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Wyoming and Western South Dakota—Timber Production and Mill Residues, 1983

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RESEARCH SUMMARY

Wyoming's industrial roundwood production in 1983 was 30 million cubic feet, up 17 percent from 1976, and the same as that of 1969. Sawlog production was 29 million cubic feet. No round pulpwood production was reported in 1983. The mill residues volume was estimated at 19.1 million cubic feet. The volume of residues used was 11.4 million cubic feet.

South Dakota's industrial roundwood production reached a new high of 23.1 million cubic feet. Sawlog production was 22 million cubic feet, while pulpwood dropped to less than 250,000 cubic feet. Mill residues produced were 21.5 million cubic feet. The volume of mill residues used was 15.3 million cubic feet.

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Wyoming and Western South Dakota—Timber Production and Mill Residues, 1983

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INTRODUCTION

This bulletin reports the estimated timber production¹ of Wyoming and western South Dakota (west of the 103d meridian) in 1983, coinciding with the year of forest inventory in those States.

The data for this report were obtained by canvassing primary wood processing plants in 1984. These plants, sawmills, and yards were identified from "The 1980-81 Wyoming Timber Industries Directory," updated by the Wyoming Timber Industry Association and the Wyoming State Forestry Division, from a directory of sawmills supplied and updated by the South Dakota Department of Agriculture/Division of Forestry, and from information supplied by National Forest personnel in Wyoming and South Dakota.

WYOMING

In 1983, Wyoming's timber production was 30 million cubic feet, up 17 percent from 1976's 25.7 million cubic feet and equaling the 1969 production (fig. 1).

Sawlog production, 29.5 million cubic feet (tables 1 to 3), made up 98 percent of the harvest and was a 5.9 million cubic feet (25 percent) increase over the 1976 sawlog production of 23.6 million cubic feet. A less dramatic rate of increase results, only 7.6 percent, if the two are compared using board foot measure: 135.6 million board feet, Scribner rule, produced in 1976 and 146 million board feet in 1983. The difference in the percentage increase between the two measures, cubic feet and board feet, is due to the different board foot/cubic foot conversion factors used in 1976 and 1983 for sawlog production. In 1976, the

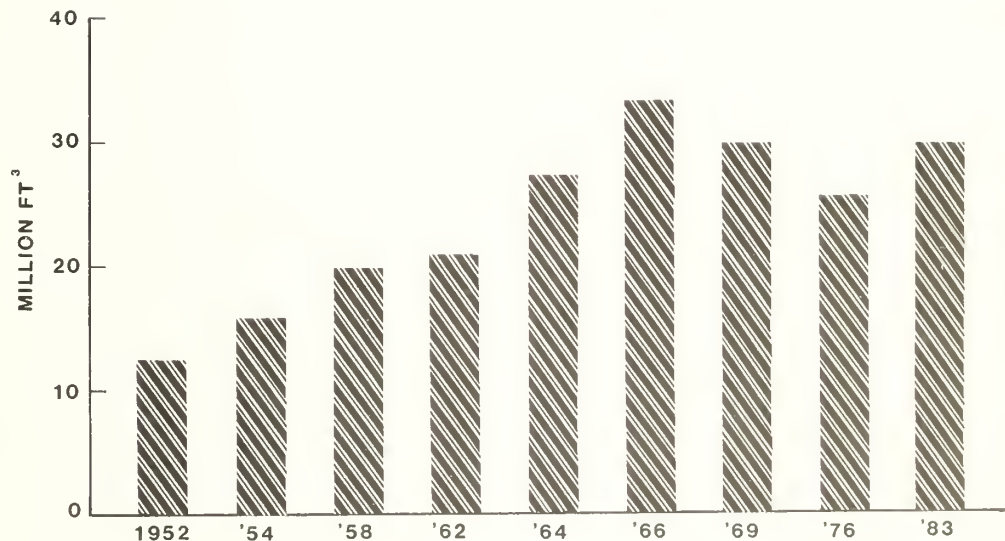


Figure 1—Wyoming's industrial roundwood harvest by selected years (Keegan and others 1979; Setzer 1971).

¹The harvest of timber products. Also called industrial roundwood production. Timber products or industrial roundwood products refer to logs, bolts, or other round sections cut from trees for industrial or consumer use and delivered "in the round" as logs or bolts to sawmills, plants, or yards. Timber products, in this report, do not include fuelwood, but do include sawlogs, house logs, pulpwood, poles, posts, mine timbers, and landscaping timbers.

ratio 1 cubic foot to 5.75 board feet, Scribner rule, was used. The ratio was changed for 1983 sawlog production to 1 cubic foot equals 4.95 board feet, Scribner rule. The new conversion factor resulted from measurements collected on active logging operations in Wyoming in 1984. Appendix I contains detailed conversion factors.

The remaining harvest, about 500,000 cubic feet, comprised poles, posts, house logs, landscaping timbers, and mine timbers. There was no reported pulpwood harvest in 1983. Of the harvest, 69 percent went to mills with annual production capacities of over 10 million board feet, lumber tally (table 4).

Ponderosa pine (*Pinus ponderosa*), 14 million cubic feet, and lodgepole pine (*Pinus contorta*), 12 million cubic feet, combined for 89 percent of the harvest (tables 2, 5, 6; fig. 2). More than 94 percent, 28.4 million cubic feet (138.9 million board feet, Scribner rule or 166 million board feet, International 1/4-inch rule) were from live trees. Growing-stock removals² due to harvest were 30.2 million cubic feet, and sawtimber removals³ were 138.2 million board feet, Scribner rule, or 164.9 million board feet, International 1/4-inch rule.

Twelve million cubic feet, 40 percent of Wyoming's production, were harvested in Crook County (tables 3, 6, 7; fig. 3).

As would be expected, the largest part of the harvest was from National Forests, almost 20 million cubic feet or 66 percent of the total (tables 1, 5, and 7). Almost 9 million cubic feet (29 percent) were harvested from privately owned lands.

Seven million cubic feet were delivered to mills in States other than Wyoming. Although the 1983 harvest was more than 4 million cubic feet over that of 1976, the 1983 mill residues volume decreased more than 2 million cubic feet (fig. 4). Because mill residue is a function of many things, including the volume of logs processed rather than the volume of logs harvested, the author chooses not to speculate on comparisons of the 1976/1983 estimates of residues

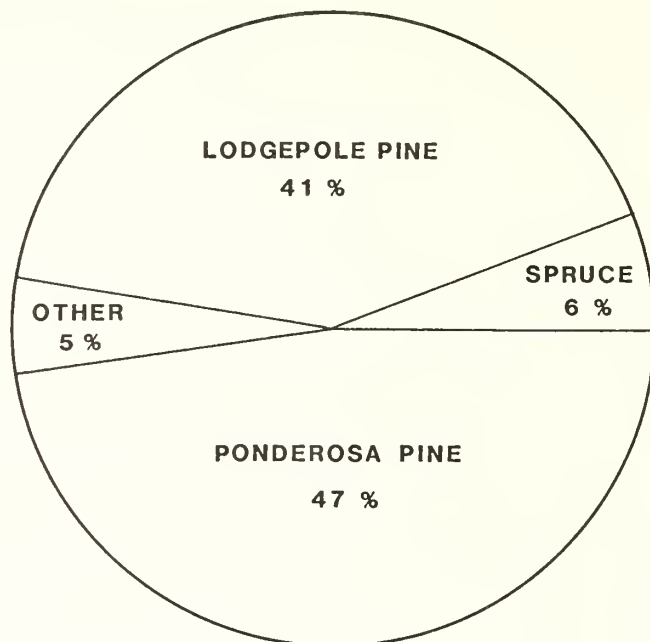


Figure 2—Industrial roundwood products harvested in Wyoming by species, 1983.

volumes. In 1983 the proportion of bark and fine residues used increased, and coarse residue remained about the same compared to 1976. Totals of 20 percent of the bark, 6 percent of the coarse, and 15 percent of the fine residues were used as hogged fuel, while 61 percent of the coarse residue was used by the pulp industry (table 8). Board plants used 11 percent of the fines, while 23 percent were used for livestock bedding, landscaping, and by the oil/gas and mining industries. Totals of 68 percent of the bark, 23 percent of the coarse, and 51 percent of the fine residues were unused.

Tables 9-20 give board-foot volume data to correspond to the first eight tables.

²The growing-stock volume "removed" from the standing inventory and delivered to wood processing plants or left in the forest as slash. Growing-stock volume is the net cubic-foot volume of wood in live trees from a stump 1 foot high to a 4.0-inch diameter top, outside bark. Such trees must be timber trees, those traditionally harvested for lumber products (excludes pinyon, juniper, ornamentals, and fruit trees), must have a central stem at least 5 inches in diameter at breast height (d.b.h.), and must meet specified standards of quality and vigor, thus excluding cull trees.

³The sawtimber volume "removed" from the standing inventory. Sawtimber volume is the net volume in board feet of the sawlog portion of live sawtimber trees; that is, the volume between a 1-foot stump and a 7-inch diameter top of sound (noncull) timber trees at least 9 inches d.b.h. (11 inches d.b.h. for aspen and cottonwood).

WYOMING

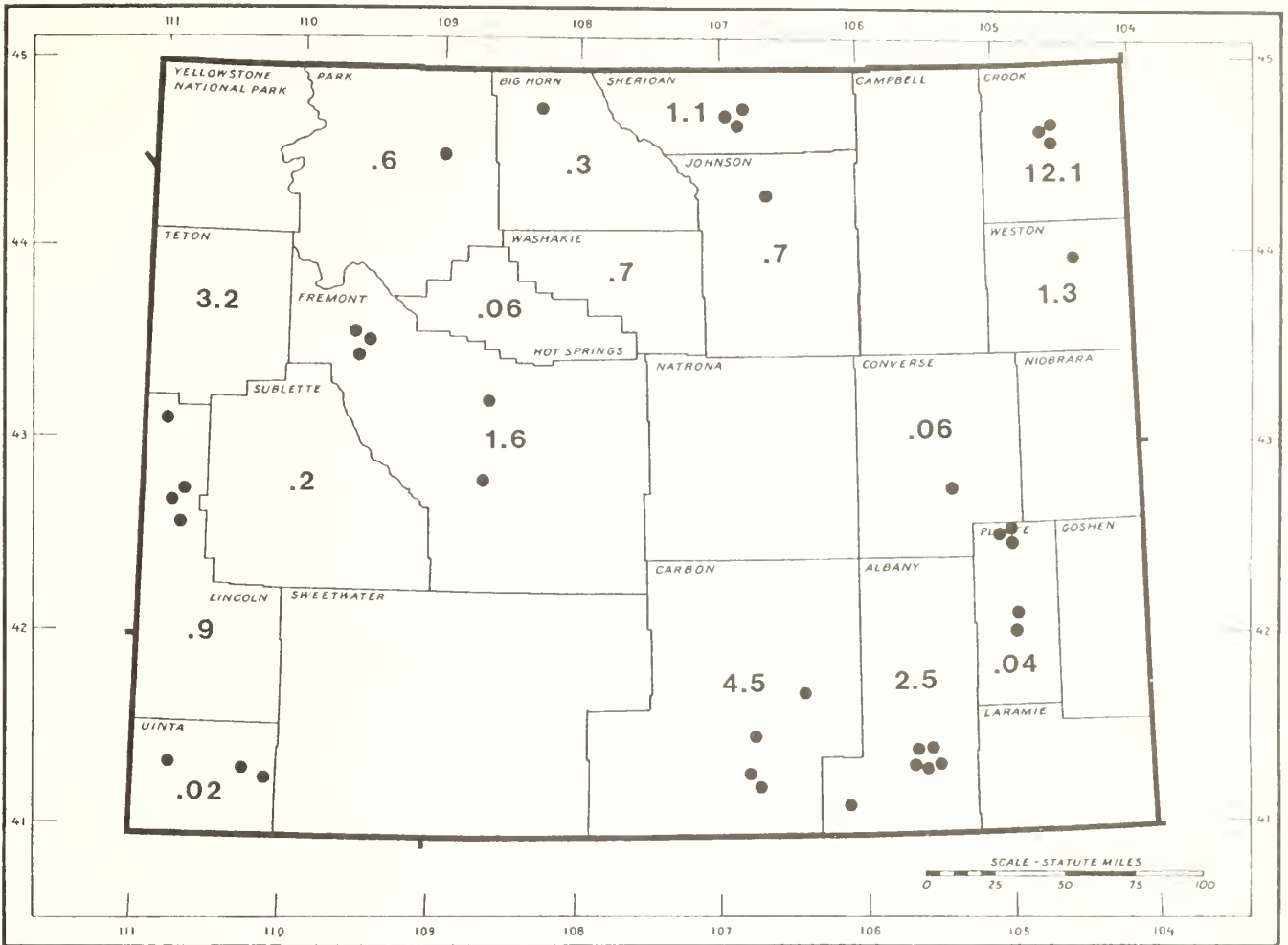


Figure 3—Industrial roundwood production by county in millions of cubic feet and locations of primary wood processors in Wyoming, 1983 (from mill canvass respondents).

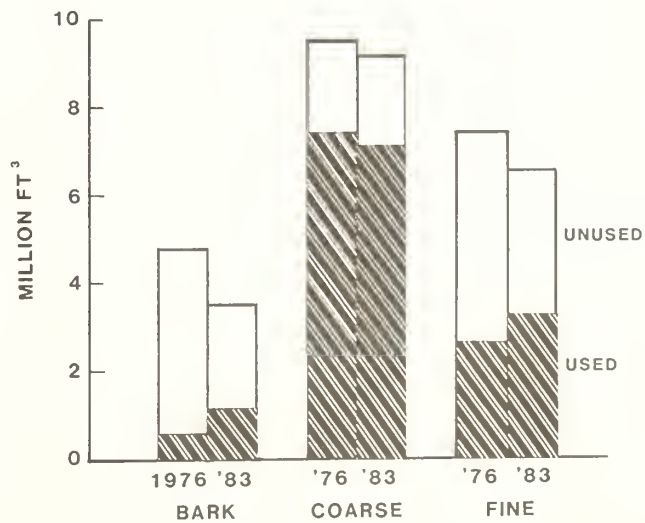


Figure 4—A comparison of used and unused residues from mills in Wyoming, 1976 and 1983, in million cubic feet.

WESTERN SOUTH DAKOTA

In 1983 western South Dakota recorded a record industrial roundwood harvest of 23.1 million cubic feet, up 5.1 million cubic feet (28 percent) from the reported 1974 harvest, the previous record year (fig. 5). (Appendix I contains detailed conversion factors.)

Sawlog production was 22 million cubic feet (96 percent of the industrial roundwood harvest) (tables 21-23). Pulpwood production dropped to less than 250,000 cubic feet (less than 1 percent). In 1974, sawlogs composed only two-thirds of the harvest, with pulpwood at 3.8 million cubic feet or 21 percent of the total harvest. The remainder of the 1983 production comprised posts and poles.

Of the harvest, 76 percent went to mills with capacities exceeding 10 million board feet (table 24), and 7 million cubic feet (30 percent) went to mills in States other than South Dakota, primarily Wyoming. A total of 18.5 million cubic feet (80 percent) were harvested from National Forest lands. Most of the remainder came from private lands (tables 22, 25, 26).

Pennington and Lawrence Counties, with production volumes of about 8 million cubic feet each (tables 21, 25,

27; fig. 6), accounted for 70 percent of the harvest. County comparisons for previous years are unavailable in cubic volume, but are presented in board feet, International 1/4-inch rule, in figure 7.

Live tree harvest was 22.9 million cubic feet (99 percent) or 114.8 million board feet, Scribner rule (135.2 million board feet, International 1/4-inch rule).

Growing stock removals were 24.6 million cubic feet; removals from sawtimber were 115.2 million board feet, Scribner (135.7 million board feet, International 1/4-inch rule).

Residues produced by mills in South Dakota in 1983 increased by 13.7 million cubic feet (178 percent) compared to the volume produced in 1974 (fig. 8). Use of fine residues increased from 36 percent in 1974 to 61 percent in 1983; 75 percent of the bark residue was used in 1983, mostly as hogged fuel, compared to 8 percent in 1974 (table 28). The use of coarse residue declined from 1974, when 87 percent was used, to 79 percent in 1983 (mostly converted to pulp chips).

Tables 29-40 give board-foot volume data to correspond to tables 21-28.

