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GOVERNMENT
FOREST WORK



THE FOREST RANGER'S
MOTTOES

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DEPARTMENT OF AGRICULTURE
DEPARTMENT CIRCULAR 211

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DEPARTMENT OF AGRICULTURE

DEPARTMENT CIRCULAR 211

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Washington, D. C.	

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GOVERNMENT FOREST WORK



F-174806

Forestry has to do with the growing of successive crops of timber from the soil. Forest workers are concerned with the perpetuation and development of the forests because of their many benefits to mankind—in providing wood for man's use; in preventing erosion of soil and in regulating stream flow and water supply for irrigation, for power, and for domestic use; in harboring wild life; in giving abundant opportunity for outdoor recreation.

Forestry is closely related to agriculture, and the chief forest work of the Federal Government is therefore charged to the United States Department of Agriculture.

When forestry is practiced, timber becomes a crop produced from the soil under methods which must be developed scientifically, as other branches of agriculture are developed. In most countries where forestry is an important governmental activity it is grouped with agriculture. Right handling of the forest ranges is a problem of animal husbandry and forage-plant production. Water conservation has in view the interests of irrigation farmers. Forestry and agriculture are interwoven and akin.

The Forest Service is a bureau of the Department of Agriculture. Its chief is designated the Forester. Besides administering the national forests, the serv-

ice also makes investigations in the interest of the best use of the forests and forest products of the country generally. These investigations are, in purpose and method, comparable with those of other bureaus in the same department and often concern kindred matters.

The keynote of national forest administration is service. The object aimed at is the best use of the many resources of the forests in the interest of the public welfare. From the standpoint of material wealth the forests have their greatest importance as sources of supply of wood, water, and range forage. They have also a great and growing value to the country as places of recreation. Not only are they open to all persons for all lawful purposes, the prime object always held in view is to make them more useful to more people. Naturally they are of greatest benefit to the local residents near them and to the States in which they lie; but they are useful also to the whole country in ways that are not always realized.

Most of the national forests are located in the mountainous regions of the country, where the preservation of tree growth is of great importance. From the hardwoods of the southern Appalachians to the spruces of the White Mountains in New England, from the piñon and juniper stands where tree growth begins in the southern Rockies of New Mexico to the pine and fir forests of the Canadian line in Montana and Idaho, from the brush-covered foothills of the San Jacinto and San Bernardino Mountains in southern California to the vast softwood stands of the Olympics and Cascades in northern Washington, the national forests lie mainly on the mountain slopes. Even along the Alaskan shore, where the Tongass and Chugach National Forests form a tattered ribbon 600 miles long from the southern tip of the Territory to within sight of Mount McKinley, the valuable Sitka spruce and hemlock growth clothes the lower flanks of the coastal mountains. In these rugged regions of the country permanent forests constitute the highest use to which the land can be put.

The timber, water, grazing, recreational opportunities, and other resources of the national forests are for the use of the people. The national forests contribute largely to industrial enterprises through their yearly cut of over a billion and a half board feet of timber; they protect watersheds of about one-third of the water-power resources of the country and help to insure pure and abundant water supplies to hundreds of towns and cities; they furnish pasturage for about 13,800,000 head of livestock of all ages; and they afford playgrounds for millions of recreation seekers, to whom these vacation places are made accessible by the building of roads and trails.

This circular tells in a general way how these resources are handled in carrying on the manifold work involved in making them of fullest use to the public. It tells also something of other activities of the Forest Service in bringing about better use of our forests and forest products generally. More detailed information concerning the use of the national forests and their resources may be obtained by applying to any forest officer or to the Forest Service, United States Department of Agriculture, Washington, D. C.

BEGINNING OF GOVERNMENT FOREST WORK

Though the national forests represent the greatest single activity of the Government in forestry, Government forest work had its real beginning as far back as 1876, with the appointment by the Department of Agriculture of a special agent to study general forest conditions in the United States. In 1881 a division of forestry was created in the department, but for a long time it received an annual appropriation of less than \$30,000, and could be little more than a bureau of information and advice. From this small beginning, as its field of work expanded, the division grew (1901) into the Bureau of Forestry, and finally (1905) into the Forest Service, with an appropriation for the fiscal year 1931 of slightly over

\$16,500,000, including \$100,000 for the suppression of fires on the national forests, \$1,700,000 for cooperative fire protection, \$93,000 for cooperative distribution of forest planting stock, and \$2,000,000 for the purchase of additional forest lands. The total of \$16,500,000 includes \$1,500,000 for strictly protection roads and trails on the national forests. It does not include appropriations for the construction and maintenance of other roads and trails, some of which are primarily valuable for fire-control purposes. In addition to the foregoing regular appropriations Congress appropriates annually the amount expended during the fiscal year for fire suppression on the national forests. For the 10-year period 1921 to 1930 the average yearly expenditure for this purpose has been \$1,328,885.

To-day the forest work of the Government is mainly centered in the Forest Service, but the Government also does other forest work. The Department of the Interior, through its Office of Indian Affairs and its National Park Service, administers the forests on the Indian reservations and the national parks. The Office of Forest Pathology of the Bureau of Plant Industry, in the Department of Agriculture, studies the diseases of trees, and the branch of insect investigations in the Bureau of Entomology of the same department seeks means for controlling the insect enemies of forests.

CREATION OF NATIONAL FORESTS FROM PUBLIC DOMAIN IN THE WEST

Less than 40 years ago the forests on the public domain seemed in a fair way to be destroyed eventually by fire and reckless cutting. Nothing was being done to protect them, or even to use them in the right way. They were simply left to burn, or else to pass by means of one or another of the land laws into the hands of private owners whose interest in most cases impelled them to take from the land what they could get easily and move on.

Had this destruction gone on unchecked, there would in the end have been little timber left in the West, and the development of the country, which calls for timber not only at certain times but all the time, would have been retarded or stopped altogether.

More than this, the destruction of the forest cover on the watersheds supplying hundreds of streams which rise in the western mountains would have had its certain effect on stream flow—low water or no



F-36527-A

FIGURE 1.—The first national forests were established on timber-covered areas withdrawn from the public domain in the West

water at all during the long dry periods and destructive floods after heavy rains. This, of course, would have meant disaster to the systems of irrigation by which thousands of farmers raise their crops. It would also have very seriously hampered, and in many cases prevented, hydroelectric power development.

Congress, therefore, in 1891 authorized the President to set aside forest reserves, as national forests were for some years called, in order to protect the

remaining timber on the public domain from destruction and to insure a regular flow of water in the streams. (Fig. 1.) The first forest reserve—the Yellowstone Park Timberland Reserve—was created by President Harrison that same year, and later Presidents have created others, until at present there are 151 national forests with a total net area of over 160,000,000 acres. Within the forest boundaries are also some 24,000,000 acres in private ownership, consisting of lands granted or taken up for one purpose or another before the forests were created or of forest homesteads and mining claims patented since.

The law of 1891 provided that national forests may be set aside from public lands covered wholly or in part with timber or undergrowth. Later laws have prohibited the enlargement of the forests or the creation of new forests in the States of Colorado, Wyoming, Montana, Idaho, Washington, Oregon, California, Arizona, and New Mexico, through additions from the public lands, except by act of Congress. Some national forests are heavily timbered and are mainly for timber production; others are located in thinly wooded regions primarily to protect and conserve the water supply, without which the country would be uninhabitable.

The original act made no provision for administering the reserves, and the withdrawal of land involved from all forms of settlement met with vigorous disapproval, especially in the West, where the reserves were situated. These defects, however, were largely removed by Congress on June 4, 1897, in a law outlining a system of organization and management for the reserves and placing their administration under the Secretary of the Interior. The American national-forest system really dates from the passage of that act.

Government administration of the reserves soon made apparent the necessity for scientific forestry to make their use general. It was the duty of the Secretary of the Interior to prescribe regulations which would insure the fulfillment of the objects aimed at

in creating the reserves. Timber cutting must provide for the growing of a new timber crop. Unrestricted grazing had seriously injured the range; it was necessary to devise methods for increasing the forage crop. Both timber use and grazing use must be so managed that water supplies would be maintained and bettered. All the resources of the forests needed to be given careful consideration and plans devised for their best development. Without such plans little of the value of the forests to the public could be secured. Technical problems were involved which the officials of the Interior Department felt to be outside their province. They therefore at first requested the aid of the experts of the Department of Agriculture as advisers and soon recommended the transfer of administration of the reserves to the latter department.

This transfer took place in 1905. In 1907 the name "forest reserves" was changed to "national forests," by act of Congress, to indicate that their resources are not locked up as "reserves" for a distant future. National forests are under Government management for the purpose of securing sound economic and industrial development of large areas of timberland in the best interests of all, which experience has shown can not be equally attained under private ownership. In administering the national forests, therefore, the first aim of the Forest Service has been to protect their resources so that they will always be there to use, and at the same time to see to it that the greatest number of people have an equal chance to use them.

