

THE NATIONAL FORESTS AND THE FARMER.

By HENRY S. GRAVES,
Forester and Chief of the Forest Service.

A FEW years ago more than a hundred farmers in the Kootenai Valley, in Montana, petitioned against the proposed elimination of their section from the Kootenai National Forest. They wanted it to remain where it was. Its elimination they knew, from the history of adjacent land outside the Forest, would mean that it would at once be taken up by timber speculators and lumber companies, to be held for years without development. They knew also that if this came about neighbors could not be secured nor roads and schools be developed in the county anything like as rapidly as if the land remained in the Forest, where those portions better suited for agriculture than for forest purposes could be entered by permanent settlers under the forest homestead act.

In 1911 an association of farmers in Colorado, who draw upon the North Platte River for water to irrigate their farms, sent an urgent request to the Government to restrict timber cutting on the North Platte watershed, so that as far as possible high spring freshets might be prevented and more water furnished during the summer months, when their crops were most in need of it. They relied upon the National Forest which included that watershed to insure them a steady flow of water in the stream, on which their crops depended.

These two instances, taken at random from a great number of similar ones, indicate the interest which farmers take both in the existence of the National Forests and in the way they are administered. This interest does not belong only to farmers in and near the Forests; it belongs to farmers everywhere. The examples cited illustrate but two of the many ways in which the National Forests influence the welfare and development of agricultural communities, an influence which extends far beyond the Forest boundaries. For one thing, the National Forests are the American farmer's most valuable source of wood, the chief building

material for rural purposes. For another, they are his most valuable source of water, both for irrigation, as just indicated, and also for domestic use. Scarcely less important, they afford him a protected range for his stock; they are his best insurance against damage by floods to his fields, his buildings, his bridges, and his roads, and against decreasing soil fertility.

Geographically, the National Forests cover a wide area. They comprise the higher portions of the Rocky Mountain Ranges, the Cascades, the Pacific Coast Ranges, a portion of the forested coast of Alaska, some of the mountain and hilly regions in eastern Montana and in the Dakotas, Oklahoma, and Arkansas, and limited areas in Minnesota, Michigan, and Florida. Besides these, land is now being purchased for National Forests in the White Mountains of New Hampshire and in the Southern Appalachians. In regions so vast and widely scattered the conditions of agriculture, and forest conditions too, necessarily vary in a great degree, which brings about corresponding differences in the way the National Forests affect agricultural interests and the extent of their influence. But wherever agriculture can be practiced the farmer is benefited by the existence of National Forests and their proper handling.

Experience has amply proved that in regions where timber is the most important natural resource permanent forests managed with a view to sustained timber production are not only beneficial to the farmer but absolutely essential to the continuance of agriculture. If the timber is exploited without thought of the future, lumbering presently comes to an end. The result is that the local market for farm products furnished by the presence of lumbering operations is withdrawn. Forest fires ravage the cut-over lands and in the end destroy all prospects for further lumbering. What should be productive timberland is converted into a waste. From such a region the farmers who may have established themselves on scattered areas of land suitable for agriculture move out. In some parts of Europe it has been found necessary, as a preventive of distress to the agricultural population and of abandonment of farm lands, to modify the cutting plans laid down for the forests in order to provide for greater continuity of operations. There

are parts of the United States in which cultivation of the soil has ended with the local lumbering, or shortly afterwards. The farmers have found that without the market for their meats, vegetables, hay, and grain which the lumbermen supplied they can not make a living. There are other regions where the stability of the agricultural industry is absolutely bound up with forest protection. This is strikingly true in parts of the Appalachian Mountains. It is no less true in many of the National Forest regions in the West.

FARMS IN THE NATIONAL FORESTS.

In general, the National Forests occupy the higher and more rugged portions of the mountains, at elevations above the main agricultural zone. Their permanent boundaries are drawn in such a way as to exclude all large bodies of agricultural land; the lands included in the National Forests are those chiefly valuable for forest purposes. In many instances, however, there are within the Forest boundaries scattered patches and strips of land of agricultural character, but too small to be eliminated from the Forest by themselves. These lands occur along some of the valley bottoms, at the confluence of streams, and on narrow benches. Whenever such tracts are suitable for the development of agricultural homes they are opened to entry. Thus the establishment of a National Forest does not mean that agriculture within its boundaries is prohibited. On the contrary, the Department of Agriculture is classifying the lands in the Forests in order to search out the agricultural areas and to bring about their development as fast as possible. To show how the classification of forest and agricultural lands works out in putting every acre or parcel of land within the National Forests to its best use, the Kootenai Valley may be taken as an example. Here a large river winds for 150 miles through a National Forest. It is distinctly a mountain stream. At many points steep, densely wooded hills drop down to the water's edge, making the valley a gorge or canyon. Where tributary streams join the main river, narrow V-shaped valleys run up them for short distances, narrowing in width as the mountains close in. Here and there bars in the river have resulted in a deposit of silt to form long and narrow fertile bottoms, or