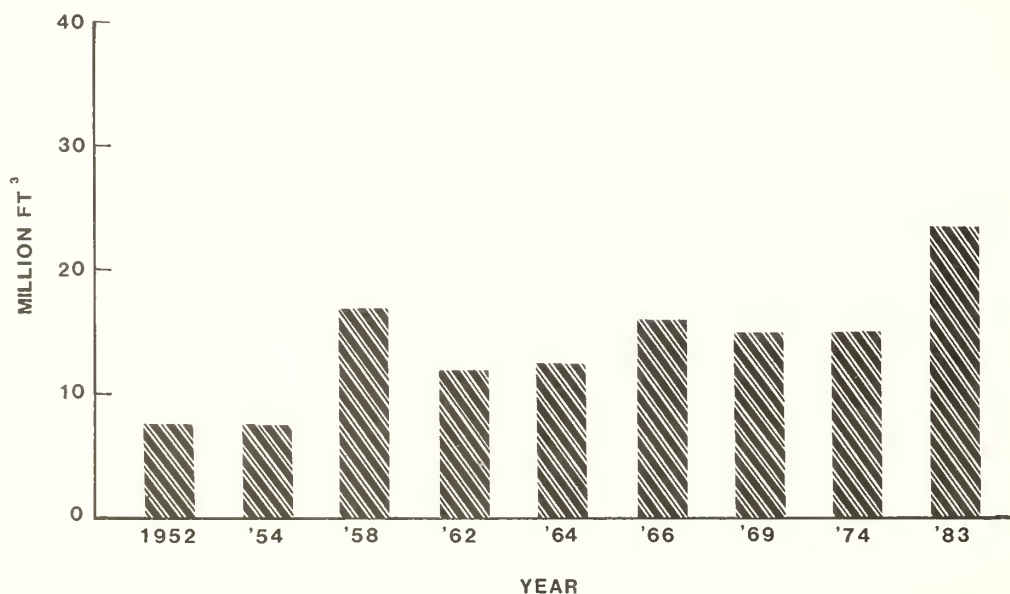


Figure 5—Western South Dakota's industrial roundwood harvest by selected years (Setzer and Barrett 1977; Setzer 1971).

SOUTH DAKOTA

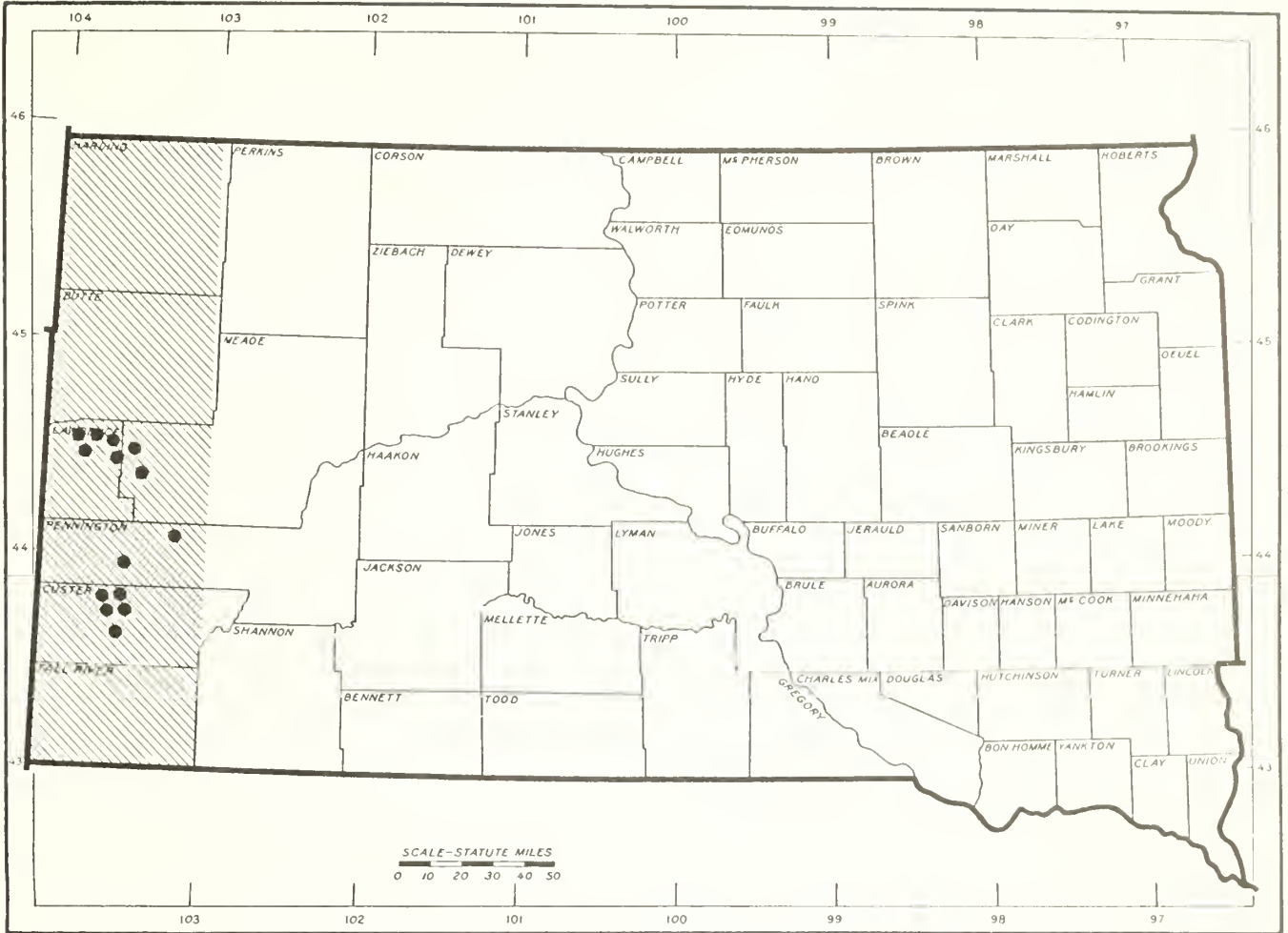


Figure 6—Locations of primary wood processors in western South Dakota, 1983 (from mill canvass respondents).

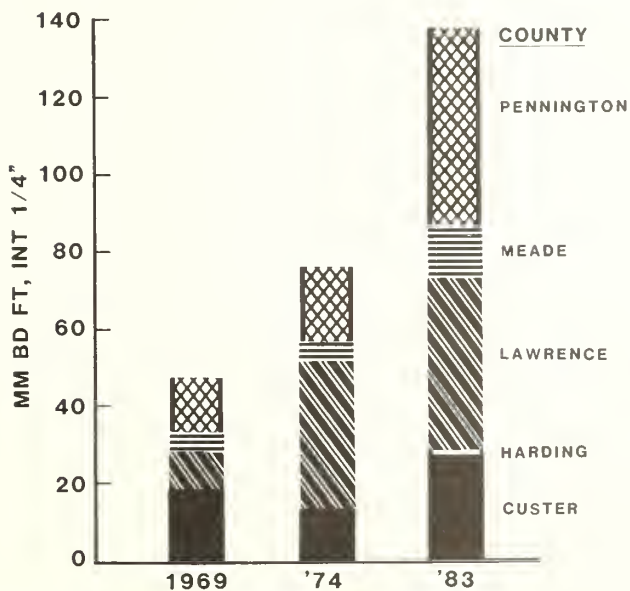


Figure 7—Western South Dakota's industrial roundwood production by county for selected years.

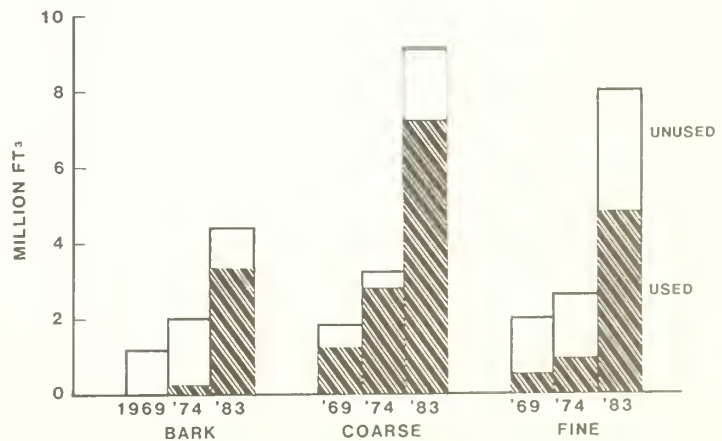


Figure 8—A comparison of used and unused residues from mills in western South Dakota, 1969, 1974, and 1983, in million cubic feet.

PRIMARY WOOD PROCESSORS

Primary wood processing plants responding to the 1984 canvass:

Wyoming (fig. 3)	
Sawmills	29
Sawmills/post and pole yards	5
Post and pole yards	3
House log plants	2
House log plant/sawmills	2
South Dakota (fig. 6)	
Sawmills	14
Other States	
Sawmills	1
Post and pole yards	2

Appendixes II and III are directories of processing plants in Wyoming and western South Dakota.

REFERENCES

- Keegan, Charles E., III; White, Randle V.; Setzer, Theodore S. 1979. Wyoming timber production and mill residues, 1976. Resour. Bull. INT-19. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 5 p.
- Setzer, Theodore S. 1971. Estimates of timber products output and plant residues, Wyoming and South Dakota, 1969. Res. Note INT-136. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 6 p.
- Setzer, Theodore S.; Barrett, Michael K. 1977. Western South Dakota timber production and mill residues, 1974. Res. Note INT-233. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 5 p.

TABLES FOR WYOMING

Table 1--Cubic volume of industrial roundwood products harvested in Wyoming by land owner or management agency category and product category, 1983

Owner	Sawlogs	Other products ¹	Total industrial ²
- - - - - Thousand cubic feet - - - - -			
National Forest	19,262	497	19,759
Other Federal ³	1,062	--	1,062
State	440	6	446
Private	8,733	19	8,752
Total ²	29,496	522	30,019

¹Includes utility and building poles, posts, house logs, landscaping timbers, and mine timbers.

²Data may not add to totals due to truncating or rounding.

³Lands managed by Federal agencies other than the USDA Forest Service, such as Department of Defense, Bureau of Land Management, and Bureau of Reclamation.

Table 2--Cubic volume of industrial roundwood products harvested in Wyoming by species and product category, 1983

Species	Sawlogs	Other products ¹	Total industrial ²
----- Thousand cubic feet -----			
True firs	503	--	503
Spruce	1,902	26	1,928
Lodgepole pine	11,990	439	12,429
Ponderosa pine	14,138	43	14,181
Douglas-fir	937	14	951
Other softwoods ³	19	--	19
Cottonwood	7	--	7
Total ²	29,496	522	30,019

¹Includes utility and building poles, posts, house logs, landscaping timbers, and mine timbers.

²Data may not add to totals due to truncating or rounding.

³Limber pine.

Table 3--Cubic volume of industrial roundwood products harvested in Wyoming by county of origin and product category, 1983

County	Sawlogs	Other products ¹	Total industrial ²
----- Thousand cubic feet -----			
Albany	2,484	42	2,527
Big Horn	241	77	318
Carbon	4,298	157	4,455
Converse	44	19	64
Crook	12,116	20	12,136
Fremont	1,565	36	1,601
Hot Springs	61	--	61
Johnson	715	6	721
Lincoln	937	--	937
Park	525	61	586
Platte	38	--	38
Sheridan	1,073	--	1,073
Sublette	196	--	196
Teton	3,111	94	3,205
Uinta	10	10	20
Washakie	746	--	746
Weston	1,336	--	1,336
Total ²	29,496	522	30,019

¹Includes utility and building poles, posts, house logs, landscaping timbers, and mine timbers.

²Data may not add to totals due to truncating or rounding.

Table 4--Cubic volume of industrial roundwood products harvested in Wyoming by size of mill, plant, or yard receiving products, 1983

Mill capacity	Production
Million board feet	Million cubic feet
More than 10	20.8
5.1 - 10	3.1
1.1 - 5	3.6
1 or less	2.5
Total	30.0

Table 5--Cubic volume of industrial roundwood products harvested in Wyoming by species and land owner or management agency category, 1983

Species	Owner				Total industrial ²
	National Forest	Other Federal ¹	State	Private	
- - - - - Thousand cubic feet - - - - -					
True fir	414	89	--	--	503
Spruce	1,610	150	7	161	1,928
Lodgepole pine	11,069	744	34	582	12,429
Ponderosa pine	5,819	71	386	7,905	14,181
Douglas-fir	825	4	18	104	951
Other softwoods ³	14	3	1	--	19
Cottonwood	7	--	--	--	7
Total ²	19,759	1,062	446	8,752	30,019

¹Lands managed by Federal agencies other than the USDA Forest Service, such as Department of Defense, Bureau of Land Management, and Bureau of Reclamation.

²Data may not add to totals due to truncating or rounding.

³Limber pine.

Table 6--Cubic volume of industrial roundwood products harvested in Wyoming by county of origin and species, 1983

County	Species							Total
	True firs	Spruce	Lodgepole pine	Ponderosa pine	Douglas-fir	Other softwoods ¹	Cottonwood	
----- Thousand cubic feet -----								
Albany	107	276	2,119	24	--	--	--	2,527
Big Horn	--	7	219	50	42	--	--	318
Carbon	385	642	3,428	--	--	--	--	4,455
Converse	--	--	21	42	--	--	--	64
Crook	--	135	18	11,983	--	--	--	12,136
Fremont	--	252	1,350	--	--	--	--	1,601
Hot Springs	--	5	45	--	6	4	--	61
Johnson	--	20	318	198	163	14	7	721
Lincoln	--	70	637	--	230	--	--	937
Park	--	188	327	--	71	--	--	586
Platte	--	--	--	38	--	--	--	38
Sheridan	--	--	558	300	215	--	--	1,073
Sublette	9	40	146	--	--	--	--	196
Teton	2	293	2,834	--	76	--	--	3,205
Uinta	--	--	20	--	--	--	--	20
Washakie	--	--	388	209	149	--	--	746
Weston	--	--	--	1,336	--	--	--	1,336
Total ²	503	1,928	12,429	14,181	951	19	7	30,019

¹Limber pine.

²Data may not add to totals due to truncating or rounding.

Table 7--Cubic volume of industrial roundwood products harvested in Wyoming by county of origin and land owner or management agency category, 1983

County	Owner				Total ²
	National Forest	Other Federal ¹	State	Private	
----- Thousand cubic feet -----					
Albany	2,527	--	--	--	2,527
Big Horn	318	--	--	--	318
Carbon	3,642	813	--	--	4,455
Converse	14	--	14	35	64
Crook	5,227	--	207	6,702	12,136
Fremont	1,129	81	10	381	1,601
Hot Springs	--	42	18	--	61
Johnson	352	--	24	345	721
Lincoln	937	--	--	--	937
Park	586	--	--	--	586
Platte	18	--	20	--	38
Sheridan	897	--	1	175	1,073
Sublette	196	--	--	--	196
Teton	3,150	54	--	--	3,205
Uinta	20	--	--	--	20
Washakie	746	--	--	--	746
Weston	--	71	152	1,114	1,336
Total ²	19,759	1,062	446	8,752	30,019

¹Lands managed by Federal agencies other than the USDA Forest Service, such as Department of Defense, Bureau of Land Management, and Bureau of Reclamation.

²Data may not add to totals due to truncating or rounding.

Table 8--Estimated cubic volumes of used and unused residues produced by primary wood processing plants in Wyoming, 1983

Residues	Used			Total used ¹	Total unused ¹	Total used and unused ¹
	Product					
	Pulp and boards	Hogged fuel	Other			
----- Thousand cubic feet -----						
Bark	--	718	408	1,126 (32%)	2,400	3,526
Coarse	5,559	563	946	7,068 (77%)	2,060	9,128
Fine	732	1,004	1,474	3,210 (49%)	3,291	6,501
Total ¹	6,291	2,285	2,828	11,404 (60%)	7,751	19,155

¹Data may not add to totals due to truncating or rounding.

Table 9--Board-foot volume of industrial roundwood products harvested in Wyoming by land owner or management agency category and product category, 1983

Owner	Sawlogs	Other products ¹	Total industrial ²
----- Thousand board feet, Scribner rule -----			
National Forest	95,354	963	96,317
Other Federal ³	5,255	--	5,255
State	2,181	18	2,198
Private	43,232	95	43,327
Total ²	146,022	1,076	147,098

¹Includes utility and building poles, posts, house logs, landscaping timbers, and mine timbers.

²Data may not add to totals due to truncating or rounding.

³Lands managed by Federal agencies other than the USDA Forest Service, such as Department of Defense, Bureau of Land Management, and Bureau of Reclamation.

Table 10--Board-foot volume of industrial roundwood products harvested in Wyoming by land owner or management agency category and product category, 1983

Owner	Sawlogs	Other products ¹	Total industrial ²
<u>Thousand board feet, International 4-inch rule</u>			
National Forest	113,948	1,151	115,099
Other Federal ³	6,280	--	6,280
State	2,606	21	2,627
Private	51,662	114	51,776
Total ²	174,496	1,286	175,782

¹Includes utility and building poles, posts, house logs, landscaping timbers, and mine timbers.

²Data may not add to totals due to truncating or rounding.

³Lands managed by Federal agencies other than the USDA Forest Service, such as Department of Defense, Bureau of Land Management, and Bureau of Reclamation.

Table 11--Board-foot volume of industrial roundwood products harvested in Wyoming by species and product category, 1983

Species	Sawlogs	Other products ¹	Total industrial ²
- - - <u>Thousand board feet, Scribner rule</u> - - -			
True firs	2,490	2	2,492
Spruce	9,417	111	9,528
Lodgepole pine	59,358	700	60,058
Ponderosa pine	69,988	215	70,203
Douglas-fir	4,640	48	4,688
Other softwoods ³	93	--	93
Cottonwood	36	--	36
Total ²	146,022	1,076	147,098

¹Includes utility and building poles, posts, house logs, landscaping timbers, and mine timbers.

²Data may not add to totals due to truncating or rounding.

³Limber pine.

