

# TIMBER

STORY OF A TIMBER SALE ON A NATIONAL FOREST



*The National Forests*  
**LANDS OF MANY USES**

U.S. DEPARTMENT OF AGRICULTURE  
FOREST SERVICE • PA-545





## FOREWORD

This is the story of a timber sale on a National Forest, told against a background typical of Forest Service Ranger Districts in the Pacific Northwest. A background provided by almost any of the 154 National Forests would have served as well, for the basic story told here is a factual accounting of the many activities involved wherever National Forest timber is harvested.

Across the Nation, logging methods vary according to timber type, topography, and other factors, but however timber is harvested on the National Forests, the purposes are the same: to improve the health and productivity of the forests, to provide raw material for industry, and to furnish more timber for wood products for Americans.

The Forest Service makes some 25,000 timber sales each year to large and small operators. The timber is harvested and removed from the Forests under sound management practices prescribed and supervised by the Service to protect soil, water, esthetic, and other values, and to insure that the harvested areas will grow more trees for timber.

National Forest timber sales make thousands of jobs for Americans who work in the woods and in forest products industries. The annual income from these sales, which goes into the national treasury, ranges as high as \$140 million. Twenty-five percent of this money is returned to counties in which National Forests are located, and is used for county roads and schools.

In the years ahead, National Forest timber will continue to make substantial contributions to the economy of many communities and of the Nation. Like other renewable resources of the forest—water, wildlife, forage, recreation—the timber resource is managed so that it will sustain a maximum yield of goods and services for the American people.

*Edward P. Cliff*

Chief, Forest Service  
U.S. Department of Agriculture



# TIMBER



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## STORY OF A TIMBER SALE ON A NATIONAL FOREST