level silt islands have been thrown up in the stream itself. Part way up on the mountain slopes occasional level benches afford a few acres or a farm or two of fertile land. At first it was proposed to throw out the entire valley, a strip 3 miles in width on either side of the river. Ninety-five per cent of this belt, however, is nonagricultural land, whose cultivation should not be attempted. It can be of most use to the local community, as well as to the country at large, by growing timber. So instead of throwing the whole valley out of the National Forest, the Forest Service has painstakingly surveyed every little river bottom, island, or bench which contains enough arable land to support a home. Many of these patches are small, but their soil is so fertile that a home can be maintained upon them by intensive truck or orchard farming. Much of the valley is not yet covered by the rectangular system of public land surveys, and instead of waiting for them the Forest Service has, by metes and bounds, run out the boundaries of each of these farmsteads, segregating them from the Forest and making them available for settlers. In this fashion more than 300 farms have been carved out of the Kootenai Valley. The rest of the land has been kept under Government control for continuous forest production, the economic function which it should fulfill.

Another illustration might be cited from Fortine Creek, in the western portion of the Blackfoot National Forest, in northern Montana. Here conditions are somewhat different from those in the Kootenai Valley. Two high, rugged mountain ranges, one on the north along the Canadian border and one on the south, form a divide from the Flathead drainage. Between them lies a broad, level valley, not unlike many of the lower valleys in the Allegheny region. In places it is 3 miles or more in width, offering almost unbroken stretches of arable land. Here and there along its edges spurs jut out from the mountains, forming an irregular boundary with little fingers of cultivable land running up the channels of many of the small mountain streams. The problem here is not alone to determine the most valuable use for each acre of land. Outlets must be retained for the large bodies of timber back in the mountains, and mill sites for manufacturing this timber must be available. In a word, a practical boundary line must be fixed which will set off the

forest areas, together with the necessary facilities for utilization, from the arable lands to be turned over to the farmer. This is precisely what the Forest Service is doing, and in this way the greatest permanent usefulness of each resource as an economic asset of the country is secured.

The fact that a farm is within the boundary of a Forest does not operate to hinder the owner in developing his property. Actually he receives many direct benefits and privileges from the fact that his farm is there. In some places farm values are higher because the land is in a Forest. Settlers are seeking such farms in order to get the advantages of protection of stock and other privileges, and it is very common, as cited at the beginning of this article, for farming communities inside the Forests to protest against proposed eliminations that would put them outside the boundaries.

Many thousands of farms are now being developed within the boundaries of the Forests. This does not include those occupying the wider valleys which extend into the Forests and which have been segregated by elimination, but only the individual farms and small groups which could not in practice be eliminated without including large areas of nonagricultural timberland. During the last decade the Forest Service has classified as agricultural and opened to entry over 15,500 individual scattered tracts in the Forests, covering over 1,700,000 acres. The classification has resulted further in lessening the area held in the Forests by over 9,000,000 acres, through eliminations, which enable the unappropriated and unreserved agricultural land to be taken up under the general homestead laws. Within the last two years there has been eliminated in large blocks 2,650,426 acres. Not all of this land was agricultural, but these areas and the 1,763,867 acres under consideration for elimination contain the bulk of the agricultural lands originally included in the Forests. The remaining agricultural land is chiefly confined to isolated tracts scattered here and there; to restricted areas requiring irrigation, but where water can not be developed; and to certain river bottoms and benches which are now covered with very heavy and valuable timber.

The scattered patches and strips of agricultural land will be opened to entry as fast as classified. The best of such tracts have in most cases been taken up. What remain are

as a rule not only isolated, but so high up that the seasons are short and farming is not as good as upon hundreds of thousands of acres of vacant land on the public domain outside the Forests. Where the area is too small to constitute a practical farm unit, the small cultivable strips or patches are not opened for homesteading but are retained for forest purposes. A real injury is done the homeseeker who is induced to settle upon a tract of land so small and unproductive that his only escape from poverty is to abandon it. That very land, however, may be valuable for forest purposes, and an attempt to use it as a farm is an economic error for the reason that existing wealth is destroyed and no new wealth created. The aim in administering the National Forests is to establish permanent farm homes and communities of homes. Where the land can not be developed for agriculture but can be used for timber development or some other industrial purpose, it should be devoted to what will bring the greatest service to the localities and the country as a whole.

There is also a certain amount of land in the Forests which ultimately can be farmed, but which at the present time is covered with very heavy timber. A constant pressure is brought on the Government by private individuals who want to acquire possession of these lands primarily for their timber value. Single tracts of 160 acres often have a value for the timber alone of \$20,000. So it is inevitable that here and there individuals are willing to use almost any means to get possession of such a timber stake for nothing or next to nothing. But in spite of the fact that some of these lands have soil of an agricultural character, to throw them open for homestead purposes would not result in farm development. This has been proved over and over again where lands acquired in this way under the guise of the homestead law are to-day in the hands of lumber companies who promptly purchased them from the settlers as soon as title passed, and are either reserving them for later cutting or are holding the land itself after cutting for from \$40 to \$60 an acre, or even more—a speculative process which effectively prevents the possibility of men of small means acquiring and establishing homes there.

Thus agricultural development is retarded by the speculator capitalizing the unearned increment and passing it on

as a perpetual burden on the land. Removing the timber through its sale by the Government before the land is opened to settlement removes the speculator and makes it reasonably certain that the land will be taken by a permanent settler and that the unearned increment will go into clearing and productive farm development.