Table 12--Board-foot volume of industrial roundwood products harvested in Wyoming by species and product category, 1983

Species	Sawlogs	Other products ¹	Total industrial ²
<u>Thousand board feet, International 1/4-inch rule</u>			
True firs	2,976	2	2,978
Spruce	11,253	133	11,386
Lodgepole pine	70,933	837	71,770
Ponderosa pine	83,636	257	83,892
Douglas-fir	5,545	57	5,602
Other softwoods ³	111	--	111
Cottonwood	43	--	43
Total²	174,497	1,286	175,782

¹Includes utility and building poles, posts, house logs, landscaping timbers, and mine timbers.

²Data may not add to totals due to truncating or rounding.

³Limber pine.

Table 13--Board-foot volume of industrial roundwood products harvested in Wyoming by county of origin and product category, 1983

County	Sawlogs	Other products ¹	Total industrial ²
<u>- - - Thousand board feet, Scribner rule - - -</u>			
Albany	12,300	120	12,420
Big Horn	1,194	119	1,313
Carbon	21,276	94	21,370
Converse	220	95	315
Crook	59,980	100	60,080
Fremont	7,746	180	7,926
Hot Springs	300	--	300
Johnson	3,538	18	3,556
Lincoln	4,640	--	4,640
Park	2,600	300	2,900
Platte	190	--	190
Sheridan	5,312	--	5,312
Sublette	969	--	969
Teton	15,400	--	15,400
Uinta	50	50	100
Washakie	3,692	--	3,692
Weston	6,615	--	6,615
Total²	146,022	1,076	147,098

¹Includes utility and building poles, posts, house logs, landscaping timbers, and mine timbers.

²Data may not add to totals due to truncating or rounding.

Table 14--Board-foot volume of industrial roundwood products harvested in Wyoming by county of origin and product category, 1983

County	Sawlogs	Other products ¹	Total industrial ²
<u>Thousand board feet, International 4-inch rule</u>			
Albany	14,698	143	14,842
Big Horn	1,427	142	1,569
Carbon	25,425	112	25,537
Converse	263	114	376
Crook	71,676	120	71,796
Fremont	9,256	215	9,472
Hot Springs	358	--	358
Johnson	4,228	21	4,249
Lincoln	5,545	--	5,545
Park	3,107	359	3,466
Platte	227	--	227
Sheridan	6,348	--	6,348
Sublette	1,158	--	1,158
Teton	18,403	--	18,403
Uinta	60	60	120
Washakie	4,412	--	4,412
Weston	7,905	--	7,905
Total ²	174,496	1,286	175,782

¹Includes utility and building poles, posts, house logs, landscaping timbers, and mine timbers.

²Data may not add to totals due to truncating or rounding.

Table 15--Board-foot volume of industrial roundwood products harvested in Wyoming by species and land owner or management agency category, 1983

Species	Owner				Total industrial ²
	National Forest	Other Federal ¹	State	Private	
<u>----- Thousand board feet, Scribner rule -----</u>					
True firs	2,049	443	--	--	2,492
Spruce	7,958	741	31	797	9,528
Lodgepole pine	53,325	3,685	167	2,881	60,058
Ponderosa pine	28,806	350	1,912	39,135	70,203
Douglas-fir	4,070	21	82	514	4,688
Other softwoods ³	72	15	6	--	93
Cottonwood	36	--	--	--	36
Total ²	96,317	5,255	2,198	43,327	147,098

¹Lands managed by Federal agencies other than the USDA Forest Service, such as Department of Defense, Bureau of Land Management, and Bureau of Reclamation.

²Data may not add to totals due to truncating or rounding.

³Limber pine.

Table 16--Board-foot volume of industrial roundwood products harvested in Wyoming by species and land owner or management agency category, 1983

Species	Owner				Total industrial ²
	National Forest	Other Federal ¹	State	Private	
- - - Thousand board feet, International 1/4-inch rule - - -					
True firs	2,449	529	--	--	2,978
Spruce	9,510	886	37	953	11,386
Lodgepole pine	63,723	4,404	200	3,442	71,770
Ponderosa pine	34,424	418	2,284	46,766	83,892
Douglas-fir	4,864	25	98	614	5,602
Other softwoods ³	86	18	8	--	111
Cottonwood	43	--	--	--	43
Total ²	115,099	6,280	2,627	51,776	175,782

¹Lands managed by Federal agencies other than the USDA Forest Service, such as Department of Defense, Bureau of Land Management, and Bureau of Reclamation.

²Data may not add to totals due to truncating or rounding.

³Limber pine.

Table 17--Board-foot volume of industrial roundwood products harvested in Wyoming by county of origin and species, 1983

County	Species							Total ²
	True firs	Spruce	Lodgepole pine	Ponderosa pine	Douglas-fir	Other softwoods ¹	Cottonwood	
- - - - - Thousand board feet, Scribner rule - - - - -								
Albany	531	1,368	10,401	120	--	--	--	12,420
Big Horn	--	20	850	247	196	--	--	1,313
Carbon	1,906	3,176	16,288	--	--	--	--	21,370
Converse	--	--	105	210	--	--	--	315
Crook	--	670	90	59,320	--	--	--	60,080
Fremont	--	1,245	6,681	--	--	--	--	7,926
Hot Springs	--	24	225	--	30	21	--	300
Johnson	--	96	1,574	980	798	72	36	3,556
Lincoln	--	348	3,154	--	1,138	--	--	4,640
Park	--	930	1,620	--	350	--	--	2,900
Platte	--	--	--	190	--	--	--	190
Sheridan	--	--	2,762	1,487	1,062	--	--	5,312
Sublette	45	199	725	--	--	--	--	969
Teton	10	1,452	13,563	--	375	--	--	15,400
Uinta	--	--	100	--	--	--	--	100
Washakie	--	--	1,920	1,034	738	--	--	3,692
Weston	--	--	--	6,615	--	--	--	6,615
Total ²	2,492	9,528	60,058	70,203	4,688	93	36	147,098

¹Limber pine.

²Data may not add to totals due to truncating or rounding.

Table 18--Board-foot volume of industrial roundwood products harvested in Wyoming by county of origin and species, 1983

County	Species							Total ²
	True firs	Spruce	Lodgepole pine	Ponderosa pine	Douglas-fir	Other softwoods ¹	Cottonwood	
----- Thousand board feet, International 4-inch rule -----								
Albany	634	1,635	12,429	143	--	--	--	14,842
Big Horn	--	24	1,016	295	234	--	--	1,569
Carbon	2,278	3,795	19,464	--	--	--	--	25,537
Converse	--	--	125	251	--	--	--	376
Crook	--	801	108	70,887	--	--	--	71,796
Fremont	--	1,488	7,984	--	--	--	--	9,472
Hot Springs	--	29	269	--	36	25	--	358
Johnson	--	114	1,881	1,171	953	86	43	4,249
Lincoln	--	416	3,769	--	1,360	--	--	5,545
Park	--	1,111	1,936	--	418	--	--	3,466
Platte	--	--	--	227	--	--	--	227
Sheridan	--	--	3,301	1,777	1,270	--	--	6,348
Sublette	54	238	867	--	--	--	--	1,158
Teton	12	1,736	16,207	--	448	--	--	18,403
Uinta	--	--	120	--	--	--	--	120
Washakie	--	--	2,294	1,235	882	--	--	4,412
Weston	--	--	--	7,905	--	--	--	7,905
Total ²	2,978	11,386	71,770	83,892	5,602	111	43	175,782

¹Limber pine.

²Data may not add to totals due to truncating or rounding.

Table 19--Board-foot volume of industrial roundwood products harvested in Wyoming by county of origin and land owner or management agency category, 1983

County	Owner				Total ²
	National Forest	Other Federal ¹	State	Private	
----- Thousand board feet, Scribner -----					
Albany	12,420	--	--	--	12,420
Big Horn	1,313	--	--	--	1,313
Carbon	17,345	4,025	--	--	21,370
Converse	70	--	70	175	315
Crook	25,875	--	1,025	33,180	60,080
Fremont	5,590	400	50	1,886	7,926
Hot Springs	--	210	90	--	300
Johnson	1,742	--	108	1,706	3,556
Lincoln	4,640	--	--	--	4,640
Park	2,900	--	--	--	2,900
Platte	90	--	100	--	190
Sheridan	4,441	--	6	865	5,312
Sublette	969	--	--	--	969
Teton	15,130	270	--	--	15,400
Uinta	100	--	--	--	100
Washakie	3,692	--	--	--	3,692
Weston	--	350	750	5,515	6,615
Total ²	96,317	5,255	2,198	43,327	147,098

¹Lands managed by Federal agencies other than the USDA Forest Service, such as Department of Defense, Bureau of Land Management, and Bureau of Reclamation.

²Data may not add to totals due to truncating or rounding.

Table 20--Board-foot volume of industrial roundwood products harvested in Wyoming by county of origin and land owner or management agency category, 1983

County	Owner				Total ²
	National Forest	Other Federal ¹	State	Private	
- - - - Thousand board feet, International 1/4-inch rule - - - -					
Albany	14,842	--	--	--	14,842
Big Horn	1,569	--	--	--	1,569
Carbon	20,727	4,810	--	--	25,537
Converse	84	--	84	209	376
Crook	30,921	--	1,225	39,650	71,796
Fremont	6,680	478	60	2,254	9,472
Hot Springs	--	251	108	--	358
Johnson	2,082	--	128	2,039	4,249
Lincoln	5,545	--	--	--	5,545
Park	3,466	--	--	--	3,466
Platte	108	--	120	--	227
Sheridan	5,307	--	7	1,034	6,348
Sublette	1,158	--	--	--	1,158
Teton	18,080	323	--	--	18,403
Uinta	120	--	--	--	120
Washakie	4,412	--	--	--	4,412
Weston	--	418	896	6,590	7,905
Total ²	115,099	6,280	2,627	51,776	175,782

¹Lands managed by Federal agencies other than the USDA Forest Service, such as Department of Defense, Bureau of Land Management, and Bureau of Reclamation.

²Data may not add to totals due to truncating or rounding.

TABLES FOR WESTERN SOUTH DAKOTA

Table 21--Cubic volume of industrial roundwood products harvested in western South Dakota by county of origin and product category, 1983

County	Industrial roundwood products		Total industrial ²
	Sawlogs	Other products ¹	
- - - - - <u>Thousand cubic feet</u> - - - - -			
Custer	4,295	350	4,645
Harding	146	--	146
Lawrence	7,466	480	7,946
Meade	2,010	106	2,116
Pennington	8,243	15	8,258
Total ²	22,160	951	23,111

¹Includes utility and building poles, posts, and pulpwood.

²Data may not add to totals due to truncating or rounding.

Table 22--Cubic volume of industrial roundwood products harvested in western South Dakota by land owner or management agency category and product category, 1983

Owner	Sawlogs	Other products ¹	Total industrial ²
- - - - - <u>Thousand cubic feet</u> - - - - -			
National Forest	17,945	601	18,547
Other Federal ³	144	--	144
State	583	--	583
Private	3,487	350	3,837
Total ²	22,160	951	23,111

¹Includes utility building poles, posts, and pulpwood.

²Data may not add to totals due to truncating or rounding.

³Lands managed by Federal agencies other than the USDA Forest Service, such as Department of Defense, Bureau of Land Management, and Bureau of Reclamation.

Table 23--Cubic volume of industrial roundwood products harvested in western South Dakota by species and product category, 1983

Species	Sawlogs	Other products ¹	Total industrial ²
- - - - - Thousand cubic feet - - - - -			
Ponderosa pine	21,778	939	22,717
White spruce	382	13	394
Total ²	22,160	951	23,111

¹Includes utility and building poles, posts, and pulpwood.

²Data may not add to totals due to truncating or rounding.

Table 24--Cubic volume of industrial roundwood products harvested in western South Dakota by size of mill, plant, or yard receiving products, 1983

Mill capacity	Production
Million board feet	Million cubic feet
More than 10	17.7
5.1 - 10	1.6
1.1 - 5	2.6
1 or less	1.2
Total	23.1

Table 25--Cubic volume of industrial roundwood products harvested in western South Dakota by county of origin and land owner or management agency category, 1983

County	Owner				Total industrial ²
	National Forest	State	Other Federal ¹	Private	
- - - - - Thousand cubic feet - - - - -					
Custer	3,556	583	31	475	4,645
Harding	--	--	--	146	146
Lawrence	6,126	--	114	1,706	7,946
Meade	1,225	--	--	891	2,116
Pennington	7,640	--	--	618	8,258
Total ²	18,547	583	144	3,837	23,111

¹Lands managed by Federal agencies other than the USDA Forest Service, such as Department of Defense, Bureau of Land Management, and Bureau of Reclamation.

²Data may not add to totals due to truncating or rounding.

Table 26--Cubic volume of industrial roundwood products harvested in western South Dakota by land owner or management agency category and species, 1983

Owner	Species		Total industrial ¹
	Ponderosa pine	White spruce	
----- Thousand cubic feet -----			
National Forest	18,232	315	18,547
State	584	--	583
Other Federal ²	140	4	144
Private	3,762	75	3,837
Total ¹	22,717	394	23,111

¹Data may not add to totals due to truncating or rounding.

²Lands managed by Federal agencies other than the USDA Forest Service, such as Department of Defense, Bureau of Land Management, and Bureau of Reclamation.

Table 27--Cubic volume of industrial roundwood products harvested in western South Dakota by county of origin and species, 1983

County	Species		Total industrial ¹
	Ponderosa pine	White spruce	
----- Thousand cubic feet -----			
Custer	4,610	35	4,645
Harding	146	--	146
Lawrence	7,819	127	7,946
Meade	2,091	25	2,116
Pennington	8,051	207	8,258
Total ¹	22,717	394	23,111

¹Data may not add to totals due to truncating or rounding.

Table 28--Estimated cubic volumes of used and unused residues produced by primary wood processing plants in western South Dakota, 1983

Residues	Used					
	Product			Total used ¹	Total unused ¹	Total used and unused ¹
	Pulp	Hogged fuel	Other			
----- Thousand cubic feet -----						
Bark	--	3,118	171	3,289 (75%)	1,083	4,372
Coarse	6,507	478	165	7,150 (79%)	1,906	9,056
Fine	402	867	3,558	4,827 (61%)	3,210	8,037
Total ¹	6,909	4,463	3,894	15,266 (71%)	6,199	21,465

¹Data may not add to totals due to truncating or rounding.

Table 29--Board-foot volume of industrial roundwood products harvested in western South Dakota by county of origin and product category, 1983

County	Sawlogs	Other products ¹	Total industrial ²
----- Thousand board feet, Scribner rule -----			
Custer	22,371	--	22,371
Harding	760	--	760
Lawrence	38,885	313	39,198
Meade	10,469	202	10,671
Pennington	42,932	32	42,964
Total ²	115,417	547	115,964

¹Includes utility and building poles, posts, and pulpwood.

²Data may not add to totals due to truncating or rounding.

Table 30--Board-foot volume of industrial roundwood products harvested in western South Dakota by county of origin and product category, 1983

County	Sawlogs	Other products ¹	Total industrial ²
----- Thousand board feet, International 1/4-inch rule -----			
Custer	26,353	--	26,353
Harding	895	--	895
Lawrence	45,806	369	46,175
Meade	12,332	238	12,570
Pennington	50,574	38	50,612
Total ²	135,961	644	136,606

¹Includes utility and building poles, posts, and pulpwood.

²Data may not add to totals due to truncating or rounding.

Table 31--Board-foot volume of industrial roundwood products harvested in western South Dakota by land owner or management agency category and product category, 1983

Owner	Sawlogs	Other products ¹	Total industrial ²
- - - - Thousand board feet, Scribner rule - - - -			
National Forest	93,466	547	94,013
Other Federal ³	752	--	752
State	3,039	--	3,039
Private	18,160	--	18,160
Total ¹	115,417	547	115,964

¹Includes utility building poles, posts, and pulpwood.

²Data may not add to totals due to truncating or rounding.

³Lands managed by Federal agencies other than the USDA Forest Service, such as Department of Defense, Bureau of Land Management, and Bureau of Reclamation.

Table 32--Board-foot volume of industrial roundwood products harvested in western South Dakota by land owner or management agency category and product category, 1983

Owner	Sawlogs	Other products ¹	Total industrial ²
Thousand board feet, International 1/4-inch rule			
National Forest	110,103	644	110,747
Other Federal ³	886	--	886
State	3,580	--	3,580
Private	21,392	--	21,392
Total ²	135,961	644	136,606

¹Includes utility building poles, posts, and pulpwood.

²Data may not add to totals due to truncating or rounding.

³Lands managed by Federal agencies other than the USDA Forest Service, such as Department of Defense, Bureau of Land Management, and Bureau of Reclamation.

Table 33--Board-foot volume of industrial roundwood products harvested in western South Dakota by species and product category, 1983

Species	Sawlogs	Other products ¹	Total industrial ²
- - - - Thousand board feet, Scribner rule - - - -			
Ponderosa pine	113,429	547	113,976
White spruce	1,988	--	1,988
Total ²	115,417	547	115,964

¹Includes utility and building poles, posts, and pulpwood.

²Data may not add to totals due to truncating or rounding.

Table 34--Board-foot volume of industrial roundwood products harvested in western South Dakota by species and product category, 1983

Species	Sawlogs	Other products ¹	Total industrial ²
- - Thousand board feet, International 1/4-inch rule - -			
Ponderosa pine	133,620	644	134,264
White spruce	2,342	--	2,342
Total ²	135,961	644	136,606

¹Includes utility and building poles, posts, and pulpwood.