PURCHASE OF EASTERN NATIONAL FORESTS

By the time the national-forest movement began virtually all except some inferior remnants of the public domain within the States east of the Great Plains had passed to State or private ownership. Indeed, in some of the thirteen original States there

had never been any public domain. The poor lands remaining in Federal control were inadequate to meet public needs. The purchase of additional lands valuable for the protection of the headwaters of navigable streams or for timber production and their reorganization as national forests were therefore authorized by Congress, first by the act of March 1, 1911, called the Weeks law, and later by the amenda-



F-297472

FIGURE 2.—Pure hemlock in Heart's Content area, Allegheny National Forest, Pa., one of the land areas purchased by the Government for national-forest purposes in the East

tory act of June 7, 1924, known as the Clarke-McNary law. (Fig. 2.) For the conduct of this purchase work the Weeks law established the National Forest Reservation Commission, which consists of the Secretary of War, the Secretary of the Interior, the Secretary of Agriculture, two Members of the Senate, and two Members of the House of Representatives. At the close of the fiscal year 1930 the commission had authorized the establishment of 39 separate purchase units situated in 20 of the States east of the Great

Plains, and within 29 of these units, situated* in 16 States, had authorized purchases to the extent of 4,133,483 acres, at an average cost of \$4.63 per acre, or a total cost of \$19,143,129.79. These same units also contain 2,338,854 acres reserved from the public domain; the total area under administration by the Forest Service, therefore, is 6,471,837 acres, or 1.8 per cent of the estimated area of forest land east of the Great Plains.

As the Government obtains title the forests are put under systematic management with the object of improving their regulative effect upon stream flow and of increasing the supply of forest products. The timber alone on the eastern national forests has a present value greater than the entire cost to the Government of acquiring these lands, although much of the land had been depleted by lumbering and fires while in private ownership. Under the practice of forestry the stands of timber are increasing at the same time that the protective value of the cover as a regulator of stream flow is materially improved. From an industrial standpoint these eastern national forests will play an important part as permanent sources of supply of material, particularly hardwoods for local establishments, and will appreciably lessen the acuteness of the timber shortage in the East as the supplies of virgin timber approach the vanishing point and before the general practice of forestry on private lands has been under way long enough to supply timber of commercial size.

THE NATIONAL FORESTS FOR USE

The policy under which the national forests are administered by the Department of Agriculture through the Forest Service was laid down by the Secretary of Agriculture in a letter to the Forester, dated February 1, 1905, in which he said:

In the administration of 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. All the resources of the forest reserves are for use, and this must be brought about in a thoroughly prompt and businesslike manner, under such restrictions only as will insure the permanence of these resources. * * * You will see to it that the water, wood, and forage of the reserves are conserved and wisely used for the benefit of the home builder first of all, upon whom depends the best permanent use of lands and resources alike. The continued prosperity of the agricultural, lumbering, mining, and livestock interests is directly dependent upon a permanent and accessible supply of water, wood, and forage, as well as upon the present and future use of these resources under businesslike regulations enforced with promptness, effectiveness, and common sense. In the management of each reserve local questions will be decided upon local grounds, the dominant industry will be considered first, but with as little restriction to minor industries as may be possible; sudden changes in industrial conditions will be avoided by gradual adjustment after due notice, and where conflicting interests must be reconciled the question will always be decided from the standpoint of the greatest good of the greatest number in the long run.

Lands which are more valuable for agriculture than for forestry purposes have been excluded from the national forests either by changes in the forest boundaries or by being opened to settlement and entry under the forest homestead act of June 11, 1906. The act of August 10, 1912, which directed that the national-forest lands be classified for the purpose of determining those which are chiefly valuable for agriculture, has resulted in practically all agricultural lands within the national forests being listed for entry in the United States land offices. The greater part of the land which has really valuable agricultural possibilities has been taken up, and most of what is left lies at high altitudes remote from roads, schools, villages, and markets, where the winter climate is severe and the growing season short. Prospective settlers will therefore have better chances for success in the immediate vicinity of the forests than in the forests themselves.

Mineral deposits within national forests, except such forests as were purchased under the act of March 1, 1911, are open to development exactly as on unreserved public land unless otherwise provided by special acts of Congress. A prospector can go anywhere he chooses

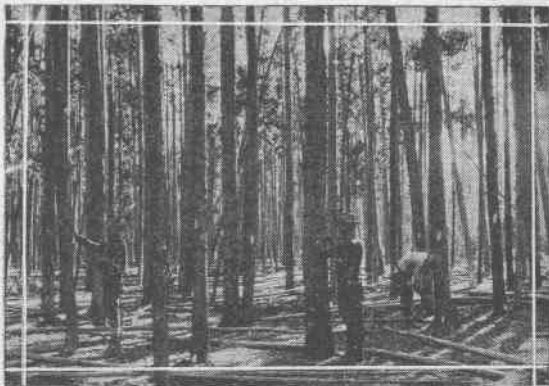
and stake a claim wherever he finds any evidence of valuable minerals. The only restriction is that mining claims must be bona fide and not taken up for the purpose of acquiring valuable timber, or for a town or power site, or to monopolize the water supply on stock ranges. Bona fide mining men do not wish to take up claims for an unlawful purpose, and the national forests are open to them at all times. Prospectors may obtain a certain amount of national-forest timber free of charge to be used in developing their claims, and in other ways the Forest Service gives the mining man all the help it can. As to deposits of coal, oil, and gas, permits to prospect for and leases to develop must be secured through the Department of the Interior.

MANAGEMENT OF TIMBER RESOURCES OF NATIONAL FORESTS

Ripe standing timber on the forests, of which there is a large amount, is sold at a fair price. Anybody may purchase timber, but no one can obtain a monopoly of it or hold it for speculative purposes. The Government is anxious to sell the mature timber on the forests, because it is no longer growing at a profitable rate and should give way to younger trees and seedlings which will constitute succeeding crops of timber. The fewest possible restrictions are imposed upon purchasers of timber, only such as will insure cut-over areas being left in the best condition for future growth. Experienced foresters estimate the quantity and quality of national-forest timber and its approximate value as a basis for the price to be charged. (Fig. 3.) In fixing this all factors which affect the cost of lumbering, such as accessibility, number, and kind of improvements necessary, as well as general market conditions, are taken into account. The prices set allow the purchaser of national-forest timber opportunity for a fair profit. Bids are then obtained through public advertisement, unless the amount is small enough to come within the limit which can be sold without advertisement.

Information concerning attractive logging chances and the conditions of sale is gladly given inquirers, for the Forest Service wants the ripe timber used.

Before an extensive program of timber sales is started on any national forest, forest officers make a careful survey of its timber resources and prepare a plan of management prescribing the area of timberland to be cut over each year and the methods and



F-222464

FIGURE 3.—The Government sells ripe timber on the national forests. Trees to be cut are marked in advance by a forest officer

order of cutting. These long-time plans are made in order to insure a constant supply of timber for the communities and industries dependent upon the forest for raw material. This makes possible the establishment of permanent wood-using plants and prosperous communities of people who look to the woods as a market for their labor.

The trees to be cut on a sale area are marked in advance by a forest officer, the object being to leave enough of the younger trees to seed the ground and

form the basis of a second crop of timber on the same land. (Fig. 4.) This is merely applying the principles of practical forestry to make sure that there will always be timber on the national forests to cut. Timber on the watersheds of streams is not cut to an extent that will impair the protective cover that the forest affords, because one of the chief objects of the national forests is to regulate stream flow, nor is mature timber taken from recreational areas where it has a higher use for scenic purposes.



F-183957

FIGURE 4.—A timber-sale area on the Plumas National Forest, Calif. Enough younger trees are left for a later cut or to seed the ground for a new crop. Logging slash is burned in suitable weather

Small sales of timber are made by local forest officers without delay. Red-tape methods are not permitted in national-forest timber sales, big or little. Larger sales are made either by the supervisor of the forest, the regional forester, or the Forester, according to the amount desired.

Though single sales have been made that involved timber with a contract value of as much as \$5,000,000, approximately 98 per cent of the sales are for \$100 worth or less of timber. Of the 13,864 timber sales on

the national forests in the calendar year 1929, 13,560 were of this latter kind.

Homestead settlers and farmers may obtain national-forest timber for their own use at the actual cost of making the sale. No charge is made to them for the timber itself. This is one of the ways in which the national forests are made to serve local residents.