It is not meant to imply, of course, that most applicants for a timbered tract fail to show good faith. Without question, many really desire the land primarily for the agricultural value, and start with the idea of clearing it, even if the timber has to be cut and burned. The fact remains, however, that in most cases the settler sells out and goes elsewhere. When it costs from \$100 to \$250 per acre to clear land and requires a long time and the most arduous effort to get a tract under cultivation, while it is possible to sell that same tract for its timber at from \$2,000 to \$10,000, or even more, the average settler prefers to realize on the timber and move to another place where the difficulties of farming are less severe.

The Government is withholding from agricultural entry such heavily timbered land until after the timber is cut off. But as soon as this is done the land is opened to entry and settlers acquire it directly from the Government for free homesteading, instead of having to pay from \$40 to \$60 an acre to speculative holders. This procedure is being successfully carried out in many places to-day. For example, in the Kaniksu National Forest, in Idaho and Washington, timber sales have been made to include much of the remaining agricultural timbered land. Within eight years fully 10,000 acres of land will be made available for settlement. Permanent homes will be established and there will be available for the use of the communities approximately \$225,000 for roads and schools, their share of the proceeds from the sale of the timber. In the Kootenai Forest, in Montana, the Government is disposing of the timber in a way to open up the remaining acres of agricultural land in the Kootenai Valley lying within the Forest. Directly adjacent to this Government land are thousands of acres of timbered lands taken up under the homestead law before the Forests were established, and now held by timbermen and speculators without development of any kind. It is private ownership

of heavily timbered agricultural land that blocks farming development; Government ownership insures such development under conditions that give opportunities to the small settler whose only capital is his strength and courageous perseverance.

There are still some lands in the Forests which have soil suitable for cultivation if water were available for irrigation. Where water can be secured such land is promptly opened to entry. In case water can not be developed the land is retained in the Forest and used for tree growth and grazing.

One of the most serious agricultural problems of the Northwest to-day is the development of the logged-off lands in private ownership. In Oregon and Washington alone over 3,000,000 acres of such logged-off lands are lying idle, though much of the area has fine agricultural soil and a climate to insure abundant crops and the development of thriving farming communities. Yet in this same region hundreds of settlers are seeking to find some place in the National Forests, usually remote from transportation, high in the mountains, where the climate is harsh and soil relatively inferior, because the good lands at lower elevations outside the Forests are held at prohibitive prices. The real solution of the problem of agriculture in such sections is to develop the rich logged-off private lands that lie outside the Forests and are now idle and unproductive, not to throw open the nonagricultural Forest lands as some are urging.

SPECIAL BENEFITS TO THE FARMER.

Specifically, the benefits to the farmer from the existence of National Forests may be discussed under the following heads:

- (a) The benefits through protection of water resources.
- (b) The benefits through supplies of Forest products.
- (c) The benefits from grazing privileges.
- (d) The benefits, direct and indirect, from the establishment and maintenance of various industries utilizing the resources of the Forests.
- (e) The benefits from public improvements built by the Government.



FIG. 1.—A FARM IN THE IDAHO NATIONAL FOREST, TAKEN UP UNDER THE ACT OF JUNE 11, 1906.



FIG. 2.—A SMALL BUNCH OF CATTLE GRAZING IN AN OPEN YELLOW PINE STAND ON THE DURANGO NATIONAL FOREST, COLO.

[Of the 29,000 grazing permits issued annually on the forests, 24,000 are for small owners of stock.]



AN "AGRICULTURAL" CLAIM ON THE ST. JOE NATIONAL FOREST.

[The 60° slopes rise directly from the creek. There is practically no level land on this claim, but the white pine timber is valued at \$20,000.]



ANOTHER "AGRICULTURAL" CLAIM ON THE ST. JOE NATIONAL FOREST.

[The ground is so steep that both hands have to be used to keep from sliding off into the creek. The photograph was taken on May 22, but snow was still on the ground. The applicant claimed that this was excellent wheat land.]



FIG. 1.—IMPORTANT IRRIGATING DITCH AND LATERAL LESS THAN ONE MILE FROM BUSINESS SECTION OF EPHRAIM CITY, UTAH, BADLY DAMAGED BY THE FLOOD OF AUGUST 24, 1912.

[The flood overflowed the cribbing above man on left, lowered the creek bed 5 feet, and washed out the headgate.]



FIG. 2.—A STREAM IN A NATIONAL FOREST WHOSE HEADWATERS ARE PROTECTED.

[Quosatema Creek as it enters Rogue River, Siskiyou National Forest, Oreg.]



A SMALL TIMBER SALE AREA IN AN ENGELMANN SPRUCE STAND ON THE MADISON NATIONAL FOREST, MONT.

[Farmers and other local residents may purchase timber from the Forests for the actual cost of making the sale, and the number of such sales is steadily increasing from year to year.]



A REGION FOR THE MOUNTAIN CLIMBER, CAMPER, AND SPORTSMAN.

[In the Cascades, Snoqualmie National Forest, Wash., sometimes called the "Alps of the United States." The mountains here are very high and rugged, with peaks rising over 11,000 feet. The great Douglas fir stands on the west slopes are the most heavily timbered forests in the country.]