²Data may not add to totals due to truncating or rounding.

Table 35--Board-foot volume of industrial roundwood products harvested in western South Dakota by county of origin and land owner or management agency category, 1983

County	Owner				Total industrial ²
	National Forest	State	Other Federal ¹	Private	
- - - - - Thousand board feet, Scribner rule - - - - -					
Custer	18,519	3,039	160	653	22,371
Harding	--	--	--	760	760
Lawrence	29,719	--	592	8,887	39,198
Meade	6,031	--	--	4,640	10,671
Pennington	39,744	--	--	3,220	42,964
Total ²	94,013	3,039	752	18,160	115,964

¹Land managed by Federal agencies other than the USDA Forest Service, such as Department of Defense, Bureau of Land Management, and Bureau of Reclamation.

²Data may not add to totals due to truncating or rounding.

Table 36--Board-foot volume of industrial roundwood products harvested in western South Dakota by county of origin and land owner or management agency category, 1983

County	Owner				Total industrial ²
	National Forest	State	Other Federal ¹	Private	
- - - - Thousand board feet, International 4-inch rule - - - -					
Custer	21,815	3,580	188	769	26,353
Harding	--	--	--	895	895
Lawrence	35,009	--	697	10,469	46,175
Meade	7,104	--	--	5,466	12,570
Pennington	46,818	--	--	3,793	50,612
Total ²	110,747	3,580	886	21,392	136,606

¹Lands managed by Federal agencies other than USDA Forest Service, such as Department of Defense, Bureau of Land Management, and Bureau of Reclamation.

²Data may not add to totals due to truncating or rounding.

Table 37--Board-foot volume of industrial roundwood products harvested in western South Dakota by county of origin and species, 1983

County	Species		Total industrial ¹
	Ponderosa pine	White spruce	
- - - - - Thousand board feet, Scribner rule - - - - -			
Custer	22,187	184	22,371
Harding	760	--	760
Lawrence	38,604	594	39,198
Meade	10,539	132	10,671
Pennington	41,886	1,078	42,964
Total ¹	113,976	1,988	115,964

¹Data may not add to totals due to truncating or rounding.

Table 38--Board-foot volume of industrial roundwood products harvested in western South Dakota by county of origin and species, 1983

County	Species		Total industrial ¹
	Ponderosa pine	White spruce	
- - - Thousand board feet, International ¼-inch rule - - -			
Custer	26,136	216	26,353
Harding	895	--	895
Lawrence	45,475	700	46,175
Meade	12,415	156	12,570
Pennington	49,342	1,270	50,612
Total ¹	134,264	2,342	136,606

¹Data may not add to totals due to truncating or rounding.

Table 39--Board-foot volume of industrial roundwood products harvested in western South Dakota by land owner or management agency category and species, 1983

Owner	Species		Total industrial ¹
	Ponderosa pine	White spruce	
- - - - - Thousand board feet, Scribner rule - - - - -			
National Forest	92,438	1,575	94,013
State	3,039	--	3,039
Other Federal ²	731	21	752
Private	17,769	391	18,160
Total ¹	113,976	1,988	115,964

¹Data may not add to totals due to truncating or rounding.

²Lands managed by Federal agencies other than the USDA Forest Service, such as Department of Defense, Bureau of Land Management, and Bureau of Reclamation.

Table 40--Board-foot volume of industrial roundwood products harvested in western South Dakota by land owner or management agency category and species, 1983

Owner	Species		Total industrial ¹
	Ponderosa pine	White spruce	
- - Thousand board feet, International $\frac{1}{4}$ -inch rule - -			
National Forest	108,892	1,856	110,747
State	3,580	--	3,580
Other Federal ²	861	25	886
Private	20,932	461	21,392
Total ¹	134,264	2,342	136,606

¹Data may not add to totals due to truncating or rounding.

²Lands managed by Federal agencies other than the USDA Forest Service, such as Department of Defense, Bureau of Land Management, and Bureau of Reclamation.

APPENDIX I: CONVERSION FACTORS

Table 41--Conversion factors used in this publication for Wyoming data.

Product	Cubic feet	Board feet, Scribner	Board feet, International ½-inch rule
Sawlogs, house logs, mine and landscaping timbers ¹	1	4.951	5.916
Utility, corral, and building poles ²	1	1.391	1.656
Posts ²	1	.178	.212
Mill residues ³			
1 bone dry unit (BDU) =	100	--	--

¹From timber utilization data collected on active logging operations in Wyoming in 1984.

²From mill canvass data, converted to cubic feet and board feet based on reported dimensions. Segments of posts and poles with small end diameters of less than 6 inches have zero board feet, resulting in average board feet/cubic feet conversions that appear somewhat inconsistent.

³From Bureau of Business and Economics Research, University of Montana, Missoula.

Table 42--Conversion factors used in this publication for western South Dakota data.

Product	Cubic feet	Board feet, Scribner	Board feet, International ½-inch rule	Cords
Sawlogs ¹	1	5.208	6.135	--
Utility, corral, and building poles ²	1	3.099	3.649	--
Posts ²	1	.329	.387	--
Pulp ³	72.516	0	0	1
Mill residues ⁴				
1 bone dry unit (BDU) =	100			

¹From timber utilization data collected on active logging operations in South Dakota in 1984.

²From mill canvass data, converted to cubic feet and board feet based on reported dimensions. Segments of posts and poles with small end diameters of less than 6 inches have zero board feet, resulting in average board feet/cubic feet conversions that appear somewhat inconsistent.

³Area standard for South Dakota from USDA Forest Service.

⁴From Bureau of Business and Economic Research, University of Montana, Missoula.

APPENDIX II: DIRECTORY OF PRIMARY WOOD PROCESSING PLANTS IN WYOMING

County	Name of plant	Mill location	Type of plant
Albany	Authentic Homes Corp. P.O. Box 1288 Laramie, WY 82070 (307)742-7530 Mike Jolovich	Laramie	Sawmill, house log plant
Albany	Big Hollow Wood Products 1219 South 4th Laramie, WY 82070 (307)745-7406 Robert Hopkins	Laramie	Sawmill, post and pole yard
Albany	Big Horn Lumber Co., Inc. P.O. Box 479 Laramie, WY 82070 (307)742-3237 Dean Alexander	Laramie	Sawmill
Albany	Brandt & Wicklund Forest Products, Inc. Box 7 Fox Park, WY 82057 (307)745-5994 Marvin Brandt	Fox Park	Sawmill
Albany	Crabtree Posts & Poles 4053 Coalmont Rt. Laramie, WY 82070 (307)742-4516 Mrs. Crabtree		
Albany	Lodgepole Products Co. P.O. Box 1409 Laramie, WY 82070 (307)742-6992 Norman Tyser	145 Sand Creek Rd. Laramie	Sawmill, post and pole yard
Albany	Precision Logs 5920 Chaparral Rd. Laramie, WY 82070 (307)745-7739 R. L. Wagner	Laramie	House log plant
Big Horn	Gross Wholesale 37 Bighorn Ave. Lovell, WY 82431 no telephone David C. Gross	Lovell	Sawmill
Carbon	Bockman Timber Company Box 352 Encampment, WY 82325 (307)327-5713 Gary Bockman	Saratoga	Post and pole yard
Carbon	Hammer Lumber & Timber Encampment, WY 82325 (307)327-5157 Mike Hammer	Encampment	Sawmill
Carbon	Louisiana Pacific-Saratoga Plant P.O. Box 809 Saratoga, WY 82331 (307)326-5241 Larry Eggers	517 E. Bridge Ave. Saratoga	Sawmill

(con.)

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County	Name of plant	Mill location	Type of plant
Carbon	Platte Valley Timber & Construction P.O. Box 154 Encampment, WY 82325 (307)327-5784 Fred Lorenz	Encampment	Sawmill
Carbon	Wyola Wood Products P.O. Box 74 Elk Mountain, WY 82324 (307)348-7373 Scott W. Krey	County Rd. 402 Elk Mountain	Sawmill
Converse	Stinson Sawmill, Inc. P.O. Box 535 Douglas, WY 82633 (307)358-3283 Gary Stinson	Douglas	Sawmill
Crook	Hulett Post & Pole, Inc. P.O. Box 248 Hulett, WY 82720 (307)467-5789 Phil Neiman	Hulett	Sawmill
Crook	Johnson Sawmill P.O. Box 176 Hulett, WY 82720 (307)467-5725 Jessie Johnson	Hulett	Sawmill
Crook	Neiman Sawmill, Inc. DBA Devil's Tower Forest Products P.O. Box 218 Hulett, WY 82720 (307)467-5252 Jim Neiman, Jr.	Hulett	Sawmill
Fremont	D. M. Wilson Lumber, Inc. P.O. Box 202 Dubois, WY 82513 (307)455-2717 D. M. Wilson	Dubois	Sawmill, house log plant
Fremont	Louisiana Pacific P.O. Box 787 Dubois, WY 82513 (307)455-2239	Dubois	Sawmill
Fremont	S&S Wood Products P.O. Box 44 Pavillion, WY 82523 (307)856-5170 Orville D. Stevens	12 North Pavillion Rd. Pavillion	Sawmill
Fremont	Wind River Ranch P.O. Box 278 Dubois, WY 82513 Frank Cole	West of Dubois	Sawmill
Fremont	Wyoming Wood Products, Inc. Rt. 63, Box 471 Lander, WY 82520 (307)332-4542 Patrick C. Hickerson	North 2d St. Lander	Sawmill
Hot Springs	Grasscreek Lumber P.O. Box 426 Meeteetse, WY 82433 (307)867-2361 Shane Scott	Meeteetse	Sawmill

APPENDIX II (Con.)

County	Name of plant	Mill location	Type of plant
Johnson	Buckingham Lumber Co., Inc. P.O. Box L Buffalo, WY 82834 (307)684-2231 Anna Buckingham	East of Buffalo	Sawmill
Lincoln	Dry Creek Lumber P.O. Box 151 Smoot, WY 85126 (307)886-9840 Bart Johnson	Smoot	Sawmill
Lincoln	Leavitt Lumber Co. P.O. Box 96 Kamas, UT 84036 (801)783-4678 Stan Leavitt	Alpine, WY	Sawmill
Lincoln	Star Studs P.O. Box 517 Afton, WY 83110 (307)886-3144	Afton	Sawmill
Lincoln	Valley Lumber Co. 44 E. 4th Ave. Afton, WY 83110 (307)886-3316 Arthur C. Schwab	Afton	Sawmill
Park	Cody Lumber, Inc. P.O. Box 757 Cody, WY 82414 (307)587-2642 Michael E. Hanson	Cody	Sawmill
Platte	American Recycling Co. P.O. Box 412 Wheatland, WY 82201 (307)322-4511 Hubert Nickle	Wheatland	Pole and landscaping timber yard
Platte	Cole Lumber & Construction, Inc. Harris Park Rt. Wheatland, WY 82201 (307)322-2139 Stanley Cole	Wheatland	Sawmill
Platte	McVay Log Homes P.O. Box 126 Glendo, WY 82213 (307)735-4236 F. H. McVay	Glendo	House log plant
Platte	McVay Lumber, Inc. P.O. Box 126 Glendo, WY 82213 (307)735-4236 F. H. McVay	Southwest of Glendo	Sawmill
Platte	Wildcat Post & Pole Box 253 Glendo, WY 82213 (307)735-4378 John Dailey	Glendo	Post and pole yard
Sheridan	Sheridan Forest Products Corp. Box 6327 Sheridan, WY 82801 (307)672-5263 Mary Novotny	Fort Road Sheridan	Sawmill

(con.)

APPENDIX II (Con.)

County	Name of plant	Mill location	Type of plant
Sheridan	Valley Post & Sawmill Box 913 Sheridan, WY 82801 (307)674-6907 C. E. Sayer		Sawmill, post and pole yard
Sheridan	Wyoming Sawmills, Inc. P.O. Box 6088 Sheridan, WY 82801 (307)672-3051 R. C. Newman	Railroad yards Sheridan	Sawmill
Uinta	Ayres & Baker Pole & Post Co. Box 600 Mountain View, WY 82939 (307)782-3170 Larry Ayres	½ mile north of Mountain View	Sawmill, post and pole yard
Uinta	Bates Lumber Co. Box 158 Mountain View, WY 82939 (307)782-6194 Norman Bates	Mountain View	Sawmill
Uinta	Fenus Lumber Co. Box 309 Mountain View, WY 82939 (307)782-3395 Edward Fenus	On ranch	Sawmill
Uinta	South & Jones Timber Co. P.O. Box 788 Evanston, WY 82930 (307)789-2398 Dan L. South	Evanston	Sawmill
Weston	Powder River Timber, Inc. P.O. Box 8 Osage, WY 82723 (307)465-2390 Marlys G. Mallams	14 Skull Creek Rd. Osage	Sawmill

APPENDIX III: DIRECTORY OF PRIMARY WOOD PROCESSING PLANTS IN WESTERN SOUTH DAKOTA

County	Name of plant	Mill location	Type of plant
Custer	Custer Lumber Co. P.O. Box 191 Custer, SD 57730	Custer	Sawmill
Custer	Morgan Sawmill Pringle, SD 57773 (605)673-2681 Dave Morgan	Pringle	Sawmill
Custer	Newberg Lumber Co. Rt. 1, Box 97 Custer, SD 57730 (605)673-2398 Dennis Brown	Custer	Sawmill
Custer	O'Conner Lumber Co. Rt. 1, Box 6 Custer, SD 57730 (605)673-4551 Glenn O'Conner	Custer	Sawmill
Custer	R. E. Linde Sawmills, Inc. 639 Harney St. Custer, SD 57730 (605)673-4514 Bob Linde	Custer	Sawmill
Lawrence	Black Hills Resources P.O. Box 504 Spearfish, SD 57783 (605)642-2143 Lee Dutcher	Spearfish	Sawmill
Lawrence	Francis Potter Sawmill HC 30, Box 105 Whitewood, SD 57793 (605)578-2130 Sharry Bennett	Whitewood	Sawmill
Lawrence	Garhart & Pool, Inc. P.O. Box 610 Spearfish, SD 57783 (605)642-3733 John M. Garhart	Whitewood	Sawmill
Lawrence	Heemstra Lumber & Equipment P.O. Box 334 Whitewood, SD 57793 (605)347-6295 Wayne Heemstra	Whitewood	Sawmill
Lawrence	McLaughlin Sawmill Co. St. Onge Star Rt., Box 3B Spearfish, SD 57783 (605)642-2891 Dave Meredith	Spearfish	Sawmill
Lawrence	Wheeler Lumber P.O. Box 8 Whitewood, SD 57793 (605)269-2215 Pat Goldammer	Whitewood	Sawmill
Lawrence	Wood Sawmill P.O. Box 498 Spearfish, SD 57783 (605)642-5162 Jerry Wood	Spearfish	Sawmill

(con.)

APPENDIX III (Con.)

County	Name of plant	Mill location	Type of plant
Meade	Dickerson Forest Products, Inc. Box 730 Sturgis, SD 57785 (605)347-2556 William J. Cacek	Sturgis	Sawmill
Pennington	Continental Lumber Co. P.O. Box 619 Hill City, SD 57745 (605)574-2512 Arlin Bates	Hill City	Sawmill
Pennington	Potter's Sawmill Rt. 8, Box 4350 Rapid City, SD 57702 (605)342-3339 Eugene Potter	Rapid City	Sawmill

McLain, William H. 1987. Wyoming and western South Dakota—timber production and mill residues, 1983. Resour. Bull. INT-45. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 32 p.

Wyoming's industrial roundwood production in 1983 was 30 million cubic feet, up 17 percent from 1976, and the same as that of 1969. Sawlog production was 29 million cubic feet. No round pulpwood production was reported in 1983. The mill residues volume was estimated at 19.1 million cubic feet. The volume of residues used was 11.4 million cubic feet.

South Dakota's industrial roundwood production reached a new high of 23.1 million cubic feet. Sawlog production was 22 million cubic feet, while pulpwood dropped to less than 250,000 cubic feet. Mill residues produced were 21.5 million cubic feet. The volume of mill residues used was 15.3 million cubic feet.

KEYWORDS: timber products output, industrial roundwood, primary wood products.