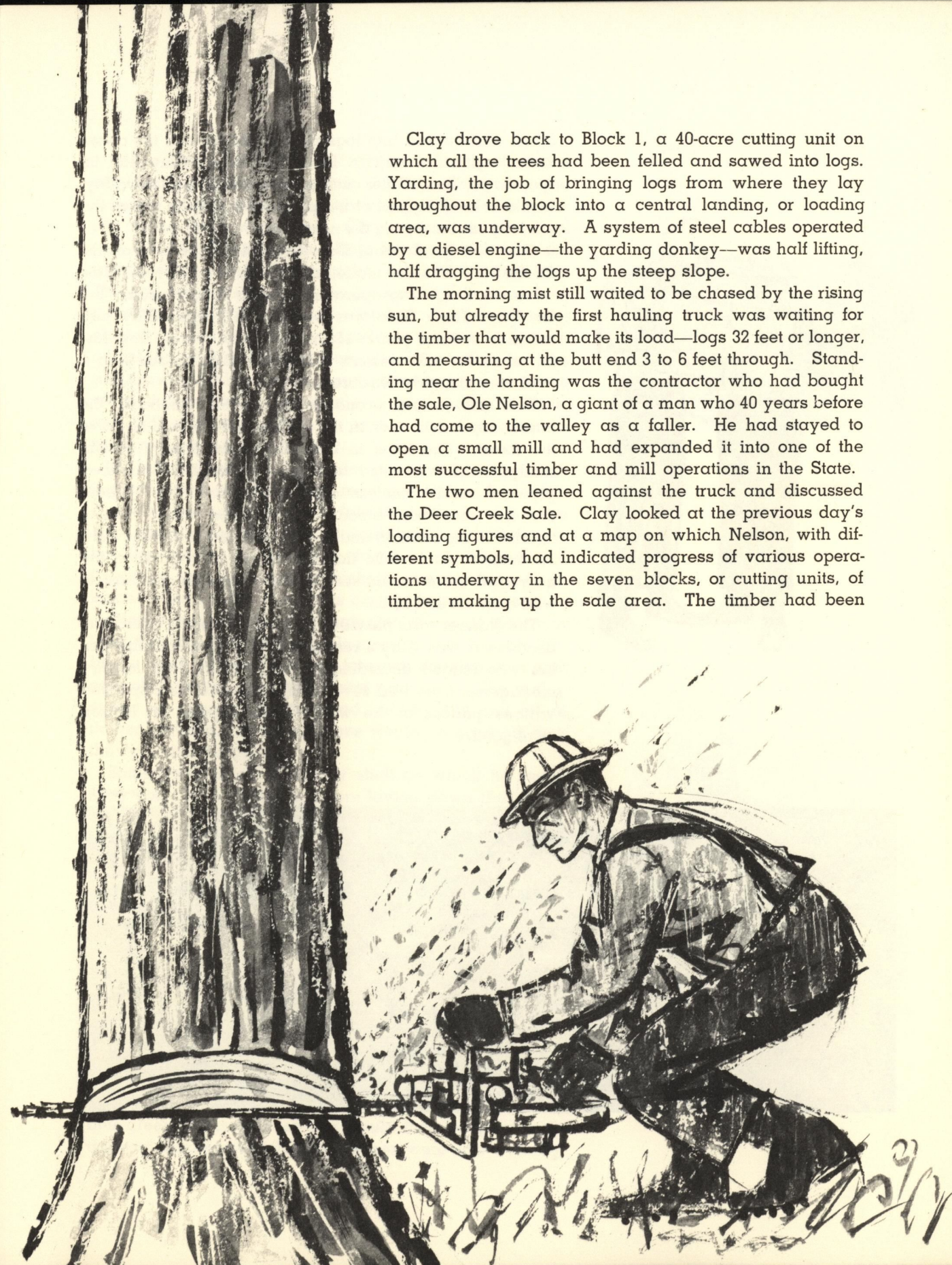
### DEER CREEK

The harsh "brrrr" of a powersaw broke into the cry of a blue jay. The insistent growl echoed from ridge to ridge and spread across Deer Creek Valley until it dominated all other forest sounds.

As suddenly as it began, the saw was silent. For a moment the forest, too, was silent, as if holding its breath. Then a prolonged cry shouted the warning, "timber-r-r." There was a deep, guttural crack, a gathering crash of flailing branches, and a final, heavy thump.

"That's the first one in Block 3, Clay." The tree faller wiped the sweatband of his hardhat and watched the buckers climbing on top of the trunk, longer than 100 feet, to cut its limbs and saw it into logs.

"Right." Forest Ranger Clay O'Neal's smile almost squeezed shut his blue-gray eyes. "But you've still got a few thousand more trees to fall on this sale." He checked the height of the stump, pushed back his orange hardhat, stenciled with his first name and the Forest Service shield, and with a wave to the faller walked to his pickup truck.



Clay drove back to Block 1, a 40-acre cutting unit on which all the trees had been felled and sawed into logs. Yarding, the job of bringing logs from where they lay throughout the block into a central landing, or loading area, was underway. A system of steel cables operated by a diesel engine—the yarding donkey—was half lifting, half dragging the logs up the steep slope.

The morning mist still waited to be chased by the rising sun, but already the first hauling truck was waiting for the timber that would make its load—logs 32 feet or longer, and measuring at the butt end 3 to 6 feet through. Standing near the landing was the contractor who had bought the sale, Ole Nelson, a giant of a man who 40 years before had come to the valley as a faller. He had stayed to open a small mill and had expanded it into one of the most successful timber and mill operations in the State.

The two men leaned against the truck and discussed the Deer Creek Sale. Clay looked at the previous day's loading figures and at a map on which Nelson, with different symbols, had indicated progress of various operations underway in the seven blocks, or cutting units, of timber making up the sale area. The timber had been



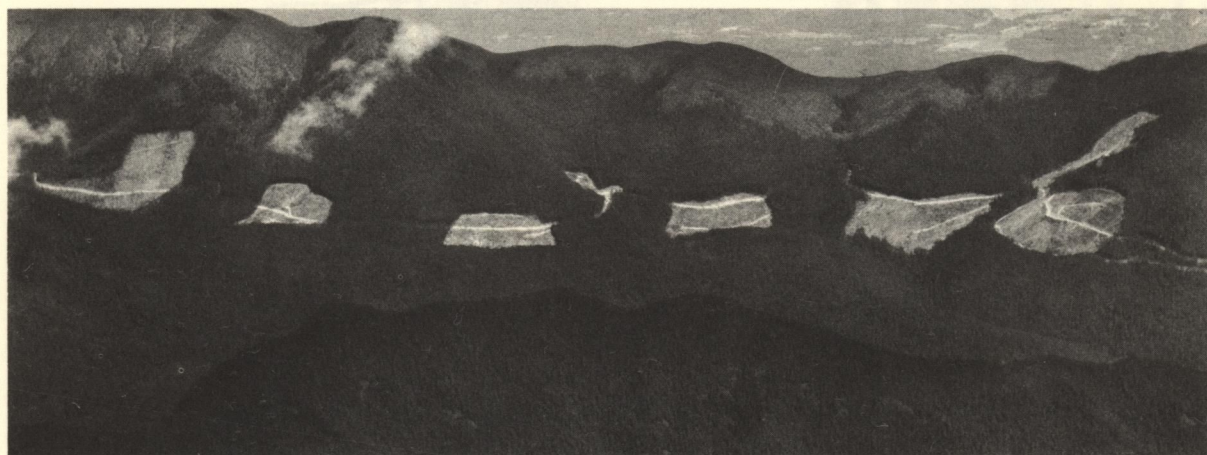
felled and bucked into logs on two blocks and the crews were beginning work in Block 3, the one Clay had inspected earlier. Other cutting units, farther up the valley, would echo the growl of the powersaw and the toot of the yarding engine during the next year.

