressed the problem. Benson recognized the conflict as in part stemming from the:

> understandable desire on the part of the National Park Service to exercise leadership in the planning of recreation on public lands, and to cooperate with States and local agencies on recreation planning on their lands. The Act of June 23,1936 (49 Stat.1894) directs the National Park Service to undertake the planning and development work in Federal lands and to cooperate with State and local agencies, *but all lands under the jurisdiction of this Department are exempted from the provisions of that Act*.

Benson explained that recreation planning for National Forest System lands presented a different problem because they are managed for multiple use, and that job is logically one for the Forest Service."[44]

The Memorandum of Understanding of 1948, between the Bureau of Reclamation (Department of the Interior) and the Forest Service, required coordination and cooperation in the development of recreation management for reclamation and National Park Service projects adjacent to, inside, or outside of national forest boundaries when those areas affected a common reservoir. The agreement, between two agencies with different missions, has required constant negotiation, particularly in the Southwestern Region, where so much National Park System land is within or adjacent to National Forest System boundaries. Recreation planning by one agency affects the other agency. The Grand Canyon, administered by the National Park Service, and one of the most popular scenic vistas in the United States, cuts through the Kaibab National Forest, which catches the spillover of visitors without participating in the appropriations or sometimes the planning for Grand Canyon developments."[45]

Table 14. Recreational use (thousands *of* visits) *of* national forests in the United States (1946-55)

Forest Service Region	1946	1950	1955	Rate of Increase (percent)
Northern	755	1,196	1,863	148
Rocky Mountain	2,038	3,930	7,182	252
Southwestern	813	1,502	3,546	340
Intermountain	3,068	4,281	6,105	98
California	3,913	3,695	7,715	98
Pacific Northwest	2,186	3,078	5,186	138
Eastern	2,406	2,205	2,897	20
Southern	1,159	4,382	56,322	445
Lake States	1,812	2,826	4,464	146
Alaska	37	102	262	610
Total United States	18,187	27,297	45,542	250

Source: Operation Outdoors (Washington DC: U.S. Department of Agriculture, Forest Service, 1957), p. 11.

The Forest Service particularly benefited from the political and moral support of the National Forest Recreation Association, which was organized in 1948 and boasted most of its membership from the Western States, including Arizona and New Mexico. The association directed its efforts toward promoting the "greater use and enjoyment of the national forests." It sought to educate the

public about "good manners in the forest," encouraged private campground and recreation development, and sought to help the Forest Service in such duties as providing campfire permits, fire protection, and clean-up and sanitation. At meetings in Pinecrest, CA, in 1955, and Tucson, AZ, in 1956, association members and Forest Service personnel discussed land-use fees, wilderness programs, resort entertainment, advertising, "good housekeeping," and winter sports.[46]

Winter Sports Blossom

Winter sports experienced an awakening in the 1920s, became something of an attractive novelty in the 1930s, and, in the 1960s and 1970s, blossomed into one of the most intensive recreational activities in the Southwest, generally at higher elevations—which happened to accord with national forest boundaries. Most of the developed ski areas in the Southwest are in or adjacent to national forests: Sandia Peak, Cibola National Forest; Sierra Blanca and Ski Cloudcroft, Lincoln National Forest; Santa Fe Ski Basin, Santa Fe National Forest; Sipapu, Red River, and Taos Ski Valley, Carson National Forest—all in New Mexico; Mt. Lemmon, Coronado National Forest; Fairfield Snow Bowl, Coconino National Forest; and Bill Williams Mountain, Kaibab National Forest—all in Arizona.[47] In addition to the ski areas, the Forest Service identifies many "snow-play" areas as places where tubing, sledding, tobogganing, and other such activities commonly occur.

Winter sports have been an important addition to the recreational uses of the national forests, in part because they attract a different clientele, in a different season, thus affording year-round use to far larger numbers of the public than could otherwise be accommodated. Moreover, winter sports seemed to offer less threat to the natural environment. Although there had been some interest in skiing in the 1920s, not until improved roads were built, largely through CCC efforts, did real winter sports and ski activities develop.

By the close of the decade of the 1930s, "ski fever" was becoming a new phenomenon. In the Carson National Forest, 23 El Rito sportsmen took to the "runners" on Christmas Day in 1938. Every Saturday and Sunday thereafter that winter, skiers and fans on toboggans and sleds tried their skills in the Vallecitos Ranger District. An El Rito merchant offered "desirable" prices on skiing outfits, and it was clear that "when the snow and a merchant cooperate in the ski business, the people will benefit likewise."[48] This 1939 observation is in retrospect a serious understatement of the realities of the modern commercial winter sports and recreation industry. But it was an accurate premonition of things to come.

In January 1940, El Rito residents organized the El Rito Ski Club. The Taos Winter Sports Club and the Amarillo Ski Club bought a new ski tow cable for the Agua Piedra ski course that year. Stories about skiing at Agua Piedra appeared in two national sports publications. In March, ski enthusiasts assisted in the rescue of stranded motorists near Holman Pass. Four hundred and six people registered in the Agua Piedra ski shelter during the 1940 season, and forest officials estimated that they represented only 10 percent of the total people who used the shelter. Thus some 4,000 skiers tried the slopes at Agua Piedra that winter; most of the out-of-state visitors were from Texas.[49] The growing public enthusiasm for winter sports prompted the Southwestern Region to conduct an official inspection of winter sports.

Robert S. Monahan of the Forest Service completed a study in 1941 and concluded that once the public (and especially the population of western Texas) became aware of the ideal snow and skiing conditions in the mountains of New Mexico and Arizona, investments in such areas would

be more than justified. Monahan believed that the Agua Piedra area near El Rito and the La Madera area offered the best opportunities for expansion. The Arizona Snow Bowl, being developed by Flagstaff ski enthusiasts with the warm support of such Forest Service personnel as Edward C. Groesbeck in the Coconino, was ideally located, but access roads were then very primitive. The Hyde State Park ski area near Santa Fe was small and very limited in its snow season. Monahan believed a ski area on national forest land near Santa Fe should be considered necessary. A ski area near Big Tesuque offered possibilities, as did one at McGaffey near Gallup, NM. Roads and access were something of a problem in every winter sports area. Monahan believed that winter recreation developments complemented summer recreation programs. He advised giving priority to developing winter recreation areas near population centers, such as Albuquerque, Santa Fe, Las Vegas, Gallup, and Taos in New Mexico; and Prescott, Williams, and Flagstaff in Arizona. Cloudcroft was being developed as a private ski resort near Alamogordo in the Lincoln National Forest.[50]

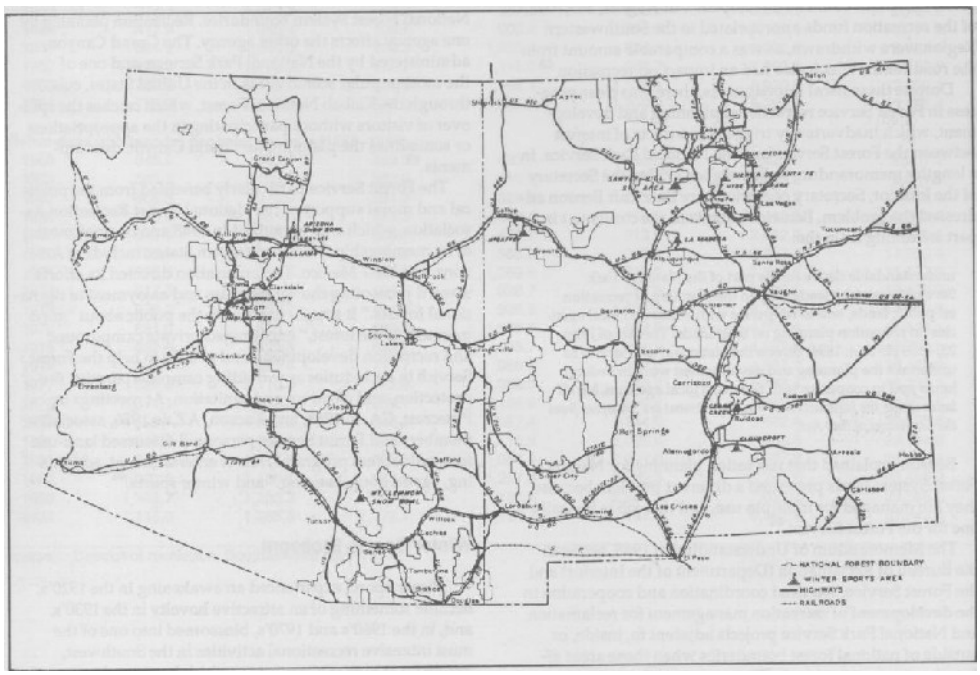

Figure 50. Winter sports areas in the Southwestern Region

Monahan noted that permanent, heated log latrines were to be built at the Arizona Snow Bowl, La Madera, and Agua Piedra and were urgently needed. A comfortable, glass-fronted warming shelter built by private interests in Hyde State Park could be used as an example for future construction in ski area development. Rope or cable tows, as at McGaffey, Agua Piedra, La Madera, and the Arizona Snow Bowl, were operated by permit holders-usually local ski clubs. No charge was levied by the Forest Service for permits in several instances, while members of Flagstaff clubs at the Arizona Snow Bowl were charged $5.00 for a season until the lift costs had been liquidated. Monahan believed a $10.00 seasonal permit should be levied uniformly.[51]

Today's skiers would be intrigued and amused by the costs of a ski outing in 1941. The Agua Piedra lift near El Rito was a 900-foot rope tow that elevated the skier 225 feet above the starting point. An adult season ticket was $5, and a single-day ticket was 75 cents for adults and 35 cents for children. Dinner at a nearby private resort cost 75 cents. Hyde State Park used a 700-foot rope

that elevated the skier 175 feet at a cost of 50 cents per day and 25 cents for children and ski club members. At La Madera in the Cibola, the rope tow was 2,000 feet long with an elevation of 300 feet, costing ski dub members $5 for the season and nonmembers $1 per day. The Arizona Snow Bowl in the Coconino used a 1,750-foot rope tow that elevated the skier 340 feet, and a smaller portable rope tow was used for variable distances at a cost of 5 cents per trip. Hamburgers could be bought for 15 cents at La Madera and 10 cents at the Arizona Snow Bow1.[52]

The Hyde State Park area comprised 350 acres surrounded by the Santa Fe National Forest. The park was developed by the CCC under National Park Service supervision in 1935 and 1939 and was operated by the Santa Fe Winter Sports Club, which boasted 300 members who each paid annual dues of $2. The club paid $1 for its permit to operate and maintain the area and provided a ski instructor (Graeme McGowan), liability insurance, a warming shelter, a lunch concession, and a two-stage tow. Monahan thought the Hyde Park arrangements should be a model for future development.[53]

The report specifically identified Forest Supervisor Merker, Assistant Supervisor Charles, Staff Assistant Groesbeck, and District Rangers Keeney, Hodgkin, Zane Smith, and Sims as persons actively interested in and promoting winter sports. Monahan also commented that "the difference between a Forest Service Officer dressed in winter uniform and able to ski and one who doesn't ski and has no winter outfit" is striking.[54] In the latter case, the public gets a very unfavorable view of the Forest Service, he said, and he advised that:

> the growing, public interest in winter sports, many of which can be found in large measure only on National Forest land in the Southwest, affords a remarkable opportunity to guide this enthusiasm as a vehicle for explaining other land use activities. Included in the membership of the various ski dubs are many present and potential community and state leaders whose support is of growing value.[55]

Monahan advised good public relations efforts, publicity, informational programs including press and radio reports on snow and weather conditions, and "positive" roadside signs. For example, he advised that instead of the "No Smoking," "No Tree Cutting," "No Fireworks" signs, there should be roadside notices that advise the traveler on "Rules for National Forest Winter Sports Area," "Good Skiing Ahead," and so forth.[56] As with other developing recreation activities in the late 1930s, winter sports expansion was aborted by World War II, and until the mid-1950s, there was little opportunity or effort to catch up.

Figure 51. Sierra Blanca Ski Area, Lincoln National Forest, operated by the Mescalero Apache tribe

By the winter of 1954-55, winter sports developments had not changed markedly from the rather informal, noncommercial, club-oriented pattern set before World War II. The Southwestern Region published a brochure entitled "Winter Sporting in Your National Forests" that winter, which advised that "all winter sports areas in the National Forests are public and free," but that where tows had been erected under permit by a ski group, the operators were allowed to charge a small fee for its use.

The 1954 brochure identified five winter sports areas in Arizona: the Arizona Snow Bowl, Bill Williams in the Kaibab, Mingus Mountain and Indian Creek in the Prescott, and the Mt. Lemmon Snow Bowl in the Coronado. It listed eight in New Mexico: adding to the older Agua Piedra (Carson), Hyde State Park (Santa Fe), La Madera and McGaffey (Cibola), and Cloudcroft (on private land in the Lincoln) two new areas in the Santa Fe National Forest (Sierra de Santa Fe and Sawyer Hill) and Cedar Creek in the Lincoln National Forest near Ruidoso.[57]

Development of Ski Areas

The development of the individual ski area is perhaps exemplified by La Madera (Sandia Peak). In the 1920s and 1930s, hearty winter sports devotees, many of them from the Northeast and Midwest, engaged in winter play and some skiing on the higher slopes of the Sandia Mountains. These slopes were made accessible by the automobile and road building; considerable road construction occurred in the early 1930s under Forest Service auspices and with CCC labor. By the late 1930s, sufficient interest in winter sports led to the organization of the Albuquerque Ski Club. The club obtained a special use permit from the Forest Service to operate a rope tow and a restaurant. The club operated the lifts from 1937 until 1946, when Robert J. Nordhaus organized the La Madera Company and assumed operations under a Forest Service Permit (with the blessings of the Albuquerque Ski Club) until 1963. In 1963, Nordhaus organized the Sandia Peak and Aerial Transway Company to raise more capital. The Sandia Peak company built a chairlift on the east side to the top of the mountain and a long tramway system on the west side extending from the base to the Summit House Restaurant and it has since continued to operate a modern ski area.[58]

Like Sandia Peak, modern ski facilities using staged chairlifts as opposed to the older rope tows, with resident lodges, restaurants, snowmobiles, saunas, spas, and hot tubs, date from the mid-1950s, with most of the construction and heavy capital investment occurring since 1965. Most of the current ski capacity has been developed since 1955. In New Mexico, use by skiers rose 30 percent between 1955 and 1964, and it has continued to climb. Cross-country skiing began to rival or exceed downhill skiing in popularity. Snowmobiling became significant in the mid-1960s. By the end of the 1960s, the Forest Service was estimating that $350 million in new recreation facilities would be required for the next decade.[59]

A Surge of New Visitors

President Lyndon Johnson urged "strengthening the cooperative relationship between government and private enterprise in the field of outdoor recreation."[60] Both government and private recreation industries struggled to raise the capital to meet the surge of new visitors to the national forests and winter sports areas. The Land and Water Conservation Fund Act of 1965 allowed for increased fee charges and created the Golden Eagle passport system for year-round admission to Federal fee areas. The Golden Eagle "all areas" passport was discontinued and replaced by a local fee system after 1968. Although receipts averaged $100 million during the first 5 years, the fee

system brought new problems.[61] People like Nordhaus argued that new fee formulas discouraged private capital investment. And, those who paid fees seemed to expect more from the Forest Service than in the past, including greater personal security, cleaner campgrounds, more modern facilities, and other amenities. In addition, there seemed to be some evidence that fees collected tended to be spent on campgrounds, recreation areas, and historic places in the Eastern United States rather than in the Western States. Privately owned, developed recreation facilities, within and on the margins of the Southwestern Region forests, began to supplement and replace those built and operated by the Forest Service. The Forest Service, in turn, began to move toward the idea of maintaining and preserving the *setting* for outdoor recreation, as opposed to the facilities.

The Forest Service began to prepare feasibility plans for the development of new ski areas under permits to private industry. Areas under consideration included the Sangre de Cristo in the Carson National Forest, 6 miles above the Red River; Gold Hill in the Carson; Mount Taylor in the Cibola; Elbe Mountain in the Santa Fe Forest; and Las Huertas in the Cibola near Albuquerque. Expansion and the acceptance of bids for permits were in each case to be contingent upon new access roads, although Sangre de Cristo and Gold Hill were both considered accessible. Projections were to open all of the areas between 1969 and 1973.[62]

Nine Major Ski Areas

The Vietnam War, energy crises, and new expansion by existing ski areas, which absorbed the projected increase in visitors, resulted in the Southwestern Region having nine major ski areas and six designated snow-play areas. The Southwestern Region recorded 17,475 people at one time in ski areas and 1,565 in snow-play areas in 1983.[63] Major ski and resort expansion in Colorado, Utah, Nevada, California, and Canada in the 1970s and 1980s have slowed further winter sports expansion in the Southwest. Nevertheless, winter sports and the traditional camping, fishing, hunting, and other recreational activities have generally replaced grazing, timber harvests, and mining as the single most important source of private regional income.[64]

In addition to the expansion of winter sports in the 1960s and 1970s, major developments occurring under the stimulus of Federal legislation affected recreation in the National Forest System as well as forest management. The passage of the Organic Act of the Bureau of Outdoor Recreation, under the authority of the Department of the Interior in 1963 (P.L. 88 629), established inventory and classification systems for all Federal agencies related to recreational areas or activities. The Bureau was authorized to develop a nationwide outdoor recreation plan, gather and classify recreational data, prepare an outdoor recreation manual, and generally provide a framework for Federal, regional, State, local, and private recreation programs.[65]

The Wilderness Act

Wilderness, a concept long cherished by forestry personnel and the public in the Southwest, became a policy under the Wilderness Preservation Act of 1964. The act defined wilderness as an area "where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain," or areas where "the imprint of man's work [is] substantially unnoticeable." The act required the maintenance of wilderness areas and the exclusion of most activities except grazing cattle, mining minerals, and building trails. Timber cutting was generally precluded. After 1985, mineral prospecting was prohibited in wilderness areas. Hikers and campers were instructed by foresters to leave *no trace* in wilderness areas.[66]

The Wild and Scenic Rivers Act of 1968 placed similar protection on designated areas, such as the Rio Grande of northern New Mexico. The National Trails Act of the same year encouraged and provided some funding for a system of recreational and scenic trails, and the National Environmental Policy Act required an environmental impact study and formal public review of all proposed government actions affecting the natural environment. This act prompted the Forest Service's Roadless Area Review and Evaluation (RARE I) of all roadless areas of more than 5,000 acres for possible wilderness designation. RARE I evaluations, conducted between August 1971 and June 1972, designated some areas for wilderness study and others for multiple-use management, but any action was halted by court litigation instituted by the Sierra Club. The result was that all projected multiple-use management areas would require an environmental impact statement.[67]

New Wilderness Areas

RARE II studies, completed in 1979, led to the New Mexico Wilderness Act of 1980 and the Arizona Wilderness Act of 1984. The New Mexico act created nine new wilderness areas and added 223,357 acres to existing areas, totaling 606,502 acres of designated wilderness. The Arizona act created 30 new wilderness areas or additions to existing wilderness areas.[68] Those wilderness areas within the national forests of the Southwest are identified in table 15.