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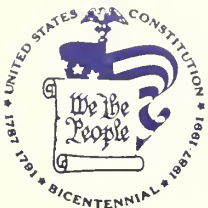
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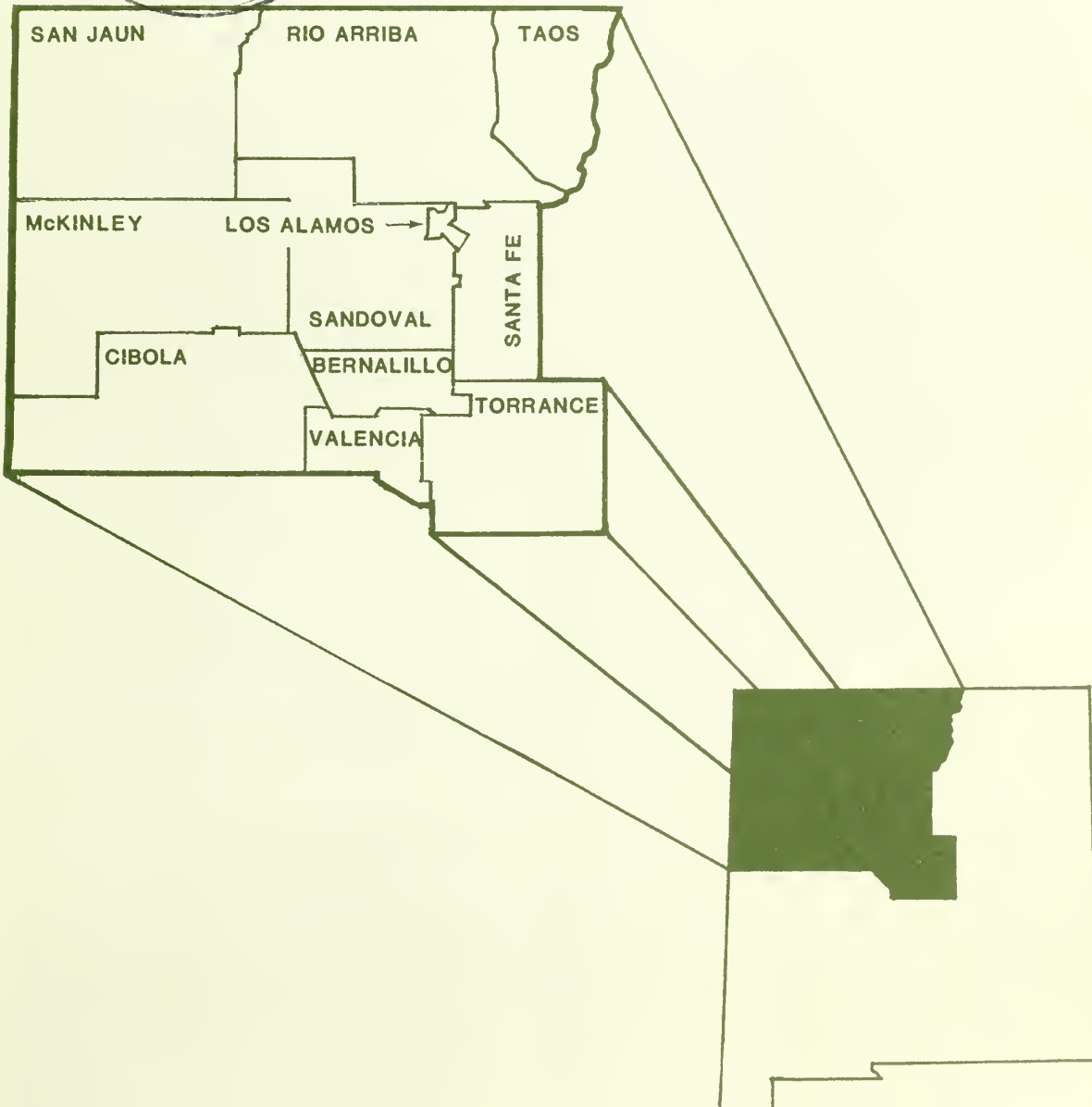
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Resource Bulletin
INT-46



Timberland and Woodland Resources Outside National Forests in Northwestern New Mexico, 1987

Dwane D. Van Hooser



PREFACE

The primary objective of Forest Survey—a continuing, nationwide undertaking of the Forest Service, U.S. Department of Agriculture—is to provide an assessment of the renewable resources for the forest lands of the Nation. Fundamental to the accomplishment of the objective are the periodic State-by-State resource inventories. Originally, Forest Survey was authorized by the McSweeney-McNary Act of 1928. The current authorization is through the Renewable Resources Research Act of 1978.

The Intermountain Research Station with headquarters in Ogden, UT, conducts the forest resource inventories for the Rocky Mountain States of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, western South Dakota, Utah, Wyoming, western Texas, and Oklahoma's Panhandle. These inventories provide information on the extent and condition of the forests—its volume of wood and stand dynamics as expressed by growth, removals, and mortality for State, privately owned, and most other forest lands not in the National Forest System. These data, when combined with similar information on National Forest lands, provide a basis for forming forest policies and programs and for the orderly development and use of the resources.

THE AUTHOR

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ACKNOWLEDGMENTS

The Intermountain Research Station gratefully acknowledges the cooperation of the New Mexico Natural Resource Department, Forestry Division, and the U.S. Department of the Interior, Bureau of Land Management. We extend a special note of gratitude to Mr. Ray Gallegos, former New Mexico State Forester, and his staff; Mr. Jack Dossett, New Mexico State Office of the BLM; and the private land owners who provided information and access to field sample locations.

RESEARCH SUMMARY

The forest land base outside the National Forests in northwestern New Mexico totals more than 4 million acres. Three-quarters of these forests are owned by private individuals or companies. Acres supporting stands of timber species total 917,000, while the woodland resources typified by stands of pinyon-juniper account for more than 3 million acres. These areas contain wood volumes of 936 million cubic feet and 1.5 billion cubic feet, respectively. This report presents additional information on the land base, timberland and woodland area, and associated inventory volume, growth, and mortality.

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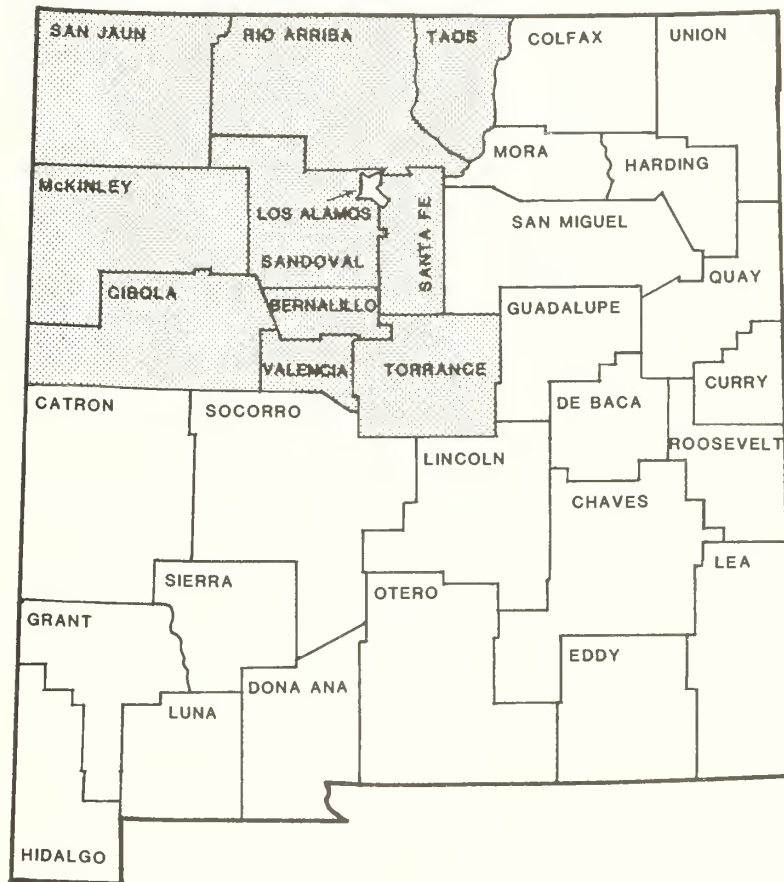
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Timberland and Woodland Resources Outside National Forests in Northwestern New Mexico, 1987

Dwane D. Van Hooser

INTRODUCTION

This report presents the principal findings of the most recent Forest Survey of the timberland and woodland resources outside the National Forests in northwestern New Mexico. Phase I of the survey began in 1985 with the collection and reconciliation of area information and aerial photo interpretation. The field phase began in early June 1986 and was completed in mid-November of the same year.



Northwestern New Mexico counties.

The resource statistics in this report include estimates for those lands in private ownership and those public lands administered by the USDI Bureau of Land Management, other Federal agencies, the State of New Mexico, and county and municipal governments. Reserved areas, such as those lands administered by the USDI National Park Service, are not field sampled but are included in the total area summaries (table 1). Resource estimates for those lands administered by the USDA Forest Service in the National Forest System are not included in this report but will be combined with the estimates presented here and in other sample area reports to form the basis for a comprehensive statewide analysis of New Mexico's forest resource situation.

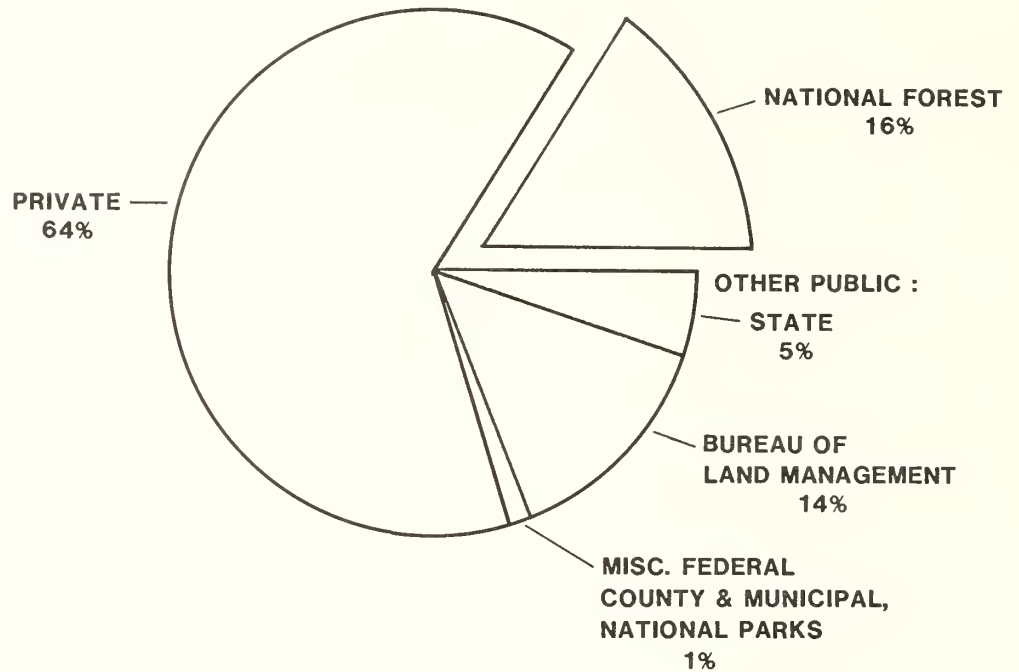
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HIGHLIGHTS

Area

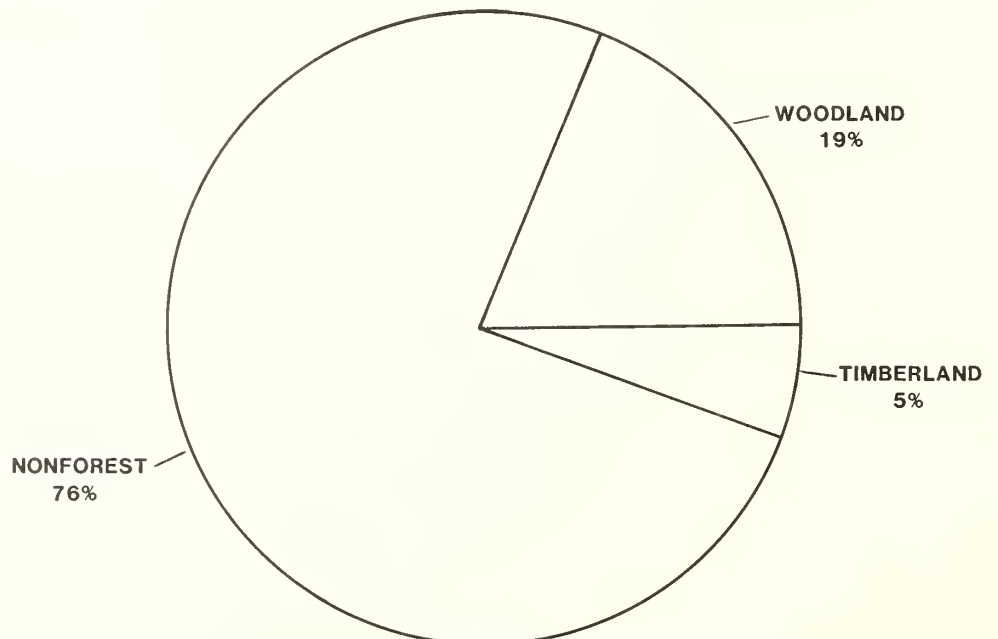
The total land area of northwestern New Mexico is 20.2 million acres. Some 7.3 million of it is publicly owned.

Those lands outside the National Forests, about which this report is concerned, amount to 17 million acres. Of these, the Bureau of Land Management (BLM) administers nearly 3 million acres, the State of New Mexico controls over 1.1 million acres, and the remaining area—nearly 13 million acres—is in private ownership.



Distribution of land in northwestern New Mexico by ownership.

Of the 17 million acres of land outside the National Forests about 4.1 million are forested. Slightly more than a fifth is timberland, and 77 percent is classified as woodland.

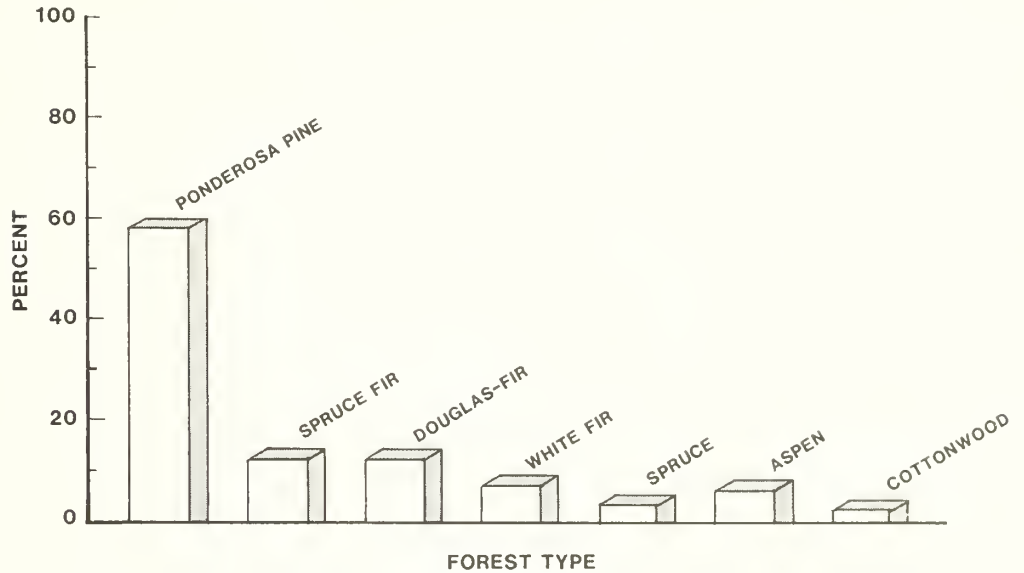


Distribution of land outside National Forests by type of land.

Timberland

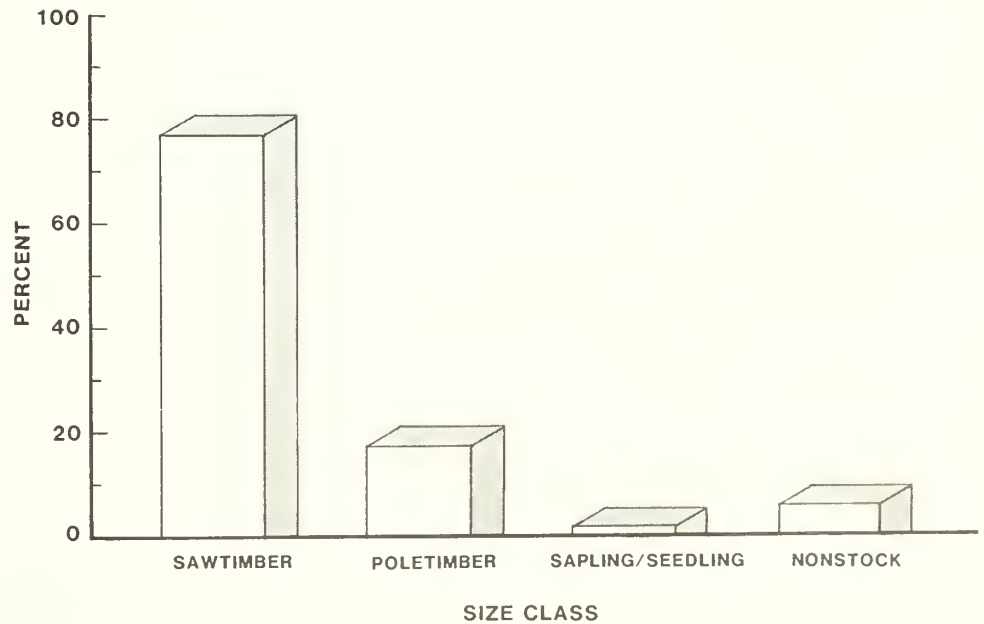
Area—Of the 917,800 acres of timberland a substantial portion is in private holdings. Only 5 percent is administered by public agencies.

Well over half the timberland acres support stands in which ponderosa pine (*Pinus ponderosa*) predominates. Another 25 percent of the area is about evenly divided between the spruce-fir and Douglas-fir types. The remaining area supports stands of white fir, spruce, aspen, or cottonwood.



Distribution of timberland outside National Forests by forest type.