Clay felt good about Deer Creek for several reasons. Of the 20 to 30 sales made on the District each year, most were small sales to operators smaller than Nelson. But the Deer Creek Sale was one of the largest Clay had made in several years: 15 million board feet of Douglas-fir, white fir, and western redcedar would be cut from a total area of nearly 300 acres.

The sale would economically benefit Bannock, the timber-dependent town in the valley, and it would improve the forest. The trees in Deer Creek were fully grown, ready to be harvested and manufactured into lumber, plywood, and countless other useful products. Where the old trees once stood, a new forest would rise to flourish in the sunlight and to grow tall and straight toward the future. And while the new forest was growing, the harvested areas would serve as new feeding grounds for wild animals and birds.

The Ranger was pleased, too, with Nelson's operation. Because it was Clay's responsibility to see that the timber was logged according to practices of good forestry management, he had several of his assistants inspecting various phases of the work. Their reports on Nelson were good.

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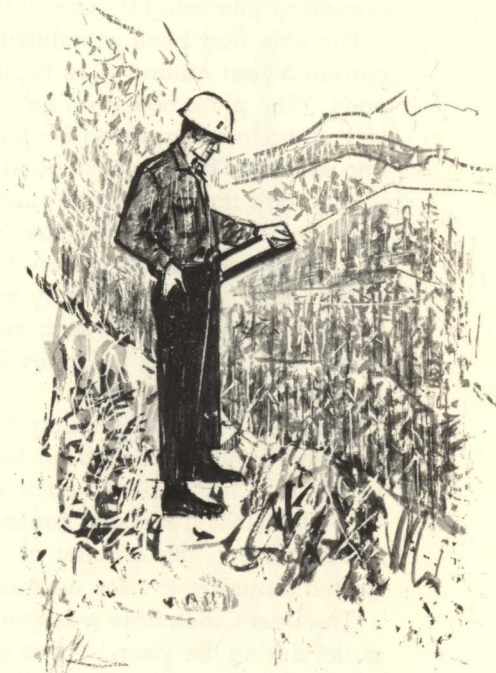
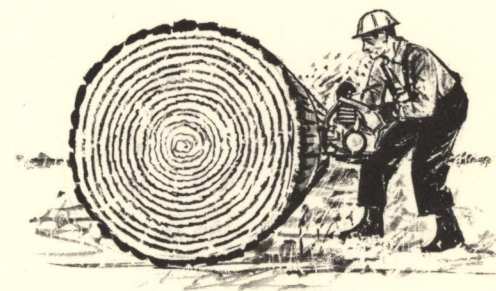
When Clay left Nelson, the first truck had loaded and was hauling to the mill, clouds of steam rising from the drums of its airbrakes as the driver cooled them with water jets during the downhill run. Clay crossed the haul road and climbed to a ridgetop. Here he could look over the tree-covered valley, dark green in the morning sun. Through the trees he could see the stream that came from the watershed higher in the mountains. Farther down the stream the valley bottom widened into a natural site for a manmade lake that would store water for valley farmers and provide fishing, boating, and swimming for all. These water values had been considered in planning the sale, and protective strips of timber next to Deer Creek and its tributaries were to be left intact.

He watched another log hauler move out from the landing and down the main haul road that Nelson had built. The road had opened a way into Deer Creek, and when other timber sales were made it would penetrate still deeper into the valley. In the future, forest users—hunters and fishermen, campers and picnickers, recreationists of all kinds—would follow the paths cut by timber crews.

Clay was glad to see this beginning of a road system in Deer Creek. Without roads, loggers cannot harvest timber in back country, nor can foresters develop, manage, or protect timber and other forest resources. The valley would be changed by the road and by this and future timber harvests, but the changes would be good for both the forest and the people.

