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# Research Note

UNITED STATES DEPARTMENT OF AGRICULTURE  
FOREST SERVICE

**INTERMOUNTAIN FOREST & RANGE EXPERIMENT STATION**  
OGDEN UTAH

U.S. Forest Service  
Research Note INT-20

1964

## FOREST AREA AND TIMBER VOLUME IN WESTERN SOUTH DAKOTA<sup>1</sup>

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### ABSTRACT

Inventory of forests in Western South Dakota completed in 1960 reveals that this portion of the State has 1.3 million acres of commercial forest land with about 996 million cubic feet of merchantable wood. Ponderosa pine is the principal species on all but 23,000 acres of this commercial forest, and it makes up 95 percent of the total cubic volume. Eighty-three percent of the timber is publicly owned.

In 1960, the forests of Western South Dakota covered 1,399,000 acres, which is about 2.9 percent of the State's total land area.<sup>2</sup> Ninety-four percent of the Western South Dakota forest, or 1,311,000 acres (table 1), is commercially important for timber production and contains 3.4 billion board feet of sawtimber. The other 6 percent includes 20,000 acres of productive forest land reserved from

commercial timber cutting and 68,000 acres that are incapable of producing trees of the size and quality that can be profitably used by forest industry.

About 957,000 acres (or 73 percent) of commercial forest land is National Forest, approximately 99 percent of which is in the Black Hills National Forest (table 2), with the remainder in the Custer

<sup>1</sup>Includes all of Harding, Butte, Lawrence, and Fall River Counties and all lands west of the 103d meridian in Meade, Pennington, and Custer Counties. See map, p. 2.

<sup>2</sup>Information on forest area and volume reported in this Note are part of the results of the first comprehensive forest inventory of Western South Dakota. The 1960 timber survey was completed through the combined efforts of the Intermountain Forest and Range Experiment Station, the Rocky Mountain Forest and Range Experiment Station, and Region 2 (the Rocky Mountain Region) of the Forest Service, U.S. Department of Agriculture.



National Forest in Harding County. Collectively, farmers are the second largest ownership group. Altogether they own 224,000 acres of commercial forest.

There is relatively little nonstocked commercial forest land in these seven counties (only 16,000 acres) and only 45,000 acres of seedling and sapling stands (table 3). Sawtimber covers 708,000 acres and pole-size timber 542,000 acres.

The commercial forest land is dominated by softwood timber (table 4). Ponderosa pine, the principal species in the locality, predominates on 98 percent of the total area, or 1,288,000 acres. White spruce, the only other commercially important tree in this area, is the most important species on 23,000 acres.

The total cubic volume in merchantable live trees 5 inches in diameter and

larger is nearly 996 million cubic feet (table 5). Although sawtimber stands occupy more than half of the commercial forest area, a rather high proportion of the total volume is in smaller size stems. Seventy-six percent of the total cubic-foot volume is in trees smaller than 15.0 inches, and 46 percent is in trees smaller than 11.0 inches.

About 95 percent of the cubic-foot volume is ponderosa pine. White spruce and hardwoods make up the remaining 5 percent. Publicly owned forests account for 83 percent of this volume or 829 million cubic feet.

The estimate of 1,098,000 acres of commercial forest land within the boundary of the Black Hills National Forest (all ownerships inclusive) was determined by a 100-percent type mapping from aerial photos. Therefore, 84 percent of the commercial forest area estimate for Western

South Dakota has no sampling error. The remaining portion, 213,000 acres, was determined from a sampling procedure on aerial photos and has a sampling error of  $\pm 3.45$  percent. The sampling error for the estimate of total cubic-foot volume of

growing stock is 5.6 percent. These errors are on the basis of odds of two out of three that values which would result from a 100-percent inventory would lie within the range indicated by the error.

Table 1.--Area of forest land by land classes, Western South Dakota, 1960

Land class	Thousand acres
Commercial forest land <sup>1</sup>	1,311
Unproductive forest land <sup>2</sup>	68
Productive--reserved forest land <sup>3</sup>	20
Total forest land	1,399
Nonforest land	5,493
All land	6,892

<sup>1</sup> Forest land that is producing or is capable of producing crops of industrial wood and is not withdrawn from timber utilization.