WATER RESOURCES.

One of the purposes underlying the establishment and maintenance of the National Forests is the protection of the sources of water supply. By their situation in the mountains the Forests cover the higher and more rugged portions of the watersheds at the headwaters of various rivers and streams. The protective influence of the forest cover on sources of water supply is of importance to all industries using water from the streams rising in the National Forests. It is of special importance to the agricultural interests. In many parts of the West the water used in irrigation is derived almost entirely from streams which have their source in the National Forests. This is true of the majority of the great reclamation projects of the Government, which furnish water for many hundreds of thousands of acres of land. Every farmer who uses this water is, in a measure, directly dependent in the long run on the proper handling of these National Forests. In several instances National Forests are maintained primarily for the purpose of watershed protection. The headwaters of the Salt and Verde Rivers in Arizona, on which is one of the greatest of the Federal reclamation projects, are comprised in the Tonto and Prescott National Forests. Considerable portions of these watersheds are administered as National Forests in order to control the grazing and so to prevent erosion. Every water user on this project realizes that overgrazing of the watershed would greatly hasten the silting up of the reservoirs and canals.

On many National Forests in the Rocky Mountains and elsewhere, protection belts of forest have been established on the upper sources of important streams. In these belts all cutting will be very carefully regulated, so as to run no risk of disturbing the forest cover, which exerts a beneficial influence in holding snow and storing water during the period of heavy precipitation. Often no cutting at all is permitted, except of dead timber. In the steep mountain ranges of southern California the use of the pine forests high up on the watersheds is absolutely controlled by the necessity for conserving the water needed to irrigate the citrus-fruit farms in the valleys below. Except where it is very clear that

heavier logging will have no harmful effects upon stream flow, cutting is confined to the removal of an occasional overmature tree whose usefulness as a conserver of water is practically gone. Often Forest officers cooperate with local water users in studying conditions of stream flow and determining how they should affect the management of the Forests. In Colorado committees representing irrigation associations have been conducted over timber sales on watersheds in National Forests, the methods of cutting explained to them, and conferences held to determine how far the Government may safely go in utilizing the timber. All told, the value of the farms whose water supply for irrigation is protected by the National Forests will run into the hundreds of millions of dollars.

Farmers and other water users are very jealous of the way in which the Forests are handled. On the Angeles Forest alone local citizens contribute over \$15,000 a year to aid in building fire lines for the prevention of disastrous forest and brush fires. Such men see in the right handling of the Forest the source of their own prosperity, and they cooperate in every way they can to aid the Government in its forest work.

A second way in which farmers are affected by the National Forests is in the use of water for domestic purposes. Not only do individual farmers get the water used in their homes and for their stock from streams rising in the Forests, but many small towns and communities are thus supplied. Altogether about 1,200 towns and cities depend on National Forest water. With the increased development of the country which is following the utilization of the National Forest resources, the number of communities dependent on water from the Forests is increasing, and constantly larger quantities are used in each locality. In the planting operations on the National Forests special attention is given to watersheds which supply municipalities and rural communities. From 10,000,000 to 15,000,000 little pines, firs, and spruces are planted every year in the Forests, and some tons of tree seed sown. Not only is the forest cover on these watersheds being extended by the Government with the aid of local citizens, but special arrangements are made for controlling grazing and other uses of the area in order to prevent the silting of the stream or pollution of its water.

One of the greatest handicaps which the Forest Service has already encountered in meeting this problem of guaranteeing pure water for domestic use is the fact that certain portions of the watersheds have already been privately acquired and the control thus passed from public to private hands. Every year petitions are received for additions to the National Forests, in order to include under the protective system some town or community watershed.

SOIL WASHING AND FLOODS.

Of no less importance to the farmer and the community is the need for having the water supply under constant control and free from torrents which carry away diversion dams, headgates, bridges, and roads, and leave irrigation ditches, fields, and streets strewn with bowlders and mud. Such floods are a matter of disastrous experience in a number of mountain valleys where successful agriculture depends upon unfailing streams. In the San Pete and Castle Valleys of Utah alone the damage to cultivated fields, irrigation works, roads, water-supply systems, and power systems, as the result of erosion and floods since 1890, may be conservatively estimated as totaling in six figures.

When these valleys were settled the streams flowing into them were clear even during the high-water season. As settlement grew the increasing number of cattle and sheep were forced back to the headwaters of the streams for summer pasturage and the timber for domestic supply was cut where it could be secured most conveniently without thought of future protection. The herbaceous and shrub vegetation on the high untimbered slopes, which formerly broke the force of the rain, bound the soil together in its resistance to the combined force of water and gravity, and kept it sponge-like through the constant addition of vegetable matter, was reduced or destroyed by overstocking and premature grazing with cattle and sheep. At the same time the originally mellow soil became packed beneath, and a dust bed on top. The transformation brought about a change similar to the difference between a cultivated field and an adjoining barnyard, the former highly receptive to falling rain, the latter almost impervious. Small gullies soon formed; these increased in number and size, widening out into fan-shaped

drainage at the headwaters of streams and collecting as a funnel in the canyon below. The character of the run-off under such conditions of the watershed is illustrated by an observation in the San Pete Mountains of Utah. At 11 a. m., July 30, 1912, a light rain started; at 11.45 a. m., the roar of a flood was heard at the head of a small canyon draining approximately 1,500 acres of sparsely timbered land at 10,000 feet elevation, lying fan-shape at the head of the canyon. The natural stream, a mere dribble, was increased to a maximum front 25 feet wide and 8 feet high. The main flow lasted approximately an hour and in this time changed its course at the mouth three times. A solid section of bank approximating 5,000 cubic feet was torn out in a few minutes. It is estimated that 30,000 cubic feet of gravel and bowlders came down in this flood resulting from 0.5 inch of rain in 2 hours over a drainage area of 1,500 acres which was hard packed and gullied.