Somewhere below the rocky shelf on which he stood, Clay could hear Nelson's fallers laying down the timber on Block 3. Looking down now he could only see a mass of tree crowns, but soon the rough outlines of the block would begin to show, and when the trees were all felled it would look as if a hole had been clipped in the green mantle of the forest. The hole, as would others resulting from the Deer Creek Sale, would appear from a distance almost as if trees had never grown there.

But Clay knew that here, on the western slopes of the Pacific Northwest's mountains, this way of logging—clear cutting in blocks—was necessary; it would leave the forest soil open to the sunlight which Douglas-fir seedlings must have to grow. Within 5 to 10 years the slopes before him would vary from the deep green of virgin trees, left as reserve seed sources in the uncut forest, to the fresh blue-green of young trees that would then be growing in the very blocks in which Nelson's men were now working.





## PLANNING THE TIMBER SALE

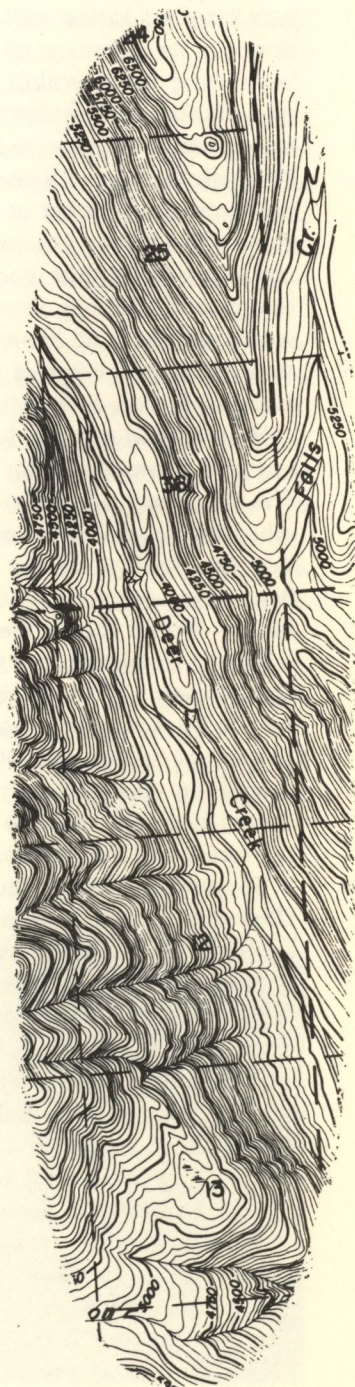
Before Nelson's crews ever cut the first tree on Block 1, the Ranger and his assistants, working with the Forest Supervisor and his staff, had spent many days planning this and other timber sales. They had, in effect, been preparing this sale for several years.

The sale had been scheduled 3 years before when the current 5-year cutting plan for the forest had been developed. The plan, based on new data from a timber inventory of the forest, covered each of the five Ranger Districts into which the forest was divided.

Although the plan was primarily a schedule of timber sales to be made during the 5-year period, it was also pointed toward improving the future yield and usefulness of the forest. Harvesting fully grown timber and replacing it with young, faster growing trees is a principal means of bringing a forest to a higher level of continuous timber production.

The data used in making the plan indicated that an average of 48 million board feet of timber could be harvested on Clay's District each year, nearly enough wood to build 5,000 five-room houses. This was the District's allowable cut, the amount of timber that should be harvested annually to keep the forest healthy and productive.

The Deer Creek Sale was one of many the District would make during the year. These sales, providing substantial support to timber-dependent industries like Nelson's mill



and communities like Bannock, would vary in size so as to give both small and large mills and logging operators an opportunity to bid for contracts. The timing and location of each had also been considered. Sales would be made at various times of the year, and would be located at different elevations so that some logging—and some payrolls—could continue year round.

But before plans could be completed for any sale, Clay's men checked tentative sale locations against the District's road system. Roads already existed near some new sale areas, providing access for logging equipment and a transportation route for the log trucks that would haul the timber to the mills. Other sales would be made farther up the valleys, and access roads would be needed.