Generally, the wilderness areas are dedicated to preserving a part of the national heritage in its natural state. 'Roads, motorized travel, logging, resorts, or other commercial developments are not allowed in wildernesses and primitive areas,' and permits are often required for day or overnight access, usually for the protection of the visitor.[69] Wilderness programs have effectively altered the uses of almost 2,000,000 acres of land in the Southwest. Lumbering, commercial development, and mining have been most directly affected. Access in some instances is limited by the natural environment to the more serious and athletic outdoors person. The 1980 and 1984 New Mexico and Arizona Wilderness Acts have resolved recent years of public controversy, legislation, and litigation involving wilderness designations in the Southwestern Region.

The Wilderness designations have also complemented Forest Service initiatives toward dispersed recreation, thus encouraging the use of unimproved forest resources. In part because of increasing budgetary pressures, and in part because it historically has perceived the natural environment as a forest resource, the Forest Service has increasingly elected to leave "urbanized recreation" to the private sector. Hiking trails, bike trails, undeveloped campgrounds, and wilderness modify the natural setting as little as possible. This new emphasis represents a departure from the recreation policies between 1930 and 1960, which were concerned with accommodating (and controlling) visitors in developed camp and recreational areas. Budget cuts and new recreational policy attitudes, which actually harken back to earlier values, have combined in a few instances to eliminate landscape architect and other specialist positions.[70]

The idea and perception of recreation in the Southwestern Region have changed markedly since 1905, and certainly the reality of recreation has changed. Modern recreation in the Southwest is largely a phenomenon of the automobile. Previously inaccessible areas became increasingly available to domestic and out-of-state residents. The New Deal and the CCC enabled the Forest Service to accommodate urban visitors to the forests, but by the mid-1950s, old CCC facilities proved woefully inadequate. Massive public and private expansion of recreational facilities between 1955 and 1975 enabled the region to barely accommodate the onslaught of recreational

visitors. But by the mid-1970s, the expansionist and fiscally liberal programs of the New Frontier and Great Society had begun to wane. Appropriations for recreational developments declined.

Table 15. National Forest areas in the National Wilderness Preservation System of the Southwest, 1984

Forest	Wilderness	Acres
Arizona		
Apache	Bear Wallow	11,080
	Mt. Baldy	7,079
Coconino	Fossil Springs	11,500
	Kachina Peaks	18,200
	Munds Mountain	18,150
	Red Rock-Secret	43,950
	Strawberry Crater	10,140
	West Clear Creek	13,600
	Wet Beaver	5700
Coconino/ Kaibab/	Sycamore Canyon	55,937
Coronado	Chiricahua	87,700
	Galiuro	76,317
	Miller Peak	20,190
	Mt. Wrightson	25,260
	Pajarito	7,420
	Pusch Ridge	56,933
	Rincon Mountain	38,590
	Santa Teresa	26,780
Kaibab	Kanab Creek	63,760
	Saddle Mountain	40,600
Kaibab/ Coconino	Kendrick Mountain	6,510
Prescott	Apache Creek	5,420
	Castle Creek	26,030
	Cedar Branch	14,950
	Granite Mountain	9,800
	Juniper Mesa	7,600
	Wookchute	5,600
Prescott/Tonto	Pine Mountain	20,061
Tonto	Four Peaks	53,500
	Hellsgate	36,780
	Mazatzal	252,016
	Salmone	18,950
	Salt River Canyon	32,800
	Sierra Ancha	20,850
	Superstition	159,780
New Mexico		
Carson	Cruces Basin	18,000
	Latir Peak	20,000
	Wheeler Peak	19,663
Cibola	Apache Kid	44,650
	Manzano Mountain	36,970
	Sandia Mountain	37,003
	Withington	19,663
Gila	Aldo Leopold	202,016

Forest	Wilderness	Acres
	Blue Range	29,304
	Gila	558,065
Lincoln	Capitan Mountain	35,822
	Wilderness	Acres
	White Mountain	48,873
Santa Fe	Dome	5,200
	San Pedro Parks	41,132
Santa Fe/Carson	Chama River Canyon	50,300
	Pecos	223,333

Tonto National Forest Becomes Playground

The energy and fiscal crises of the 1970s affected recreation in the national forests in the Southwestern Region in a special way. A surge of new migration to the Sunbelt brought new visitors to the national forests As Phoenix, Tucson, Flagstaff, and Albuquerque became major metropolitan areas, the people from those areas stayed close to home for their recreation, particularly during the oil embargo in the 1970s. The Tonto National Forest, for example, became the playground for one of the most rapidly growing urban areas in the United States. One-fourth of all annual recreational visits in the Southwestern Region are to the Tonto National Forest. This means, as one recreation officer in a more remote forest pointed out, that since 1975 the greater portion of declining recreation dollars spent by the Forest Service in the region have gone to the Tonto National Forest.[71]

In recent years, declining recreation budgets and growing recreational uses have encouraged Forest Service cooperation with county and municipal authorities, and more efforts to transfer recreational development to the private sector. Because an increasing part of the administrative activity and responsibility in the Southwestern Region relates to recreation—and recreation involves people—forest personnel have been forced to shift their focus from trees, cattle, and mining onto people. As one retired forester reflects, old-time foresters, of not so long ago, were not people oriented. Now they must be.[72] More accurately, old-time foresters related to people on a one-to-one basis, whereas the modern forester must deal with special interest groups, lawyers and courts, lobbyists, citizens' associations, and the rather nebulous "media" audience. The national forests continue to offer people something special-a special kind of recreation, a special kind of scenery, a special feeling that was recognized when the Forest Service was created in 1905. It is a tradition especially recognized in the Southwest, and it remains a prime objective of the Forest Service's Southwestern Region. The region provides a variety of recreational opportunities, ranging from developed skiing to dispersed, primitive, or wilderness environments, in addition to well-developed campgrounds and picnic areas readily accessible to people in their automobiles.

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Chapter 14. Relations with Other Federal and State Agencies

The Forest Service in the Southwestern Region, as is true elsewhere, interacts on a daily basis with literally thousands of people and special interests, representing Federal, State, and local governments, private businesses, interest groups, and individuals. The famous Tama Wilson letter to Gifford Pinchot of February 1, 1905, set the tone for the problems of conflict and the advantages of cooperation in the management of the forest reserves by the Forest Service under the direction of the U.S. Department of Agriculture. Wilson was addressing all Forest Service personnel when he explained that in administering the forest reserves it must be clearly borne in mind "*that all land is to be devoted to its most productive use for the permanent good of the whole people and not for the temporary benefit of individuals or companies.”*[1] That is not an easy charge. As the years have passed, competing demands for use of national forests and their resources have heightened.

Gifford Pinchot elaborated on this charge in instructing "Fritz" Olmstead, in the preparation of the *Use Book*, to emphasize that the forest reserves were accessible to all persons for all lawful purposes and that the national forests were not to be administered for the benefit of the government but for the benefit of the people. Forest officers, he said, are servants of the people. “They must obey instructions and enforce the regulations for the protection of the reserves without fear or favor, and must not allow personal or temporary interests to weigh against the permanent good of the reserves . . ."[2] It is not easy to defer real or imagined current needs to anticipated requirements in the future.

Much more recently, D. Michael Harvey explained the crisis in Federal forest management as a product of intense competition for all the resources of the forests and the resulting disputes over their allocation. Each interest group believes that the forests should be immediately available to satisfy its particular requirements. The hunters want game, the wildlife conservation people want game preserves, and the timber interests want timber. Some conservationists want wilderness, Indian tribes want to reacquire public lands for their reservations, and cattle interests want grazing rights. State and local governments want to develop recreational facilities and to improve their economies, and different branches of the Federal Government have different rationales and approaches to management. The Forest Service must mediate all these competing interests and make it clear to these interests that "all alternatives have been objectively considered and that the ultimate decisions strike a balance among competing interests and uses.”[3]

Before the organization of the Southwestern Region, competitors for the natural resources of the forest reserves often settled their disputes directly. Cattlemen disputed with each other and with sheepherders over grazing; mining interests were settled by filing claims that were then sometimes defended by force. Timber interests sometimes simply moved in and harvested timber; settlers, farmers, and hunters squatted or used the land as they desired. Nevertheless, the demands for the resources were usually local and, compared to later days, created by a very small number of people or interests. Officials of the Southwestern Region usually found that competing demands could be settled locally and often at the level of the smallest administrative unit, the ranger district.

Early on, rangers became arbitrators in disputes over the uses of the forest reserves and later the national forests. The ranger was often the negotiator, judge, and enforcement officer of forest use regulations, until at least the close of World War II. The ranger's duty was to protect the forests, enforce the regulations, settle disputes between local persons and interests, and generally be a

good neighbor. It was not an easy thing to do, but rangers in the region established their reputations as good neighbors and good citizens of the community.

As time passed, the competitors for the use of forest resources became more divergent, more broadly conceived, larger and better organized, and often national in their scope and purposes. These were interests that no single ranger or forest supervisor could effectively coordinate, manage, or arbitrate. Cooperation, coordination, and often conflict increasingly became the business of the regional office. To be sure, elements of cooperation and conflict were built into the system for managing the forest reserves. Federal forestry in the Southwest began with overlapping and confused jurisdiction and boundaries. The region has spent much time and effort since its creation in defining boundaries, exchanging land tracts, and negotiating questions of jurisdiction with other Federal and State agencies.

For example, when the Pecos River Forest Reserve was created in 1892, it was placed under the jurisdiction of the U.S. Department of the Interior, General Land Office. In 1905, management of the forest reserves was turned over to the Department of Agriculture, Bureau of Forestry, but the Department of the Interior continued to rule on questions affecting easements, mining, and the disposal of lands, while the Department of Agriculture decided issues relating to temporary occupancy and use. Often the directives of the two agencies conflicted, and court action was sometimes needed to resolve issues of agency jurisdiction.[4] Since the beginning of the Southwestern Region, the Forest Service has had to interact with the Department of the Interior, particularly three of its agencies: the Bureau of Land Management, the National Park Service, and the Bureau of Indian Affairs.

Interior and Agriculture

The Departments of the Interior and Agriculture have been zealous stewards of the Nation's landed resources. Conferences and discussions relating to the return of the forest reserves to the jurisdiction of the Department of the Interior began as soon as their transfer to the Department of Agriculture was complete. At a conference held at Yellowstone National Park in 1911, and attended by Chief Forester Henry S. Graves, a Department of the Interior spokesman said, "the difficulty in perfecting this work," that is, supervising the forests, derived from the fact that the bureaus involved were located in two different departments. The conclusion of the group was that "consolidation of all forestry questions in an enlarged and more efficient Forest Service must place that service in the Interior Department "[5] Chief Graves judiciously made no response, but the argument has continued unabated from that time to the present.

In his book, *The Forest Service: A Study in Public Land Management*, Glen Robinson said that it would have been surprising, "considering all known laws of bureaucratic behavior," if the growth of the Forest Service had gone on unnoticed or unenvied by the Department of the Interior, "and, in fact, it did not "[6] More recently, in 1985, a congressional study by Representative James V. Hansen of Utah examined the possibility of merging the Department of Agriculture's Forest Service with the Department of the Interior's Bureau of Land Management. The report included a summary by Representative Hansen of previous attempts to merge the agencies.

The first serious merger effort was by President Herbert Hoover, who issued an Executive Order on December 9, 1932, to transfer the Forest Service to the Department of the Interior, but it could not be completed without the agreement of Congress. Subsequently, President Franklin D. Roosevelt tried to transfer the Forest Service to the Department of the Interior. In 1949, the

Hoover Commission recommended that Congress transfer all Federal land management to the Department of Agriculture, and in 1953 the President's Advisory Committee on Government Organization recommended merging the Department of the Interior's Range Management Division with the Forest Service under the Department of Agriculture. From about 1964 through 1970, efforts were made to transfer the Forest Service from the Department of Agriculture into a reorganized Department of the Interior, to be called the Department of Natural Resources and Environment. In 1976, the Federal Land Policy and Management Act specified independent and cooperative activities for the Bureau of Land Management (BLM) and the Forest Service. President Jimmy Carter wanted to move the Forest Service into a new Department of Natural Resources during his administration (1977-81). Most recently, the problem of jurisdiction is being approached with the idea of interchanging public lands between the two agencies.[7]

The interchange proposal announced on January 30, 1985, would give some Forest Service land to the Bureau of Land Management and some of the Bureau's land to the Forest Service.[8] Although the question of merger and reorganization rarely generated active public interest at the local or regional levels, where interagency cooperation is perhaps more necessary and real than it is in Washington, DC, the interchange proposal created a storm of public protest, particularly in the Southwestern Region. It centered around Prescott, AZ, where local citizens equated interchange with the loss of their forest supervisor's office, their national forests, and the long tradition of cooperation and accord between the Forest Service and the local government and residents.

Articles in the Prescott *Courier*, "serving the communities of Prescott, Prescott Valley, Chino Valley, Dewey, Mayer, and Humboldt, Arizona," reflected the rising irritation and then anger over the interchange proposal. On February 1, 1985, the Courier noted that the proposed land swap could affect the Prescott National Forest. On February 10, the paper stated that the swap would "swallow" the Prescott National Forest and that most people "can’t stomach it." On February 22, 500 people attended a hearing in Prescott to "save the forest." On March 1, petitions were sent to Representative Robert Stump. The "Citizens for the Protection of the Prescott Area" was formed, and in March the children of the area wrote letters to their representative to save the forest. Representative Stump publicly objected to the impact of the interchange plans on his district, and retired Forest Service people in the region began to study the interchange from the perspective of professional foresters. Finally, the regional forester proposed to keep the forest, but consolidated the supervisor's office with that of another forest. A local group then threatened a lawsuit to stop such a move, others expressed "outrage," and forest workers "blasted" the proposal. Many more editorials, letters, and public protests led to a public hearing in Prescott in June, but the *Courier* stated on June 30 that the hearings had settled very little. On July 2, with no reference to the dispute over the Prescott National Forest or the land interchange, Regional Forester M.J. Hassell announced his retirement. Despite the fact that the issue was not firmly resolved in July 1985, the *Courier* expressed the belief that the system of public review and participation really did work.[9]

Controversy and cooperation over the interchange proposal will continue to occupy the agencies involved and the public affected by the proposal for quite some time. The public's involvement in the "Prescott affair" illustrates a number of important lessons and themes in the administration of the forests in the Southwestern Region. On one level, that is, Federal administrative agencies, the interchange is another incident in the continuing effort to resolve problems of jurisdictional overlapping and confusion between agencies involved in the administration of the public lands. On the regional and local levels, the public's reaction to the interchange proposal and its effects on the Prescott National Forest illustrates the vital and very real identification that the

Southwestern Region has with State, local, and regional interests. This affiliation, which some believe has developed in the Southwestern Region more so than in other regions of the National Forest System, is an excellent example of the development of "federalism" within the administrative units of the national government. That is, part of the administrative responsibility of an agency is to represent the policies of the Federal government, but another part is to administer those policies fairly and equitably within the region or the designated areas of responsibility.[10] Thus, there is a tendency for administrative agencies of the national government to identify with the locale or interests they are designated to serve or regulate.

There is, perhaps, an even more important significance to the Prescott interchange activity. The public concern over the interchange and the loss of a local forest supervisor's office exhibits an unusually strong public support for and identification with the work of the Forest Service in the Southwest. Such concern is good evidence that the Forest Service in the Southwest is performing its mission in a satisfactory, if not outstanding manner.

Responsibilities of Federal Agencies In the Southwest

The major jurisdictional overlaps involving the Forest Service in the Southwest are with the Bureau of Land Management, the National Park Service, and the Bureau of Indian Affairs, all in the Department of the Interior.

Although it is difficult to obtain short policy statements from the various Federal agencies, three fairly succinct statements appeared in a 1981 publication, *Adjacent Lands Study, Grand Canyon National Park, Arizona:*

National Park Service

The National Park Service is guided in its land management policies by the National Park Service Organic Act of 1916 (39 Stat. 535). The act states that the National Park Service shall promote and regulate the use of parks to conform to the fundamental purpose of the parks, which is . . . to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations.[11]

Bureau of Land Management

The Bureau of Land Management's public land policy is based on the Federal Land Policy and Management Act of 1976 (P.L. 94-579, October 23,1976), which established guidelines for its administration: to provide for the management, protection, development, and enhancement of the public lands.

The Bureau's policy is based on the premise that any particular land area and its resources offer the potential for a variety of uses, some of them mutually exclusive. It is the objective of the Bureau to provide maximum public benefits through the best combination of uses of which an area is capable.[12]

Under the Bureau of Land Management multiple-use concept, several components were discussed: livestock grazing, fish and wildlife development, utilization and protection of endangered and threatened species, industrial development, mineral production, occupancy,

outdoor recreation, timber protection, watershed protection, wilderness preservation, preservation of public values, and cultural resources.[13] These multiple-use objectives are similar to those of the Forest Service.

Forest Service

The Forest Service is charged with administration of the National Forest System. The National Forest System's policy is to manage all resources of these lands under the principle of multiple use and sustained yield so that the products and benefits therefrom will best serve local and national needs of the people.[14]

The Multiple-Use Sustained Yield Act of June 12, 1960, stated that it is the policy of Congress that the National Forest System be administered for "outdoor recreation, range, timber, watershed, and wildlife and fish purposes," and it directed the Secretary of Agriculture to develop programs and policies to support multiple use and sustained yields. The Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA) directed that long-range plans be developed by the Forest Service to ensure future supplies of renewable resources. The legislation specified that the national forests should be managed in a manner that would protect "the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values," and that certain lands should be preserved as habitat for fish and wildlife, that grazing for domestic animals should be maintained, and that provisions should be made for outdoor recreation and human occupancy.[15] RPA was amended by the Forest Management Act of 1976, which liberalized the timber harvesting provisions of the 1897 act but added numerous restrictions.

Bureau of Indian Affairs

Today the Bureau of Indian Affairs is headed by the Assistant Secretary for Indian Affairs of the Department of the Interior. This position was created in 1977 because of the Indian Self-Determination and Education Assistance Act of January 4, 1975 (P.L. 93-638). This legislation implemented the policy of self-determination advocated by President Johnson in 1968 and by President Nixon in 1970. It encouraged tribal control over reservation programs:

Today, some 50 million acres of Indian reservation lands are held in trust by the United States for Indian tribes and individuals. They are not properly public lands, because they must be managed for the benefit of the specific beneficiaries involved. Thus an additional decision-maker, the tribal government, is involved when resource development is to be considered on an Indian Reservation.[16]

In 1978, President Nixon "emphasized negotiation rather than litigation to resolve Indian water rights."[17] Because Indian lands are now operated somewhat in the fashion of private lands, semi-autonomous in the hands of the individual tribes, they will not be discussed in this chapter other than from an historical standpoint.