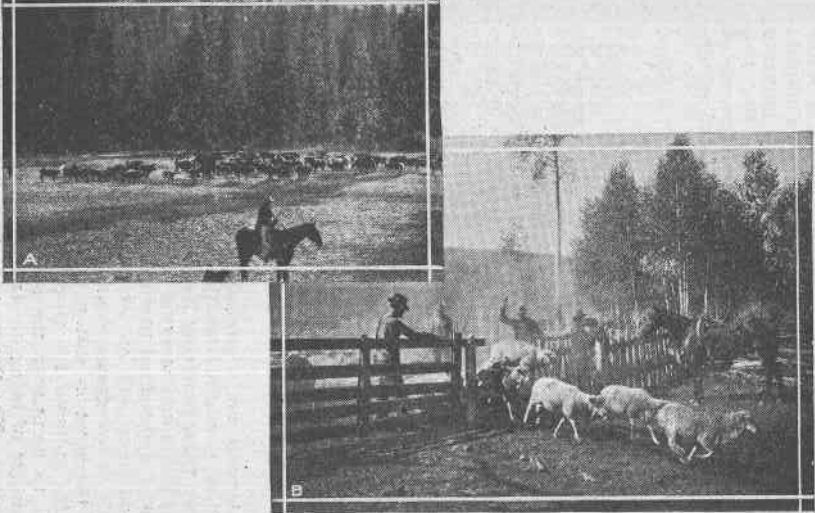
RANGE MANAGEMENT OF THE NATIONAL FORESTS

Along with the timber on the national forests, particularly those in the West, there is a great deal of grazing land which at present is used every year by almost 6,680,000 sheep and goats and nearly 1,436,000 cattle, horses, and swine. If the 5,703,000 young of all kinds (which are not counted or charged for) are added, the total number of animals on the national forests is about 13,819,000 of all ages. (Fig. 5.)

Local settlers and stockmen are given first consideration in the use of the range, just as in the case of the other resources, and every man who grazes stock on the forest under permit is allotted a certain area for the grazing season. Unfair competition between the big man and the little man, which in the old days worked so much harm, is done away with. A good supply of forage year after year is insured by not allowing the land to be overcrowded with stock. Under regulation overgrazed range is improved, instead of being further run down or denuded, as has been the case with many of the outside public lands.

WATERSHED PROTECTION

Undoubtedly the greatest value of the mountain ranges of the country, most of which are within national forests, lies in their influence upon the regularity of the water supply. In many of the States the mountains afford the main water supply for domestic use, for irrigation, and for the development of power. The future development of the entire coun-



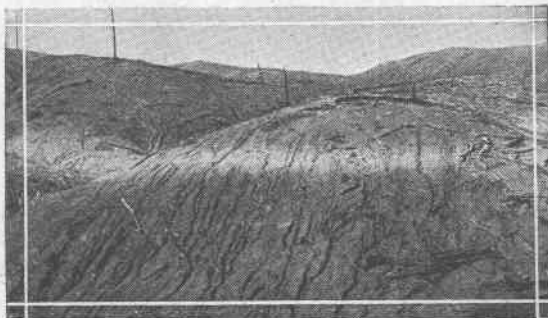
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FIGURE 5.—A.—National-forest ranges afford pasturage for many million head of stock. Rounding up cattle on the Rainier National Forest, Wash. B.—When the grazing season opens on a forest, the ranger counts sheep and cattle as they come up out of the valleys to use the national-forest range

try, therefore, will depend upon the amount of water and the manner in which it flows from the mountains.

The vegetal covering has a very decided influence on run-off. For this reason Congress made the preservation of conditions favorable to stream flow one of the principal objects in the establishment and administration of the national forests.

A well-kept forest is the best of natural soil holders.

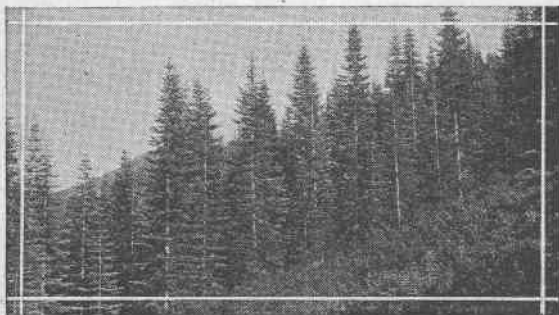


F-175334

FIGURE 6.—Heavy erosion following lumbering and fire

Where there is no vegetation, particularly on steep slopes, there is nothing but the friction of the soil to keep water from following its habit of going downhill as fast as it can and carrying much of the soil with it. Forests and well-sodded pastures hold back more rain water and more soil on steep slopes than denuded woodlands or overgrazed ranges. (Figs. 6, 7, and 8.)

Along the streams within the national forests are many sites suitable for power development. These are open to occupancy for such purposes and have the advantage of being on streams whose headwaters are protected. The Government does not permit the monopolization of power in any region or allow power sites to be held without prompt development. Utiliza-



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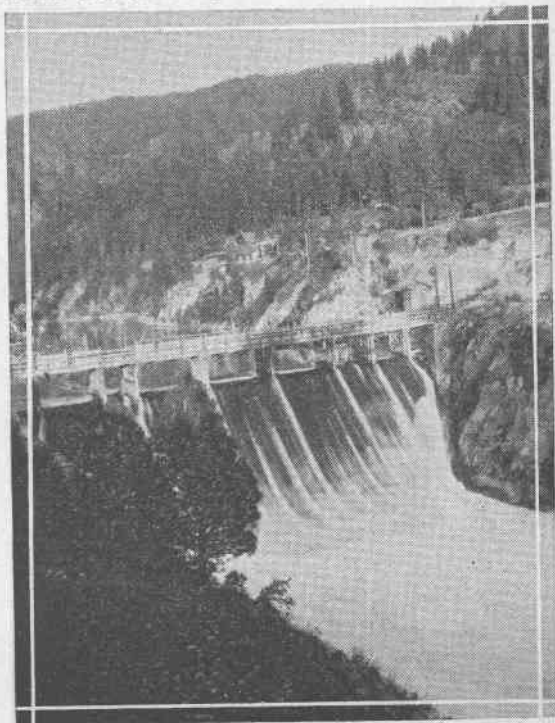
FIGURE 7.—Renewal of tree growth on a burned hillside. Wood and water supplies are promised in the comeback of the forest on this steep slope



F-200734

FIGURE 8.—Where the rivers begin. Watersheds clothed in forest green insure a continuous supply of water for power, for irrigation, and for domestic use, as well as an abundance of timber

tion and development of water powers in the national forests are encouraged. The Federal Power Com-

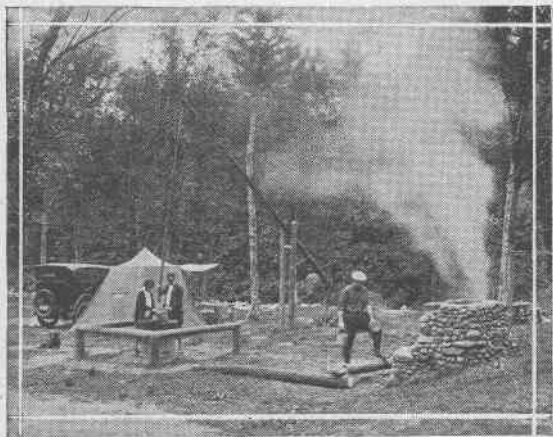


F-150220

FIGURE 9.—Power plant on South Fork of Payette River,
Payette National Forest, Idaho

mission is by law permitted to issue licenses for periods of not to exceed 50 years, and such licenses may be renewed under certain conditions. A pre-

liminary permit also may be secured to protect the applicant's rights during the period necessary for making financial arrangements and for obtaining engineering and other data necessary to the construction of the power project. The law authorizes the commission, other factors being equal, to give preference to applications by States and municipalities, and between other applicants the commission may give preference to the project which is best adapted to develop, conserve, and utilize the navigation and water resources of the region. (Fig. 9.)



F-212278

FIGURE 10.—Zealand camp ground, White Mountain National Forest, N. H. Shade, water, and fuel are abundant, and the "fool-proof" fireplace is an added convenience, also a safeguard

RECREATION IN NATIONAL FORESTS

To the camper, sportsman, and seeker after health, rest, and recreation, the national forests offer unrivaled opportunities for outdoor life and enjoyment. The

popularity of these great mountain playgrounds is evidenced by the fact that millions of people visit them each year. In 1930 the number of visitors to national forests exceeded 31,000,000. Roads and trails, marked by signs, make the forests reasonably accessible. There are countless secluded spots along the banks of streams and lakes where the camper may pitch his tent. Camping is free and generally requires no permit. In localities frequented by large numbers of people free public camp grounds are being established



F-162398

FIGURE 11.—Fishing at Anthony Lake 5 miles away from the nearest road, Whitman National Forest, Oreg.

and water developments, camp fireplaces, and comfort stations constructed for the convenience of visitors as fast as the funds available permit. (Fig. 10.) Big game is to be found in the more secluded parts of the mountains, and there are many excellent trout streams and lakes, frequently restocked with young fish, which offer keen sport to the angler. (Fig. 11.) The only restrictions are those imposed by the fish and game laws of the States in which the forests are located, and all that is asked of the visitor is that he

look to the proper sanitation of his camp and be careful with fire.