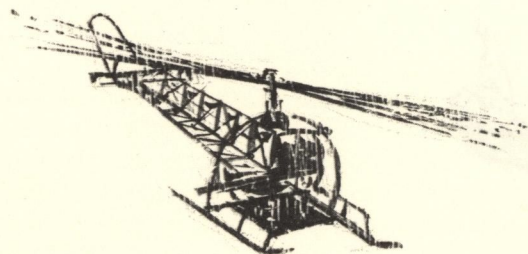
For the Deer Creek Sale, a main haul road would be extended up the valley about 5 miles, and all the timber cut would be hauled over this new section. For economical hauling, the purchaser would need a well-planned and well-constructed road. It was essential, too, that the road be located and built so as to protect the streamside and to keep construction debris out of the Creek.

To insure that the road, which would be built by the purchaser, would meet these requirements, it would be located and designed by the District Engineer, and specifications for its building would become part of the timber sale contract. The cost of the road would be estimated, and allowances to pay for its construction would be made when setting the price for the timber.

Finally and most important, the effects the sale would have on other forest resources—water, wildlife, recreation, and forage for animals—were considered. Under the Forest Service's policy of multiple use management, the Ranger—the land manager—is responsible for protecting and developing all renewable resources of the forest.







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## LAYING OUT AND APPRAISING THE SALE

When plans for Deer Creek had been completed and Clay had approved them, he put his timber management specialist, Don Thompson, in charge of laying out the sale area and appraising the value of the timber.

Thompson already had studied maps and photos of the area, and had hiked through most of it for a close look at the heavily timbered mountain slopes. Layout is one of the most important steps in preparing a timber sale, for many factors must be considered when marking an area to be logged. Harvesting timber, however lightly or carefully done, temporarily disturbs soil, water, and other forest resources. But in most cases, care in laying out a sale can hold adverse effects to a minimum.

Because of the topography and the denseness of the forest, Thompson felt an overall look at the area was also needed to make sure that all factors would be considered. He took a helicopter, and from the air closely studied the topography of the valley and the steep-sloped mountains, checked distances to roads, and on a topographic map and aerial photographs roughly estimated desirable boundary lines for the cutting blocks. He planned to leave strips of timber standing along Deer Creek and its tributaries to protect streamsides, and drew preliminary boundary lines along or below ridgetops so that timber left standing after the harvest would be protected from high winds. He also looked for routes for the timber sale road, and made note of obstructions such as outcroppings or rock where construction would be difficult.

The map and photographs were then turned over to the District's Engineer. His was the job of designing the main haul road, plotting the best routes for it to follow, surveying the road location on the ground, and of setting road standards and writing construction specifications that would be included in the sale contract.



Thompson's next step was to lead his crew in the rough, on-the-ground job of transforming pencil-marked boundaries on the topographic map and aerial photos into corresponding boundaries of paint-blazed trees in the forest, and of cruising, or surveying, a percentage of the timber to gather data for his appraisal.

Along predetermined lines laid straight across the blocks, the crew established quarter-acre circular plots at regular intervals and within these plots measured the diameter and number of logs in every tree. Because each species would bring a different market price, the crew also estimated by species the volume and quality of timber that would be sold.

From the mass of data collected, Thompson figured the total volume of each species—Douglas-fir, western red-cedar, white fir. And for each species he tabulated the proportion of logs by grade and size, from top-quality number 1 through grade 4, and the proportion of peelers in 3 grades (logs suitable for peeling into sheets of veneer).

The market value of the timber was figured next. The Forest Service had made studies at sawmills and plywood plants in the vicinity which showed the grades of lumber and plywood being produced from different grades and sizes of logs. Thompson used these studies to estimate by grades the amount of lumber and plywood which might be manufactured from the Deer Creek timber, and he used current prices to compute the value of that amount of wood products. This estimated market value gave him a base figure to work with in determining the price at which the timber would be advertised for sale.

Thompson then calculated how much it would cost the operator to get the timber from forest to market. He added costs of felling the trees and bucking them into logs, of yarding, loading and hauling to the mill, and the cost of manufacturing the raw material into lumber and plywood. Fire-protection and road-building costs were included.

These costs, plus an allowance to the purchaser for profit and risk, were subtracted from the market value the Deer Creek timber would have after its manufacture. The remainder was the indicated stumpage or appraised value—the lowest price at which the Forest Service would offer the timber "on the stump."