Federal Agency Cooperation with the Forest Service

Cooperative relations are a double-bitted axe. The Forest Service cooperates with other Federal agencies on projects beneficial to it, and the other agencies cooperate with the Forest Service for the same reason. Often the cooperation is initiated by the other agency, sometimes by the Forest

Service; sometimes it is legislated by Congress or mandated by the Administration. In 1962, the Forest Service policy was to maintain "cooperative relations with representatives of interested agencies and organizations."[18] These include the Department of Agriculture Soil Conservation Service; the Department of the Interior Bureau of Land Management, Fish and Wildlife Service, and National Park Service; as well as the Departments of Commerce, Defense, Education, Energy, Health and Human Services, Justice, Labor, State, and Treasury.[19]

USDI National Park Service Cooperative Activities

Cooperative relations in national park activities within the Department of the Interior and the Forest Service began early, before 1911 and before the National Park Service became a separate bureau.

> Perhaps you do not know that the Forest Service, contrary to general understanding, is not a part of the Department of the Interior, but a part of the Department of Agriculture. The result of this is not always happy, although during my administration both the Department of the Interior and the Forest Service have shown every possible disposition to cooperate whenever the necessity for such cooperation was realized.[20]

Since this statement by the Secretary of the Interior in 1911 followed soon after the Pinchot-Ballinger controversy, it meant that the way was still open for the two agencies to work together on common goals. For example, Arthur Ringland reported that in 1916 he represented the Department of Agriculture on a committee with the Department of the Interior to work out boundaries of the proposed Grand Canyon National Park by adjustment from three adjoining national forests.[21] In a memorandum to the District Forester (Albuquerque) dated April 22,1920, W.B. Greeley, new Chief of the Forest Service, stressed that in cooperative relations with the National Park Service, "I want to have the Forest Service do its full share, or more, in such forms of cooperation as those indicated above which may come up in current administration."[22]

This desire by the Chief of the Forest Service to have Southwestern District (Region) officials cooperate with National Park Service personnel had apparently not taken full hold by 1929. In that year the Chief of the Forest Service sent a memorandum to all Regional Foresters urging them “. . . to find a way to resolve differences on what is best for the land and the public, and have our pint achievements instead of our differences.”[23]

The National Park Service engages in cooperative efforts with the Forest Service and others in several areas as enunciated in its 1975 publication *Management Policies*:

> Joint agency planning may be undertaken when a park is adjoined by Indian reservations, other Federal lands, State lands, or lands subject to State, regional or local planning or regulations. Formal agreements to coordinate major planning efforts with planning agencies and other governmental agencies will be made where appropriate.[24]
>
> The National Environmental Policy Act of 1969 requires consultation with any other Federal Agency which has jurisdiction by law or special expertise with respect to the plan's environmental impacts. Formal written comments from these agencies will be solicited.[25]

Of course, this cooperation between other Federal agencies and the Forest Service continues today, as does occasional conflict. There is, however, management merit in preserving

competition between agencies. Competition and conflict can lead to constructive cooperation and eventual efficient management of the Nation's resources.

Bureau of Land Management Cooperative Activities

In 1906, cooperation between the Department of Agriculture and the Department of the Interior concerned the examination, location, and evaluation of agricultural lands within the forest reserves by the Department of Agriculture and the filing of such information with the Department of the Interior.[26] Other cooperative work with the Department of the Interior General Land Office and the Grazing Service and finally the Bureau of Land Management consisted of agreement on grazing fees and development of parallel land management activities. In recent years Congress and the Presidents have imposed certain laws and regulations on both the Forest Service and the Bureau of Land Management, by which they are now required to work cooperatively. Three of these include management of wild horses and burros, setting of grazing fees, and administration of mining of public lands.

A requirement of the Wild Horses and Burros Protection Act, passed in 1971, was to establish the National Advisory Board for Wild Free-Roaming Horses and Burros. Leadership is shared between the Department of the Interior Bureau of Land Management and the Department of Agriculture Forest Service, the only agencies whose lands are affected.

According to Culhane in his book, *Public Land Politics*, the Bureau of Land Management and the Forest Service have been forced into cooperative work in minerals management through the Federal Land Policy and Management Act in 1976:

> Local land managers have minimal control over mining uses. . . . When the agencies have a chance to officially approve mining rights by patenting mining claims or issuing mineral leases, those decisions are the formal responsibility of BLM state offices, not local Forest Service or BLM administrators. . . . The agencies have evolved informal administrative practices for consulting with local land managers over mineral management decisions. BLM state offices forward lease applications to BLM district offices and Forest Service rangers for review and stipulation of conditions to protect surface resources during mining operations . . . such procedures are a far cry from the formal control that local BLM and Forest Service officers have over other uses of lands under their jurisdiction.[27]

Cooperative agreements between the Bureau of Land Management and the Forest Service in range improvement work were suspended November 22, 1976, because of pending implementation of the BLM Organic Act (P.L. 94-579). However, the prohibition of these cooperative efforts was lifted on February 17, 1977.[28]

U.S. Army Cooperative Activities

From the early days, the Forest Service and the Department of the Army have cooperated with respect to forested portions of the military reservations in Arizona and New Mexico. The *Coronado Quarterly*, July 1911, reported on cooperative work between the Forest Service and Fort Huachuca resulting in the construction of a trail entirely on the reservation, to interconnect with Forest Service trails in the main divide of the Huachuca range.

A second example of cooperation at its best was with the U.S. Army during the time of the Civilian Conservation Corps. Walter Graves is quoted in Tucker and Fitzgerald's book as saying:

> . . . the Army had the responsibility of organizing the camp and handling all of the logistics, and the complete operation of the camp itself. The involved agencies, land management agencies, were assigned the boys in the morning, took them out on the job, and were responsible for them until they returned to camp in the evening, at which time the Army took them over and of course was responsible for them until the following morning.[29]

Soil Conservation Service Cooperative Activities

The Forest Service and the USDA Soil Conservation Service have entered into numerous cooperative agreements in Arizona and New Mexico. The Land Utilization Program of the Federal Government during the 1930s—based on Title II of the National Industrial Recovery Act of June 16,1933 (48 Stat.195, 200) —resulted in later transfers of land from the Soil Conservation Service to the Forest Service. Seven Land Utilization projects in New Mexico were transferred from Soil Conservation Service jurisdiction (administration, protection, and management) to Forest Service jurisdiction in 1939. These were transferred by administrative order from Henry A. Wallace, Secretary of Agriculture.

Jurisdiction over certain activities was derived through the relationships of agencies, often in Washington. These jurisdictions then filtered down into the forest regions. Once such filtering was the outcome of the Cooperative Farm Forestry Act of May 18, 1937. Quincy Randles, assistant regional forester, division of timber management, in a memorandum to the supervisor of the Apache National Forest in 1940, reaffirmed the responsibilities of the Soil Conservation Service and the Forest Service:

> The Soil Conservation Service is charged with the responsibility in administering all forest farming, i.e., forestry on farms deriving their income principally from farm products, and the Forest Service handles the work on all farm forestry projects. Farm forestry is defined as forest practices on farms or ranches which derive the major portion of their income from forest products.[30]

Fish and Wildlife Service

This agency was formerly known as the Bureau of Biological Survey. The Biological Survey assisted materially in getting the deer of the Kaibab National Forest under effective management control. The Forest Service and the Bureau of Sport Fisheries and Wildlife, a division of the Department of the Interior Fish and Wildlife Service, cooperate generally in studies concerning the management of game and fish on the national forests. Several cooperative agreements between the Bureau of Sport Fisheries and Wildlife and the Forest Service occurred in the Southwest during the 1960s.[31] More recently, the cooperation has taken the form of assistance in the handling of wildlife and birds in game management areas on national forests and in co-sponsorship of seminars or workshops. Typical of these was a seminar held in 1977, “Improving Fish and Wildlife Benefits in Range Management,” with speakers from most Federal agencies managing lands with wildlife and fisheries resources. The seminar was jointly sponsored by the International Association of Fish and Wildlife Agencies, the Wildlife Management Institute, the

Bureau of Land Management, the Fish and Wildlife Service, the Forest Service, and the Soil Conservation Service. A speaker from the Forest Service was on the program.[32]

Cooperation In Specific Situations

Managing the Kaibab Deer Herd. The conflicts between Federal and State jurisdiction were brought to a head in the Southwest with the Kaibab deer herd:

> On the basis of several court decisions, the States have claimed full jurisdiction over all game animals within their boundaries whether on public or on private land, not excepting national forests, however, the Forest Service, while directly responsible for forest administration, is powerless to take such action in connection with game management. . .[33]

In 1919 about one-fourth of the Kaibab National Forest was placed in the Grand Canyon National Park Killing game in the Park was prohibited by law. By 1926, the herd in the park numbered from 35,000 to 40,000, about 20,000 too many to sustain the habitat [34] In 1929, the U.S. Supreme Court "enjoined the Governor and other state officials of Arizona from interfering with the killing of deer by government hunters on the Grand Canyon Game Preserve where such killing is needed to protect forest lands included in the Kaibab National Forest."[35]

The Forest Service decided to hire hunters to reduce the deer herd by killing. Two reports of the affair indicated polarized positions about the event. One report emphasized slaughter, and the other preservation of the deer herds and wildlife conservation.[36] General misunderstanding about the proper management of the Kaibab deer herd continued. In 1931, the Chief of the Department of Agriculture Forest Service appointed a committee, representing 12 organizations, to visit the Kaibab National Forest. Representatives of the National Association of Audubon Societies, American Game Association, American Forestry Association, Camp Fire Club of America, Izaak Walton League of America, Society of Mammalogists, Arizona Game and Fish Commission, American National Livestock Association, University of Arizona, Arizona Game Protective Association, and U.S. Bureau of Biological Survey visited the forest, accompanied by personnel from the Forest Service, National Park Service, National Woolgrowers' Association, and local cattlemen. The committee approved cooperative plans like those in effect between the Forest Service and the State of Arizona, and urged more coordination and cooperation among Federal bureaus, including more manpower to regulate the deer herd.[37]

In 1947, the Arizona Game and Fish Department and the Forest Service undertook a cooperative study "to determine the competition between cattle and deer for the available forage." As of 1964, the work was still being done, with rehabilitation of the range and management of herd numbers to stay within the area's carrying capacity being the principal deer and deer range management activities. To make this work required the cooperation of livestock interests and the Forest Service in managing livestock numbers and livestock concentrations.[38]

Cooperation in Fire Suppression. Forest and range fire is no respecter of land ownership. Because of the mixed nature of land ownership in the Southwest, fire control is an activity needing cooperative work between Federal, State, and private interests. A wildfire starting on one type of ownership can burn into another type of ownership, if the conditions for fire spread—fuel, topography, and wind —are suitable to move it.

Numerous cooperative fire control agreements were consummated by the Forest Service in the Southwestern Region. Let us examine a few of these. As an early example of State Federal cooperation, a 1923 agreement between the Forest Service and the State Land Commissioner of New Mexico provided fire control by the Forest Service on State holdings in the Carson National Forest, primarily in the Taos District.[39] Later, in the spring of 1941, Regional Forester Pooler apprised forest supervisors in New Mexico that the State Guard was available for fire fighting on national forests and private land in emergency situations. The Forest Service was to provide the Guard with two days' training in fire fighting.[40] Federal agencies, such as the Department of the Interior, also cooperated in the control of fire on the national forests and national forest rangelands.

In 1943, Lee Muck of the Office of Land Utilization, Department of the Interior, in a memorandum to the Director of the Department of the Interior Grazing Service, authorized "cooperative action in the protection of the Nation's forests and range resources from loss and damage by fire."[41] The Grazing Service and the General Land Office were combined in 1948 to form the Bureau of Land Management. In 1952, the Forest Service and the Soil Conservation Service entered into a memorandum of understanding on fire suppression covering lands in Arizona within or adjacent to national forests. A memorandum of understanding on fire detection outlined how to report fires and prorate costs based on acres burned under each jurisdiction. Another Forest Service-Soil Conservation Service understanding was signed in 1955.[42] Private enterprises also entered into cooperative agreements with the Southwestern Region.

During fiscal year 1969, the Southwestern Region signed a cooperative agreement with the New Mexico Timber Co., Inc., for mutual assistance on fires on the San Diego Grant. Each would share fire protection costs. And, of course, timber management was of mutual interest to Government and private agencies.

Cooperation in Timber Management. The Forest Service has had a strong cadre of personnel and a long history of sound management of timber resources. The agency has managed lands of others under cooperative agreements and has entered into cooperative activities with Federal agencies, States, and forest industry firms. An early example of a cooperative management agreement was on January 22,1906, when "the Office of Indian Affairs made a cooperative agreement by which the Forest Service was to undertake for the Indian Service the supervision of logging, the sale of timber, the protection of forests, and a detailed study of forest problems."[43]

Some work was performed, but the work was improperly funded. The agreement was abrogated after a period of slightly less than 18 months. At least two versions of why the arrangement did not work were reported in hearings before the House Committee on Indian Affairs, in 1919, by the Office of Indian Affairs, and by Gifford Pinchot.[44]

In 1914 a special cooperative agreement between the Arizona State Land Commission and the Department of Agriculture allowed the Forest Service to handle State land with forests in the same manner as timbered land in national forests. In 1926 the New Mexico State Enabling Act of 1910 was amended to permit the State to enter into land-for land exchanges with the United States for either public domain or national forest land or timber. Exchanges of land and stumpage-for-land continued in both Arizona and New Mexico, and in 1933 an extensive exchange of land with the State of New Mexico was begun. A cooperative agreement had been entered into by the Forest Service and the New Mexico Game and Fish Commission on the Cimarron Canyon

Project. This was for a timber cruise and appraisal for possible state acquisition, and since the work had been completed, the agreement was terminated in 1949.[45]

Cooperation Since World War II. Numerous references to existing and needed cooperative work with a variety of different entities are mentioned in the inspection reports of the decades of the 1940s and 1950s. Several references to the need for cooperation between the Forest Service and others were made in excerpts of the Loveridge-Cliff General Integrating Inspection of the Southwestern Region made in 1945. In wildlife management, two items were considered important—the need to strengthen the working relationships with the State Game Commissions to protect national forest interests, and "continued close cooperation with the States in fish planting and other stream and lake management work." In watershed management the inspectors suggested "collaboration in the development of programs of other agencies in so far as national-forest interests are concerned or national-forest conditions affect their programs," and better relations with water users.[46]

Cooperative efforts were also mentioned in the McCutchen-McDuff General Integrating Inspection Report of the Santa Fe National Forest in 1948. Cooperative work in fire protection was noted in an arrangement with the Indian Service, and a three-way agreement between the Forest Service, the Atomic Energy Commission at Los Alamos, and the Bandelier National Monument. There were arrangements with local leaders for securing men for large fires, and placing 210,000 acres under cooperative fire agreements with 59 different cooperators. Information on cooperative work in timber management was limited to the statement that Knutson-Vandenberg Act Cooperative funds for tree planting after harvest were being collected from only two sales, and a recommendation for the Forest Service to handle sales made on Department of Agriculture Soil Conservation Service management areas where their management personnel were inexperienced in timber sales work. The report mentioned the cooperation of the Forest Service with 10 local livestock associations on the forest, and good cooperation with the New Mexico State Game Department and four game protective associations. In recreation, it was noted that a Guest Ranchers' Association had been formed on the forest. The inspectors mentioned numerous direct contributions to the local areas by Forest Service personnel on the national forest, including active participation in associations noted above and with the Santa Fe Winter Sports Club, a civic club, and the Santa Fe Chamber of Commerce, and good liaison with State officials, especially the strong relationship with the State Game Warden, Elliott Barker.[47]

The report of a 1953 inspection of the Kaibab National Forest made similar comments. Knutson-Vandenberg Act deposits were taken from all of the larger sales and special mention was made of the "very high level" and "cooperative relationships with employees of the Arizona Game and Fish Department" and the pressure that the Forest Service and women's clubs were putting to bear to clean up litter on road rights-of-way.[48]

In the Federal Records Center, Denver, for the period January 1, 1958, to June 1, 1959, the following folders were filed under "G - COOPERATION" in the Southwestern Region files: American Society for Range Management, Arizona Cattle Growers Association, Arizona Game Protective Association, Arizona Permittees Group, Arizona Wool Growers Association, Livestock Associations, National Wool Growers Association, New Mexico Association of Soil Conservation Districts, New Mexico Cattle Growers Association, New Mexico Permittees Group, New Mexico Wool Growers Association, Southwestern Lumber Company, U.S. Bureau of the Census, Department of Agricultural Research Service (relating to brucellosis), Utah Cattlemen's Association, and Yavapai Cattle Growers.[49]

Cooperative efforts conducted by the Southwestern Region cover a gamut of items with a wide range of agencies, associations, and private entities. For instance, cooperative work in fiscal year 1971, each group housed in a separate file at the Fort Worth Federal Records Center, is presented below in sample form to illustrate the diversity of these efforts.[50]

- *Albuquerque Wildlife and Conservation Association*. Highway and right-of-way problems.
- *Arizona Game and Fish Department*. Cooperative agreement on game range studies. Joint field trip. Study of lions in Sycamore Canyon.
- *Arizona Wildlife Federation*. Show-me trip with representative of the Tonto National Forest. Regional Forester Hurst spoke at its 1971 convention. Published a brochure, "Southwest National Forests are Unique." Invitation to the AWF to tour the North Kaibab.
- *U.S. Department of the Interior.* Cooperative agreement on interagency browse analysis between New Mexico Department of Game and Fish, the Bureau of Land Management, and the Forest Service. BLM manuals on wildlife habitat management sent to the regional office.
- *U.S. Bureau of Sport Fisheries and Wildlife*. Meeting of parties interested in management of Tule elk. Report on Indian Camp Reservoir.
- *Isaac Walton League*. Their newspaper sent to the Regional Office.
- *National Wildlife Federation*. Requested information on channelizing the Salt River.
- *New Mexico Game and Fish Department*. Letter from Regional Forester Hurst to its Director, May 4, 1971, trying to keep small problems small. *New Mexico Game and Fish News* sent to the Regional Office. Letter to a Congressman wanting more dollars for wildlife in BLM and FS. Interagency meeting between the Department and Apache/Gila National Forest personnel, March 9, 1971. Invitation to Regional Forester William D. Hurst to attend the State Game Commission Meeting.
- *New Mexico/Arizona Section, The Wildlife Society*. Forest Service person was program chairman of the Section Meeting, February 5-6, 1971.
- *Western Association of State Game and Fish Commissioners*. Annual meeting agendas.
- *Arizona Lake Program*. Joint meeting with Arizona Game and Fish Department.
- *Phelps Dodge Corporation*. Blue Ridge Reservoir file, relative to fishing in stream below the dam.
- *Red Rock Canyon [dam]*. Publication of USDA Forest Service, Southwestern Region, *Hydrological Survey & Analyses, Water & Related Land Resources, Red Rock Canyon, Patagonia Ranger District, Coronado National Forest*. Engineering plans for the dam.
- *Arizona Game and Fish Department*. Proposed Canyon Creek Fish Hatchery.
- *Arizona Game and Fish Department*. A file of grazing allotments—sample is "Wildlife Habitat Management Plan, Chevelon Canyon Allotment, Sitgreaves National Forest."

Observations made during an interview of retired Southwestern Region officials are that during the past 20 years relations with the National Park Service and the Bureau of Land Management have been good. When William Hurst was the Regional Forester there were one or two joint meetings per year with BLM and NPS personnel. Good relations existed with state land, game and forestry departments.