Many people who visit the national forests desire to return year after year to the same locality for an annual vacation. To meet this demand Congress, by the act of March 4, 1915, authorized the Secretary of Agriculture to issue term permits to—

responsible persons or associations to use and occupy suitable spaces or portions of ground in the national forests for the construction of summer homes, hotels, stores, or other structures needed for recreation or public convenience, not exceeding 5 acres to any one person or association.

The Forest Service wishes to accommodate as many people as practicable. For this reason tracts desirable for summer-home purposes, except in unusual instances, are limited to 1 acre or less in area, and term permits run for a period of from 5 to 15 years, with privilege of renewal. Undue crowding between permittees is avoided, and provision is made for those who especially seek isolation and privacy. The annual rental charge for lands occupied for summer homes varies from \$5 to \$25, depending on the location. Detailed information respecting any particular locality or forest may be secured by addressing the forest supervisor.

On a few of the smaller forests no permits for private summer homes are granted because of the limited amount of Government land available and because there are private lands near by which may be leased or purchased. General use, through the reservation of open camp grounds, is always given first consideration. Special use by individuals who pay rental has been made secondary to the needs of the public.

Permission to occupy national-forest land for residential, commercial, or industrial purposes not inimical to the protection and management of the forest may be secured under special-use permits obtainable upon payment of moderate fees. Detailed information may be obtained upon application to either the supervisor or the regional forester.

PRIMITIVE AREAS

Under the authority of a recent departmental regulation, the Forest Service is establishing a series of representative areas within the national forests to be known as primitive areas. In these areas primitive conditions of environment, transportation, habitation, and subsistence will be maintained, with a view to conserving permanently the value of such areas for purposes of public education and recreation. Within the primitive areas no occupancy under special-use permit is allowed, nor the construction of permanent improvements by any public agency permitted, except as authorized by the Forester or the Secretary of Agriculture. The Forest Service hopes, in maintaining these areas, to prevent the unnecessary elimination or impairment of unique natural values and give the public opportunity to experience the conditions which existed in the pioneer phases of the Nation's development and to engage in the forms of outdoor recreation characteristic of that period, thus aiding to preserve national traditions, ideals, and characteristics and promoting a truer understanding of historical phases of national progress.

WILD LIFE ON THE NATIONAL FORESTS

Closely related to the development of recreational facilities is the use of the national forests as the habitat of fish and game. Wild life adds materially to the enjoyment of the national forests by the public, and the preservation of game animals, birds, and fish is a public duty. Game protection is one of the regular activities of the field officers of the Forest Service. Cooperation with the State and local authorities in enforcing the game laws has contributed in no small degree toward making the national forests more attractive to visitors and conserving one of their valuable resources.

Special acts of Congress have designated a number of national game refuges, situated wholly or in part within national forests, for the protection of wild life. (Fig. 12.)

NATIONAL MONUMENTS WITHIN NATIONAL FORESTS

By act of June 8, 1906, Congress provided for the protection of cliff dwellings, pueblo ruins, ancient rock paintings, unique topographic or geologic features, historic landmarks, groves of rare trees in



F-176414

FIGURE 12.—This little fellow, living in security in the Pisgah game preserve, Pisgah National Forest, N. C. is friendly and unafraid.

danger of destruction, and other objects of historic and scientific interest on lands controlled by the Government, and authorized the President to create by proclamation national monuments for their preservation. When a national monument is created within a national forest, it is under the jurisdiction of the Forest Service, which cooperates with the Bureau of American Ethnology of the Smithsonian Institution in protecting it and securing information regarding

such objects. The following national monuments are situated within national forests:

Name	National forest	State
Bandeller.....	Santa Fe.....	New Mexico.
Chiricahua.....	Coronado.....	Arizona.
Devil Postpile.....	Sierra.....	California.
Gila Cliff Dwellings.....	Gila.....	New Mexico.
Holy Cross.....	Holy Cross.....	Colorado.
Jewel Cave.....	Harney.....	South Dakota.
Lava Beds.....	Modoc.....	California.
Lehman Caves.....	Nevada.....	Nevada.
Mount Olympus.....	Olympic.....	Washington.
Old Kasaan.....	Tongass.....	Alaska.
Oregon Caves.....	Siskiyou.....	Oregon.
Sunset Crater.....	Coconino.....	Arizona.
Timpanogos Cave.....	Wasatch.....	Utah.
Tonto.....	Tonto.....	Arizona.
Walnut Canyon.....	Coconino.....	Do.
Wheeler.....	{ Cochetopa.....	} Colorado.
	{ Rio Grande.....	

RECEIPTS FROM THE NATIONAL FORESTS

The total net receipts from the national forests on account of timber sales, grazing fees, and special uses during the fiscal year 1930 amounted to \$6,750,000. The annual average of receipts for the 10-year period 1921 to 1930 was more than \$5,000,000 as against an average of a little over \$3,000,000 for the decade 1911-1920. Receipts from timber sales make up about two-thirds of the annual total, and grazing fees amount to more than one-fourth of the total.

It could not be expected, of course, that rugged, inaccessible mountain lands, such as constitute by far the greater part of the national forests, would soon yield a revenue to the Government over and above the cost of administration. Many of the forests may be expected to help supply the country's future needs for timber after the more accessible lands have been cut over, rather than its present needs, while others are chiefly valuable for watershed protection, which,

though of the greatest importance to the people and industries of the country, does not yield the Government a return in dollars and cents. In the case of almost every forest, moreover, a great deal of money must be spent for roads, trails, bridges, and telephone lines before the resources can be used.

The law requires that of the total net receipts of the national forests, 25 per cent be turned over each year to the States to be apportioned for road and school purposes to the counties in which the national forests are located. An additional 10 per cent is used for road building on the national forests, so that 35 per cent in all of the receipts returns directly to the benefit of the local national-forest communities, while many of the expenditures by the Forest Service for national-forest protection and improvements also aid in local development. To June 30, 1929, the construction of 16,730 miles of roads and 47,175 miles of trails had been made possible from direct forest road appropriations and other Federal and cooperative funds apportioned to States. About \$100,000,000 has been spent on this work in the history of the Forest Service.

NATIONAL-FOREST IMPROVEMENTS

To make the national forests fully useful to the public, and also to facilitate their administration and protection as Government properties, it is necessary to equip them with various classes of improvements. Some of these are primarily for official use, as, for example, fire lookout stations, ranger stations, and telephone lines. (Fig. 13.) Incidentally, many of the improvements of this class are of material service to the public. Other improvements are purely for the benefit of specific forms of public use, as, for example, drift fences, stock-watering places, and public camp grounds. Still others are put in both to facilitate the task of administering and protecting the forests and to promote use and serve the interests of the public generally.

Roads and trails are, of course, necessary for efficient protection of the forests against fire, to enable



F-192165

FIGURE 13.—Forest patrolman communicating with headquarters by portable telephone from top of King Doodle Peak, Ouachita National Forest, Ark.

forest officers to get about in the performance of their tasks, and to open up the forests for users, but

they are also a great public convenience and necessity. The Forest Service has pushed road building as rapidly as money could be secured for the purpose, because it has believed Federal ownership of great bodies of land in relatively undeveloped regions carries with it an obligation to bear part of the cost of developing the road system required to meet the needs of local residents and communities. (Fig. 14.)



F-231604

FIGURE 14.—Road scene on the Natural Bridge National Forest, Va.

The Forest Service cooperates with State and county officials, good-roads organizations, and private individuals in the location, survey, construction, and maintenance of roads in the national forests. The road and trail construction work is financed from appropriations under four different acts of Congress. These funds may be expended upon projects located within or partly within the national forests. Through cooperative arrangement the road projects which require the supervision of engineers intensively

trained in highway engineering and construction are handled by the Bureau of Public Roads. The numerous road-improvement and repair projects required primarily for administrative and protective needs on the national forests, together with trail building and maintenance, are handled directly by the Forest Service and coordinated with fire control so far as possible so that construction crews may be available in remote areas of great fire hazard as part of the fire-suppression organization.

For the complete and economical use of the forage on the forests it is sometimes necessary to develop water supplies or to construct drift fences, bridges, trails, or other works. The Forest Service allots funds for their construction only when the benefit to the forest plainly warrants the expenditure. The use of funds for these purposes can often be made more effective if the assistance and cooperation of interested stockmen can be secured. Requests for cooperation should be addressed to the nearest forest officer.