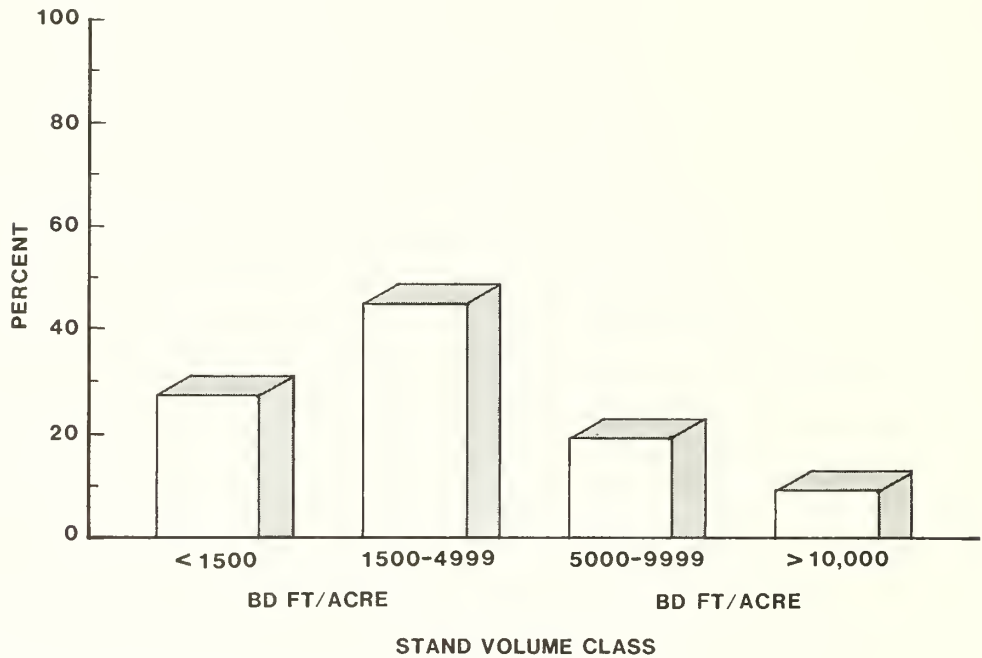
Over three-fourths of the timberland is in sawtimber-size stands. An additional 17 percent supports stands of poletimber. Some 41,000 acres are classed as nonstocked.



Distribution of timberland outside National Forests by stand size class.

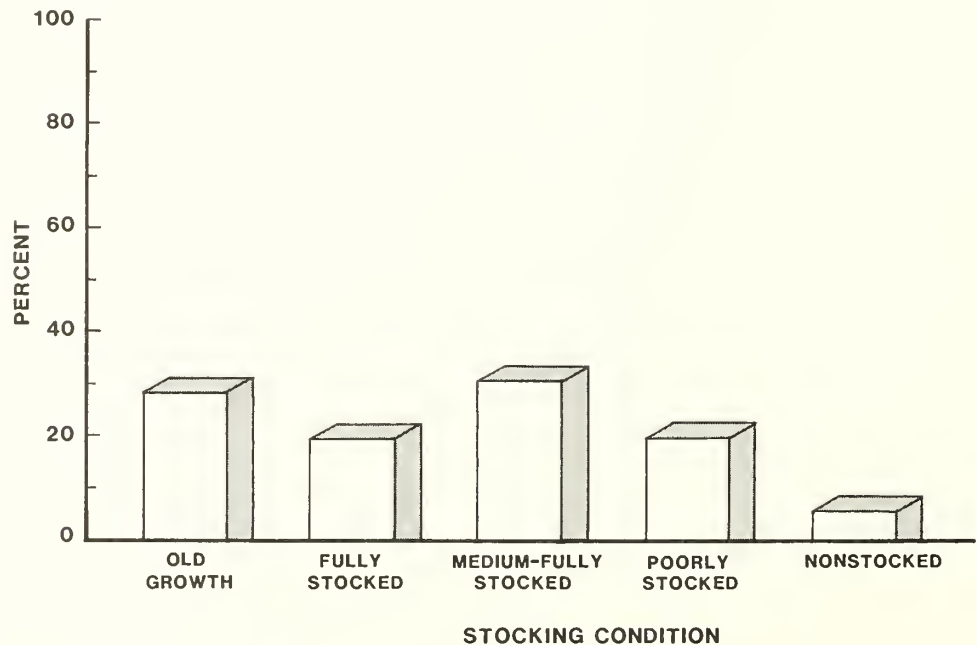
All of the timberland is capable of producing at least 20 cubic feet per acre per year, but only 2 percent has the inherent capability to produce more than 85 cubic feet per acre per year.

Nearly three-quarters of the timberland acres support less than 5,000 board feet per acre, while some 83,000 acres, all in private ownership, contain more than 10,000 board feet per acre.



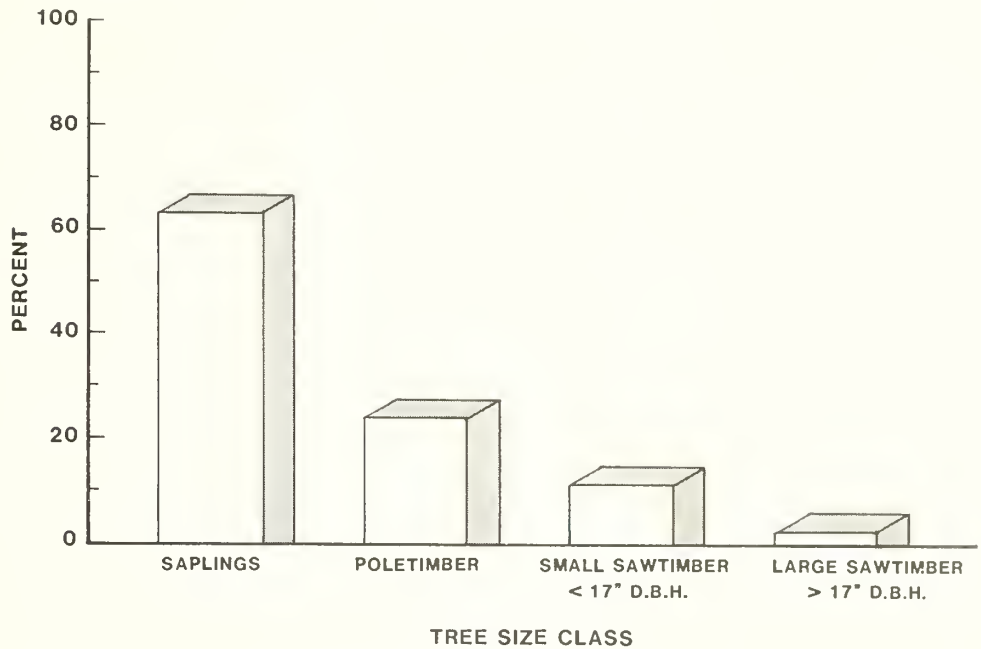
Distribution of timberland outside National Forests by stand volume class.

Nearly half of the timberland acres are medium to fully stocked with acceptable and desirable growing-stock trees. Over a quarter million acres are in stands classified as old-growth, and 19 percent are poorly stocked.



Distribution of timberland outside National Forests by stocking condition.

There are an estimated 276 million growing-stock trees. Nearly two-thirds are saplings, and only 2 percent are classed as large sawtimber. Most of the trees that are dead but considered salvable for wood products are on private land. Similarly, most of the trees that were culled are on private land, and nearly two-thirds are rotten.



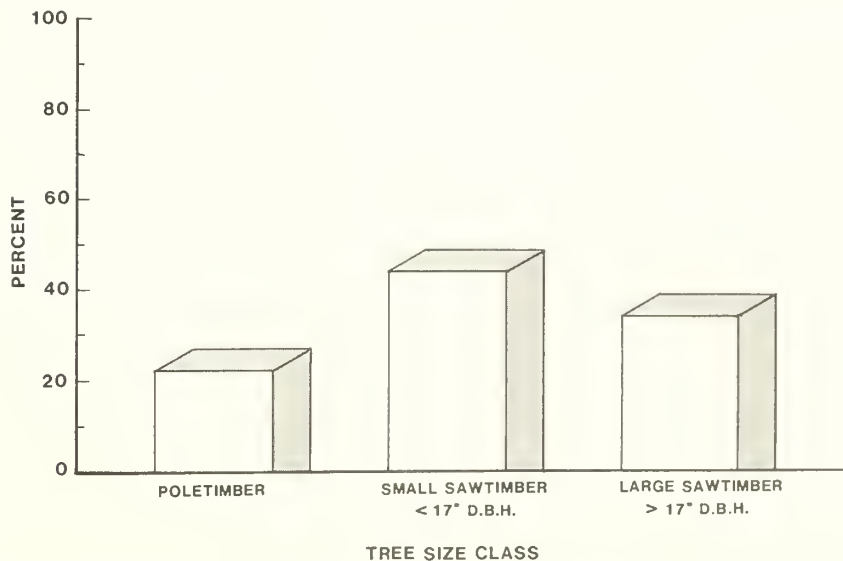
Distribution of growing—stock trees on timberland outside National Forests by tree size class.

Volume—Growing-stock volume amounts to 936 million cubic feet and includes 3.6 billion board feet of sawtimber. Rough, rotten, and salvable dead trees account for an additional 83 million cubic feet of volume.

Of the growing-stock volume, 80 percent is contained in sawtimber-size stands. Less than 1 percent of total growing stock is in sapling/seedling or nonstocked stands.

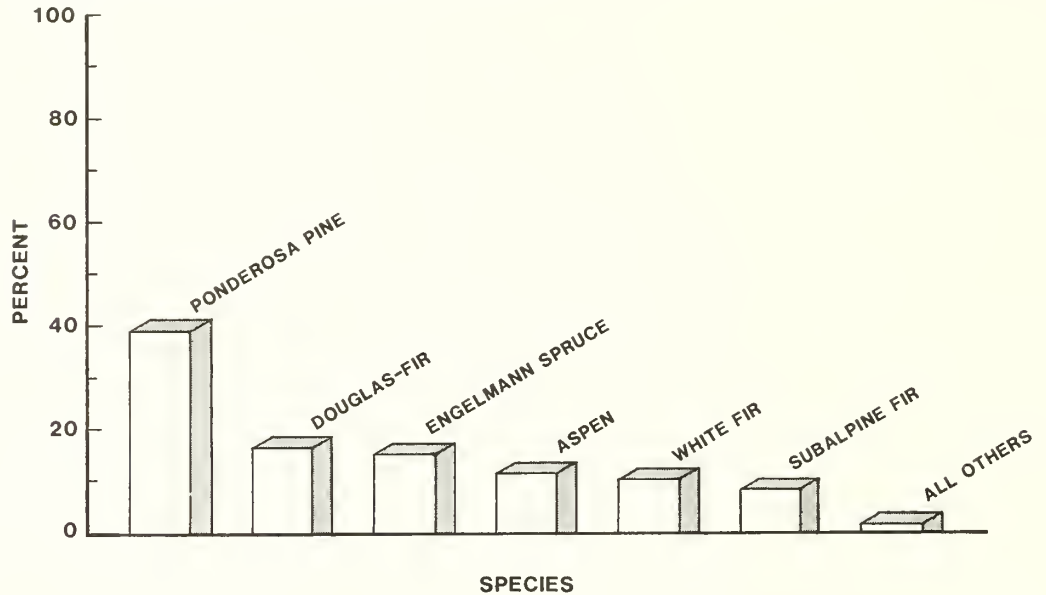
The bulk of the growing-stock and sawtimber volume is in private ownership.

Two-thirds of the growing-stock volume is in trees less than 17 inches diameter at breast height (d.b.h.). About 50 percent of the sawtimber volume is in trees less than 17 inches d.b.h.



Distribution of growing—stock volume on timberland outside National Forests by tree size class.

Ponderosa pine and Douglas-fir (*Pseudotsuga menziesii*) together account for more than half of the total growing-stock volume and 62 percent of the sawtimber volume. White fir (*Abies concolor*) and Engelmann spruce (*Picea engelmannii*) account for an additional 25 percent of the growing-stock volume, and aspen (*Populus tremuloides*) contributes 11 percent. Most of this volume is in private ownership.



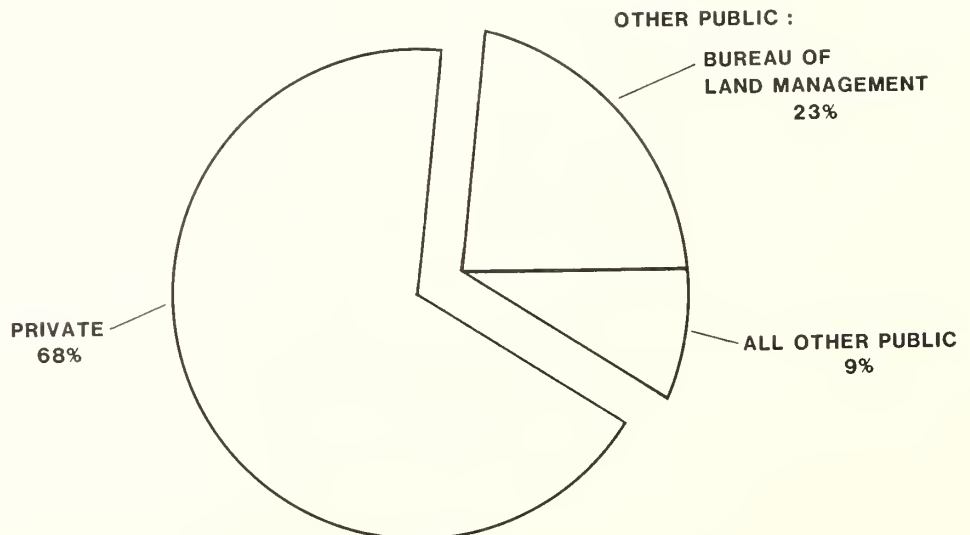
Distribution of growing—stock volume on timberland outside National Forests by species.

Components of Change—On an average annual basis, gross growth of growing stock is increasing the standing inventory by about 23 million cubic feet or 2.5 percent. When mortality is deducted, however, the annual rate of change in the absence of harvest is 22 million cubic feet.

Mortality of growing stock is low, amounting to a tenth of 1 percent of inventory. The specific cause of death for most trees was unknown. Disease, however, was the major agent where a cause of death could be determined.

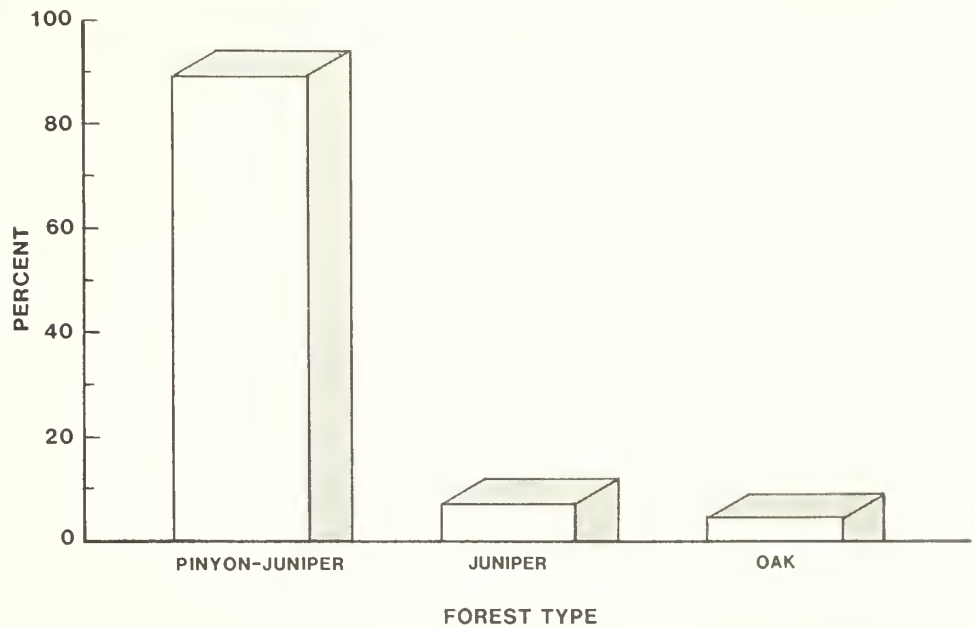
Woodland

Area—More than three-quarters of the forested area is in the woodland types. Over two-thirds is privately owned. The BLM administers almost a fourth of the woodland area.