Cooperative Relations with Arizona. In Arizona the relationship of administration of the forest the State and the USDI/USDA was set forth early by the act creating the reserves, and the Weeks Act of 1911, assisting the organization of State Forestry departments. Under these laws all persons employed in the Forest Service had the authority to make arrests for the violations of the laws and regulations relating to the national forests, including the use of stock, the prevention and extinguishing of forest fires, and for the protection of fish and game.[51]

In 1913, the Forest Service and the State Game Warden of Arizona signed a plan to cooperate in game protection (Forest Service officers to be game wardens) and fire protection.[52] Cooperation by the Forest Service and State of Arizona was reaffirmed ". . . in the act of May 22, 1928, where cooperation with the States and Territories, and with private agencies interested in conservation was provided for." Other legislation also provided for cooperation between the Arizona Game and Fish Department and the Forest Service, Southwestern Region, in setting game kills on the national forests. Another benefit to Arizona, as to other States, through cooperation with the Forest Service was the granting of monies from the sale of timber and other goods from the national forests in "sections 2, 16, 32, and 36 in each township of a State for the use of schools." These monies were prorated from the total amount received by the Forest Service from the forests within the State in a year.[53]

The Arizona Game and Fish Department became more and more active and in 1947 began a cooperative project with the Forest Service under Federal Aid in Wildlife Restoration (Pittman-Robertson Act) specifications. A biologist was assigned to an identified area by the Forest Service to obtain information on range use and condition.[54] In 1951 the renewal of a cooperative agreement between the Arizona Game and Fish Commission and the Forest Service centered around an amendment requiring the Commission to get approval of the regional forester before a wildlife refuge could be placed on a national forest. In 1958 the two agencies cooperated in a research-demonstration-management effort on the Tonto National Forest.[55]

Cooperative relations with State game and fish departments in the Southwest continue. For instance, a memorandum on needed joint action with the Arizona Game and Fish Department was sent by William Hurst, regional forester, on May 22, 1972, to assistant regional foresters and forest supervisors of the Apache, Coconino, Kaibab, and Sitgreaves National Forests. The memorandum covered a list of cooperative needs that the Game and Fish Department and the Forest Service could accomplish on these National Forests.[56]

Arizona is also concerned with the management of its water resources. The Forest Service cooperates with several Federal and State agencies. The Forest Service has recognized the necessity of taking positive steps to slow down and ultimately reverse the erosive trends on Arizona's watersheds.[57] In Arizona and in New Mexico, the management of wildlife and watersheds is a regional problem requiring the cooperation of many State and Federal agencies and local authorities.

Cooperative Relations with New Mexico. In New Mexico early cooperation between the territory/State and the Forest Service led to harmonious relations in several areas, notably with respect to the wildlife resource and fire control activities. In the January 14, 1914, issue of the Carson Pine Cone, the New Mexico State Game Warden reminded forest officers of their responsibilities as deputy state game wardens. Game wardens, in turn, were urged to promptly report forest fires and to assist in preventing them. The State of New Mexico put $10,000 into helping construct the Taos-Cimarron Road, 18 miles in length, in 1917. On April 18, 1920,

Supervisor Loveridge of the Carson National Forest attended the meeting of the State Game and Fish Protective Association as a delegate from the Taos Association.[58]

Game regulations impinging upon the national forests were slower coming in New Mexico than in Arizona. The Arizona State Game Commission "provided for two long two-deer seasons on the Kaibab in 1929 and 1930, in which a total of nearly 9,000 deer were killed, most of them by out-of-state hunters." In 1930 the New Mexico legislature finally enacted a bill that transferred authority over seasons and bag limits to the State game commission.[59]

In 1961, the Forest Service, Soil Conservation Service, and the Department of Agriculture Agricultural Conservation Program entered into a cooperative agreement with the New Mexico Department of State Forestry. The agreement specified each agency's responsibilities regarding forestry on privately owned lands in the State.[60]

Cooperative Relations with Other Public and Private Entities. The Forest Service cooperates with State agricultural experiment stations, usually in research rather than in operations. Hence, there are few records of cooperative relationships between the Southwestern Region and experiment stations. Such relationships are typified by a watershed management project funded by the Arizona State Land Department in cooperation with the Agricultural Experiment Station and the Salt River Valley Water User's Association.[61]

Local public entities have often cooperated with the Forest Service. For instance, Gila County, Arizona, maintained a campground within a national forest as early as 1921. Between 1947 and 1972 the Pima County, Arizona, Parks and Recreation Department supplemented recreation funds of the Forest Service by from $20,000 to $25,000 a year to rehabilitate recreation facilities on the Coronado National Forest.[62]

Instances of cooperation between the Forest Service and the private interests are common in the records of the Southwestern Region. The *Carson Pine Cone* reported numerous instances of Forest Service personnel who were active in the activities of local private organizations. For example, Ranger C.R. Dwire was elected vice-president of the Taos Game Association in 1920. Forest Supervisor Loveridge was elected president of the Taos Commercial Club in 1920, and Ranger Wang, with help from homesteaders around Servilleta, poisoned prairie dogs. The Forest Service enjoyed excellent cooperative relations with the various stockmen's and sheepmen's associations, particularly in the suppression of fire.[63]

Two instances of cooperation by private individuals and organizations during 1920 are reported in the *Carson Pine Cone*. The citizens of El Rito deposited $200 to be used in work on the El Rito-Canjilon road, and the Molybdenum Mines Company helped build the Questa-Elizabethen Road. The Tucson Natural History Society was instrumental in getting a tract of 4,464 acres in the Coronado National Forest set aside for preservation as a "natural area" in 1927.[64] In 1956 Southwest Lumber Mills, Inc., and the Southwestern Region entered into a cooperative agreement to cover several areas of activity on Aztec Land and Timber Company tracts, including permits to graze, for forest and range fire protection, for marking, scaling and accounting on timber sales and for slash disposal. In fiscal year 1969, the Southwestern Region entered into a cooperative agreement with American Airlines, Inc., to search for downed aircraft on national forest lands.[65]

A Special Type of Cooperation: The Forester as a Community Leader. The forester in the Forest Service of yesterday had stronger ties to local communities than he or she does today. This is the lament heard when you talk to foresters who have been retired for more than ten years.

> I one time heard it said that the Forest Ranger and the County Extension Agent were the most respected and valuable citizens in the community. More recently, the Mayor and City Council members actually shed tears in my office when the decision was made to dose down a Ranger District Office in a small New Mexico community. In hundreds of small towns, and some not so small, throughout the United States, the reason Forest Officers are valued so highly as citizens is because they are involved in community activities. They are smart, well-educated people who for the most part play an active role in community affairs, church, Boy Scouts, Fish and Game Clubs, schools, civic dubs, Chamber of Commerce, and numerous other community organizations. In the earlier years of the Forest Service, a good Supervisor saw to it that the Forest Service was represented in every important organization within his zone of influence.[66]

Herbert Kaufman, in his book *The Forest Ranger*, observes that there was potential conflict between the role of the forest ranger as a valuable member of the local community as well as the official local representative of the decentralized Forest Service. The ranger was ordinarily invited to join local civic and community organizations and was encouraged to do so by the Forest Service," partly because his position as manager of large properties automatically makes him a person of some standing in most localities, partly because the Forest Service is always ‘represented' in such associations . . ."[67]

According to Kaufman, community involvement also opens the door to the possibility of "capture" by the community. He explains: "Rangers are encouraged to take as active a part as they can in community service, social, and fraternal organizations. Slowly, they absorb the point of view of their friends and neighbors. One, for example, reported that he found himself tending to "look the other way" and to delay investigation as long as he reasonably could when he had reason to believe the chamber of commerce of the town in which he lived, and to whose executive committee he belonged, was operating a resort area without the rather expensive liability insurance required by the terms of its special-use permit . . ." [68] As a result, local interests are in a better position to bring pressure to bear on foresters.[69]

The experience of forest rangers in the Southwest tends to refute Kaufman's contention, at least during the early years of the Southwestern District. There is an advantage for the district ranger, especially, to be active in the local community. In this way, confrontation can be headed off by discussing the issues early and attempting to produce a resolution before small problems become large. Confrontation occurred when the Forest Service first intervened in the free use of public land and implemented controlled use. But the wounds inflicted by confrontation were at least, in part, removed by cooperation. Since so many different products and services emanate from the national forests in Arizona and New Mexico, cooperation with those who would use them is imperative. The Forest Service in the Southwest has a good record in cooperative efforts with its sister agencies, with the two States and with citizen groups.

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Chapter 15. The Life of Foresters

The life of the forest ranger in the Southwest has changed markedly since 1908, when the Southwestern Region came into being. The change has occurred on many levels. The background, work, and training of those who became foresters have changed; most especially, the lifestyles of the foresters and their families have changed. The essence of the change may have been captured by Charles Ames, who recalled the story of an old-time ranger, "worn out by the weight of years and too many reports," who, upon being berated by a supervisor for being unable to find a particular report in the overflowing office files, responded: "Spare your old ranger. It was the filing scheme, not me, that failed. Remember the many changes in the system rather than in me."[1]

The system has altered over the years but in the Southwestern Region, until recent decades, those changes have been largely imperceptible. There were times when the outside world seemed to bypass the Southwestern Region. Thus, in the 1930s, there were those in the Chief Forester's Office who considered the Southwestern Region the most backward region in the Forest Service. The region, its people, and its experiences, to be sure, were different; there has been a certain timelessness to the mission of the Forest Service in the Southwest, and a consistency and continuity in the character of the people who have served there. The mission is the same, but the way it is pursued has changed as have the people who seek to accomplish the work.

Over the years, the Forest Service brought in many different people from many parts of the United States to the Southwest, and most who came there stayed there. There are three major periods when the influx of new personnel affected the work and organization of the region. The first migration occurred roughly between 1908 and 1916 and can be loosely termed the frontier or pioneer phase. A small number of professionally trained foresters, mostly from the Eastern United States, directed the activities of a large contingent of untrained and largely uneducated forest guards and rangers, most of whom grew up in the West or Southwest. Many had no formal training but had passed the "ranger examinations," and some eventually became supervisors and staff personnel.

A second infusion of new blood into the region came during the Depression, when many young professional foresters left schools (often in the Midwest) and sought the only forestry jobs available—with the U.S. government. Similarly, many staff and fire protection people came to work with the Forest Service during the Civilian Conservation Corps (CCC) days and remained for their working careers. Well into the post-World War II era, even into the 1960s, many Depression Era foresters and old-timers guided the activities of the region.

Finally, in the late 1950s, young well-trained college professionals, many of these specialists rather than traditional generalists, joined the Forest Service. In this more recent era, geneticists, paleontologists, hydrologists, range scientists, agronomists, chemists, engineers, archeologists, landscape architects, botanists and biologists, and public affairs specialists began to supplant and replace the traditional forester. The specialists tended to concentrate in the forest and regional offices and were available to serve the needs of the ranger district. The ranger increasingly became an office-bound administrator who directed the specialists to the particular need or crisis of the moment. In a real sense, the Forest Service became more urban, and more urbane.

Personal Sketches

In the following brief sketches, we glimpse the people who have been the harbingers of change and the guardians of a timeless heritage.

Edward Ancona, a graduate of Pennsylvania State University, arrived on the Prescott National Forest as a forest ranger in 1913. He had to learn about horses and cooking. Rangers in those days smelled of sweat and horses instead of grease and oil, or ink and air-conditioning, he recalls. Despite the changes Ancona witnessed during his long career with the Forest Service, he remembered the sense of timelessness:

> The main thing about the Forest Service work was it put you into areas that you never would have been in any other job. You saw part of the past, a lot of the past, the early days; you could almost say the late-early days of the West. It was a terrific experience and I wouldn't have traded it for anything. It never made you a millionaire, but it was a darned nice life.[2]

Many of the early foresters in the Southwest did not just see the past—the old West—they lived it. Benton S. Rogers, for example, quit being a cowboy to join the Forest Service. He described the local ranchers in his district in 1914 as "hard hombres, carrying guns for each other."[3] Jesse I. Bushnell, who was born in Illinois in 1881 and arrived in Arizona when he was 26 years old, passed the ranger exam in 1909 and became assistant ranger on the Ash Fork District of the Coconino in 1910. Bushnell recalled the often violent conflicts between the cattlemen and the sheepmen, which lasted well into the 1920s. National Forest System lands were often trespassed by both sheepmen and cattlemen, thus bringing the Forest Service into the conflict. Happily, Bushnell finally succeeded in getting sheep and cattlemen to cooperate in widening the trail around Herder Mountain (an extension of the Heber-Reno Trail near Mesa, Arizona):

> By George, they agreed to it and they'd been fightin' each other for years, gettin' out there with guns, and everything like that. The cattlemen agreed to have the trail widened out, and they widened it out, and there was never any more trespassing.[4]

Armed Ranger. Fred Croxon was one of a number of early rangers who went armed, although most chose not to do so. In 1921, Charlie Quail, of the "Quail outfit," began passing the word that he was going to kill Croxon. Finally, Croxon got a request to go to the Quail ranch to give permission to cut pinyon trees "so pastures would grow better." Croxon correctly took that as an invitation to a fight, and after agonizing for days and nights, decided he had no choice but to face his antagonist. Once he arrived on the ranch, Quail accused him of trespass and went for his .38 Savage automatic. Croxon drew his pistol from his belt, shot and missed, but killed Quail on the next two shots. The jury (and apparently the Quail family) acquitted him.[5]

Croxon began his Forest Service career as a result of one of those fortuitous meetings or encounters that so often influence one's life. In Nevada in the winter of 1907-8, he met a forest ranger from the Toiyabe National Forest, and on a "horse trip" in the Big Smoky Valley he met another, and in the summer two more from California. "All these forest rangers were fulfilling their duties on saddle animals and pack horse outfits. After meeting and talking with the men in regards to their duties, my desire to become a forest ranger was first in my thoughts."[6] Croxon qualified as a ranger and in 1911 received his first assignment—as fire lookout on Woody Mountain, 10 miles southwest of Flagstaff. He recalls that he was the first forest officer to be assigned permanent duty as a fire lookout during fire season in the Southwestern Region. His equipment was a Forest Service badge, compass, telescope, notebook, shovel, rake, and axe. He provided his own horse and bedroll.[7]

Figure 52. Forest assistant W.H.B. Kent on the Huachuca (now Coronado) National Forest, 1905. (Forest Service Collection, National Agricultural Library)

As had Croxon, Fred Merkle had a chance encounter with two forest rangers while hunting in the Sandia Mountains near Albuquerque in 1908. The rangers visited with him, talked to him about hunting and building fires, and rode on. Merkle recalled, "I decided at that time that was the life for me if I could get in."[8] He took the examination, became a forest guard in Oklahoma, arrived in the region in 1913, and ended his career in 1941 after 6 years as supervisor of the Sitgreaves National Forest.

Jesse Nelson had worked as a bronco rider and ranch manager for Buffalo Bill before joining the Forest Service about 1910. After service in the Southwestern Region, Nelson became inspector of grazing in the Washington Office and also served as chief of grazing in the Rocky Mountain and Pacific Southwest Regions. Nelson remembers the frontier spirit of the Forest Service in the early days:

> Those were the good old days and we'll never see anything like 'em again. It was a period of tremendous crusading spirit . . . a lot of those fellows that had the crusading spirit didn't know anything about Forestry. They were ex-cowboys and lumberjacks and all that sort of thing. . .[9]

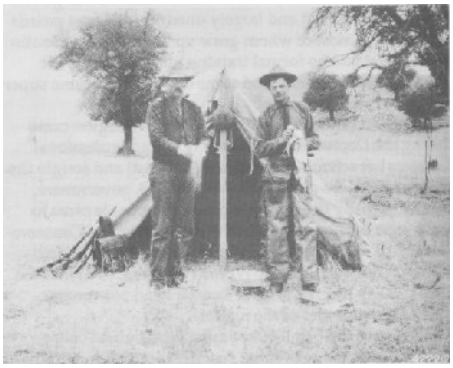

Figure 53. Forest assistant Clyde Leavitt (right) and packer Bill Donovan (left), on the Huachuca (now Coronado) National Forest, 1905. (Forest Service Collection, National Agricultural Library)

Yale School Graduate. A 1914 graduate of Yale Forestry School, Stanley Wilson arrived on the Huachuca District of the Coronado in time to help round up 300 head of stolen Mexican cattle ranging on the national forest. Although the cattle were returned to the Mexican owners, no charges were brought against the prominent New Mexico rancher who had apparently bought the cattle from the rustlers.[10] Wilson became supervisor of the Carson National Forest in the 1920s and, like so many others, retired in the Southwest.

Frederic O. Knipe, who first tried cattle ranching in 1911, desired "more adventure" and joined the Forest Service in 1916. Knipe remembers that life with the Forest Service was not "altogether a soft, easy-going life, what with rough times, fighting fires, camping out in cold weather and sometimes the extreme opposite in long hard rides in hot weather."[11] It was an unregulated life with long hours, ". . . a rewarding experience, not glamorous but very worthwhile," he said.[12]

The rugged nature of the early rangers' life is partly testified to by a note in the *Datil Tri-Monthly* for May 31, 1911. Dallas F. Wells and Robert L. Deering were doing boundary survey work: "Mr. Deering has pushed this work under difficulties. His first horse dropped over a cliff; his next one went lame; the camp outfit burned up one day in the absence of himself and crew, and finally he was left stranded in the field by his teamster who complained that he was being worked too hard.[13]

Floye W. Carlton joined the Forest Service as a clerk in World War II. She and her husband spent most of their lives on the Blue River in the Apache National Forest. She gathered considerable information about the early history of Blue River. Even at the beginning of the 20th century, buffaloes, mountain lions, bears, deer, wolves, and coyotes roamed the countryside. The settlers were primarily cattle raisers who pooled their herds and men and boys in the annual roundups. Drought, overgrazing, and even floods (1906) made life hard. The Cospers (J.H.T. or "Uncle Toles" and John or "Uncle John") gave a dance once or twice a year at their Y-Y Ranch, which they had bought from the McKittricks. Guests would come and stay a week, and the Cospers provided food for horses and people, and entertainment. Dances began at sundown and lasted until sunup, and a barrel of moonshine or whiskey was ready at hand. Clay Hunter, she recalled, was the resident hunter who lived in a cave on the Upper Blue and lived on the bounties he received for wolves and bears. He got ten grey wolves and a bear on one trip and trapped seven

mountain lions on another. His "hunting cave" was often visited by the outlaws who included Billy Johnson, the Smith Boys, and Sam Dill.[14]

Figure 54. "Uncle" Jim Owens, famous mountain lion hunter on the North Kaibab Plateau, who killed many predators for the Forest Service

Renowned Hunter. One of the most renowned hunters of the Southwest, who inherited the skills of the earlier mountain men, was "Uncle" Jim Owens. Q. David Hansen, a retired forester from the Intermountain Region, saved some of Uncle Jim's stories, which had been written down by William M. Mace. Bill Mace began his Forest Service career as an assistant forest ranger on April 1, 1909, on the Kaibab National Forest. "During my younger days," Mace wrote, "it was my good luck to have several hunting trips with James T. Owens." Mace described Owens as then almost 60 years old, with hair and mustache slightly grey, standing 5 feet 8 or 9 inches, slight in build, but of tough and tireless strength. He had a quiet dignity and a personality that enabled him to be friends with all—ranging from Theodore Roosevelt to a Paiute Indian lad who rode for the Bar 2 Cattle Company. At the time, Owens served as game warden in the Grand Canyon National Game Reserve, which covered the same area as the Kaibab National Forest. He was born in 1849 near San Antonio, TX, and spent some time as cowman, buffalo hunter, and Indian fighter.[15]

Mace spent a month with Owens and a pack of hounds and pack horses hunting cougar on the north end of the Kaibab. On the rim of the Grand Canyon, they bagged three mountain lions after following them for hours where horses could not go. Owens's favorite hound, "Pot," later wore a silver collar with the inscription: "I Have Been at the Death of More Than 600 Cougars." Owens gave his dogs first consideration, his horses second, and himself third. Theodore Roosevelt had given Owens a silk tent after their successful 1913 hunt, and one story related by Dan Judd of Fredonia recalls that during a heavy rainstorm he came into Owens' camp and found him asleep in a tarpaulin under a pine tree, while the five hounds were "snugly quartered in the silk tent."