FOREST OFFICERS AND THE PUBLIC

Whoever wishes to make any use of the resources of the national forests for which a permit is required should consult the nearest forest officer. Supervisors, rangers, and other forest officers carry out the administrative policy prescribed for the national forests by Congress, as embodied in the regulations made by the Secretary of Agriculture. Forest officers are agents of the people, and their duty is to assist the public in making use of the resources of the forests. They aim to prevent misunderstandings and violation of forest regulations by timely and tactful advice rather than to follow up violations by the exercise of their authority. Forest users can aid greatly in the efficient performance of the public business by according to forest officers the same frankness, consideration, and courtesy which the forest officers are expected to show them. (Fig. 15.)



F-222965

FIGURE 15.—The forest ranger inspects a buried camp fire and gives his word of caution. Natural Bridge National Forest, Va.

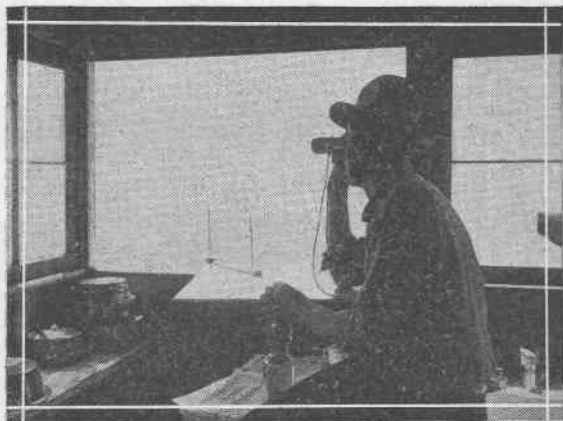


FIGURE 16.—National forests and related data

PROTECTION OF THE NATIONAL FORESTS

FIRE DANGER

Fire is an ever-present danger on the national forests. The great size of the forests compared with the size of the patrolling force, the difficulty of reach-



F-35680A

FIGURE 17.—In his lofty tower, the lookout keeps watch for the danger signal—smoke. A telephone connects him with the nearest ranger station.

ing remote areas across miles of wilderness, the dry air and light rainfall in parts of the West, the prevalence of lightning in the mountains, and the constant use of fire in the daily life of the people and in the industries all combine to make the hazard exceptional. (Fig. 16.)

Among the chief causes of fire are lightning, smokers, incendiarism, campers, railroads, brush burning, and lumbering operations.

A small fire may spread into a conflagration, and fires, matches, and burning tobacco should be used as carefully in the forest as they are in the home. Carelessness in this respect may mean the loss of lives, homes, stock, and forage, and of a vast amount of timber which belongs equally to all citizens.

Fires may start in a remote region and reach vast proportions before a party of fire fighters can get to the scene, no matter how promptly the start is made.



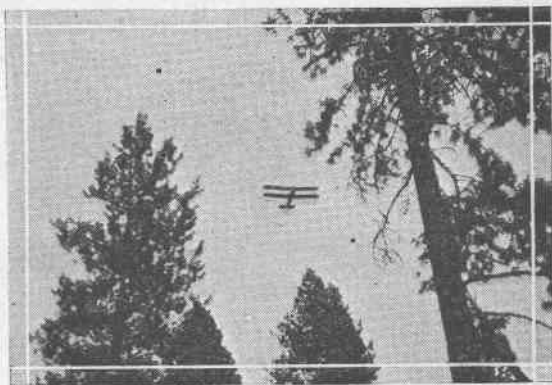
F-223755

FIGURE 18.—On the way to battle. Fire fighters must often camp for days at the front when combating a fire

By far the best plan, therefore, is to prevent fires rather than to depend upon fighting them once they start. This subject has been given the most earnest attention by the Forest Service. During the danger season the main attention of forest supervisors and rangers is devoted to preventing fires and to catching while still small those that do start. Extra men are employed, the forests are systematically patrolled, and a careful lookout is maintained from high points. Roads and trails are being built so that all parts of the forests may be quickly reached. Tools and food for fire fighters are stored at convenient places. The

ranger stations and lookouts are connected with the offices of the supervisors by telephone, so that men may be quickly assembled to fight fires which the patrolmen can not subdue alone. (Figs. 17 and 18.)

Through arrangement with the Weather Bureau forecasts of "forest-fire weather" are sent to forest officers in order that when critical conditions are indicated special preparation can be made to meet them.



F-223786

FIGURE 19.—Airplanes are frequently used to aid in the protection of national forests from fire, particularly in the immense forests of the West

USE OF RADIO IN FIRE-CONTROL WORK

After several years of experimentation and development work radio as a means of communication in fire-control work was used in 1930 on a small scale. This use of radio will probably remain in the experimental stage for some time to come.

AIR PATROL IN FOREST PROTECTION

For several years airplanes have been used to aid in fire control in Oregon, Washington, northern Idaho, western Montana, and in California, and more recently in Minnesota and Arkansas. When fires get large a reconnaissance from the air is a very useful method of obtaining desired information. Not only have planes been used to observe a going fire and for detection of fires immediately following a lightning storm but also for patrolling areas during periods when heavy smoke blankets obscure the vision of the ground lookouts and for transporting materials and food to crews working on actual fire lines. Airplanes have also been used in map making on some of the western national forests. (Fig. 19.)

HOW MR. EVERYMAN CAN HELP

The cooperation of all forest users is earnestly sought in the work of preventing and controlling fire by exercising every care not to cause fires and by informing the nearest forest supervisor or ranger of any fire which may be discovered.

By the observance of the following simple rules for the handling of fire in the mountains users of the forests will very materially assist in their protection:

1. **Matches.**—Be sure your match is out. Break it in two before you throw it away.

2. **Tobacco.**—Be sure that pipe ashes and cigar or cigarette stubs are dead before throwing them away. Never throw them into brush, leaves, or needles.

3. **Making camp.**—Before building a fire scrape away all inflammable material from a spot 5 feet in diameter. Dig a hole in the center and in it build your camp fire. Keep your fire small. Never build it against trees or logs or near brush.

4. **Breaking camp.**—Never break camp until your fire is out—dead out.

5. Brush burning.—Never burn slash or brush in windy weather or while there is the slightest danger that the fire will get away.

6. How to put out a camp fire.—Stir the coals while soaking them with water. Turn small sticks and drench both sides. Wet the ground around the fire. If you can not get water, stir in earth and tread it down until packed tight over and around the fire. Be sure the last spark is dead.



F-222402

FIGURE 20.—A scene of utter desolation after the fire has passed

Since practically 90 per cent of the forest fires of known causes are due to human agencies, the need of the most energetic efforts to bring home to the public the importance of care to prevent fires is evident. The Forest Service is earnestly seeking to lessen the number of man-caused fires in this way. As recreational use of the forests by the public increases and the local population and activities of all kinds on and near the forests become greater, man-caused fires are bound to

become more numerous unless educational methods can be made effective. (Fig. 20.)

SANITARY PRECAUTIONS IN THE NATIONAL FORESTS

Precautions are taken by forest officers to protect the public health. All persons on national-forest lands are liable to trespass proceedings if insanitary conditions result from their presence. Forest officers enforce compliance with regulations on the part of all campers, stockmen, permittees, and other persons traveling through or occupying national-forest lands.

CONTROL OF INSECT INFESTATIONS AND TREE DISEASES

Aggregate losses in the forests of the United States from insect damage are enormous. The principal forest insect pests are tree-bark beetles and defoliating insects. In the former class are the western-pine beetles, the mountain-pine beetles, the Black Hills-pine beetle, the Engelmann-spruce beetle, the southern-pine beetle, and the eastern-spruce beetle. In the second class are the gypsy moth, the spruce bud worm, and the larch sawfly. Forest fires are frequently followed by beetle outbreaks, due to the enfeebled condition of the trees, which lowers their powers of resistance.

Where insect attacks reach epidemic proportions on the national forests, control measures are undertaken in cooperation with the Bureau of Entomology. Experimental work in insect control also is carried on in cooperation with this bureau.

Forest trees, like any other crop, are subject to attacks of fungous diseases. "Infantile" diseases, such as damping-off, are a factor in the destruction of seedling trees. At all ages trees are subject to canker diseases, root rots, etc., while after maturity heart rots rapidly reduce the timber content of the living tree, but by far the most serious menace of disease to forest crops at the present time lies in the imported parasite. Outstanding examples of this menace are the chestnut blight, imported from eastern

Asia on nursery stock in the early nineties, and the white-pine blister rust introduced from Europe within the last 30 years. The blister rust has become established in the Northeast; the Lake States, and in the western white pine region. Its threat to many millions of dollars' worth of valuable white pine, in both public and private ownership, has become acute. With the cooperation of the Bureau of Plant Industry, efforts are being made to check the disease by the eradication of all currant and gooseberry bushes within or near stands of white pine, as the blister rust spreads from these bushes to the pines. The chestnut appears to have been hit by the chestnut blight throughout the range of the tree. No effective means of control have as yet been discovered. Efforts are being made to find and establish a blight-resistant strain of chestnut.