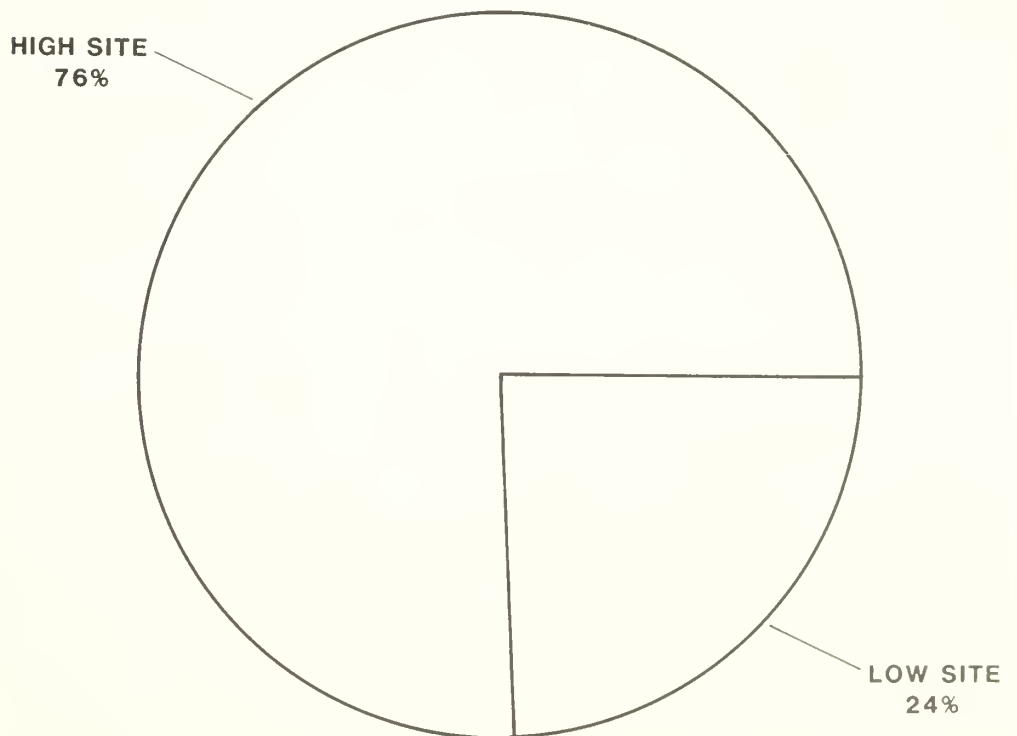
Distribution of woodland outside National Forests by ownership.

The woodland area is composed of three forest types, but the pinyon-juniper complex (P-J) is by far the most extensive. Although stands of pure juniper, either Rocky Mountain (*Juniperus scopulorum*), Utah (*J. osteosperma*), or oneseed (*J. monosperma*), exist they are rather insignificant in relation to P-J, as is the Gambel oak type.



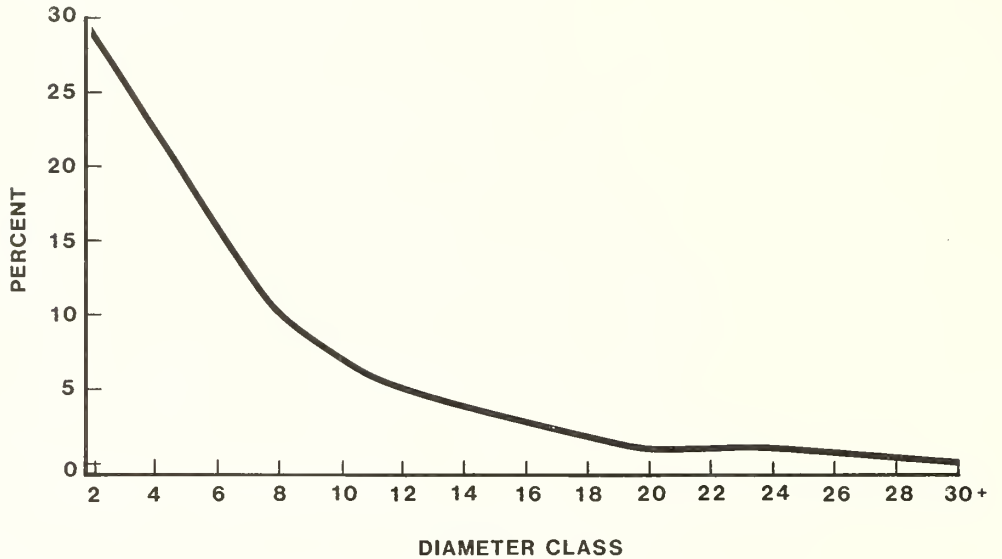
Distribution of woodland outside National Forests by forest type.

Slightly more than three-fourths of the woodland acres are capable of producing crops of wood such as fuelwood and fenceposts on a more or less sustained basis. The 743,000 acres classed as low site usually occupy the more harsh sites where vigorous growth and successful natural regeneration are difficult if not impossible to attain.



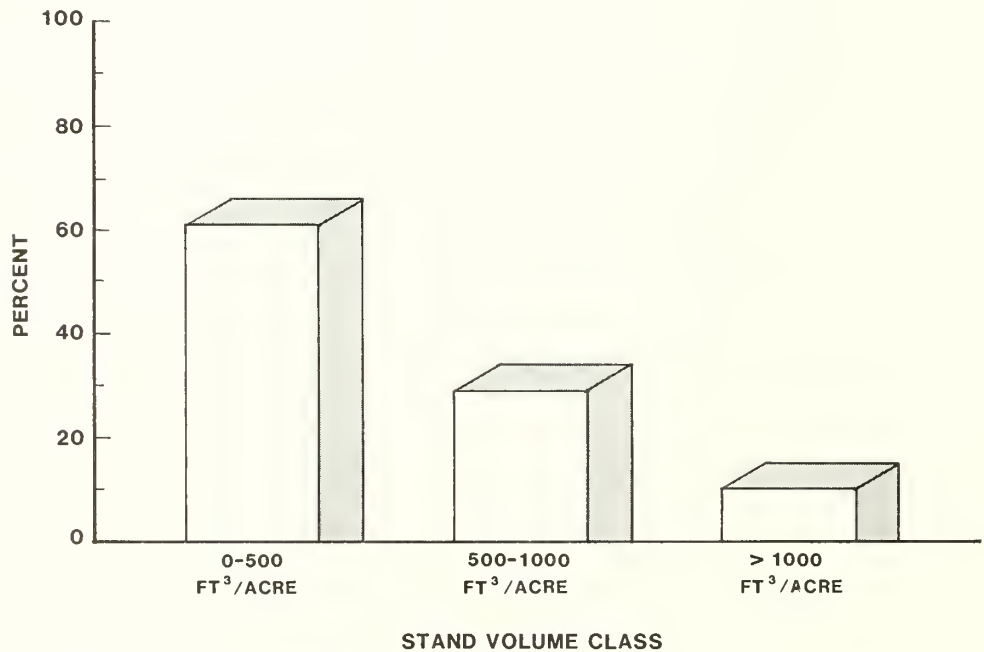
Distribution of woodland outside National Forests by productivity class.

Nearly half of the 703 million trees tallied on woodland were pinyon (*Pinus edulis*) and almost 30 percent were sapling size, that is, less than 3 inches diameter at root collar (d.r.c.).



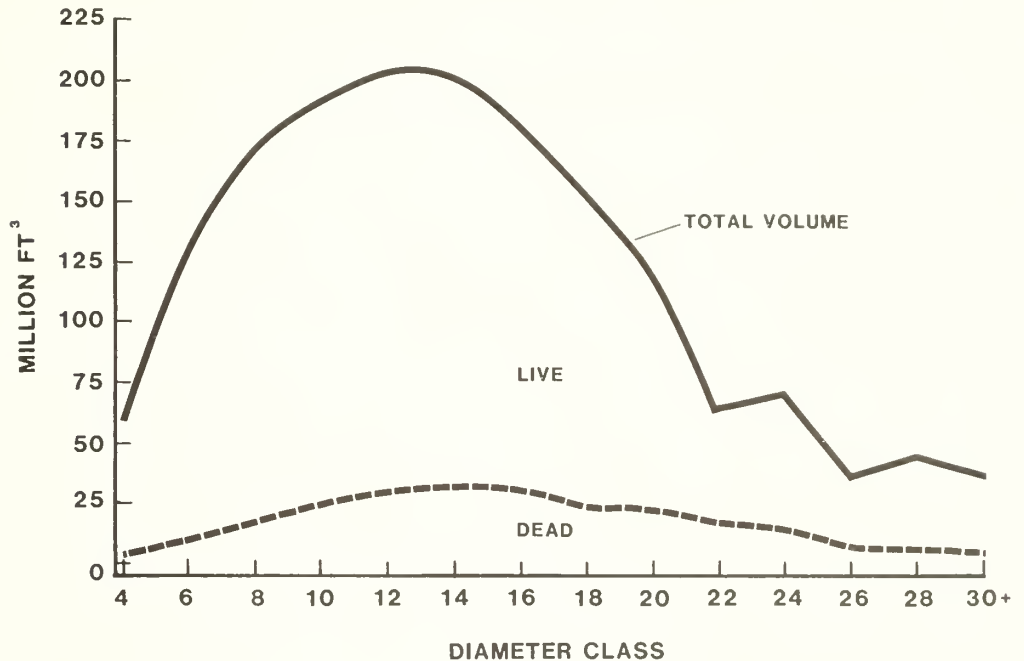
Distribution of trees on woodland outside National Forests by diameter root collar (d.r.c.) class.

Volume—Three-fifths of the woodland acres contain less than 500 cubic feet per acre, and just over 10 percent support 1,000 cubic feet or more. The average volume per acre is just over 450 cubic feet.



Distribution of woodland outside National Forests by stand volume class.

Volume on woodland acres amounted to 1.4 billion cubic feet, most of which is in P-J or oak (*Quercus gambelii*). A small amount, some 3 percent, is in the timber species of Douglas-fir, ponderosa pine, white fir, and cottonwood (*Populus fremontii*).



Distribution of cubic foot volume on woodland outside National Forests by d.r.c. class.

Because merchantability standards are nonexistent for woodland species, all of this material is potentially usable for fiber products such as fuelwood and fenceposts. An additional 254 million cubic feet of dead material was also tallied, most of which is contained in live trees.

Slightly more than 10 percent of all the pinyon tallied qualified as potential Christmas trees. Of these, some 2.9 million or 7 percent are classed as premium grade, 33 percent are standard, and the rest are utility grade. The bulk of these trees are in the 6- to 10-foot class, which is the most desirable for household use.

Of the juniper and oak trees tallied, 18 percent met minimum criteria for fenceposts. Slightly more than two-thirds of the qualifying segments were classed as line posts with the remainder meeting the criteria for the more valuable corner post. More than three-quarters of the fenceposts were juniper.

Components of Change—The woodland inventory is increasing at an annual rate of 1.5 percent. In total, 21 million cubic feet of wood was added to the standing volume in 1986. Consumption of products from woodlands will reduce this increment somewhat.

Overall, net annual growth per acre for woodland amounts to about 7 cubic feet. By type, the most productive is the oak averaging just over 20 cubic feet per acre in annual increment.

HOW THE INVENTORY WAS CONDUCTED

The inventory was designed to provide reliable statistics primarily at the State and sample area levels.

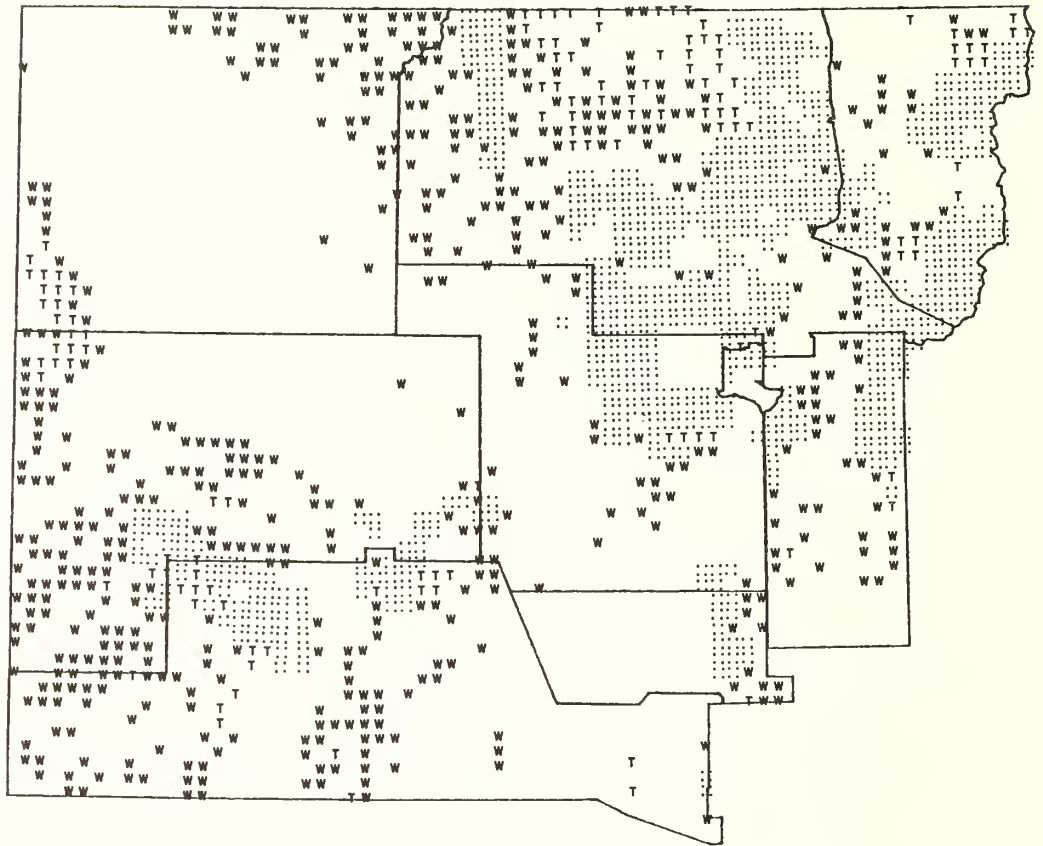
Prefield

Initial area estimates were based on the classification of 69,032 sample points systematically placed on the latest aerial photographs available. The sample points were summarized and grouped into strata for subsequent field sampling. The photo points, adjusted to meet known land areas, were used to compute area expansion factors for the sampling strata means.

Field

Land classification and estimates for timberland and woodland characteristics and volume were based on observations and measurements recorded at 2,657 field sample locations, of which 632 were forested.

1986 FOREST SURVEY OF NORTHWESTERN NEW MEXICO



T = TIMBERLAND W = WOODLAND :: = NATIONAL FOREST

Distribution of timberland and woodland field locations outside National Forests in northwestern New Mexico.

Sample trees for timberland were selected using a 5-point cluster. Trees less than 5 inches d.b.h. were measured on a 1/300-acre fixed radius plot. Trees 5 inches d.b.h. or larger were selected using a variable radius plot. A 20 basal area factor was used for ponderosa pine locations. Other timberland locations were measured using a 40 basal area factor. Sample trees for woodland were selected using a 1/10-acre or a 1/5-acre fixed radius plot for trees 3 inches d.r.c. and larger. Trees less than 3 inches d.r.c. were tallied on 1/300-acre subplots.

Compilation

All photo and field data were loaded onto tape and stored for computer editing, computation, and tabulation. Final estimates from these data were based on statistical summaries, a portion of which is included in this bulletin. Volume and defect were computed using equations developed by Edminster and others (1980, 1981), Kemp (1958), Chojnacky (1985), Meyers (1964), and Meyers and others (1972).

DATA RELIABILITY

Individual cells within tables should be used with caution. Some are based on very small sample sizes, which may result in high sampling errors. The standard error percentages shown in tables 2 and 3 were calculated at the 67 percent confidence level.

TERMINOLOGY

- Acceptable tree*—Growing-stock tree meeting specified standards of size and quality, but not qualifying as a desirable tree.
- Area condition class*—A classification of timberland reflecting the degree to which the site is being utilized by growing-stock trees and other conditions affecting current and prospective timber growth (see Stocking):
- Class 10—Areas fully stocked with desirable trees and not overstocked.
 - Class 20—Areas fully stocked with desirable trees, but overstocked with all live trees.
 - Class 30—Areas medium to fully stocked with desirable trees and with less than 30 percent of the area controlled by other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.
 - Class 40—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees, or conditions that ordinarily prevent occupancy by desirable trees, or both.
 - Class 50—Areas poorly stocked with desirable trees, but fully stocked with growing-stock trees.
 - Class 60—Areas poorly stocked with desirable trees, but with medium to full stocking of growing-stock trees.
 - Class 70—Areas nonstocked or poorly stocked with desirable trees, and poorly stocked with growing-stock trees.
 - Class 80—Low-risk old-growth stands.
 - Class 90—High-risk old-growth stands.
 - Nonstocked—Areas less than 10 percent stocked with growing-stock trees.
- Basal area*—The cross-sectional area of a tree expressed in square feet. For timber species the calculation is based on diameter at breast height (d.b.h.); for woodland species it is based on diameter at root collar (d.r.c.).
- Christmas tree grade*—Pinyon species are classified as Christmas trees using the following guidelines:
- Premium—Excellent conical form with no gaps in branches and a straight bole.
 - Standard—Good conical form with small gaps in branches and bole slightly malformed.
 - Utility—Conical in form with branches missing and bole bent or malformed.
 - Cull—Not meeting one of the above classifications.
- Cord*—A pile of stacked wood equivalent to 128 cubic feet of wood and air space having standard dimensions of 4 by 4 by 8 feet.
- Cull tree*—Live tree that is unmerchantable now or prospectively (see Rough tree and Rotten tree).
- Cull volume*—Portions of a tree's volume that are not usable for wood products because of rot, form, missing material, or other cubic-foot defect. Form and sound defects include severe sweep and crook, forks, extreme form reduction, large deformities, and dead material.
- Deferred forest land*—Forest lands within the National Forest System that are under study for possible inclusion in the Wilderness System.
- Desirable tree*—Growing-stock tree (1) having no serious defect in quality to limit present or prospective use for timber products, (2) of relatively high vigor, and (3) containing no pathogens that may result in death or serious deterioration within the next decade.
- Diameter at breast height (d.b.h.)*—Diameter of the stem measured at 4.5 feet above the ground.
- Diameter at root collar (d.r.c.)*—Diameter equivalent at the point nearest the ground line that represents the basal area of the tree stem or stems.
- Diameter classes*—Tree diameters, either d.b.h. or d.r.c., grouped into 2-inch classes labeled by the midpoint of the class.
- Farmer/rancher-owned land*—Land owned by a person who operates a farm or a ranch and who either does the work or directly supervises the work.
- Forest industry land*—Land owned by companies or individuals operating a primary wood-processing plant.