A flood of this character originating at the headwaters of a single canyon on August 24, 1913, carried bowlders as large as 10 cubic feet to the settlement beyond the canyon; head-gates were washed out and the main ditch was lowered at one point 5 feet below the intake of laterals, and at another point the channel was filled up and changed. Basements, sidewalks, lawns, and corrals were left under a sheet of mud; the city light plant and the water system were temporarily impaired, and 7 miles of a much-used timber wagon road was made impassable.

To eliminate such floods it is essential to eliminate the conditions which give rise to them. With the watersheds under protection, grazing is adjusted to give nature a chance to revegetate the untimbered slopes; timber cutting is so planned as to protect areas of critical position against erosion and floods; and investigations are under way to develop feasible methods of repairing damage where erosion has progressed to a degree beyond repair by nature alone. By proper management it is believed that this repair work can be done in time without interfering materially with the farmers' need for timber and range. The Government is thus working to protect the farms from disasters that in a few hours might wipe out the results of many years' hard work.

Fully as important, but less noticeable, is the protection afforded both local and general soil fertility by the National Forests on our principal mountain ranges. The pioneer found rich soil on both hillside and plain; but experience has taught him, and the soil expert has demonstrated, that while the fertility of the valley is permanent, the fertility of the hillside is transitory. The humus produced by forest growth makes an exceedingly rich soil, but rainfall and gravitation constantly tend to carry that fertility to lower lands. So long as the slopes are well protected by tree growth, they continue to add to the fertility of the valley lands. Each year a ton or more of litter is added to each acre of forest soil in a dense forest, but the soil fertility remains practically constant, the increase being slowly contributed to lower lands through the forces of nature. The hillside lands are slowly lowered, while those of the valley are raised. So long as this continues at an imperceptible rate the valley is benefited, while the hills are not injured. An analysis of Illinois soils showed that on hill land the surface 7 inches of soil contained an average of 2,000 pounds of nitrogen, while the next 7 inches contained only one-third as much, and the next still less. At the same time the valley land contained in many instances three times as much, and was fairly uniform to a considerable depth. Under normal forest conditions the more valuable elements are slowly transported from forest to field. Cut off the forest, and the hillsides become a source of sterility instead of fertility. The unregulated rush of waters carries sand and gravel instead of valuable plant food down into the field, destroying the soil fertility of both hillside and valley. This wholesale soil waste and destruction is prevented by the regulated cutting of timber and restricted grazing in the National Forests. The continuation of this protection is all that stands as a safeguard against great injury to the soil fertility of millions of acres of very valuable and productive farm land.

PROPER CONTROL OF TIMBER RESOURCES.

One of the immediate benefits to the farmer comes through the public control of the timber resources. In the first place, settlers who live in and adjacent to the Forests are granted free use of firewood and certain other material for

domestic purposes, and through a recent enactment of Congress there is now authority for such settlers to secure larger amounts of timber needed on their farms merely by paying the Government what it actually costs to administer the sale. This ordinarily is from 50 to 75 cents per thousand feet, which means an actual saving in money to the farmer of from 50 cents to \$5 per thousand, according to the class of timber. In administering the National Forests, provision is made first of all for the needs of the farmers and other local residents. There is thus a guarantee of a permanent supply of material for local communities. The importance of this is illustrated in those regions where the National Forests constitute practically the only source of wood and timber. In certain places in the Southwest and in other places east of the Rocky Mountains, farmers sometimes travel 100 miles to a National Forest to obtain firewood.

Many National Forests in sparsely timbered regions serve as community woodlots for the farmers surrounding them. Instead of cutting material for fuel and farm improvements from the woods on his place, like the average farmer east of the Mississippi, the ranchers turn to these public woodlots. The Sioux National Forest, on the Dakota-Montana line, supplies from 1,200 to 1,500 farmers. The Wichita National Forest, in western Oklahoma, furnishes material to between 1,400 and 1,500 more, and the Cache and Minidoka National Forests, in southern Idaho, together each year furnish farm materials to 3,400 permittees. This use covers every conceivable requirement of the farm—cordwood, fence posts, derrick poles for stacking hay, corral poles and barn rafters, and lumber for buildings. Where timber is particularly scarce these forest woodlots are reserved entirely for the needs of localities surrounding them, including mining industries, where they occur, and local towns as well as rural farm communities. Sales of timber for shipment to outside regions are only permitted where there is clearly more timber than local users require.