THE EXTENSION OF FORESTRY PRACTICE

The greatness of the national-forest enterprise and the prominence accorded its accomplishments have given the impression to some that the problem of forestry is solved. In point of fact, this is by no means the case, for the national forests contain only about one-sixth of the forest area of the country and not quite one-fourth of the standing saw timber. Private owners hold almost four-fifths of the timberland of the United States. A small amount is in national parks, military and Indian reserves, State and municipal parks and forests, and the public domain. The amount of lumber which is actually placed on the market from the national forests amounts to only about $4\frac{1}{2}$ per cent of the entire consumption of the country. The rest comes from private lands. While the proportion will be altered in the future, the country must still look to private lands for a large part of its forest supplies.

The forests of the country that are in private hands have been undergoing depletion with great rapidity. Conditions are changing, however, and private owners

are giving more and more attention to forest management. Unstable ownership of forest land has been a large obstacle to the rapid spread of timber growing; but there is now evidence of a trend toward greater stability of ownership, accompanied by a greater interest on the part of owners in timber growing as a form of land use.

Over two-thirds of the original forests of the United States have been culled, cut over, or burned, and three-fifths of their merchantable timber is gone. About 25,000,000,000 cubic feet of wood is removed annually from the forests and but 6,000,000,000 cubic feet is grown.

We have been using up our forests without growing new ones. At the bottom of the whole problem is idle forest land. The United States contains some 330,000,000 acres of cut-over or denuded forests; many million acres of this amount has been completely devastated by forest fires and methods of cutting which destroy or prevent new timber growth. We are short of growing forests; and the timber supply of the future must come from forests which are grown, as the supply of virgin timber can not last indefinitely.

The situation necessitates a broad policy of forestry for the whole Nation, which will include both an enlarged program of public acquisition of forests by the Federal Government, the several States, and municipalities, and the protection and perpetuation of forest growths on all privately owned lands which may not better be used for agriculture and settlement. For the latter there must be an organized system of protection of all forest lands, including cut-over lands, against fire, with a division of the cost of maintaining protection between the public and timber-land owners.

COOPERATION WITH STATES

CLARK-McNARY LAW

Activities in State cooperation have been extended materially through the Clarke-McNary law of June 7, 1924. This act authorizes annual appropriations of

\$2,500,000 for the prevention and suppression of forest fires, \$100,000 for the distribution of forest planting stock to the owners of farms, and \$100,000 for assistance to farmers in managing their forest lands. The appropriations for the year July 1, 1930, to June 30, 1931, are: \$1,700,000, \$93,000, and \$70,000, respectively.



F-215270

FIGURE 21.—Southern California fire equipment—warehouse and fire truck. Angeles National Forest

FIRE CONTROL

Forest fires in the United States have burned over annually during the 10 years from 1920 to 1929 an average of 26,000,000 acres and have caused damage averaging \$37,584,564 a year. During this period the number of forest fires averaged 93,605 a year. (Fig. 21.)

Through cooperation of the Federal Government with the States under the provisions of the Clarke-McNary law, which in the provisions covering such work supersedes the Weeks law of 1911, substantial progress has been made in bringing about protection

against forest fires. The law authorizes the Secretary of Agriculture to enter into cooperative agreements with States which provide by law for a system of forest-fire control and are prepared to spend each year at least as much as the Federal Government contributes toward maintaining the system.

In 1911, the first year of cooperation under the Weeks law, 11 States entered into agreements to protect a total of 7,000,000 acres of forest land, at a total cost of \$350,000, of which the Federal Government contributed about \$39,000. In 1930 the 38 States, cooperating under the Clarke-McNary law, protected approximately 224,000,000 acres of forest land at a total cost of \$5,372,096, of which the Federal Government contributed \$1,252,444. The funds contributed by or through the States included considerable contributions made by landowners. Further extension of this important work depends in no small measure on an increase in Federal funds.

COOPERATIVE DISTRIBUTION OF FOREST PLANTING STOCK

The Clarke-McNary law also provides for assisting in the procurement, production, and distribution of forest-tree seeds and plants for the purpose of establishing windbreaks, shelter belts, and farm woodlands. During the calendar year 1929, 39 States and the Territories of Hawaii and Porto Rico distributed a total of 25,243,000 trees to farmers under this provision of the law.

The Federal appropriation for this work for the fiscal year ending June 30, 1931, is \$93,000. The distribution of planting stock is handled by State forestry officials in the cooperating States.

FOREST POLICIES

The Forest Service cooperates with the States in the formulation of forest policies. To the extent of its ability, the Forest Service also offers to assist owners of timberland who wish to adopt a definite policy of reforestation and forest management. This

work has been carried on more extensively in the South than elsewhere, largely in the naval-stores industry.

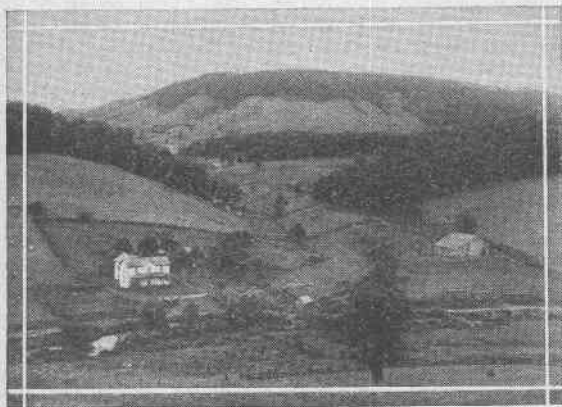
FARM FORESTRY

In carrying on an educational program as applied to farm forestry the Forest Service works in co-operation with the Extension Service of the United States Department of Agriculture. This work is focused particularly on the more efficient management of farm woodlands, the reforestation of those farm lands not now suitable for agricultural crops, and the marketing and utilization of farm timber. A considerable number of agricultural colleges give courses on these subjects, and an increasing number are including similar work in their extension programs. Forestry extension specialists are appointed as members of the college extension staff. They work with the county agricultural agents and the farmers in much the same way as do the extension specialists in other lines of agriculture. The object of their efforts is to demonstrate to farmers that the growing of trees and the efficient utilization of forest products is a desirable part of their plan of farm management. When it is considered that about 150,000,000 acres, or about one-third of the forest land of the country, is in farm woodlands, the importance of this work is realized. (Fig. 22.)

RESEARCH

Comparable in importance with the administration of the national forests are the many investigative activities in the field, laboratory, and office that are grouped under the heading of forest research. These investigations cover a wide range of subjects, including the growth, management, and protection of the forests, the management of livestock range within forest areas, and the conservative and effective utilization of forest products, as well as the economic features of forest ownership, production of lumber and

other products, and the country's present and future need for timber. The research is not limited to problems which directly concern the management of the national forests. Its object is to promote the best use of the forest and range resources of the United States, whether in public or private ownership. Three special fields of investigation that are nation-wide in



F-244373

FIGURE 22.—Bluegrass pastures and woodlands on a Virginia farmstead

scope are represented by the Forest Products Laboratory at Madison, Wis., the forest-taxation inquiry at New Haven, Conn., and the forest survey.

All lines of forest research head up in Washington, D. C., but by far the greater part of the investigative work is conducted in regional units that roughly correspond to the major forest regions throughout the country. In each of these regions it is planned to establish a forest experiment station, where all lines of research in that particular region will be centered. Eleven of these stations have already been organized. In each, so far as the needs of the region require,

are represented the investigative activities relating to forest management and protection, forest products, forest economics, and range research.

FOREST-MANAGEMENT AND PROTECTION INVESTIGATIONS

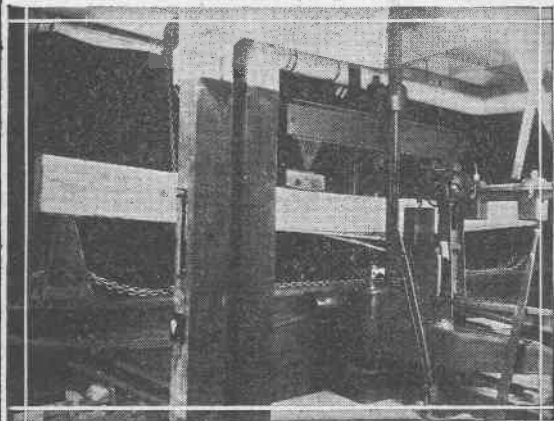
The purpose of research in forest management is to discover for the many varied and diverse forest types and forest soils of the country, the basic facts upon which the proper management and protection of forest lands for the production of timber and related products can be established. Such research is intended to furnish the owner of timberland, whether farmer or lumberman, State or Federal Government, information wherewith forest lands can be brought to the point of producing the highest returns. The field is broad. Such diverse subjects are studied as seed production and germination, nursery and planting practice, and sprout and seedling growth. Intensive studies are made of thinning practices, of rate of growth of trees and stands at different ages, and of the various methods of harvesting the forest to obtain natural reproduction of desirable species. Closely associated with forest-management research is the endeavor to find effective means of protecting the forests from fire and of suppressing the fires that start. Other important lines of investigation are the study of flood and erosion control by forestry measures and the climatic and recreational benefits which properly managed forests may provide. In short, forest-management research covers all phases of forest growth and forest protection, from the seed and bare land to the full-grown tree and the mature forest ready for harvesting for the use of mankind.