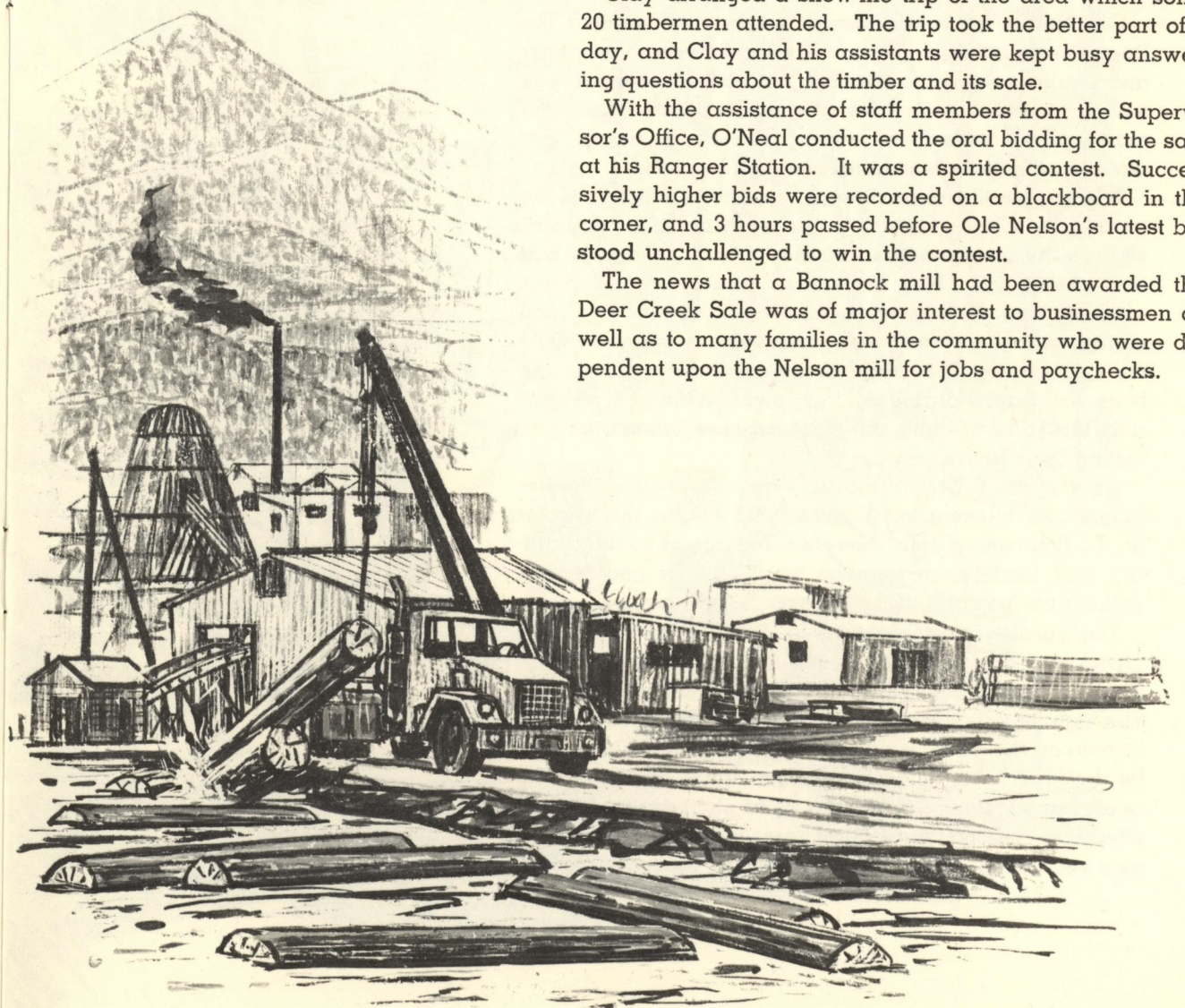


### SELLING THE TIMBER

The Deer Creek Sale, its timber appraised and boundaries marked and planning completed, was at last ready to be advertised and put on the market.

Ranger O'Neal's staff prepared a description of the sale, with details as to its location and size, the estimated amount and quality of the timber, and other information of interest to prospective buyers.

A sample contract was also prepared. Its terms covered all aspects of the sale, including the method of harvesting, building and maintaining logging roads, how payments would be made, and the time allowed for completing the harvest. A full understanding of these terms would help prospective purchasers in bidding, and later on would make administration of the sale by the Ranger and his men more satisfactory to both parties.



The Deer Creek Sale was advertised in Bannock's newspaper, and the date for bidding was set for 30 days after publication of the first notice of sale.