Mace remembers Owens killing a coyote at 400 yards with the .30 caliber army rifle given him by Roosevelt. Owens died in Las Cruces, New Mexico, on May 11, 1936, after spending his declining years fighting to preserve bison and wild game in general.[16]

Q. David Hansen recalls Kanab in the early 1920s: walking down Main Street, you passed the drug store, and about the only people you would see would be "the old-time cowboys sitting in the sun, boots and Bull Durham tags out their pockets, telling how they worked for Grand Canyon Cattle Company."[17] With an estimated deer population of 50,000 on the Kaibab, the Forest Service declared open season on deer in 1927 or 1928, he recalls. "Any hunter could get 3 bucks only for $5.00. But the deer were very poor and not edible. They had very unusual horns. They were considered trophies."[18] He recalls attempting deer counts. "We could stop on a ridge on those western slopes, riding through there and whistle and holler and hundreds of deer would file out of a canyon," he said. When the Forest Service declared open season, the State of Arizona filed an injunction and sent deputy sheriffs to arrest the hunters. Forest Service personnel helped the hunters dodge the sheriffs. Finally, a cooperative agreement was reached that allowed hunting only in October and November and required a payment of $4.00 for an Arizona hunting license.[19]

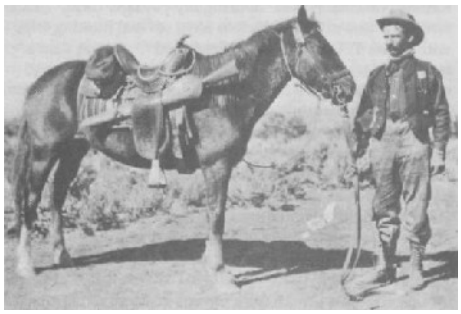

Figure 55. Forest assistant on the Apache National Forest. (Forest Service Collection, National Agricultural Library)

Hansen, who was assigned to work several of the special Kaibab deer camps, recalls the activities as follows:

> Hunting camps were set up. Two on the east side of the Plateau, one at Kane Springs and one at South Canyon. Three camps on the west side, one at Ryan (checking station), one at Moquitch and one at Big Saddle. Big Saddle was against the rim of the Grand Canyon. A short walk from the camp was Crazy Jug Point, which was a spectacular view of the Grand Canyon. These hunts were very successful, being the first attempt at managing hunting. All hunters registered into a camp. A Forest Ranger and an Arizona Game Warden were in each camp. All the deer were checked out with a special tag. All guns were sealed when entering two checking stations, Ryan and Kane Springs, and unsealed at the Camps. This was a safety measure to keep hunters from shooting deer along the road. Horns were measured and carcass weighed and measured.
>
> The Camps were under Special Use Permits to provide tents, meals, and horses to the hunters, if they so desired, also guides were available. So the hunters could drive in and have all the accommodations that they wanted, which was rather primitive, but satisfactory. In 1929, the hunters came, everything was very prosperous, good cars, and they enjoyed their stay in the Camps, even after bagging their deer.

> The 1931 hunt was different because of the depression. A lot of hunters could see a difference in their pocket-books and they were anxious to get meat. After two years of controlled hunting, the deer were still not in good flesh, the average weight in bucks in 1931 was 1351bs., the average weight 10 years later, was 1801bs. By 1941 the forage had improved considerably. However, which is usually the case with winter loss, nature seems to solve the problem, along with hunting.[20]

Bertha Schell. Men were not the only hunters of renown in the Southwest. Bertha Schell worked for the Forest Service for 5 years in the 1930s on the Prescott at Camp Wood on Hyde Mountain. Her job was to pack supplies into the camp. Bertha was widely known as a hunter who tracked and bagged deer and lion. She remembered that the Forest Service never noticed her until she killed a mountain lion. “Then they came to chastise me.” Her husband, Hardy, managed the Yolo Ranch. Bertha, for a time, leased and worked the Black Pearl Mine, south of the Yolo Ranch. When interviewed in the 1970s, Bertha remembered Ranger W.H. Koogler of the Walnut Creek District with fondness. "He was everywhere," she said. "Nothing went on in the forest that he didn't know about and the people liked him. He was a good cowboy."[21]

One of the stories that later circulated about Koogler is that when he and a revenue officer went into the forest to break up a moonshine operation, an “independent, hardheaded little burro” was the only living thing they found. The burro took off in a different direction loaded with two barrels of whiskey and later turned up at the Yolo bunkhouse. The ranch foreman fired all hands after they remained soused for a week. “Moonshine,” the burro, became a folk hero, and soon the hands were rehired [22]

Lafayette (Laf) S. Kartchner was born in Snowflake, AZ, in 1893 and completed high school in 1915. He took his ranger examination in October and was called into duty as a lookout on the Deer Spring Tower. Eleven days later, he was called up with the State militia and spent the next 3.5 months patrolling the Rio Grande. He then became an assistant ranger under Ranger James L. Hall at the Heber Station on the Sitgreaves National Forest and, within 2 months, was promoted to ranger and assigned to the Chevelon District. On the morning of March 28,1917, he put his camp bed on the big roan mare, “Clip,” said goodbye to the Halls, and went along the 4 or 5 miles north to the old Casby crossing in big Chevelon Canyon. The next day, the old ranger signed over the property, and following a "warm farewell," they never met again. Kartchner saw a trail going down into the canyon, put a rope on Clip with her little colt following, and "we all three learned where we had to go to get our water.”[23]

Figure 56. Miss Anderson, lookout at Hillsboro Peak, Gila National Forest, 1923. (Forest Service Collection, National Agricultural Library)

Kartchner decided, upon the advice of Ranger Dolf Slosser, to follow the fall roundup. So he took three horses, a tarpaulin, and several quilts and joined up with the Tom Dye ranch hands. “That turned out to be the best experience I could have had, learning my district and the people in it,” he said. Kartchner soon was called into military service, and after service at Verdun, was discharged from Fort Bliss, TX, in 1919. He returned as ranger to the Heber District. He married, got the opportunity to move to the Show Low Ranger Station (which had running water), and, from 1925 until his retirement in 1956, spent much of his time managing timber sales from such places as Heber, Snowflake, Springerville, Williams, and Flagstaff, AZ.[24]

Had Army Service. Virgil D. Smith was raised in Ohio and spent two years at Marshall College in Huntington, WV, before enlisting in the Army in 1905. He was assigned to Troop F of the Fifth Cavalry in Wyoming, which had the dubious assignment of returning a group of Ute Indians, who were making their way to Canada, back to the reservation. The soldiers located the Indians and blocked off all routes of escape except the southern route, which led back to the reservation. After some discussion with the cavalry commander, the Indians elected to return to the reservation, which “relieved much tension.”

After service in Colorado and Utah, Smith was sent to Fort Apache, AZ, where in 1908 he was discharged from the Army. Because of his skills in surveying and engineering, Smith received an appointment as forest ranger and was assigned the Heber District of the Sitgreaves National Forest, where his primary duty was to supervise the passing of sheep over the Heber Reno Sheep Trail in the spring and fall, as sheep passed from summer to winter range, and then back to summer ranges. He surveyed the boundaries of the trail, and attempted to keep the herds on the trail route.[25] Jesse Bushnell, mentioned earlier, was involved in settling cowman-sheepman disputes on the same trail in the Coconino in the 1920s.

After the sheep drives were complete, Smith was assigned to work on approving and surveying homesteading applications being processed under the Act of June 11, 1906, which allowed people to take up homesteads on the national forests. Smith remembered, “We carried our equipment on pack animals and would make metes and bounds surveys of the homestead areas applied for that were not on surveyed land, and then tie the survey to a known land mark, such as the forks of a stream or a Forest Service monument. . . .”[26]

In the 1920s, he was assigned duties as forest and range supervisor and, in 1930, was transferred to the Papago Indian Reservation at Sells, AZ, where he conducted range surveys, planned and built stock tanks and wells, and encouraged the Indians to develop their cattle herds while eradicating their wild horse herds. In 1933, he was given a similar assignment on the Navajo Reservation with headquarters in Ft. Defiance. Smith's surveys indicated severe overgrazing, and when he advised the Indians to get rid of “unnecessary” goats while maintaining their more productive sheep herds, the Indians dubbed him "Old Goat Hater." He was made supervisor of forest and range management for the Hualapai, Havasupai, Yavapai, and Verde Reservations in Arizona and the Moapi Reservation in Nevada, with headquarters in Peach Springs, AZ. He retired after a term with the Indian Service in the Department of the Interior on January 1, 1950.[27]

Colorful Career. Gilbert S. Sykes was born in Flagstaff and grew up in Tucson, where his father, Godfrey Sykes, was a staff member of the Carnegie Desert Laboratory, which later became the Santa Rita Experimental Range administered by the Forest Service. In 1911, Gilbert and his brother Clinton were sent to school in England. The outbreak of World War I prevented their returning home. Gilbert joined the British Navy and served as a wireless (radio) operator under the tutelage of Marconi, who invented the radio. In 1919, he joined the Forest Service as a lookout in the Catalinas and assisted in establishing a heliograph (signal communications) system using army surplus heliographs. By the late 1920s, radio replaced the heliograph being used in remote areas. Sykes apparently had an unsatisfied yearning for adventure, for he left the Forest Service in 1924 to become a barnstorming pilot, a parachute jumper, and an aerial acrobat. When the barnstorming days ended in 1933 for Sykes, he returned to the region and spent the rest of his career on the Coronado National Forest—the last 23 years in the Nogales District where he retired in 1962.[28]

Forest rangers of the Southwestern Region were stamped from different molds, but all seemed to share a sense of adventure and a preference for the rugged, outdoor life. For example, Roger D. Morris, a trained forester from the University of Iowa, joined the Forest Service in Minnesota before World War I, then joined the Army and spent 20 months with the American Expeditionary Force in France before returning to forestry duties in Minnesota. In 1920, he transferred to the Southwestern Region to participate in a range reconnaissance effort that lasted 6 years, most of those years in the field living out of tents and hauling supplies and equipment on pack horses. He headed the range reconnaissance during the last 2 years. He covered, on foot, the Santa Fe Forest in its entirety and the New Mexico portion of the Apache. Morris recalls one of those rare occasions when he savored the comforts of civilization. Having left a truck with a broken axle at the top of a mountain pass, Morris and his crew chief borrowed a team of horses and hauled the truck down into El Rito. He spent Thanksgiving Day at the only hotel in town and was served venison, mallard duck, bear steaks, and wild turkey for his dinner. Morris retired as assistant supervisor in charge of fire control and timber management of the Coronado National Forest in 1957.[29] Unlike the more contemporary forest ranger, early rangers were, by preference and by necessity, woodsmen.

Familiar With Forest Users. The Southwestern Region policy encouraged close familiarity with and knowledge of the forests and forest users. As Stanley F. Wilson explained, "In my day of course we rode horseback. We were encouraged to make trips where we had nothing in particular to do except see the country. I never made a trip of that sort but what I came up with was something I ought to know:"[30] Instructions for early foresters were often quite simple—patrol as much country as possible and keep down fires. Henry Woodrow, who began as a forest guard in 1909, passed the ranger exam in 1910, and retired in 1942, began his work with chuck (food), one horse, and a bedroll that he supplied himself. "No tools were furnished me. I took my axe and shovel—all the equipment I had with which to fight fires. No tent was furnished, had an extra tarp which I used for a tent when it rained."[31]

As a ranger on the McKenna Park District of the Gila, Woodrow discovered he had inherited a particularly difficult situation with a widow who had a grazing permit on forest lands. As he told the story shortly after his retirement:

> There happened to be a widow on this part of the District with a grazing permit on the Forest and a ranch near the Gila Station. So I married her on October 14,1912. Later I heard of Rangers on other Forests and Districts having quite a bit of trouble with widow permitters in the District. I would suggest that the Forest put a single man for a Ranger there and probably he would marry her and stop all of the trouble.[32]

There is certainly no evidence that such careful planning ever became a part of Forest Service policy, but there is ample evidence that widows as well as eligible young ladies frequently married rangers.

The advent of the automobile began to change the lifestyle of forest rangers, but the changes were at first little noticed. The automobile made it possible for the ranger to cover more territory and to complete much of his work more efficiently. A ranger and his family could live in "town" and drive to the woods. It also began to affect the woodsmanship or "woods-sense" of the forester. Technical knowledge clearly became more important. Personal knowledge of the woodlands and even of neighboring people became less. Although the 1920s and 1930s marked the transition into a new era in the life of the Forest Service in the Southwestern Region, it was not nearly so apparent as might have been assumed. Even in the 1930s, the automobile and truck were not always central to the ranger's duties. Moreover, the real lifestyle of the ranger did not change rapidly or appreciably until after World War II.

Robert Diggs, a graduate of the Yale School of Forestry, arrived at the High Rolls CCC camp in 1933 as camp foreman. He was sent to the Jicarilla District of the Carson in 1935, which he described as "still a horseback district." While in the Jewett District, working under Bob Stewart, he met and married his wife Odie. Stewart allowed the couple one day and night away before returning to work Diggs remembers that the 1930s were the days when the work force on a ranger district meant "the Ranger and his wife."[33]

Samuel R. Servis from upstate New York was a graduate of the New York College of Forestry and, like Diggs, began his Forest Service career with a CCC job. Servis recalls his lifestyle in the 1930s as not unlike that of "old-time" foresters. He joined a roundup with "Old Cole Railston" of the V-Cross-T Ranch on the Cibola. He said they got up at 3 a.m., fixed a quick breakfast, rode like crazy until 3 p.m., ate biscuits, played "coon-can" until night, slept until 3 a.m., and then rode like fools until 3 p.m.[34]

Garvin Smith. Zane G. Smith, who spent most of his life in the Southwestern Region, remembers that his father, H. Garvin Smith, joined the Forest Service in 1917, when Zane was 8 years old. After a few months experience in the Capitan District of the Lincoln National Forest, he was transferred to Mayhill District as ranger. Smith said that his father "was a high school graduate and had experience in farming, ranching, and biological survey. He was representative of the rangers until the 1930s, when there was an influx of forestry graduates with the CCC programs"[35] In the Mayhill District, boundaries were poorly marked, and livestock trespass and overgrazing were everywhere. Stockmen, he said, who largely dominated State politics, resented Forest Service controls, and corrective actions were therefore difficult to achieve. Renewing homestead applications took up a sizable part of the workload—not to mention fire control and timber management.[36]

The family moved to the Cloudcroft District of the Lincoln, and then to the Chloride District of the Datil National Forest in 1923. The family moved on horseback with a few pack animals, and household goods were shipped by rail from Alamogordo to Magdalena and by wagon to the Chloride Station. Communications through the 1920s was by grounded party telephone lines, and most stations were located far from towns. Rangers' wives usually served as dispatchers and received a $5 per month stipend during fire season. Zane Smith began his work as a fire lookout on the Gila in 1926 and, after completing college in 1931, served as ranger and on the supervisor's staff and regional office staff for 33 years; for 5 additional years (1952 to 1957), he served as forest supervisor in the Northern Region and on the Chief's staff.[37]

Although wild animals were ordinarily no threat to humans who were reasonably circumspect, and the population of cougar and bear had declined considerably by the 1930s, nevertheless, there were dangerous creatures in the woods. In 1931, ranger O.J. Olson was allotted $300 by Supervisor. Fred Winn to build a telephone line from Sunnyside on the west side of the Huachuca Mountains to Miller Peak Lookout, a distance of 6 or 7 miles. Olson recalls that he hired two young men, Norman Johnson and Abraham Ruiz, to build the line. He drove them to the starting point with bedrolls and gear:

> Since it was late when we arrived, I decided to stay the night. We fixed a cold meal out of the chuck box. Then the boys spread their bedroll on the ground. The 3 of us got into bed with me in the middle. It was a beautiful night in August with a full moon lighting up the vast area surrounding us. About midnight I awoke with a bloodcurdling scream that sent both of my bedfellows scampering in different directions down the mountain side. I then realized I had grabbed for my nose and had a skunk by the throat. I squeezed until I thought he was dead, but to be sure, banged his head on a rock never letting his hind feet touch the ground to avoid being sprayed.[38]

The skunk was rabid. Olson began the Pasteur treatment, one shot a day in the arms, legs, torso, or buttocks, each swelling to the size of a small hen's egg. It was an extremely painful and grim ordeal and made him something of a sensation and a curiosity among local folks. Many curious callers over the next few years expected to see him turn up foaming at the mouth and wondered how his family stayed in the same house with him. The skunks, however, had not finished. The line crew, Johnson and Ruiz, while camped at an old mine shack, awoke in the middle of the night to find a rabid skunk fastened to the neck of their mule. Finally, after 7 years, doctors gave Olson a clean bill of health—and his family and friends were much relieved.[39]

Primitive Living Conditions. The rather primitive conditions under which the forest rangers and their families lived had not changed markedly by the end of World War II. Walter Graves moved his family from the Coyote Ranger District of the Santa Fe National Forest to the Long Valley Ranger District of the Coconino in March 1944. Graves was born in Chicago, completed his forestry training at Iowa State University, and took his first job as a CCC camp foreman at Hyde Park on the Santa Fe. He headed the Coyote District for 5 years before being moved to the Coconino.