FOREST PRODUCTS

It is just as important to know what to grow as how to grow it, and just as important to make the most of what is produced as to make the forests produce more material for consumption. The investigations in forest products closely interlock with those

in forest management. Their object is to bring production and consumption into the most advantageous adjustment, from the standpoint of the public welfare, through study on the one hand of the raw material that the forests produce and on the other hand of the requirements of our industries and their processes of manufacture.

The bulk of this work on forest products is centered at the Forest Products Laboratory at Madison, Wis., maintained in cooperation with the University of Wis-



F-245020

FIGURE 23.—Testing the strength of structural timber at the Forest Products Laboratory, Madison, Wis.

consin. Here intensive studies are made of the physical, mechanical, and chemical properties of wood and wood products. These include tests of the strength of practically all North American woods of commercial importance, studies in seasoning and kiln drying, wood preservation, the manufacture of paper pulp, fiber board, and the like, and the production of alcohol, turpentine, rosin, tar, and other chemical products. (Fig. 23.)

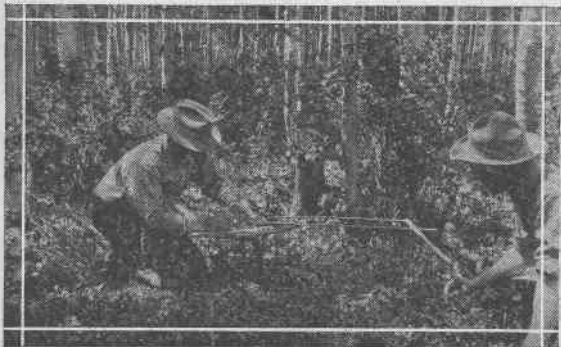
Through such studies the wood-consuming industries are helped to find the most suitable raw material and to develop methods of utilizing their waste products, while forest owners are helped by having new uses developed and new markets opened for what they grow. An important part of the work is to discover ways of using the woods which, though often abundant, have been considered of little or no value. On such studies largely depends the extent to which the practice of forestry will be taken up. In a nutshell, the investigations in forest products are conducted in order that the forest resources of the country may be best conserved, developed, and utilized. While some of the work aims directly at making possible the most effective utilization and marketing of national-forest timber, the general object is to do this for timber grown anywhere, and thus to extend forestry and increase the service and value of forests to the Nation.

FOREST ECONOMICS

Closely bound up with problems of forest management and utilization are problems of forest economics, for economic factors in the final analysis determine both the desirability and the practicability of given silvicultural and technological measures.

Investigations in forest economics aim to furnish basic information as to the extent and economic importance of our forest resources, existing and probable future requirements for forest products, and the economic factors which govern the use of land for forestry and which affect methods of forest utilization under different conditions. Statistics are collected on the price of timber and other important forest products, and on the production and consumption of timber products by various industries. A comprehensive survey of the forest resources and requirements of the whole country is now in progress. Information is also collected on the forest resources and requirements of other countries because of their bearing on American forestry. Other studies cover such sub-

jects as the effect of timber depletion on industrial and community development, the relation between forestry and agriculture in regions where there are considerable areas of marginal land, the costs of and returns from forestry enterprises, methods of forest taxation and their results, forest-fire insurance, and possible measures for promoting private forestry practice.



F-176923:

FIGURE 24.—Forest officers of the Great Basin Experiment Station mapping quadrat with chartograph, Manti National Forest, Utah

RANGE RESEARCH

The objective of range research is to determine, or aid in determining, how lands suitable for grazing can be utilized to the best advantage. It concerns itself primarily with increasing and maintaining the productivity of national-forest ranges, with promoting the welfare of a profitable range livestock industry, and with coordinating range and other forest uses. Under a wide diversity of conditions studies are conducted along fundamental lines, including the influ-

ence of herbaceous and shrubby range vegetation and its use by livestock on soil erosion, irrigation, domestic water supplies, floods, and the production of hydroelectric power; the correlation of grazing with satisfactory timber production; utilization of various forage species consistent with their proper maintenance and adequate reproduction; artificial reseeding to cultivated and native forage plants; the forage values, life histories, and requirements of range plants; range livestock management, including systems of handling different classes of stock, water development, and salting, and their relation to the welfare of the range; the relation of available water for range livestock to injury to timber reproduction; the relation of climate to plant growth and of plant succession to range management; and the eradication or control of poisonous plants. (Fig. 24.)

NATURAL AREAS AND EXPERIMENTAL FORESTS AND RANGES

Certain areas within national forests are designated as "experimental forests," to be maintained permanently as outdoor laboratories for research in silvicultural and other forest practices in each forest region. A supplemental series of areas known as experimental ranges is set aside for range investigations. The Forest Service also has designated a series of "natural areas" sufficient in number and extent adequately to illustrate or typify virgin conditions of forest or range growth in each forest or range region, to be retained in a virgin or unmodified condition for purposes of science, research, historical interest, and education. Within the areas so designated, except for permanent improvements needed in experimental forests and ranges, no commercial use is allowed, and public use is carefully regulated. Use of the areas by other research or educational agencies for purposes which do not conflict with Forest Service projects is allowed under cooperative agreements.

INFORMATION ON FORESTRY

The Forest Service does all that it can to put its information at the service of the public in order that the results of its investigations may be put into actual practice on all forest lands. Besides publishing its findings in helpful, practical bulletins, it furnishes information, advice, and cooperation in many other forms.

Timberland owners, farmers who have woodlands, other small owners, and persons wishing information on tree planting for timber production, windbreaks, shelter belts, and the like are given such data as the service has available, applicable to their special needs. For the benefit of farmers and other small owners, information has been gathered, and may be had on application, concerning the marketing of timber in relatively small quantities. By devoting land of relatively low agricultural value to timber growing, applying intelligent methods of production, and marketing to advantage, many farmers could add substantially to their income. In those States which have State foresters, or State extension foresters, however, these officers are ordinarily in a better position to give information regarding local conditions and the best methods of forestry practice for the individual to use than is the Forest Service. Applicants for information and advice who are residents of such States are therefore customarily referred to the proper State official for better attention to their specific needs.

Information on such matters as the properties and uses of wood, wood seasoning, and preservative treatment, and methods of obtaining or utilizing forest products of any kind is obtainable from the Forest Products Laboratory, where investigations of this character are centered. Cooperation is sought particularly with the wood-using industries for the solution of their problems and the application of results. Examinations may be made, on request, of the methods

of individuals, companies, and corporations in handling forest products, and plans may be prepared for improved methods, if it is judged that this will reduce waste in utilizing forest products and will secure information useful generally in the industry concerned to a degree sufficient to justify the project. Details regarding the terms on which cooperative agreements will be made may be had on application to the Forest Products Laboratory.

PUBLICATIONS

To facilitate widespread diffusion of useful knowledge relating to forests, forestry, and forest products, to promote increased use of the national forests, and to obtain the fullest possible cooperation of the public in their protection the Forest Service has issued a large number of publications. Its purpose is to make available as promptly as possible, through publications, all new results of research work of value to scientists, foresters, timberland owners, farmers, lumbermen, or the woodworking and allied industries. Some of these publications may be had free of charge as long as the supply lasts by applying to the Office of Information, Department of Agriculture. Others are sold at a low price by the Superintendent of Documents, Government Printing Office, Washington, D. C., from whom price lists may be had free on application.

PHOTOGRAPHS, LANTERN SLIDES, MOTION PICTURES, AND EXHIBITS

The Forest Service has a considerable collection of photographs showing forest conditions and illustrative of forest utilization and forestry work generally in all parts of the United States. This collection is open to the public for inspection. Photographic prints, lantern slides, and forest maps are furnished for educational purposes, through loan or sale.

Material for use in visual education may be borrowed for short periods without cost except for transportation, by schools, libraries, clubs, and other institutions or organizations. This material consists of traveling exhibits, sets of lantern slides, and motion-picture films.