Often the community feature of a National Forest is further emphasized by cooperative sawmills constructed and run by groups of farmers or small communities to supply their needs as a whole. Several small mills of this character are in successful operation on the National Forests in the

great farming region of central Utah. The farmers who own them go up into the mountains with their teams for a month or more after the harvesting season, cut and haul logs to the mill, saw the logs into lumber, and haul the latter down to their farms for the next year's use. Opportunity is thus afforded to keep the farms in the vicinity of the National Forests supplied with wood for all purposes at a very slight cost, aside from the time of men and use of teams when ordinary farm work is slack. Not infrequently one finds timber cuttings in progress on the National Forests which are meant to supply the specialized industries of a region. Small mills in the Sierras, for example, are manufacturing National Forest timber into trays which are used in enormous quantities in the raisin belt and citrus-orchard districts of California. Other purchasers of timber from the Government are engaged in cutting fence posts in large quantities for the supply of farming communities, where the individual ranchers can not themselves go to the mountains to procure such material.

The free-use privilege was taken advantage of during the past year by over 34,000 persons, who obtained material entirely without charge aggregating 120,500,000 board feet and with a total real value of \$183,000. Through these privileges and through the public control of the timber, local communities at a distance from the general lumber markets are protected from the excessive prices which frequently obtain where the small man is unable to protect himself on account of the control of supplies by private individuals.

GRAZING.

One of the greatest benefits of the National Forests to the farmers is the protected range which is given to them for their stock. On about two-thirds of the area of the Forests there is more or less forage. Like other resources this is put to use, and more than 9,400,000 cattle, sheep, horses, swine, and goats graze on the Forest range. The grazing is under Government regulation, so that the forests are not injured and at the same time the ranges are not overstocked.

Every farmer is to a certain extent a stockman. When his farm is remote from markets it is the live stock which yields him his income. This is especially true of the farms

in and near the National Forests, most of which are at considerable distances from centers of population and where the transportation facilities are still very poor. If the farmer can secure suitable grazing grounds upon which his stock may remain during the summer, a period averaging throughout the West about five months, he is thereby relieved of the care and expense of maintaining them upon his own land, and the feed they would otherwise have eaten during the summer is accumulated for winter use. It is precisely at this point that the National Forests serve to meet his special needs, for the farmer is given preference in use of the forage on the Forests. Every man is allowed to graze 10 milch and work animals entirely free of charge. He is then preferred before all others in further grazing privileges, for which he pays a very moderate fee. The regulation of the use of the ranges gives him protection, so that he is sure of having enough forage to carry his stock through the summer. Prior to the creation of the various National Forests the small live-stock owner was practically prohibited from utilizing the ranges adjacent to his lands because they were already stocked to their utmost capacity by larger owners. If in one year there was enough feed for the farmer's stock the next year some large outfit might sweep through and use it all. The small man could not afford to turn his few head loose among such large herds because of the danger of the animals straying to remote ranges.

As a concrete example of how the present Government policy has encouraged and built up the production of live stock by farmers, the Manti Forest, in the State of Utah, may be cited. This Forest lies between two very productive valleys in central Utah, where the demand for farms is so great that the farm unit is being reduced every year, the average for 1914 being 38 acres. When the Forest was created the ranges were practically monopolized by the large herds. Now the Forest range is occupied almost wholly by the stock of the farmers living in the near-by valleys. During the season of 1914, 1,259 permits were issued for the grazing of cattle and horses and 513 permits for the grazing of sheep upon this Forest. The ownership of these animals was divided as follows: Permits for 1 to 40 cattle, 1,185 owners; 41 to 100, 61 owners; above 100 cattle, 13; from 1 to 1,000

sheep, 506 owners; above 1,000, only 7. Several hundred cattle permits were for less than 10 head and dozens of the sheep permits for less than 75 head. The average number of sheep grazed per permit was 290 head, and the average number of cattle and horses was 15. This shows how the small owners are taken care of.

It will be seen to what an extent the farmers in the valley surrounding the Manti Forest depend upon it as an aid to their farming operations. Every year there are applications from new settlers who desire grazing privileges for from 1 to 10 head of cattle, and the larger owners are being continually reduced to make room for this class of permittees. These farmers turn their stock into the Forest in the early spring and return them to their farms in the fall, when those which are ready for market are sold, while the breeding stock is wintered upon the farm. It is an attested fact that stock sold from the Forest ranges weigh more and bring better prices per pound than the same class of stock from the open ranges outside the Forests. It is also true that these farmers could not successfully operate such small farm units without the aid of the Forest ranges. This is the sort of result that is being secured on all the National Forests where there is grazing land and near-by farms. Every year a larger number of permits are issued to small owners. In fact, out of 29,000 permits, 24,000 are for small men, chiefly farmers living in and near the Forests.

The development of the dry-farming principle, which is bringing under cultivation large areas of land hitherto believed to be incapable of producing agricultural crops, can be successfully carried through only by maintaining live stock to eat the rough forage crops which are produced upon the majority of such farms. If the dry farmer can depend upon obtaining range for part or all of his surplus stock within the neighboring Forests, he will be able to add very materially to the meat production of the nation and at the same time develop his land much more rapidly.