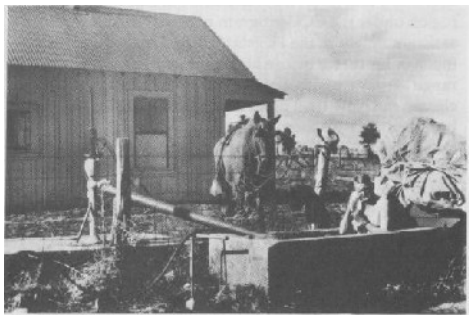

Figure 57. . Ranger Cleo J. Anderson, Jicarilla Ranger Station, Carson National Forest,

The move was made in Forest Service stake-bed trucks. As soon as the family arrived at the Clear Creek Station, one of his children used the toilet, which promptly flooded the bedroom when it was flushed. The wood-burning stove had never been cleaned, and the grime had to be chipped away with a chisel. Cupboards were caked with jam, syrup, and dried foods. The two-bedroom house was too small and infested with termites. Scorpions, centipedes 6 to 8 inches long, and black widow spiders occupied the house, while outside rattlesnakes, porcupines, and "various other varmints . . . would keep us awake nights with their yowling, fighting, and lovemaking." In 1945, the family was delighted to be moved to the Capitan Ranger District in the Lincoln National Forest.[40]

Other foresters who joined the region in the 1930s and whose careers in many ways paralleled or intersected with Graves included Dick Johnson, who was from Las Vegas, NM. Johnson began work in February 1937 conducting range surveys on the Tonto National Forest with Hollis Palmer as chief of the party. Dean Cutler, from Iowa, joined the Southwestern Region as a CCC foreman at the Woodsprings camp in charge of porcupine control. In 1935, he went to work under Fred Merkle in timber sales and stayed in the region until his retirement in 1973, but for an interlude in the Chief's Office in Washington, DC. Robert Courtney was born in a log cabin in northern California and completed forestry studies at Oregon State University in 1933. The only jobs available were with the Federal government, so he took a job as camp foreman at the Los Burros CCC camp on the Sitgreaves National Forest in Arizona, with a salary of $1,600 per year. He still remembers riding up to the camp on a truck carrying explosives. Courtney retired in 1970.[41]

Raised on Cattle Ranch. Stanton Wallace, whose father had been a forest ranger on the Coconino from 1904 to 1910, was raised on an Arizona cattle ranch. He graduated from Northern Arizona University in Flagstaff in 1932 with a Bachelor of Arts degree in education. He taught school, worked as a fire lookout, built telephone lines, drove teams, and went back to school to do graduate work in forestry and range management. He was hired by the region under the CCC program in July 1935 and was made assistant ranger in the Flagstaff District in August. He spent

much of his career before his retirement in 1969 working on range surveys, grazing, and range management.[42] Very clearly, the New Deal programs, and the CCC in particular, brought many potentially unemployed forestry professionals into Forest Service employment. The result was an infusion of trained professionals, unusually well-qualified and ambitious young men, into the Forest Service at a particularly critical juncture of Forest Service development in the Southwestern Region and elsewhere throughout the United States.

As had so many others, Cleo J. Anderson worked in the region under CCC auspices during the Depression, but he went directly from the CCC into military service without having been a regular Forest Service employee. After World War II, Anderson experienced some difficulty in being reinstated under Civil Service and with the Forest Service. He finally obtained his appointment and served as ranger in the Payson and Williams Districts of the Tonto, in the Guadalupe on the Lincoln National Forest, and at the Jicarilla Ranger District of the Carson National Forest, among other duties. Lacking a college degree, Anderson thought himself lucky to have headed six different ranger districts during his career. His years, however, were not easy, and he developed considerable animosity for some of his colleagues and superiors. By the time he retired, after 33 years in the Southwestern Region, he became convinced that the Forest Service had become an "out-of-control bureaucracy" and that there had been many mistakes made particularly concerning summer home permits, grazing permits, and promotions. Many rangers' dwellings, he felt, had become grossly inadequate, if not dangerous.[43] Since his retirement, Anderson has compiled rosters of the rangers from the 60 or so ranger districts in the region. These are to be placed in a museum for the permanent record.

Although Anderson's concerns tended to be very specific and highly personalized, his premonitions that began to develop in the 1950s and 1960s had some basis. The region in 1950 was very much like it had been in 1935. The people were often the same, the houses were the same, and the work was being carried on in much the same way. But problems were clearly developing. Postwar inflation was affecting the whole Nation, but government pay seemed to remain critically low. Attractive employment alternatives with government, the military, and particularly private industry made recruiting and employment in the Forest Service difficult, even when rare budget increments made it possible to hire new personnel.

Pressures Increase. Pressures on personnel and staff also became greater, rather than less. Traditional permit activities such as timber harvesting, grazing, and building summer homes continued, while recreation, tourism, and other special uses soared. Moreover, rising conservation and wilderness preservation interests among the public increased the focus of public attention and the media on the Forest Service. Old-time foresters, unused to the necessity of the new "impersonal" public contact, the increasing bureaucracy, and mounting paperwork, chafed at the growing amount of white-collar desk and clerical work. In reality, the deluge of new conservation, preservation, safety, and open-hearings laws that made the work of the forester predominantly one of filing reports, answering charges, and appearing in court and public hearings was yet to come. By the mid-1950s, the urgency of reform and improvements finally began to be reflected in larger congressional appropriations to the Forest Service. Smokey Bear and the forest ranger's traditional image as a conscientious public servant, and a person who helped safeguard the Nation's forest resources, helped direct new funds into national forest programs in the late 1950s and throughout the 1960s.

This period marked the day of the new Forest Service professional and specialist. Special staff positions supplemented the forester's work at the ranger district, forest supervisor, and regional

forester levels. Recreation specialists, archeologists, landscape architects, biologists, engineers, and other specialists joined the Forest Service staff in the region. Long-time foresters, such as Donald Bolander and Milo Jean Hassell, are very sensitive to the changes occurring in the work and personnel of the region since the 1950s.

Donald Bolander, whose father, A.L. "Archie " Bolander, spent his entire career on the Carson National Forest, was literally born and reared in the Forest Service. Bolander, currently supervisor of the Prescott National Forest, believes that in its exuberance to preserve the land and timber resources, the Forest Service has sometimes overlooked the interests of the "little guy" and the local community. He feels that the service had relatively little "cultural awareness" and that the influx of new people, and the specialist, contributed to a growing gulf between the residents and the users of the forest resources and the Forest Service.[44]

Bolander believes that the ranger, who was once a member of the community, has become a bureaucrat. Wives and children, who were once active members of the Forest Service "family," now live in urban centers and have little involvement with the service—and seem to prefer it that way. Moreover, those who work for the service have "8 to 5" jobs. Even if one desired to do so, working in excess of an 8 hour day is now prohibited by law, he said. He foresees a considerable decline in enthusiasm for a Forest Service career. There is too much bureaucracy, the people are different, the job is different, and there is too much paperwork. One can no longer really *do* a thing, he said. The outdoors is not even accessible to the professional forester.[45]

Jean Hassell Retires. Regional Forester Milo Jean Hassell announced his retirement from the Forest Service on July 2, 1985, after 31 years of Federal service. He was born in Chihuahua, Mexico, and reared in Grants, NM. He graduated from Utah State University and, while a student, worked in the summers on the Kaibab National Forest. He began his career as a junior forester in 1958 and became ranger on the Elgin District of the Coconino in 1960. With a degree in forestry, a minor in range management, and good experiences and associations with Hispanic and Indian groups in Arizona and New Mexico, Hassell had special concerns and competencies that uniquely fitted him for leadership positions in the region. Hassell believes, for example, that the Southwestern Region has tended to ignore the plight of the northern New Mexico villages whose economy and lifestyle had been so closely linked to grazing on National Forest System lands. And as Bolander had suggested, Hassell believes that regulations had tended to ignore the "little guy."[46] This sentiment was echoed by William Hurst, who preceded Jean Hassell as regional forester. Hurst explained:

> . . . that it was not so much the attitude of the individual Forest Officers which encouraged neglect of local people and their needs as it was the policies of the Forest Service itself. For example, every citizen of the United States has the right to acquire a grazing permit on the National Forest through purchase with waiver of an established farm or ranch which has a grazing permit attached to it. Outsiders with money could and did come into the small, predominately Spanish speaking communities in Northern New Mexico, buy up the small farms and ranches and acquire the grazing permits. In a short time this left many local people without a traditional means of making a living since many did not choose to leave and seek employment elsewhere. Similar situations developed in the timber business where small sales were discouraged in place of large timber sales which local people were not able to handle. Because of these and other situations of encroachment, unrest fermented culminating in the Tijerina uprising of the 1960s.

> To meet this challenge the Forest Service made major adjustments in its grazing and timber policies in Northern New Mexico and initiated a concerted effort to recognize the traditional needs of the local people. Rangers and staff officers were required to learn Spanish to improve communications. Contracting opportunities for fence, road, campground and other construction opportunities and work oriented projects such as timber thinning, among others, were made available to local residents. Grazing and timber policies were adopted making it more difficult for outsiders to acquire small timber sales and grazing permits in areas which had traditionally served local people. These changes, along with a strong emphasis on cultural awareness, was infused in the Region in the late 1960s and early 1970s.[47]

Hassell also believes that rangers, because of consolidation of the ranger districts and increasing paperwork loads, were losing contact with the land and the people. Specialization tended to widen the breach between the ranger's traditional role as one who was knowledgeable of the land and the people within his district. A ranger, he said, should *know the land,* and a ranger district must be a finite territory. He also was concerned that the Governor of Arizona had recently labeled the Forest Service as "30 years behind the times," because he felt it still thought of timber harvest as its major function–as opposed, for example, to the contemporary interest in and economics of recreation and tourism.

Hassell's career clearly aimed at keeping the region in step with the times. He had infused a new cultural awareness in the region. He believes that the Forest Service had, in fact, moved from the "axe and grounded telephone line" to the computer age. In making this rather difficult transition to the modern age, Hassell believes that the old dedication and pioneering spirit of Forest Service personnel lived on.[48] Jim Owens, Arthur Ringland, Bob Courtney, Ralph Crawford, Bill Hurst and so many before them had made an indelible imprint upon Jean Hassell, the region, and the national forests and its users. Times had changed, faces were new, people sometimes were different, jobs often were more technical, and paperwork was more ponderous, but the inherent mission and spirit of the Southwestern Region have survived.

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Chapter 16. The Organizational Structure

The Forest Service is a Federal bureaucracy with operations and offices in almost every State of the Union. It has, almost from the beginning and with unusual consistency, pursued a policy of decentralized administration. The Chief of the Forest Service in Washington, DC, prescribes general policy guidelines and allocates funding to the nine regional offices of the Forest Service, as directed by the Secretary of Agriculture and authorized by the President and the Congress of the United States. The regional forester's office defines and interprets the guidelines as they apply to the region, where policy directives are then issued to the national forests. There, the forest supervisor disseminates those instructions to the staff divisions and ranger districts as might be appropriate.

Figure 58. Office of the Supervisor of the Alamo National Forest, about 1905. (Forest Service Collection, National Agricultural Library)

The development of administrative policies and guidelines themselves are derived from Federal law, and from the reports and information channeled up from the ranger districts through the forest supervisor and the regional forester to the Chief of the Forest Service. The Chief, of course, is responsible to the Secretary of Agriculture and, through that office, to the President and the Congress of the United States. Within the region, planning and management tend to be concentrated at the national forest level. The regional office serves prominently as the agency that collects and disseminates information, coordinates planning and policy formulation, and allocates resources among the national forests. The ranger district is at the end of the administrative hierarchy. In addition to the National Forest System, the Forest Service has a Research Division and the State and Private Forestry Division. Although this is a very loose characterization of the administrative system of the Forest Service, it provides perspective for understanding the administrative structures and systems of the Southwestern Region.

In 1908, about 36 full-time professional staff people administered the regional office and 17 national forests in the Southwestern Region, with a field force of rangers and assistant rangers numbering less than 200. Now there are 109 full-time professional staff people in the regional office and 539 in the field. There were, in 1908, few secretaries, clerical people, or even typewriters in the entire region, and essentially none at the ranger district level.

Line and Functional Authorities

Administrative philosophies, planning procedures and systems, and management concepts, superimposed on the structures established for administration, provide a good overview of how the Forest Service operates. *Line and functional* authorities are parallel administrative networks that operate under control systems that assign work, delegate authority, and review achievements. Planning has been the primary activity of the functional divisions of the regional organization, which provides the direction for line actions. The administrative skeleton of the region can be fleshed out by reviewing the mechanisms for planning, management, directives, and program evaluation. These mechanisms and the administrative structures began to develop very early and have changed relatively little other than in size and complexity.

When the Forest Service began operation in 1905, Chief Forester Gifford Pinchot and Secretary of Agriculture James Wilson emphasized that conservation and "wise use" would be the guiding principles of the agency. Wilson advised in his famous authorizing letter to Pinchot that these principles could best be applied and pursued "only when the administration of each reserve is left very largely in the hands of the local officers, under the eye of thoroughly trained and competent inspectors."[1] Thus the basic administrative policy of the Forest Service was immediately set in place.

Despite the theory and structure, in reality during the first few years, administrative control did emanate directly from Washington, DC, perhaps necessarily until personnel and management systems could be put in place within the districts (regions). During the first few years of operation, field administrators were brought to Washington for training sessions of 2 or 3 months to learn the business of managing the national forests. This "detail" assignment of administrators to the Chief's Office, in fact, continues today. Finally, on December 1, 1908, Pinchot reaffirmed the policy of decentralization and localized national forest administration.[2][2]

Six districts, later renamed regions, were formed at first. Arthur C. Ringland became District Forester of the Southwest Region, and Earle Clapp was named his associate. Ringland recalls that all of the district foresters had studied forestry in school, served as forest assistants, had field experience, and had served as inspectors of the forest reserves.[3] In 1908, 15 foresters were assigned to the Southwestern Region, who, said Ringland, "concentrated intensely on carrying out the Pinchot philosophy of service in the public interest."[4] Ringland observed later that the policy of decentralization was based on Pinchot's temperament that "accepted and applied the dictum that a straight line is the shortest distance between two points."[5] Pinchot believed that problems from the field could best be solved by administration as close to the source as possible.

Decentralized Administration

Pinchot believed that decentralized administration was wise because it reduced paperwork and left more time for local foresters to work in the field. Ringland recalled that before the institution of decentralized programs in 1908, "the supervisors would have to send reports to Washington

that assumed the size of a cowpuncher's bedsheet." It was necessary, he said, that "clear cut channels of direct action and administration be set up from field to office."[6]

By July 1, 1914, the southeastern units, including Arkansas, Florida, and Oklahoma, were separated from the southwestern units of the original district to create new dimensions for District 3, leaving only Arizona and New Mexico, and so essentially establishing the size of Region 3 as it is today. The addition of the grasslands in Oklahoma, Texas, and New Mexico after World War II completed the region. In 1914, there were 23 personnel at district headquarters in Albuquerque, 34 in the national forest supervisors' offices, 141 year-long rangers (one per ranger district), and 188 short-term guards.[7] The 1918 *Use Book* described the principal permanent positions of the Forest Service at the national forest and ranger district levels, all of which fell under Civil Service specifications.

Job titles included supervisors, deputy supervisors, forest examiners, rangers, lumbermen, and scalers. Forest supervisors planned the work of the national forest under the direction and supervision of the district foresters. Forest examiners provided technical expertise in areas such as the examination and mapping of forests. They made recommendations on applications for timber purchases and advised on scaling, marking, and forest planting operations. Rangers supervised timber sales, grazing, free and special uses, contracts and permits, protection and improvement plans, and other administrative activities. Lumbermen were required to have much previous experience in woods work and a high degree of proficiency in cruising, logging, and milling. Scalers also needed considerable previous experience in scaling and woods work.[8] The *Use Book* also established qualifications for forest assistants, forest guards, field assistants, and temporary laborers and clerks, all of whom, unlike the regular staff positions, were exempt from qualifying examinations.[9]

A Businesslike Approach

The essence of Forest Service administration on the regional level has been a businesslike approach to problems, and the solution of those problems on the ground by those who have firsthand contact. In addition, the administrators and workers on the local level have, over the years, displayed a remarkable degree of dedication to their work. They are, commented author George Fitzpatrick, "wedded to their jobs and dedicated to the philosophies of the Forest Service even when they differ personally as to the best ways to carry out the policies of the agency."[10]

Dedicated employees and often inspired leadership have combined to make the mission of the Forest Service in the Southwestern Region, on the whole, successful and well-executed, despite the sometimes enormous difficulties created by the region's own unique physical and cultural environment.

Region 3 has been blessed with very strong and dynamic leadership in the Regional Forester's office. Arthur C. Ringland, the first "Regional Forester," set the tone and style of leadership and responsibility for those who followed. Moreover, many of the regional foresters enjoyed unusually long tenure. Only nine people, excluding Arlo Jackson who was named Acting Regional Forester from January 1 through February 12, 1966, have served as regional foresters since the district was organized in 1908.[11] They are:

Arthur C. Ringland	December 1908-April 1916
Paul G. Redington	April 1916-December 1919
Frank C.W. Pooler	January 1920-June 1945
Philip V. Woodhead	July 1945-July 1949
C. Otto Lindh	October 1949-October 1955
Fred H. Kennedy	October 1955-December 1965
William D. Hurst	February 1966-June 1976
Milo Jean Hassell	June 1976-July 1985
Sotero Muniz	July 1985-present

Sotero Muniz, the current regional forester, served under Jean Hassell as deputy for administration in Region 3 from 1980 to 1983. He is a native of Ogden, UT, and an engineering graduate of the University of Utah. His first job with the Forest Service was as a materials engineer in the regional office in Ogden. After duty in Nevada and Washington, DC, he went to San Francisco in 1967 to serve as chief for water developments and sanitation in that regional office. He received an assignment as deputy supervisor of the Sierra National Forest in California in 1969 and became forest supervisor in 1971.[12] His Hispanic and western cultural background and his training in engineering and experiences in water resources in the West and in the region provide him with a strong identification with the Southwest and its unique characteristics.

Regional Forester Must Handle Everything

The tradition is that the regional forester must be everywhere and handle everything. That style of administration, initiated by Ringland, and certainly perpetuated by such administrators as Pooler, Hurst, and Hassell, could only work with the able assistance of strong staff officers. The assistant regional foresters have been invaluable contributors to the successful administration of the region. Many of these, of course, have moved into higher leadership positions. Raymond H. Marsh, for example, was a particularly effective assistant whom E.E. Carter lauded in a 1926 inspection of the region.[13] For decentralization to work, authority must be vested in the people in charge of local offices. At the national forest level, it is the forest supervisor, and at the ranger district level, it is the forest ranger who exercise authority.

Early rangers were expected to have intimate personal knowledge of their district and to be able to work and survive in the forest alone. They were directed to conduct regular patrols on horseback, protect their district from fire and trespass, mark boundaries, and supervise the use of timber and stone.[14] As time passed, the responsibilities and the instructions to rangers were clarified and broadened. Regular visits with other line and staff personnel were scheduled. One of the earliest such scheduled ranger programs, for example, occurred in October 1912, when all officers and rangers of the Apache, Datil, and Gila National Forests met. Assistant District Forester A.O. Waha discussed "policies pertaining to forest administration," and Datil Supervisor Johnston reviewed the "possibility of increasing efficiency of administration through joint meetings." Another separate rangers' meeting was held for the Pecos, Carson, and Jemez National Forests during the same month where "problems in local administration" was the topic.[15] To be sure, decentralization was not always easy to sustain, and within the region, some thought it could be carried to extremes.

