

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 1920’s and 1930’s, 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 1870’s and 1880’s. 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 1950's and 1960's 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

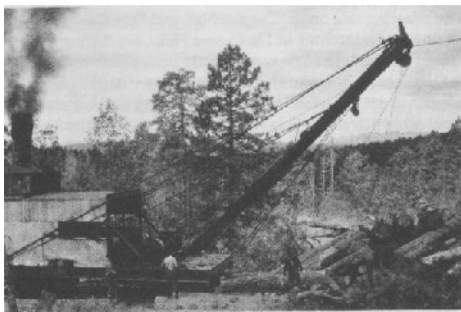


Figure 18. Railroad crane in action, Coconino National Forest, 1924.



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 1950’s. 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 \$2.00 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 trend³⁵

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 II. In the late 1940's and early 1950's, 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.

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
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.



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 Chief 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 land³⁹

Steen further noted that after World War II, 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 effect⁴⁰. 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 1970's 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.

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



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 1970's 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.

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



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

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

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- 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 the United States*, Forest Res. Rep. 20 (Washington, DC: USDA Forest Service, 1974), table 8, pp. 244-45, table 9, pp. 246-47; USDA Forest Service, *An Analysis of the Timber Situation in the United States, 1952-2030*, Forest Res. Rep. 23 (Washington, DC: USDA Forest Service, 1982), table 3.12, pp. 372-73, table 3.13, pp. 374-75; Telephone communication with USDA Forest Service, Timber Management, Southwestern Region, January 7, 1986.
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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.

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

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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.

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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.,

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- 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.
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- 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.

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- 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.
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- 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.
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- 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-1950's 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.