<sup>2</sup> Forest land incapable of growing crops of industrial wood because site conditions are adverse.

<sup>3</sup> Productive public forest land withdrawn from timber utilization through statute or administrative regulation.

Table 2.--Area of commercial forest land by ownership classes, Western South Dakota, 1960

Ownership class	Thousand acres
National Forest	957
Other Federal:	
Bureau of Land Management	9
Indian <sup>1</sup>	--
Miscellaneous Federal	1
Total other Federal	10
State	62
County and municipal	--
Farmer-owned	224
Miscellaneous private	58
All ownerships	1,311

<sup>1</sup> Indian tribal lands and trust allotments, that is lands held in fee by the Federal Government but administered and managed for Indian tribal groups or allotted in trust to individual Indians.

Table 3.--Area of commercial forest land by stand-size and ownership classes for Western South Dakota, 1960

Stand-size class	All ownerships		
	Public	Private	
Thousand acres			
Sawtimber stands <sup>1</sup>	708	609	99
Poletimber stands <sup>2</sup>	542	373	169
Sapling and seedling stands <sup>3</sup>	45	34	11
Nonstocked area <sup>4</sup>	16	13	3
All classes	1,311	1,029	282

<sup>1</sup> Stands at least 10 percent stocked with growing stock trees with a minimum net volume per acre of 1,500 board feet (International  $\frac{1}{4}$ -inch rule) in sawtimber trees (9.0 inches d.b.h. and larger).

<sup>2</sup> Stands failing to meet the sawtimber stand specifications, but at least 10 percent stocked with poletimber and larger (5.0 inches d.b.h. and larger) trees and with at least half the minimum stocking in poletimber trees.

<sup>3</sup> A stand not qualifying as either a sawtimber or poletimber stand, but having at least 10 percent stocking of trees of commercial species and with at least half the stocking in sapling and seedling trees (less than 5.0 inches d.b.h.).

<sup>4</sup> An area not qualifying as a sawtimber, poletimber, or a sapling seedling stand; i.e., normally an area less than 10 percent stocked.

Table 4.--Area of commercial forest land, by forest types and ownership classes for  
Western South Dakota, 1960

Forest type	All ownerships	Public ownerships	Private ownerships
	----- Thousand acres -----		
Ponderosa pine	1,288	1,008	280
White spruce	23	21	2
All types	1,311	1,029	282

Table 5.--Volume of growing stock and sawtimber on commercial forest land by  
species for Western South Dakota, 1960

Species	Growing stock <sup>1</sup>	Sawtimber
	Thousand cubic feet	Thousand board feet <sup>2</sup>
Ponderosa pine	945,330	3,221,492
White spruce	45,726	201,207
Hardwoods	4,679	7,228
Total	995,735	3,429,927

<sup>1</sup> Growing stock volume: Net volume in cubic feet of live merchantable sawtimber trees and pole-timber trees from a 1-foot stump to a minimum 4.0-inch top inside bark.

<sup>2</sup> International  $\frac{1}{4}$ -inch rule.

Table 6.--Volume of growing stock and sawtimber  
on commercial forest land by ownership  
classes, Western South Dakota, 1960

Ownership class	Growing stock <sup>1</sup>	Sawtimber
	Thousand cubic feet	Thousand board feet
National Forest	781,506	2,687,276
Other Public	47,615	177,911
Private	166,614	564,740
Total	995,735	3,429,927

<sup>1</sup> International  $\frac{1}{4}$ -inch rule.

Table 7.--Volume of growing stock and sawtimber  
on commercial forest land, by stand-size  
classes, Western South Dakota, 1960

Stand-size class	Growing stock	Sawtimber
	Thousand cubic feet	Thousand board feet <sup>1</sup>
Sawtimber stands	721,522	2,886,038
Poletimber stands	271,054	531,889
Sapling and seedling stands	2,204	7,961
Nonstocked areas	955	4,039
All classes	995,735	3,429,927

<sup>1</sup> International  $\frac{1}{4}$ -inch rule.