John H. Preston thought in 1921, after an inspection of the region, that in the area of silviculture District 3 was entirely too strongly centralized. Sufficient authority, he said, was not being given to forest supervisors on timber sale matters. He could see no reason, he said, for not giving

supervisors on the Tusayan, Coconino, Santa Fe, Carson, and perhaps the Lincoln full authorization to handle timber sales.[16] But Assistant Regional Forester Raymond Marsh responded that "we must not be swept off our feet by Preston's comments on decentralization, which are based on strong personal ideas" and are debatable. If Preston's ideas of decentralization are carried to their logical conclusion, he said, we would end up with 14 different marking policies, systems of brush disposal, and appraisal. "I am in favor of decentralization," he said, "just so far as it can be made efficient."[17]

Frequent Inspections

Frequent inspections of ranger districts by forest supervisor staffs established controls over the districts, just as such inspections by the regional office imposed control over the national forest offices. Forest Supervisor W.H. Goddard advised his staff in 1912 that field inspectors should not hesitate to "extend praise for good work and express disapproval in the case of negligence."[18]

National forests within the region developed the policy of having annual meetings for the entire work force in order to benefit from each person's experiences and to promote *esprit de corps*.[19] Similarly, forest supervisors met annually in the district (Albuquerque) office, and regional foresters met with personnel from the Washington, DC, headquarters at some centrally located place (often Ogden) once each year.[20] In the Southwestern District, these annual meetings with forest supervisors were called *executive sessions*. They often produced real policy changes within the region. For example, in 1921, the executive session criticized the size of the district office staff, and as a result, the staff was reduced the following year.[21] Since 1908, forest supervisors have had considerable autonomy in line responsibilities, including developing and applying policy, planning, organizing, directing, training, controlling, internal relations, and public relations.[22]

At the level of the ranger district, the responsibility for the management of all activities was assigned "clearly and definitely" to one person—the district ranger. "He may delegate some of his authority and related responsibility to his subordinates," but he could not subdivide his district, or delegate responsibility for all activities within a subunit to a subordinate.[23] As the size of ranger districts enlarged, partly because of the automobile, and partly because of real or imagined needs for greater economy and efficiency, the ranger's personal knowledge of the district has declined. As Ed Groesbeck observed, "Years ago the Ranger knew his permittees, where their lands were, and how to speak the permittees' language"; now, he said, some rangers do not even know where their boundaries are, and many are moved around so fast they have no time to become acquainted with their district. All are buried in paperwork.[24] But while the modern ranger may differ from his predecessor, the modern ranger tends to be better educated in the technology of his job. He is now more of a business executive with trained specialists to help him do his job, but like his predecessor, he is still an outdoorsman.[25]

The basic administrative unit is the ranger district, and despite changing times and the greater influx of users, it has been a most efficient unit. It represents the delegation of authority literally to the "tree and grass roots."[26] An excellent review of the administrative character of the ranger district and the national forest is contained in the Kirkpatrick-Lott General Integrated Inspection report of the Gila National Forest in 1954. This analysis is especially helpful in evaluating the organization of the Southwestern Region prior to changes in management and planning resulting from the management acts passed by Congress in 1960 and after. Representative of the other forest units, personnel on the Gila were well-organized and clearly informed of their place and

responsibilities in the chain of command.[27] Staffing was adequate to provide the required support, but, probably as was true on many other forests, work plans tended to be perfunctory, in good measure because the rangers and personnel knew their jobs without having an elaborate written explanation.

Line and Staff

Within the Forest Service, as within most organizations, the line and staff served separate functions. In line authority, a superior exercised direct authority over a subordinate, whereas a staff relationship is advisory.[28] Clare Hendee has described the organizational format of the Forest Service very succinctly in the study entitled *Organization and Management in the Forest Service*. Hendee explained that the Forest Service has adopted a line and functional staff combination as its basic form of organization. The line authority makes decisions, activates overall objectives, policies, plans, and programs, and coordinates the different functional activities. The role of the functional staff is primarily to advise, recommend, observe, and report. Functional staff people derive their authority from the line officer to whom they report.[29]

Hendee described four principles of Forest Service organization:

1. *Functional segregation principle*—where similar kinds of work are segregated and assigned to a person or group.
2. *Scalar principle*—where the organization acts like a hanging chain, with vertical links where authority flows down and where responsibility flows up.
3. *Decentralization principle*—where responsibility and authority to act are placed at the lowest possible level.
4. *Span-of-control principle*—where the line makes decisions of policy and procedures, but assigns tasks for their application to staff assistants.

In addition, the Forest Service uses a system of fine controls, through audits and inspections. Hendee summarized these as including "assignment of program and work responsibilities; delegation of authorities commensurate with those responsibilities; and a system of checking to determine whether responsibilities are met within the authority delegated."[30]

Five Types of Inspections

Administrative controls on a ranger district, on a national forest, or in the Southwestern Regional Office are accomplished in a number of ways. Inspections constitute a time-honored method of determining the level of local or regional control of Forest Service policies and practices. There are five types of inspections that examine the performance of the regional forester, forest supervisor or forest ranger; and their line/staff subordinates. These are: (1) the general integrating inspection, looking at all aspects of the land management job; (2) the general functional inspection, evaluating one resource management function; (3) the limited functional inspection, concentrating on one task within a function or an area; (4) the board of review; and (5) investigations.[31] Several general integrating and functional inspection reports provide useful examples for developing a critical historical perspective of Forest Service effectiveness in the Southwest.

Personnel management was the subject of a general functional inspection of the Prescott National Forest in 1968. M.D. Ray, the inspector, praised the decentralized nature of the personnel management achieved on the Prescott since the last inspection in 1962. He complimented the delegation of employment authority and the integration of the personnel management concept. A specific example cited was the supervisor's withholding a step increase that had been scheduled for a ranger; upon appeal, the action was upheld. Also noted was the good record on equal employment opportunity and a poor record in the business management section of the supervisor's office.[32] The national forests are basically autonomous in some respects, but they must abide by the general principles and procedures outlined by the Washington office. The history of the Southwestern Region and the decentralization in the Forest Service help one understand why the administration of the southwestern national forests has worked well. In the parlance of top professional football team defenses, "It may bend, but it doesn't break." Directives from the top are adapted to local conditions, but the spirit and purpose of the directives are implemented, and all programs are reviewed to be certain that they do accord with the directives issued.

The Forest Service Directives System

The Forest Service's administrative governance has been through its directives system. In 1981, the publication *Organization and Management* in the Forest Service explained that "the directives system is designed to include all laws, regulations, orders, policies, standards, and procedural instructions that govern Forest Service programs and functions." The directives system comprises four major components: (1) the *Forest Service Manual*, (2) the *Forest Service Handbook*, (3) temporary directives, and (4) external directives not incorporated in the Manual or Handbook.[33] The original comprehensive directive, of course, was the Use Book, first published in 1905. On August 23, 1905, Thomas M. Meagher, Forest Supervisor for the Santa Catalina and Santa Rita Forest Reserves, in Arizona, mailed a copy of *The Use of the National Forest Reserves* to Charles J. Bush, Forest Guard at Catalina Camp. In the letter, he explained:

> Forest officers, therefore, are servants of the people. They obey instructions and enforce regulations without fear or favor, must not allow personal or temporary interests to weigh against the permanent good of the reservations but it is no less their duty to encourage and assist legitimate enterprises. They must answer all inquiries concerning reserve methods fully and cheerfully, and be at least as prompt and courteous in the conduct of reserve business as they would in private business.[34]

The next day, he wrote to Washington requesting additional copies. The *Use Book* was also supplemented by what were then known as "forest reserve orders."[35]

The *National Forest Manual* first appeared in 1911. A separate section of the manual, "General Administration and Protection," was issued in 1912. Included was a section on "relations of forest officers to the public," containing much the same language used by Supervisor Meagher to Forest Guard Bush in 1905. The field organization of the Forest Service was outlined and included a recitation of "Duties of Service and District Officers and Supervisors When in the Field: "[36]

The Southwestern Region has issued, from time to time, documents for regional use, which supplemented material in the *Forest Service Manual*. In April 1916, the District issued a *Silviculture Handbook*. The introduction, above District Forester Arthur C. Ringland's signature, stated that the handbook contained policies and instructions to supplement the *Forest Service*

Manual. A more recent supplement, the 1948 *Timber Management Handbook*, contained information on the proper method of managing the region's timber resources. Another supplement, the *Multiple Use Management Guide*, was first issued in 1959, and revised and enlarged in 1967. In 1972, the region's *Guide to Land Use Planning* was issued.[37]

The functions of the several layers of guides and plans that were formulated to document and set direction for multiple use management of the National Forest System were outlined in the original *Multiple Use Management Guide*:

> At each administrative level, a multiple use analysis of these inventories is made for specific areas of land. Broad policy and guidelines are established for the entire National Forest System. More specific management direction and Coordinating requirements in keeping with the broad policy and guidelines are spelled out in Regional Multiple Use Guides. Loral multiple use management decisions are spelled out in Ranger District Multiple Use Plans.[38]

Instructions or "handbooks" for describing procedures for special types of work are also published. One of these, which pertains to Arizona and New Mexico national forests, is *Field Instructions for Forest Inventory, Rocky Mountain Area*, revised in 1957, with the Intermountain and Rocky Mountain forest and range experiment stations and Forest Service Regions 1 through 4 as participants. State supplement sheets were prepared for the treatment of inventory of national forest lands in these regions.[39]

Directives generated at the Chief's Office to serve all national forests in the Nation, and at the regional office to serve the national forests in that region, form the basis for standardized procedures. They are the basic management tool for a bureaucratic structure that has become increasingly large and complex over the years.

Planning in the Southwestern Region

Plans for the national forests of the Southwestern Region were developed very early, and planning is a continuing element of good management. Timber management, fire control, and grazing plans date from 1912. Fire control always had been a high-priority item. The Loveridge-Cliff inspection report on the Southwestern Region in 1945 contained a critical evaluation of planning. One of these criticisms concerned the conversion of plans into action. "There continues to be the 'need' . . . for forest officers—from the R.O. Staff down to the individual rangers—to convert plans into active action. This is the most serious weakness in I&E [Information and Education] in R-3," the report stated:[40]

Kirkpatrick and Lott, in their 1954 inspection report of the Gila National Forest, devoted considerable time to the status, quality, and degree of use of the various plans needed or in effect. They stated that the annual plan of work was more visionary than specific and that it should "tie down jobs to be done" and assign clear responsibility to each person. The financial plan was evaluated as workable. Monthly work plans were deemed "perfunctory." The maintenance plan was viewed as very good, having been developed with the rangers and the construction and maintenance foremen. The general range management plan was expected to be "strengthened, localized, and made more specific." The only watershed improvement or rehabilitation plan in effect was noted to be on the Silver City Watershed, but no critical comment was issued on why

others were not available. Timber management plans were viewed as adequate. The inspectors found the fire plans on the Gila "in good shape."[41]

The national forests of the Southwestern Region have for decades also employed "action plans" for specific purposes or in a certain aspect of the multiple use management charge on a small area. Examples of these are timber sale plans, road layout plans, permittee range management plans, and controlled burning plans.[42] In addition, the various divisions in the Southwestern Region also produce annual accomplishment reports and plans, such as the "Watershed Management Planning and Accomplishment Report for Fiscal Year 1976."[43] Records of the regional office and of several national forest offices during the 1960s and 1970s include such titles as:

1. Regional Office, Interagency Planning Program, Fiscal Year 1967
2. Apache National Forest, A Plan for Reducing Fuel Accumulation
3. Apache National Forest, Fire Plan, 1969
4. Apache National Forest, Apache Forest Dispatching Plan, 1969
5. Apache National Forest, Apache Aerial Operations Plan, 1969
6. Apache National Forest, Range Restoration Plan
7. Cibola National Forest, Sandia Mountain Hazard Reduction Plan
8. Prescott National Forest, Preattack Planning
9. Santa Fe National Forest, Master Fire Plan, Calendar Year 1968
10. Santa Fe National Forest, Five Year Timber Harvest Plan

Another system of planning by the Forest Service that had great effect on the Southwestern Region, and all the other regions, began early in the 1960s under the Multiple Use-Sustained Yield Act. "Each forest prepared a multiple-use plan, which provided a general framework within which the plans for specific resources could be coordinated; ranger districts then prepared their own multiple-use plans based on the plan for the forest." In 1971, the Forest Service began to substitute *unit plans* for the multiple-use plans.[44]

The central authorization for recent planning in the Forest Service has been expressed differently in *Organization and Management in the Forest Service*, published in 1962 and again in 1981. In 1962, the Multiple Use-Sustained Yield Act had just been passed; in 1981, the Resource Planning Act of 1974 and the National Forest Management Act of 1976 were in force; and in both years, the National Environmental Protection Act was in effect.

As a result of interpretations of Section 6 of the National Forest Management Act, area guides and unit plans have now been replaced by regional and national forest plans. A publication issued by the regional forester in 1980, *Land & Resource Management Planning: Issues, Concerns, and Opportunities, Arizona's National Forests*, outlines the planning process to the general public. It mentions that plans for management of the national forests, "known as Land and Resource Management Plans, . . . apply to all three levels of the Forest Service: national, regional, and to each National Forest."[45]

Planning Today

Today, planning on the national forests of the Southwest is a major effort, and voluminous documents are produced. The procedure on each national forest calls for a two-step process, with distinct activities for each step:

1. Listing issues, concerns, and opportunities; gathering inventory data on the resources of the national forest; preparing a proposed national forest plan (with alternative choices of action and selection of one of them) and draft environmental impact statement (hereafter called “proposed /draft”); and filing them with the Environmental Protection Agency, to be followed by a period of public input.
2. Integrating public input into the proposed plan; accepting the proposed alternative or choosing another; preparing a final national forest plan and final environmental impact statement (hereafter called "final/final"); and filing them with the Environmental Protection Agency.

The procedure for the proposed /draft step for each national forest in the Southwestern Region is similar to that outlined for the Gila National Forest, where its supervisor, in a letter accompanying the proposed/draft reports issued in mid-1985, stated:

> Planning on National Forests is conducted under the authority of the Multiple Use-Sustained Yield Act of 1960, and the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act of 1976. The assessment of environmental consequences of alternatives is prepared in conformance with the National Environmental Policy Act of 1969.[46]

The sequence and timetable for the proposed /draft step of the forest plan for the Cibola National Forest is typical of those of the other national forests in the Southwestern Region.

The Cibola National Forest on August 17, 1984, issued the proposed /draft documents and announced eight "open house" meetings to explain the plan, a final meeting to gather information from the public, and an invitation to respond in writing for those who could not attend the meeting. On July 15, 1985, the Cibola issued the final set of planning documents, a six-part package. Included were:

1. *Environmental Impact Statement for the Cibola National Forest*, 240 pages.
2. *Cibola National Forest Land and Resource Management Plan*, 279 pages.
3. *Public Comments and Forest Service Response to the DEIS, Proposed Cibola National Forest Plan*, 374 pages.
4. *Summary of the Environmental Impact Statement for the Cibola National Forest Plan*, 33 pages.
5. *Record of Decision*, 6 pages.
6. A set of maps.

The cover letter from Forest Supervisor C. Phil Smith explained the role of each of the six parts. The letter also included a statement that the plan provided a "framework for the Forest Service and all interested parties to work together during the next decade."[47]

By September 30, 1984, the Carson, Cibola, Coronado, and Tonto National Forests had draft forest plan environmental impact statements filed with the Environmental Protection Agency. The

planning process for all forests was nearing completion. The fiscal year 1984 annual report of the Forest Service stated that each region, including the Southwestern Region, had completed guides and environmental impact statements required by the National Forest Management Act. The final outcome of this planning process, which produces such detailed, ponderous documents, is still unknown. An article in the December 1985 issue of Journal of Forestry shows that not all foresters agree on the practicality of national forest plans with such length and so many alternatives investigated. "Comprehensiveness," one author said, "is a trap. . . . The current disarray and high cost of National Forest System planning, pursuing the will-o'-the-wisp of the Resource Planning Act's misconceived comprehensiveness, is a tragic illustration."[48]

In Conclusion

Administration under the magnifying glass can be a debilitating experience; over scrutiny and the threat of lawsuits take the joy out of work. This seems to be the case of the Forest Service today, not just in the Chief's Office, but in Albuquerque and even in forest supervisors' offices, or in the rangers' offices in towns such as Alpine, Sedona, Sierra Vista, El Rito, Mountainair, or Coyote. Burnout, disillusionment, or both seem to result in careers being shorter now than in the "old days." More paperwork and less time in the field tend to discourage people who enter the profession of forestry or the other land and resource management professions, because of their altruism, from staying on until they reach normal retirement age. As one staff member of the supervisor's office of an Arizona national forest confided, his best memories in the Southwestern Region were when he could spend an entire day on the New Mexico national forest where he once served without seeing another human being.[49] The day he said this, he was too busy working on the forest's planning documents to visit but a few minutes!

In the early days of the Forest Service, perhaps too much time was devoted to field endeavors. Now, however, perhaps too much time is devoted to office endeavors. Seeking a happy compromise to the two extremes seems to be advisable. It is unfortunate that the resources to be managed cannot respond. Might they seek more personal care and less tabular treatment in planning documents? Aldo Leopold's phrase "thinking like a mountain" might be a good motto to follow.

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[26] Earle W. Loveridge, "The Administration of National Forests," in *Trees, Yearbook of Agriculture*, 1949 (Washington, DC: U.S. Department of Agriculture), p. 373.
[27] Dahl J. Kirkpatrick and Kenneth W. Lott, "General Integrating Inspection Report, Gila National Forest, July 5-August 5,1954," n.p.,1954, various pagination, 0-2-0-3, Federal Records Center, Denver, 095-62A0421.
[28] Harold Koontz and Cyril O'Donnell, *Principles of Management: An Analysis of Managerial Functions* (New York: McGraw-Hill, 1964), p. 263.
[29] Clare Hendee, *Organization and Management in the Forest Service* (Washington, DC: USDA Forest Service, 1962), p. 9.
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[31] Paul J. Culhane, *Public Lands Politics: Interest Group Influence on the Forest Service and the Bureau of Land Management* (Baltimore: Johns Hopkins University.
[32] Press, for Resources for the Future, Inc., 1981), p. 67. 32.Milton D. May, Regional Personnel Officer, "General Functional Inspection [Personnel Management], Prescott National Forest, April 9-May 3,1968," (Albuquerque, NM, 1968), pp. 1-2.
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[34] Thomas F. Meagher, Forest Supervisor, letter to Charles J. Bush, Forest Guard, Catalina Camp (Tucson, AZ), August 23, 1905, 2 pp. (filed at the Coronado National Forest, 1685).
[35] Thomas F. Meagher, Forest Supervisor, Letter to the Forester, Forest Service (Tucson, AZ), August 22, 1905, p. 2. (filed at the Coronado National Forest, 1685).
[36] See USDA Forest Service, *The National Forest Manual. General Administration and Protection* (Washington, DC, 1912).

[37] USDA Forest Service, District 3, *Silviculture Handbook*, n.p., April 1916, p.1. (filed at the Coconino National Forest, 1685); *Multiple Use Management Guide for National Forest Administration* (Albuquerque, NM: USDA Forest Service, Southwestern Region, 1959),10 pp. (filed at the Tonto National Forest, 1685); *Multiple Use Management Guide* (Forest Service Handbook, FSH 2121.4) (Albuquerque, NM: USDA Forest Service, Southwestern Region, 1967) (in Robert D. Baker's personal files).

[38] *Multiple Use Management Guide*, 403.1-2.