In many parts of the West the dairying industry is rapidly growing, and applications from settlers for range within the Forests upon which to graze their dairy cattle are being received in large numbers. To meet this situation certain areas have been reserved exclusively for this class of animals,

and drift fences have been erected to prevent the dairy cattle from mixing with the purely beef herds around them, and also from wandering from their own ranges. Already farms in and near the Forests bring a higher price in the market by reason of the grazing privileges which the farmer has for his stock.

BENEFITS FROM INDUSTRIAL DEVELOPMENT.

The Government is aiming to secure a development of all the various natural resources in the National Forests. This means the establishment of new industries of all kinds; it means, further, that the industries will be permanent ones, because the resources upon which they depend are being handled conservatively; it means the development of communities, towns, and even cities; it means more people working to create wealth and an increased demand for all the products of the farm. It means, therefore, for the farmer, a greatly increased market for his products. Every timber sale means development of the lumber industry, with the establishment of camps in the Forest to log out the timber and a sawmill established for its manufacture. There is developed immediately a market for all food products raised on the farm to supply the needs of the men employed in the work; there is also created a demand for grain and hay for the horses and mules used in the various lumbering operations. Very commonly a large timber sale means a railroad, either a main line or a branch line, and all extensive railroads built under National Forest contracts must be common carriers. In many instances this means not only that more people are brought into the farming communities, but that still greater markets become available by shipping over the railroad. Exactly the same process follows every substantial mining development.

There is one industrial development going on very rapidly in the National Forests which is often overlooked as an industry, and that is the development of the recreation resources. Throughout the National Forests there are a multitude of small lakes and streams and points of special scenic attraction. Many thousands of people are going every year into the National Forests for recreation purposes. Probably not less than 1½ million pleasure seekers

use the Forests in this way every year. The development of the recreation resources is being encouraged by the Government in every way possible. Not only are the points of special interest being protected from injury by forest fires or otherwise, but improvements in the way of roads and trails are very rapidly making these interesting areas available to the public. In consequence hotels and cottages are being built around the lakes and at other points, and summer communities are springing up in great numbers. Such a community establishes a market for produce from the neighboring farms.

THE FARMER AS A CAMPER.

In many sections the people making use of the Forests for recreation are the farmers who live in the hot valley at the foot of the mountains. Thus, for example, in California, when the fruit-canning season closes in the hot San Joaquin Valley, thousands of small farm owners load up a camp outfit on a wagon and start for the Sierra and Sequoia National Forests. Each takes his wife, children, and dogs, and while the family gain new health in the timber camp on the edge of some mountain meadow, the farmer cuts his year's supply of cedar fence posts, and shoots the two deer which the law allows him.

In addition to the farmers' direct benefit from all development in the National Forests through increased markets for their products, there is immediately created a demand for labor and for the use of teams and other equipment. The Forest Service goes to the local ranchers, as well as to the lumber camps, for much of its labor in building trails and other work. Many of the patrolmen are young ranchmen having homes in or near the Forests. Exactly the same market for labor follows the use of the resources.

In some localities farmers work at certain seasons of the year in the National Forests cutting timber for sale, just as the New England farmer puts in time in the winter, when he has no other work for himself and his teams, getting out material from his own woodlot. The advantage to the farmer of being able to employ his time in off seasons profitably is self-evident. Where a local market exists the farmer can go into the National Forests, make a purchase of timber

on the stump at a reasonable price, and go to work. This is already a very valuable opportunity for many western settlers. The Forest officers prescribe methods of cutting which insure the maintenance of the forests and prevent unnecessary waste. As the country about the Forest becomes more fully populated the value of the opportunity thus afforded will increase. The farmer has his timber supplies taken care of by the Government without cost to him, and in consequence is often better off than the eastern farmer who must pay taxes on his woodlot, perhaps at an excessive valuation. Of the over 8,000 small commercial timber sales involving amounts worth \$500 or less, made by the Forest Service each year, a large proportion are made to farmers, who, in connection with their ranches, run wood yards, small sawmills, and local lumber yards, or who distribute fence posts to a considerable agricultural district. Upward of 200 small sales are made annually in the vicinity of Butte, Mont., chiefly to farmers who cut and haul cordwood, mining stulls, mine props, mine lagging, converter poles, and the like from the Forests to supply the mining market of that region. Elsewhere many small timber contracts are let to farmers who cut a few thousand railroad ties each winter for delivery to some local line. Other farmers take out telephone poles in small lots, shingle bolts to be sold to some local mill, or small quantities of saw timber which are sold to local manufacturers. One of the interesting results of the establishment of National Forests in the Southern Appalachians is to bring employment to many of the people living in the mountains—employment not only in public works, but also through taking small contracts in cutting and hauling logs, piling, acid wood, and fuel. Such opportunities are often a stimulus to an entire community.

PUBLIC IMPROVEMENTS.