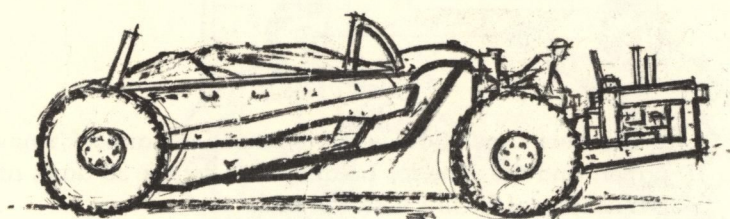
At the same time, copies of the sale description and the sample contract were sent with letters announcing the sale to mills and logging companies that Ranger O'Neal and the Forest Supervisor considered as prospective purchasers. Both advertisements and letters stated that those interested in bidding for the contract should examine terms of the sale carefully and, if possible, inspect the timber.

Clay arranged a show-me trip of the area which some 20 timbermen attended. The trip took the better part of a day, and Clay and his assistants were kept busy answering questions about the timber and its sale.

With the assistance of staff members from the Supervisor's Office, O'Neal conducted the oral bidding for the sale at his Ranger Station. It was a spirited contest. Successively higher bids were recorded on a blackboard in the corner, and 3 hours passed before Ole Nelson's latest bid stood unchallenged to win the contest.

The news that a Bannock mill had been awarded the Deer Creek Sale was of major interest to businessmen as well as to many families in the community who were dependent upon the Nelson mill for jobs and paychecks.





## OPERATIONS BEGIN

Ole Nelson took less than 2 weeks after signing the Deer Creek contract to move a road-construction crew and equipment into the valley. Ahead of the crew was the job of building 5 miles of road, beginning near the mouth of the valley and ending at the sale area. This would be the main haul road.

A route for the road already had been staked on the ground by Clay's District Engineer, who had begun designing the road even before the layout of the sale had been completed. Now he worked closely with Nelson's engineer and road crew foreman, making sure the road met specifications concerning the clearing of timber from the right-of-way, the grade of the road, materials for the base, adequate drainage, the angle of slopes on cuts and fills, and seeding the side slopes or otherwise protecting them from erosion.

As the road began moving into the valley, timber fallers and buckers went ahead and began the harvest on the first cutting unit. They worked ahead so that yarding and loading crews who would follow could work without the hazards of trees being felled nearby.

The yarding crew moved into Block 1 as soon as the fallers and buckers were finished, and began setting up the high-lead cable system specified in Nelson's contract. The high lead was required because the cutting units were located on steep slopes over which the heavy timber would be dragged to landings, or loading areas. This yarding operation would expose the soil of the slopes to the erosive effects of running water from rain and snowmelt before new vegetation and grasses would offer it cover. But be-





cause of the way it operates, the high lead would leave the soil in better condition to resist erosion than would most other methods. In addition, the exposed soil would act as a seedbed receptive to the millions of tiny seeds that would fall from the surrounding uncut forest.

The system takes its name from the rigging of the haul line used in yarding logs. One end of the line—an inch-thick steel cable—is attached to a revolving drum turned by a powerful engine, the yarding donkey. From the donkey, which is located on the uphill side of the cutting unit, the line rises almost straight up to pass through a heavy block, or pulley, fastened higher than 100 feet on a nearby tree. This is the spar tree which, when shorn of its green crown, fitted with blocks, and braced by guy wires, resembles a ship's mast more than a tree still rooted in the earth. From the top of the spar tree the haul line turns abruptly back toward the ground, reaching steeply downward to the felled timber on the slope below.

It is this rigging of the haul line that helps protect the soil, for the high lead given one end of the line causes it to lift logs partially off the ground at their forward end as it drags them uphill toward the landing. The lifting action causes logs to ride lighter across the ground, keeps them from digging into the soil, and helps them ride over instead of hanging up on stumps and heavy brush.

In spite of his years as a Forest Ranger, Clay O'Neal never tired of the drama of high-lead logging. Standing now in Block 1 on the uphill side of the setting—the yarding area of the spar tree—he watched a whirling drum of the donkey engine take up slack in the haul-back line. This line, smaller than the main cable, reached from the spar tree to a tail-stump nearly a thousand feet downhill where it ran through the tail-block and tied onto the haul line. As the haul-back wound on the drum, it pulled the main cable back downhill, and with it the chokers—the nooses of wire rope that would be placed around the next logs to be brought up.

Far downhill a team of choker-setters fitted the wire nooses around the logs. As they scrambled out of the way their foreman, the hook tender, shouted to the nearby signalman—usually called the whistle-punk because he blows by remote control the whistle on the yarding donkey. One short blast told the donkey engineer to start hauling in the line. The engine roared full power. The haul line tightened, and as the forward end of the logs lifted above the brush, 2 tons of timber began bumping its way uphill.