The traveling exhibits include sets of enlarged photographs illustrating the subjects of forestry, nature study, and farm woodlands, and specimens of commercial wood species, with maps and other information.

The lantern slides, most of which are in sets accompanied by lecture outlines, illustrate the subjects of general forestry, the work of the Forest Service, forestry in its relation to farm woodlands, nature study, geography, manual training, etc.

The motion pictures, most of which are one reel (1,000 feet) in length, cover the subjects of fire prevention, reforestation, lumbering, grazing, Forest Service work, the forests as reservoirs, and the forests as places of recreation and beauty.

The Forest Service maintains a considerable amount of material for use in making exhibits at fairs and expositions, both in cooperation with other bureaus of the Government and independently.

Particular attention is given to enlisting the interest and cooperation of the public in the prevention and control of forest fires and in the extension of the practice of forestry by private owners, and wide use of the national forests is promoted by directing the preparation and diffusion of information having this end in view.

GENERAL INFORMATION

The Forest Service furnishes information and illustrations, upon request, to writers of magazine and newspaper articles. Advice and assistance are available to authors and publishers of textbooks having to do with forests and forestry.

FOREST SERVICE ORGANIZATION

WASHINGTON (D. C.) OFFICE

The administration of the national forests and the conduct of all matters relating to forestry which have been charged to the Department of Agriculture by Congress are, under the direction of the Secretary of Agriculture, in the hands of the Forester and the associate forester. The work of the Forest Service is organized under the branches of operation, forest management, range management, lands, research, engineering, finance and accounts, and public relations.

The branch of operation has general supervision of personnel equipment, quarters, and supplies of the service, and of all fire control and permanent improvement work on the national forests.

The branch of forest management supervises the sale and cutting of timber on the national forests and reforestation of denuded land.

The branch of range management supervises the grazing of livestock upon the national forests, allotting grazing privileges, and dividing the ranges between different owners and classes of stock. It is also charged with the work of improving depleted grazing areas and of cooperating with the Federal and State authorities in the enforcement of livestock quarantine regulations.

The branch of lands examines and classifies lands within the national forests to determine their value for forest purposes; conducts the work in connection with claims on the national forests prior to proceedings before United States registers and receivers; and has general supervision over the use and occupancy of national-forest lands under special-use permits, the development of recreational resources within the national forests, the exchanges of national-forest lands and timber for lands in private ownership within the national forests, and the administrative work connected with the purchase of forest lands in the eastern United States.

The branch of research has supervision over the investigative work of the service, including silvicultural studies, studies of State forest conditions, investigations of the lumber and wood using industries and lumber prices, grazing studies, and the investigative work carried on at the Forest Products Laboratory and the forest and range experiment stations.

The branch of engineering administers water-power permits and easements granted prior to the passage of the Federal water power act, and makes such power investigations and reports as are requested by the Federal Power Commission. It is also charged with the making of such surveys and maps as are necessary to the national-forest work. It administers for the Forest Service the provisions of the national-forest road appropriation acts and supervises the construction of such roads and trails as are handled by the Forest Service. All civil-engineering work in the service is now handled by this branch.

The branch of finance and accounts has charge of the fiscal records and accounts of the service.

The branch of public relations exercises leadership in the analysis and interpretation of current thought and practice in forestry and strives to direct public attention toward sound forest policies. The branch also directs cooperation with the States in the protection and reforestation of State and privately owned forests lands under the Clarke-McNary law and devises and develops means of contact with the public, to the end that the services which the Forest Service is prepared to render may be better known and more generally made use of. These means include official publications, information for the press, information and material for use in schools, and forestry exhibits, lantern slides, and motion pictures. The branch gives particular attention to enlisting the cooperation of the public in the prevention and control of forest fires.

NATIONAL FOREST REGIONS

In order to prevent delay and red tape in the administration of the national forests, nine field

regions have been established, with a regional forester in charge at each of the headquarters, as follows:

Region 1.—Northern region (Montana, northeastern Washington, northern Idaho, and northwestern South Dakota), Missoula, Mont.

Region 2.—Rocky Mountain region (Colorado, Wyoming, South Dakota, Nebraska, and Oklahoma), Denver, Colo.



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FIGURE 25.—Alaskan forest rangers travel mostly by water

Region 3.—Southwestern region (Arizona and New Mexico), Albuquerque, N. Mex.

Region 4.—Intermountain region (Utah, southern Idaho, western Wyoming, eastern and central Nevada, and northwestern Arizona), Ogden, Utah.

Region 5.—California region (California and southwestern Nevada), San Francisco, Calif.

Region 6.—North Pacific region (Washington and Oregon), Portland, Oreg.

Region 7.—Eastern region (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maine, Mis-

Mississippi, New Hampshire, North Carolina, Pennsylvania, South Carolina, Tennessee, Vermont, Virginia, West Virginia, and Porto Rico), Washington, D. C.

Region 8.—Alaskan region (Alaska), Juneau, Alaska. (Fig. 25.)

Region 9.—Lake States regions (Michigan, Wisconsin, Minnesota, Iowa, Missouri, Illinois, Indiana, and Ohio). Milwaukee, Wis.

In the nine field regions established for decentralized administration of the national forests the work of the regional forester is directed through the branches in their several lines. Under the regional forester, assistant regional foresters are in immediate charge of the same specialized activities throughout the region and on the individual forests. The forest supervisors direct all activities on their national forests, and the line of responsibility runs from them to the regional foresters and from the latter to the Forester. The forests and regions are geographic divisions, each with a chief executive responsible to a single superior executive, who is aided in his supervision and direction of the division under him by specialized branches in his office.

QUALIFICATIONS AND DUTIES OF FOREST OFFICERS

All permanent positions in the Forest Service are in the classified civil service. Vacancies are filled through selections from eligibles certified by the Civil Service Commission and by promotion in rank. Definite information as to the times and places at which examinations are held may be obtained only from the Civil Service Commission, Washington, D. C.

Each national forest has in charge a forest supervisor, who plans the work on his forest under the direction of the regional forester and supervises its execution. When the amount of business on a national forest warrants it, the supervisor is assisted by an assistant supervisor, who has such duties and authority as may be delegated to him by the supervisor.



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FIGURE 26.—A job for every season. The overflow from summer work, as well as the tasks appropriate to winter weather, keep the forest officer busy in the snow-carpeted woods

Supervisors and assistant supervisors have to be men of experience in woods work, road and trail building, the livestock business, and in all other lines of work carried on in the national forests; so the positions are always filled by the promotion or transfer of experienced men from classified positions in the Forest Service. Supervisors' headquarters are located in towns conveniently situated with regard to the forests.

Junior foresters (or technical forest assistants) are employed in the various subordinate lines of technical and administrative work on the forests under the direction of the supervisor. The position of junior forester is filled through a technical examination.

After an apprenticeship period of not less than two years junior foresters who have rendered satisfactory service may be advanced in grade and assigned to such work as examining and mapping forest areas, designating timber to be cut in sales, surveying boundaries, and conducting nursery work and forest planting. (Fig. 26.)

Every national forest is divided into ranger districts, with a district ranger in charge of each. Rangers perform the routine work involved in the supervision of timber sales, grazing, and free use and special use. They also help to build roads, trails, bridges, telephone lines, and other permanent improvements on the forests. Physical soundness and endurance are essential on account of the heavy labor and exposure involved in such work as building improvements and fighting fire. The forest ranger must also know how to pack supplies and find food for himself and his horse in a country where it is often scarce. On the Alaska national forests travel is almost entirely by water, and the ranger must know how to navigate a seagoing launch. The position of ranger is filled through a civil-service examination, in which applicants are rated on the basis of a written test and also according to their education, experience, and fitness.

In addition to the different classes of forest officers mentioned, logging engineers, lumbermen, scalers, and

planting assistants are employed on the forests in the work of timber appraisal, cruising, scaling, and forest planting. Like all other permanent employees, they are appointed only after a civil-service examination.

Forest guards are temporary employees appointed during the seasons of greatest fire danger.

The permanent force employed by the Forest Service numbers approximately 2,700. Of these, about two-thirds are employed upon the national forests as supervisors, assistant supervisors, rangers, etc., and the remainder are engaged in administrative, scientific, and clerical work at the Washington and regional headquarters, the Forest Products Laboratory, and the forest and range experiment stations. In addition, more than 2,500 forest guards are employed on the national forests during the fire season each year.

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THE CONFLAGRATION
REQUIRING
HUNDREDS TO FIGHT**

**BREAK YOUR
MATCH IN TWO.**

**STAMP OUT PIPE
ASHES, CIGAR BUTTS
CIGARETTE STUBS.**

**QUENCH YOUR
CAMP FIRE BEFORE
YOU LEAVE IT.**

**BURN YOUR BRUSH
IN FAVORABLE
WEATHER**