One of the farmer's first needs is adequate transportation. Millions of acres of farm land are to-day undeveloped because of the lack of good roads. In opening a new country, road building constitutes a hard problem for the settlers. At first their number is small; every man is struggling to erect his home and farm buildings and to clear the land; during the period of actually establishing the farm there is little or no

income from it, and usually the settlers can not afford to pay high taxes. Under such circumstances the burden of road building is so great that development is slow, and in thousands of cases the settlers give it up entirely and abandon their homesteads. The National Forests comprise the remotest and least settled localities. In many cases farming in these regions is still pioneer work, under as difficult conditions as ever existed anywhere in this country. Near the Forests are very large areas of excellent agricultural lands lying idle, lands capable of supporting many thousands of families and adding greatly to the food supply of the regions. One reason for the failure to develop this land has already been mentioned, namely, the excessive speculative prices at which it is held. That is a problem that will have to be met in large part by the communities themselves, which have the power of taxation. But one great reason also why a good deal of this land lies idle is the lack of roads. Every reason exists why the public should aid in this matter, because it is of vital importance to the public to have these lands put to productive use.

This problem is being met in two ways: First, by the work of public improvements being carried on by the Government in the Forests, and, second, by the direct contribution to the counties from a share in the receipts from the Forests. Every year the Government builds in the Forest roads, trails, bridges, telephone lines, and other improvements. The National Forests have been under administration only a decade, yet there have been already constructed 2,300 miles of roads, 21,000 miles of trails, 583 bridges, and 18,000 miles of telephone lines. Every one of these improvements benefits some settlers and ranchers. Many are the communities made accessible through the roads, bridges, and trails; many the ranchers who have been brought into profitable and pleasant communication with neighbors and outside places by the Forest Service telephones. Naturally the chief benefit of these improvements is to those who live within the boundaries of the Forests.

A direct contribution to the communities for roads and schools without reference to the Forest lines is provided for by Congress. There is appropriated annually for the use of the counties in which Forests lie 25 per cent of all gross

receipts earned from the sale of timber and from other resources, this to be used in road building and for schools. Where the resources of the Forests are marketable, the returns from this source are already very considerable. In the aggregate, nearly \$900,000 is obtained in this way each year from the National Forest receipts, to be used locally in public improvements and schools. Some of the individual Forests are bringing in over \$100,000 a year, and the business throughout the Forests is increasing so that the direct contribution to community upbuilding will soon be a very large one.

But in many of the Forests the resources are inaccessible and the greatest resource, the timber, is not salable under present conditions, except in small quantities. Under such circumstances the development of the Forest resources is slow, and there is but little direct return to the communities from Forest receipts. While ultimately these Forests will be of enormous importance to the country, the people need assistance now during the pioneer period of development. A great deal of the land in the counties in which the most heavily timbered National Forests are located is still a practical wilderness. The very foundation of any development in such sections is the construction of roads and bridges, and this is in many places enormously expensive. The clearing of the land for farming, the building of the homes, the building of schools, churches, and public improvements in the towns, in addition to the road building, are the burdens of a small, struggling population.

In many cases the National Forests occupy from 20 to 60 per cent of the area of the counties and contain timber of vast amount. Is there any wonder that the people are protesting that the Forests, which are not subject to taxes and are not yielding much from timber sales, are not contributing as they should to the development of their communities? Often they use the phrase that the Forests are blocking development or that the resources are locked up. This is, of course, not true, because the resources are available for use. What is meant, and what is true, is that the Forests are not contributing as they should to development of the communities in the counties in which the Forests are located.

Various proposals have been made, from time to time, looking to a possible solution of this problem. The most common proposal has been to abolish the National Forests and distribute the land among private owners in order that it may be brought under taxation. To make clear the utterly destructive character of such a program would need only a review of the scandals that accompanied the operation of the land laws as they pertained to timber lands, prior to the establishment of the National Forests, and a review of the results of private ownership of large areas of forest land where there has been no public control or public participation in the protection and handling of them. The National Forests will be one of the greatest sources of local prosperity. Publicly owned, they will be protected from destruction and their resources will be available for continuous service in building up and permanently maintaining local industries. Above all, they serve the public and their benefits can be shared by the average man instead of serving to enrich a few who might be in a position to secure control of them. The problem must be worked out in a way which will meet the immediate needs of the communities, without breaking down the integrity of the National Forests and withdrawing from the local communities the great benefits which will increasingly be derived from them.

Just such a constructive solution of the present difficulties of the settlers in heavily timbered National Forest counties has been proposed by the Secretary of Agriculture in his recent annual report. Briefly, this new policy proposes that where existing resources justify it and the public need can be demonstrated, future receipts from the National Forests be anticipated and advances be made by Congress for the construction of roads, bridges, and other public works, these advances to be returned to the Treasury from the sums which later on will be received when the timber can be placed on the market to advantage. This new policy would apply exclusively in those counties where there is a considerable area of Forest land, and so located that the resources can not be marketed at the present time, but later will yield a large revenue. Such a policy would fully meet the local difficulties arising from the fact that the National Forests are not subject to taxation. It would make the

Forest resources immediately realizable for public improvements; it would accomplish a development not possible without public aid; it would stimulate agricultural development; it would relieve the now struggling communities from a burden of taxation they would otherwise have to assume if the development of many of the National Forests communities is to go forward as rapidly as it should; it would hasten the development of the National Forest resources and aid in their protection; in every way it would work to help the small man. With such a plan in operation there would be removed the one barrier that now in a few places prevents the farmer from enjoying immediately the benefit of the National Forests.