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There the logs would be decked, or piled, at the landing until they could be loaded on a truck and taken to the mill.

But before these logs would reach the mill, they would pass through the Forest Service scaling station, often referred to by Clay as the "cash register."

Before the sale, the quantity of timber involved had been estimated by the sampling cruise. At the scaling station, the exact quantity of each load of timber would be measured and recorded by a Forest Service scaler. This would determine the amount Nelson would pay the Government for each log he hauled to the mill. And at this point, the logs in which Nelson had invested his money in harvesting would become his property when the scaler signified their sale by branding each with a U.S.

As Clay watched the haul line bring up another load of logs, he thought of how this timber from his District was making a contribution to the economy of Bannock. He knew, too, that later it would also provide employment for workers in secondary processing plants in Bannock and across the country.

The raw material of the logs would be manufactured and remanufactured into lumber, the mainstay of home-building; thick beams of timber for all kinds of heavy construction; plywood for buildings, boats, and furniture; in fact, an almost endless list of wood products. And still more people would manufacture byproducts from the residues of the milling operations.

For Ranger Clay O'Neal there was satisfaction in knowing that National Forest timber served the needs of many people, and that wood products manufactured from timber harvested on his District would be used by Americans living, perhaps, in every State.

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## TIMBER FOR TODAY AND FOR THE FUTURE

Now it was 5 in the afternoon of the same day Ranger Clay O'Neal had inspected the Deer Creek Sale. The long workday had ended. The last hauling truck had pulled away from the landing and had started down the mountain for the mill. Behind it followed a small bus, filled with fallers, buckers, loaders, and other woodworkers.

The air was heavy with the heat of afternoon, and the sale area was quiet except for the occasional call of a blue jay and the rustling of the breeze. All the men had gone but one, the watchman who would stand a lonely night vigil, guarding equipment and constantly alert for fire.

The watchman looked down the road. Sometimes the Ranger or one of his men would stop by for a final check. From their talk he knew their plans for the valley: how the cutover blocks of this and other timber sales would grow thick with vegetation and grasses for wildlife to feed on; how the blocks would later be filled with young trees—the timber crops of the future; how a campground would be built farther up the valley; how a lake would be made to store the spring runoff. Their plans would make the valley's forest resources serve more people in more ways.

The sun lowered toward the ridgetops, but the road stayed empty, and the watchman began cooking his supper as the shadows of the great trees grew longer, some for the last time. Tomorrow, more of the Douglas-firs and cedars would fall, providing timber for people now, and making way for a new forest which a future generation of Rangers and loggers would harvest for a future generation of Americans.

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## INFORMATION

For further information on the management and development of National Forest resources, and for information on public use of the Forests for hunting, fishing, camping, wilderness travel, and other recreational activities, see the map below for the number of the Forest Service region administering the areas you are interested in and write to the appropriate Regional Forester, Forest Service:

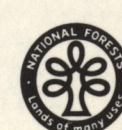
Region 1	Federal Building Missoula, Mont.	Region 6	Post Office Box 3623 Portland 8, Oreg.
Region 2	Federal Center Building 85 Denver 25, Colo.	Region 7	6816 Market St. Upper Darby, Pa.
Region 3	517 Gold Ave. SW. Albuquerque, N. Mex.	Region 8	50 Seventh St. NE. Atlanta 23, Ga.
Region 4	Forest Service Bldg. Ogden, Utah	Region 9	710 N. 6th St. Milwaukee 3, Wis.
Region 5	630 Sansome St. San Francisco 11, Calif.	Region 10	Fifth Street Office Bldg. Post Office Box 1631 Juneau, Alaska

This booklet is one of a series on the many uses and benefits of the water, timber, wildlife, forage, and recreation resources of the National Forest System. Others include "Wilderness," "Camping," and "Skiing."

Issued April 1963



■ NATIONAL FORESTS  
▨ NATIONAL GRASSLANDS





INFORMATION

The Forest Service, U.S. Department of Agriculture, is dedicated to the principle of multiple use management of the Nation's forest resources for sustained yields of wood, water, forage, wildlife, and recreation. Through forestry research, cooperation with the States and private forest owners, and management of the National Forests and National Grasslands, it strives—as directed by Congress—to provide increasingly greater service to a growing Nation.