[39] USDA Forest Service, Intermountain Forest and Range Experiment Station, Rocky Mountain Forest and Range Experiment Station, U.S. Forest Service, Regions 1, 2, 3, and 4, Field Instructions for Forest Inventory, Rocky Mountain Area, n.p., rev. 1957,120 pp., plus State supplements.

[40] Excerpts from the 1945 Loveridge-Cliff G.I.I. —Report-Region Three—and Chief Watts' Letter of Transmittal, n.p. [1946], p. 3.

[41] Kirkpatrick and Lott, "General Integrating Inspection Report, Gila National Forest," various pagination.

[42] *Multiple Use Management Guide*, p. vii; USDA Forest Service, "F.Y.1967 Program of Work, Chief's Office" (Washington, DC: February 1966), 72 pp., appendix, Federal Records Center, Ft. Worth, 095-72A0834; USDA Forest Service, Southwestern Region, "Southwestern Region Program of Work, FY 1967" (Albuquerque, NM: March 1966), 259 pp., Federal Records Center, Ft. Worth, 095-72A0834.

[43] USDA Forest Service, Southwestern Region, "Watershed Management Annual Planning and Accomplishment Report for FY 1975," n.p.,1975, 9 pp., Federal Records Center, Ft. Worth, 095-00002.

[44] Culhane, *Public Lands Politics*, p. 275.

[45] See Hendee, *Organization and Management in the Forest Service*, p.1; USDA Forest Service, *Organization and Management Systems in the Forest Service*, p.1; William D. Hurst, "The Application of Water Yield Research to the National Forests of the Southwest," *Proceedings of 18th Annual Arizona Watershed Symposium*, Rep. 6 (Phoenix, AZ: Arizona Water Commission, 1974), p. 46; Culhane, *Public Lands Politics*, p. 275; George Cameron Coggins and Charles F. Wilkinson, *Federal Public Land and Resources Law* (Mineola, NY: The Foundation Press, Inc., 1981), pp. 505507; and (quoted) *Land & Resource Management Planning: Issues, Concerns, and Opportunities, Arizona's National Forests* (Washington, DC: USDA Forest Service, Southwestern Region, 1980), p. ii.

[46] Kenneth C. Scoggin, Forest Supervisor of the Gila National Forest, letter to "Reader," accompanying *Proposed Gila National Forest Plan* and *Draft Environmental Impact Statement, Proposed Gila National Forest Plan* (Silver City, NM: May 24,1985), p.1.

[47] Lloyd C. Irland, "A Manager's Planning Guide," *Journal of Forestry 83* (12) (December 1985): inside back cover. The author of this chapter also believes that these plans are too long, include detailed but unnecessary information, and yet they often fail to include necessary information, such as acreage distribution by age class of even-aged stands—the most useful quick guide to an index of past timber management efficiency.

[48] Proposed/Draft," *Cibola National Forest Plan*, August 17,1984, Cibola National Forest, Albuquerque, NM. Frank Pooler was Regional Forester for over 25 years. The next Regional Forester in terms of longevity was Gene Haskell.

[49] An article in *The Courier*, a Prescott, AZ, newspaper, July 2, 1985, stated that Hassell, in a telecommunications note, said, "I have decided to retire from active Forest Service status and join the rolls of those who have preceded me to do something else."

Chapter 17. Management Improves the Land

Significantly, lands of the Forest Service in the Southwestern Region tend to be better because of the management. The region produces more timber today than ever before. Grasslands have been improved over their condition at the turn of the century. The Kiowa and Rita Blanca National Grasslands, part of the dust bowl not so long ago, now support over 11,000 head of privately owned livestock each year. The Clayton Livestock Research Center, operated by New Mexico State University, is located on the Kiowa National Grassland and conducts research on cattle diseases and grazing and feeding operations.[1] Once a major mining region, the Cibola National Forest now is a major recreation area, supports a rich wildlife population, and is the home for the Langmuir Laboratory for Atmospheric Research operated by the New Mexico Institute of Mining and Technology. The Laboratory specializes in studies of thunderstorm activity.[2] Water supplies have been substantially enhanced by the improvement of watersheds and the construction of reservoirs. Without the protection of the forests and improved watershed, the growth of the Sun Belt cities in the Southwest could not have taken place.

Wildlife species also have benefited from management. In the Apache-Sitgreaves National Forest, conversion of a seasonal marsh into a 51-acre lake for disposal of secondarily treated sewage from the City of Show Low has improved waterfowl habitat. As a result, duck hatchings increased from 331 in 1980 to almost 3,000, and the new lake provides outdoor recreation opportunities for thousands of visitors. More recently, a dry lakebed in the Kaibab National Forest, called Coleman Lake, was flooded by blasting into underground reservoirs, creating several acres of open water, numerous channels, islands, and mounds for wildlife. Potholes have been blasted into the Cebolla Marsh on the Santa Fe National Forest to develop nesting islands.[3] Fishing habitats and opportunities have also been expanded.

Early in the present century, the Forest Service began a census of animal life in the national forests in order to formulate, in conjunction with the States, policies to protect and encourage wildlife. Wildlife biologists soon discovered that some species in Arizona and New Mexico had declined to alarmingly small and restricted populations and that others verged on extinction. Ranger Louis Cottam described conditions in northern New Mexico, commenting that "you could ride for hours and even days without seeing any large game, and bears and cougars were seldom reported."[4]

Protection of wildlife was somewhat of a problem to the Forest Service, because technically game animals were the property of the State and fell under the prerogative of its agencies. At the same time, however, the Forest Service was responsible to the Congress of the United States for administration and protection of the public forests. Fortunately, both the Forest Service and the States had intelligent and visionary leadership, and they usually have been able to work toward a common goal of conservation of the faunal resources. When controversy arose, as it did in Arizona over the Kaibab deer herd in 1924 and thereafter, compromises have been worked out.[5] The success of the Kaibab operation provided support for the wildlife biologists in the field, and evidence that the Forest Service and the State could cooperate for mutual advantage.[6]

In 1920, the Forest Service published the first comprehensive summary of big game animals in the national forests in the Southwestern Region. Wildlife biologists, who began to be assigned to the national forests in the 1960s, admit that game counts are at best approximate and that it is dangerous to compare individual years. However, as long-range indicators, the counts are highly accurate.[7] Once the basic conditions were understood, the States and Forest Service embarked on programs to protect the threatened species. Species under pressure were supported by hunting

restrictions and habitat improvements, by scientific study of the species and their relationship to their habitats, and by reintroduction into habitats from which they had been eradicated.[8]

Many hunters and conservationists were shocked at the low population counts revealed in the 1920 big game report on the national forests. Although the report covered only game in the national forests, it was still considered to accurately reflect conditions in the Southwest as a whole, since the national forests furnished most of the available habitat. The fact that grizzly bears were almost extinct in the Southwestern Region or that black bears, cougars, wild sheep and goats, and javelina had declined to only a few hundred of each species was not alarming to many, but the revelation that the once-abundant elk and antelope numbered in the few thousands and that deer and turkey could be counted in the tens of thousands attracted considerable attention. Programs were launched immediately by both the States and the Forest Service to correct the situation. Some would take years to reach fruition; others began to reap dividends almost at once.[9]

A perusal of the wildlife reports from 1920 to the present gives an interesting and what has proven to be accurate picture of the game animals in the national forests. Elk are one of the better examples. All elk native to Arizona and New Mexico, the Merriam elk, became extinct about the turn of the century. Transplantation from herds began shortly after World War I. The elk population in 1920 for all of the forests in the Southwestern Region was on1y 585, and it increased slowly until today and has stabilized at 20,000, about the limit that the environment can support. Improvements have also occurred for many other species, including black bears and cougars. One of the more rewarding programs has been the wild sheep and goat program, which through careful management and the reintroduction into old habitat and new areas, has resulted in a constant increase from a few hundred to almost a thousand.[10]

Some efforts to maintain or restore wildlife populations have resulted in failure. The demise of the grizzly bear is an example. To be sure, cattlemen were pleased to see the grizzly removed because of its potential destructiveness to livestock.[11] The American antelope, on the other hand, had a strong and viable population by 1930, having responded remarkably to conservation measures. Populations rose three or four times in the 10-year period after 1920. Antelope remained stable for several decades at about 10,000 head, and then began a gradual decline in the 1960s, which continues into the present. Some wildlife personnel believe the open grasslands, which the antelope favor, are being invaded by brush and pinyon-juniper woods, restricting the available range and thus reducing herd size.[12] Judiciously applied prescription burning might well control such invasions of grasslands.

Cooperation in Wildlife

The Southwestern Region has cooperated for many years with the Arizona and New Mexico Game and Fish Departments in improving fishing grounds and in more recent years in protecting threatened and endangered species. The Gila trout, Rio Grande cutthroat trout, Apache (Arizona) trout, and Gila topminnow are among the species that have received special attention. The Southern bald eagle, the peregrine falcon, and the Kaibab squirrel have been especially nurtured by the Forest Service.

Figure 59. Forest ranger's office, Carson National Forest, Taos, New Mexico, 1939

The economic value of fish and wildlife resources in the Southwestern Region is estimated at approximately $135 million, with hunting and fishing accounting for $51 million, and the remainder being associated with viewing, photographing, and general enjoyment. The RUN WILD computer data base provides foresters and wildlife managers in the region with an unusually strong information base and is an important tool for environmental analysis projects.[13] Private and public agencies have joined the Forest Service in promoting the protection of wildlife and plant habitats.

In 1982, Pennzoil Corporation donated 100,000 acres of prime land in the Sangre de Cristo mountains to the Forest Service. The new lands were added to the Carson National Forest and are known as the Valle Vidal unit of this forest. The unit supports about 2,000 elk, 250 deer, 1,000 turkey, and many nongame animals. The wildlife on the Valle Vidal unit is administered jointly by the New Mexico Game and Fish Department and the Forest Service under a cooperative agreement authorized by the Sikes Act. Under this agreement, both agencies seek to provide both high-quality recreational opportunities and wildlife habitat protection. Similarly, the Sonora Desert Museum in Arizona has helped the Forest Service locate the endangered *Rumex orthoneurus* in new and more protected plant habitats.[14] Despite the great increases in the kinds and intensity of public use of the national forests, the wilderness and favorable plant and animal habitations have not only coexisted with people but have flourished.

Maps

An important work of the Forest Service that began in its first days on the job in the Southwestern Region has been to map and describe the national forests within the region. Although roads and

trails may provide public access, maps explain where to go and what one might find along the way. Timber and range survey crews began the first serious business of map-making soon after the creation of the Forest Service. These crews marked roads, trails, buildings and prominent natural features on their working charts.[15] These early maps and charts have developed into a series of constantly updated, detailed maps that are available to both casual visitors and serious hikers. The maps are based on the U.S. Geological Service Quadrangles, and they contain pertinent information relating to the national forests and their management, and include information of general interest about the forest and the region.[16]

A quick perusal of the maps reveals useful and interesting information. Counties, towns, Indian reservations, other Federal lands, private lands, wilderness areas, and recreational facilities are identified. Highways, roads, and trails are located, and their condition described. A "primitive road," for example, means just that. Overall, the maps are accurate, attractive, easy to use, and moderately priced. They have become an essential factor in the management and use of the national forests.

These maps, as Charles F. Wilkinson commented, "hold out the secrets of the forest to tempt us all. There is magic," he said, "in the national forests":

> You have all seen it, whether in the rump of a cougar heading over a ridge, in the sweep of a hawk on the wing; in the crumbling mass of a musky old-growth Douglas fir as it folds back, like us, into the soil from which it came; in the scratchy side of a sun-blasted canyon in the Arizona or New Mexico high country; or up at Pingree Park.[17]

Natives of the Southwest have long enjoyed the unusual scenic majesty of the region. At the turn of the century, writers, painters, and photographers caught the imagination of the American public through their descriptive works on the Southwest. Thomas Moran painted the Grand Canyon and other scenic attractions. Willa Cather popularized the area around Santa Fe National Forest in *Death Comes for the Archbishop*. Ansel Adams made Taos a household word through his photographs. Many an American's image of the Southwest was fired by Zane Grey's *Under the Tonto Rim*, among his other western novels, the setting for which is along the Mogollon Rim and areas of the Tonto, Coconino, and Apache-Sitgreaves National Forests. (Grey believed that Tonto had a better phonetic sound than Mogollon so he substituted the word Tonto.)

Under the National Forest Receipts Act of May 23, 1908, and the act of March 1, 1911, 25 percent of receipts from the national forests is paid to the State in which the forest is located for the benefit of schools and roads in the county in which the money is collected. As the flow of visitors began to increase, the Forest Service often contributed larger funds to the States.[18] County and State governments, in return, sometimes provide financial assistance in road building and park development. Road and trail expansion generally continued through the 1960s, but many miles of older trails and roads have been abandoned in more recent decades because of financial considerations and new emphasis on dispersed recreation and wilderness protection.[19]

Maintaining Trails

The Forest Service has recently inaugurated the "Adopt A-Trail" program, allowing interested organizations or groups to assume the responsibility for maintaining a particular stretch of trail. The work is done on a volunteer basis and can be very informal or highly organized. The Forest Service provides tools and expertise, and the volunteers the labor. The program has a strong

philosophical appeal to hikers, who thus become supporters and participants in the preservation of the forests. The response has been particularly strong in the Sandia District of the Cibola National Forest and in parts of the Lincoln, Tonto, and Coronado National Forests.[20] A somewhat similar volunteer effort has been the "Eagle Watch" program, in which individuals volunteer their time, or sometimes receive a small stipend, to camp near a mated pair of bald eagles to protect them during the nesting period. The Coronado National Forest and the Tonto National Forest have been especially successful with the Eagle Watch program.[21]

Job Corps

In recent decades, the Forest Service has attempted to duplicate the great work of the Civilian Conservation Corps (CCC) during the 1930s through the federally funded job Corps Program, which, like the CCC, seeks to provide disadvantaged and unemployed youths with work opportunities. However, service records suggest that the environmental work done by the Job Corps has been meager compared to the earlier CCC. A common complaint was that Job Corps youths were difficult to supervise and disinclined to physical labor.[22] Nevertheless, the Job Corps has been effective in restoring the dignity and sense of worth of many young people. Through such programs, the magic of the forests has become accessible to more Americans than ever before.

A trail specifically designed for visually and mobility impaired people has been constructed in conjunction with the Cienega Picnic Ground in the Sandia Ranger District of the Cibola National Forest. The Ten X campground in the Kaibab is also designed for the physically handicapped. Programs are also conducted for blind youngsters who are taken into the forest and given the experience of hearing and feeling part of the forest environment.[23] The Forest Service indirectly facilitates the recreational use of the forests by leasing land or "use" to individuals or corporations under Special Use Permits for the operation of horseback riding stables, backcountry packing, jeep trips, boating, fishing, and hunting.

Providing Conveniences

Increased public use requires providing such assumed conveniences as drinking water and sewage disposal facilities, difficult and costly undertakings in remote forested areas. Primitive campgrounds dispense with the amenities of civilization, but pollution controls are imperative everywhere. The new emphasis on dispersed recreation tends to ameliorate damage to flora and fauna in the national forests.[24]

Most of the visitors to the national forests now come in automobiles, and many never leave their vehicles during their visit. Even these have been accommodated with roadside turnouts and parking spaces at scenic vistas or unusual geologic formations. Camera buffs are counseled and encouraged by signs and brochures.[25] The number of beautiful and memorable views in the national forests of the Southwestern Region are legion.

There is magic in the forests of the Southwest, and it is a magic that tempts us. It is the Forest Service's mission in the Southwestern Region to preserve and protect, so that those who have not yet come this way may do so, and may share with the travelers, explorers, and inhabitants of the Southwest that sense of wonder and magic. This job has not been an easy one, in part because the magic and wonder are defined in different ways by different people. The job has become increasingly difficult in modern times because the Forest Service is not only concerned with

multiple uses and sustained yields, but increasingly with a variety of public opinions from within and outside the Southwest. The forests, their uses, and the people who use them have changed. They will continue to do so, and the work of the Forest Service in protecting this heritage for the people will never be finished.

Reference Notes

[1] Official Map, USDA, Forest Service, *Kiowa and Rita Blanca National Grasslands* (1980).
[2] Official Map, USDA, Forest Service, *Magdalena Ranger District, Cibola National Forest* (1977).
[3] *Southwestern Region News* (February 1986), p. 3.
[4] Louis Cottam, interview, August 16,1985.
[5] Walter G. Mann, Forest Supervisor, "The Kaibab Deer: A Brief History and the Present Plan of Management" (Kaibab National Forest, 1931,1936,1941), pp. 14-27; Roger S. Bumstead, personal interview, August 8,1984, Albuquerque, NM. Bumstead, a wildlife biologist with the Forest Service, worked for the State of Arizona Wildlife Department in the 1930s and 1940s.
[6] A common method to coordinate State and Forest Service activities is the so-called Memorandum of Understanding.
[7] *Summary of Big Game Animals in National Forests* (Washington, DC: USDA Forest Service, 1921). This original brief report in 1920 has developed into 154 detailed pages; *Wildlife and Fish Habitat Management in the Forest Service* (Washington, DC: USDA Forest Service, 1985); Bill Zeedyk, Director of Wildlife, personal interview, August 19,1985, Albuquerque, NM.
[8] Roger S. Bumstead, interview, August 19,1985
[9] Zeedyk, interview, August 19,1985; *Summary of Big Game Animals in National Forests in 1920* and yearly counts since that time.
[10] Wildlife reports, first published in 1920, have been published annually since 1924. See note 7.
[11] Bumstead, interview, August 8,1984
[12] Zeedyk, interview, August 19,1985. The last several wildlife reports indicate that the decline of antelope populations may have been arrested.
[13] *Facts About the National Forest System in the Southwest*, p. 8.
[14] *Ibid*., pp. 8-9.
[15] E.J. Dyksterhuis, "Notes on the Origin of Range Science," *Rangelands* (December 1980), p. 3-4; D.M. Lang, "Reconnaissance of the Kaibab National Forest," unpublished manuscript, 1909 (filed at the Kaibab National Forest, 1685).
[16] The observations are largely those of the author (Victor H. Treat), and in part derived from maps and conversations as well as extensive travel.
[17] Charles F. Wilkinson, *The Greatest Good for the Greatest Number* . . . p.12. University of New Mexico archives, Albuquerque, NM.
[18] The amount varies between 10 and 25 percent.
[19] Interview with Floyd A. Thompson (Trails and Volunteers), Albuquerque, NM, August 20, 1985.
[20] *Ibid.*; and see *Adopt A Trail Handbook* (Albuquerque, NM: USDA Forest Service, Southwestern Region, 1984).
[21] Interview with Larry Forbis, wildlife specialist, Phoenix, AZ, August 18, 1985.
[22] "Job Corps: Report," Federal Records Center, Fort Worth, TX, 095-72A0871.
[23] Another example of a trail for the visually handicapped is the La Pasada Encantada Trail from the Sleepy Grass Campground on the Lincoln National Forest.
[24] Interview with Dick Spray, Recreation Staff, Region 3, re: Dispersed Recreation, Albuquerque, NM, August 19, 1985.
[25] Interview with Lou Armijo, Public Affairs Specialist, Albuquerque, NM, August 20, 1985.