Forest land—Land at least 10 percent stocked by forest trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated. The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width at least 120 feet wide to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 feet wide.

Forest tree—Woody plant having a well-developed stem or stems, usually more than 12 feet in height at maturity, with a generally well-defined crown.

Forest type—A classification of forest land based upon and named for the tree species presently forming a plurality of live-tree stocking.

Gross annual growth—The average annual increase in the net volume of trees during a specified period.

Growing-stock tree—Live sawtimber tree, poletimber tree, sapling, or seedlings of timber species meeting specified standards of quality and vigor; excludes cull trees.

Growing-stock volume—Net cubic-foot volume in live poletimber-size and sawtimber-size growing-stock trees from a 1-foot stump to a minimum 4-inch top (of central stem) outside bark or to the point where the central stem breaks into limbs.

Growth—See definition for Net annual growth.

Hardwood tree—Dicotyledonous tree, usually broad-leaved and deciduous.

High-risk old-growth stand—Timber stand over 100 years old in which the majority of the trees are not expected to survive more than 10 years.

Indian land—Indian land held in trust by the Federal Government.

Industrial wood—All commercial roundwood products except fuelwood.

Land area—The area of dry land and land temporarily or partially covered by water such as marshes, swamps, and river flood plains, streams, sloughs, estuaries, and canals less than 120 feet wide; and lakes, reservoirs, and ponds less than 1 acre in size.

Logging residue—The unused portion of growing-stock trees cut or killed by logging.

Low-risk old-growth stand—Timber stand over 100 years old in which the majority of the trees are expected to survive more than 10 years.

Miscellaneous Federal land—Land administered by Federal agencies other than the U.S. Department of Agriculture, Forest Service or U.S. Department of the Interior, Bureau of Land Management.

Mortality—The net volume of growing-stock trees that have died from natural causes during a specified period.

National Forest land—Public land administered by the U.S. Department of Agriculture, Forest Service.

National Resource land—Public land administered by the U.S. Department of the Interior, Bureau of Land Management.

Net annual growth—Gross annual growth minus average annual mortality.

Net dead volume—Total net volume of dead trees plus the net volume of dead material in live trees.

Net volume in board feet—The gross board-foot volume in the sawlog portion of growing-stock trees, less deductions for cull volume.

Net volume in cubic feet—Gross cubic-foot volume in the merchantable portion of trees less deductions for cull volume. For timber species, volume is computed for the merchantable stem from a 1-foot stump to a minimum 4-inch top diameter outside bark (d.o.b.), or to the point where the central stem breaks into limbs. For woodland species, volume is computed outside bark (o.b.) for all woody material above d.r.c. that is larger than 1.5 inches d.o.b.

Nonforest land—Land that does not currently qualify as forest land.

Nonindustrial private—All private ownerships except forest industry.

Nonstocked area—Forest land less than 10 percent stocked with live trees.

Old-growth stand—Stand of timber species over 100 years old.

Other private land—Privately owned land other than forest industry or farmer-owned.

- Other public land*—Public land administered by agencies other than the U.S. Department of Agriculture, Forest Service.
- Other removal*—The net volume of growing-stock trees removed from the inventory by cultural operations such as timber-stand improvement, by land clearing, and by changes in land use, such as a shift to wilderness.
- Poletimber stand*—Stand at least 10 percent stocked with growing-stock trees, in which half or more of the stocking is sawtimber or poletimber trees or both, with poletimber stocking exceeding that of sawtimber (see definition for Stocking).
- Poletimber tree*—Live tree of timber species at least 5 inches d.b.h. but smaller than sawtimber size.
- Post*—Juniper and oak species are evaluated for post potential using the following criteria:
 Line post—A 7-foot minimum length with 5 to 7 inches diameter at the butt, 2.5-inch minimum small end diameter, and reasonably straight and solid.
 Corner post—An 8-foot minimum length with 7 to 9 inches diameter at the butt, 2.5-inch minimum small end diameter, and reasonably straight and solid.
- Potential growth*—The average net annual cubic-foot growth per acre at culmination of mean annual growth attainable in fully stocked natural stands.
- Primary wood-processing plant*—Plant using roundwood products such as sawlogs, pulpwood bolts, veneer logs, and so forth.
- Productivity class*—A classification of forest land that reflects biological potential. For timberland the potential net annual growth at culmination of mean annual increment in fully stocked natural stands is the index used. For woodland, characteristics that affect the land's ability to produce wood, such as soil depth and aspect, are used. Furthermore, woodland is classified as high site where sustained wood production is likely, or low site where the continuous production of wood is unlikely.
- Removal*—The net volume of growing-stock trees removed from the inventory by harvesting, cultural operations, land clearings, or changes in land use.
- Reserved forest land*—Forest land withdrawn from tree utilization through statute or administrative designation.
- Residue:*
 Coarse residue—Plant residue suitable for chipping, such as slabs, edgings, and ends.
 Fine residue—Plant residue not suitable for chipping, such as sawdust, shavings, and veneer clippings.
 Plant residue—Wood material from primary manufacturing plants that is not used for any product.
- Rotten tree*—A live poletimber or sawtimber tree with more than 67 percent of its total volume cull (cubic-foot), and with more than half of the cull volume attributable to rotten or missing material.
- Rough tree*—A live poletimber or sawtimber tree with more than 67 percent of its total volume cull (cubic-foot), and with less than half of the cull volume attributable to rotten or missing material.
- Roundwood*—Logs, bolts, or other round sections cut from trees.
- Salvable dead tree*—Standing or down dead tree that is currently merchantable by regional standards.
- Sapling*—Live tree of timber species 1 to 4.9 inches d.b.h., or woodland species 1 to 2.9 inches d.r.c.
- Sapling and seedling stand*—Timberland stand at least 10 percent stocked on which more than half of the stocking is saplings or seedlings or both.
- Sawlog portion*—That part of the bole of sawtimber trees between a 1-foot stump and the sawlog top.
- Sawlog top*—The point on the bole of sawtimber trees above which a sawlog cannot be produced. The minimum sawlog top is 7 inches d.o.b. for softwoods and 9 inches d.o.b. for hardwoods.
- Sawtimber stand*—Stand at least 10 percent stocked with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

- Sawtimber tree*—Live tree of timber species meeting regional size and defect specifications. Softwood trees must be at least 9 inches d.b.h. and hardwood trees 11 inches d.b.h.
- Sawtimber volume*—Net volume in board feet of the sawlog portion of live sawtimber trees.
- Seedling*—Established live tree of timber species less than 1 inch d.b.h. or woodland species less than 1 inch d.r.c.
- Softwood tree*—Monocotyledonous tree, usually evergreen, having needle or scalelike leaves.
- Standard error*—An expression of the degree of confidence that can be placed on an estimated total or average obtained by statistical sampling methods. Standard errors do not include technique errors that could occur in photo classification of areas, field measurements, or compilation of data.
- Stand-size class*—A classification of forest land based on the predominant size of trees present (see Sawtimber stand, Poletimber stand, and Sapling and seedling stand).
- State, county, and municipal land*—Land administered by States, counties, or local public agencies, or lands leased by these governmental units for more than 50 years.
- Stocking*—An expression of the extent to which growing space is effectively utilized by present or potential growing-stock trees of timber species.
- Timberland*—Forest land where timber species make up at least 10 percent stocking.
- Timber species*—Tree species traditionally used for industrial wood products. In the Rocky Mountain States, these include aspen and cottonwood hardwood species and all softwood species except pinyon and juniper.
- Timber stand improvement*—Treatments such as thinning, pruning, release cutting, girdling, weeding, or poisoning of unwanted trees aimed at improving growing conditions for the remaining trees.
- Upper-stem portion*—That part of the main stem or fork of sawtimber trees above the sawlog top to a minimum top diameter of 4 inches outside bark or to the point where the main stem or fork breaks into limbs.
- Water*—Streams, sloughs, estuaries, and canals more than 120 feet wide, and lakes, reservoirs, and ponds more than 1 acre in size at mean high water level.
- Wilderness*—An area of undeveloped land currently included in the Wilderness System, managed so as to preserve its natural conditions and retain its primeval character and influence.
- Woodland*—Forest land where timber species make up less than 10 percent stocking.
- Woodland species*—Tree species not usually converted into industrial wood products. Common uses are fuelwood, fenceposts, and Christmas trees.

REFERENCES

- Chojnacky, David C. 1985. Pinyon-juniper volume equations for the central Rocky Mountain States. Res. Pap. INT-339. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 27 p.
- Edminster, Carleton B.; Mowrer, H. Todd; Hinds, Thomas E. 1981. Volume tables and point-sampling factors for aspen in Colorado. Res. Pap. RM-232. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 16 p.
- Edminster, Carleton B.; Beeson, Robert T.; Metcalf, Gary E. 1980. Volume tables and point-sampling factors for ponderosa pine in the Front Range of Colorado. Res. Pap. RM-218. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 14 p.
- Kemp, Paul D. 1958. Volume tables. Unpublished report on file at: U.S. Department of Agriculture, Forest Service, Intermountain Research Station, Ogden, UT.
- Meyers, Clifford A. 1964. Volume tables and point-sampling factors for lodgepole pine in Colorado and Wyoming. Res. Pap. RM-6. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 16 p.
- Meyers, Clifford A.; Edminster, Carleton B. 1972. Volume tables and point-sampling factors for Engelmann spruce in Colorado and Wyoming. Res. Pap. RM-95. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 23 p.

FOREST SURVEY TABLES

Table 1--Total land and water area by ownership class in northwestern New Mexico, 1987

Ownership class	Area
	- - Acres - -
Land:	
Public:	
National Forest	3,199,399
Other public:	
Bureau of Land Management	2,914,086
National Parks ¹	57,052
Miscellaneous Federal	82,966
State	1,093,281
County and municipal	5,671
Total other public	4,153,056
Total public	7,352,455
Private:	
Indian	7,381,580
Other private	5,463,727
Total private	12,845,307
Total land area	20,197,762
Census water	30,153
Total land and water ²	20,227,915

¹Not included with miscellaneous Federal, a component of other public, for purpose of clarity. These lands are reserved and are not included in the remainder of this report.

²U.S. Bureau of the Census, land and water area of the United States, 1980.

Table 2--Area of forest land outside National Forests with percent standard error in northwestern New Mexico, 1987

Item	Softwoods		Hardwoods		All types	
	Acres	Percent standard error	Acres	Percent standard error	Acres	Percent standard error
Timberland	846,159	±6.2	71,638	±33.9	917,797	±5.4
Woodland	3,036,490	±3.0	116,207	±24.0	3,152,697	±3.0
Reserved forest land: ¹						
Timberland	119,969		5,904		125,873	
Woodland	56,204		499		56,703	
Total forest land ²	4,058,822		194,248		4,253,070	

¹Reserved lands areas are estimated from aerial photos without field verification; therefore, standard errors are not calculated.

²On this and all following tables, totals may vary due to rounding.

Table 3--Net volume, net annual growth, and annual mortality of growing stock and sawtimber on timberland outside National Forests with percent standard error in northwestern New Mexico

Item	Softwoods		Hardwoods		All species	
	Volume	Percent standard error	Volume	Percent standard error	Volume	Percent standard error
Net volume, 1987:						
Growing stock (M cubic feet)	827,498	±10.8	108,696	±24.7	936,194	±10.3
Sawtimber ¹ (M board feet)	3,390,286	±10.9	254,043	±48.1	3,644,329	±10.0
Sawtimber ² (M board feet)	2,834,586	±10.8	208,319	±48.3	3,042,905	±10.9
Net annual growth, 1986:						
Growing stock (M cubic feet)	19,208	±11.5	4,279	±33.4	23,487	±11.4
Sawtimber ¹ (M board feet)	97,143	±14.9	3,896	±42.2	101,039	±14.4
Sawtimber ² (M board feet)	81,046	±14.7	3,428	±42.2	84,474	±14.2
Annual mortality, 1986:						
Growing stock (M cubic feet)	1,277	±42.5	--	--	1,277	±42.5
Sawtimber ¹ (M board feet)	4,367	±54.3	--	--	4,367	±54.3
Sawtimber ² (M board feet)	3,505	±54.9	--	--	3,505	±54.9

¹International ¼-inch rule.

²Scribner rule.

Table 4--Total land area outside National Forests by major land class and ownership class in northwestern New Mexico, 1987

Land class	Ownership class		
	Other public	Private	Total
	- - - - - Acres - - - - -		
Timberland:			
Reserved	52,651	73,222	125,873
Nonreserved	44,664	873,133	917,797
Total	97,315	946,355	1,043,670
Woodland:			
Reserved	52,574	4,129	56,703
Nonreserved	1,000,488	2,152,209	3,152,697
Total	1,053,062	2,156,338	3,209,400
Total forest land:			
Reserved	105,225	77,351	182,576
Nonreserved	1,045,152	3,025,342	4,070,494
Total	1,150,377	3,102,693	4,253,070
Nonforest land	3,002,679	9,742,614	12,745,293
Total land area	4,153,056	12,845,307	16,998,363

Timberland Tables

Table 5--Area of timberland outside National Forests by forest type, stand-size class, and productivity class in northwestern New Mexico, 1987

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
----- Acres -----					
Douglas-fir:					
Sawtimber	--	32,797	52,271	--	85,068
Poletimber	--	19,191	--	--	19,191
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	5,262	--	5,262
Total	--	51,988	57,533	--	109,521
Ponderosa pine:					
Sawtimber	--	39,779	422,586	--	462,365
Poletimber	--	--	51,383	--	51,383
Sapling and seedling	--	--	12,359	--	12,359
Nonstocked	--	--	11,252	--	11,252
Total	--	39,779	497,580	--	537,359
Spruce-subalpine fir:					
Sawtimber	--	34,765	28,787	--	63,552
Poletimber	--	19,191	21,552	--	40,743
Sapling and seedling	--	--	--	--	--
Nonstocked	--	9,596	--	--	9,596
Total	--	63,552	50,339	--	113,891
White fir:					
Sawtimber	--	41,398	14,857	--	56,255
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	5,755	--	--	5,755
Total	--	47,153	14,857	--	62,010
Spruce:					
Sawtimber	--	9,595	--	--	9,595
Poletimber	9,596	4,186	--	--	13,782
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	9,596	13,781	--	--	23,377

(con.)

Table 5. (con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
----- Acres -----					
Aspen:					
Sawtimber	9,596	9,595	--	--	19,191
Poletimber	--	14,066	19,191	--	33,257
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	9,596	23,661	19,191	--	52,448
Cottonwood:					
Sawtimber	--	9,595	--	--	9,595
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	9,596	--	--	9,596
Total	--	19,191	--	--	19,191
All types:					
Sawtimber	9,596	177,524	518,501	--	705,621
Poletimber	9,596	56,634	92,126	--	158,356
Sapling and seedling	--	--	12,359	--	12,359
Nonstocked	--	24,947	16,514	--	41,461
Total	19,192	259,105	639,500	--	917,797

Table 6--Area of other publicly owned timberland by forest type, stand-size class, and productivity class in northwestern New Mexico, 1987

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
----- Acres -----					
Douglas-fir:					
Sawtimber	--	5,602	--	--	5,602
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	5,602	--	--	5,602
Ponderosa pine:					
Sawtimber	--	--	26,505	--	26,505
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	26,505	--	26,505
Spruce-subalpine fir:					
Sawtimber	--	--	--	--	--
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	--	--	--
White fir:					
Sawtimber	--	8,371	--	--	8,371
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	8,371	--	--	8,371
Spruce:					
Sawtimber	--	--	--	--	--
Poletimber	--	4,186	--	--	4,186
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	4,186	--	--	4,186

(con.)

Table 6. (con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
----- Acres -----					
Aspen:					
Sawtimber	--	--	--	--	--
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	--	--	--
Cottonwood:					
Sawtimber	--	--	--	--	--
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	--	--	--
All types:					
Sawtimber	--	13,973	26,505	--	40,478
Poletimber	--	4,186	--	--	4,186
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	18,159	26,505	--	44,664

Table 7--Area of privately owned timberland by forest type, stand-size class, and productivity class in northwestern New Mexico, 1987

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
----- Acres -----					
Douglas-fir:					
Sawtimber	--	27,195	52,271	--	79,466
Poletimber	--	19,191	--	--	19,191
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	5,262	--	5,262
Total	--	46,386	57,533	--	103,919
Ponderosa pine:					
Sawtimber	--	39,779	396,081	--	435,860
Poletimber	--	--	51,383	--	51,383
Sapling and seedling	--	--	12,359	--	12,359
Nonstocked	--	--	11,252	--	11,252
Total	--	39,779	471,075	--	510,854
Spruce-subalpine fir:					
Sawtimber	--	34,765	28,787	--	63,552
Poletimber	--	19,191	21,552	--	40,743
Sapling and seedling	--	--	--	--	--
Nonstocked	--	9,596	--	--	9,596
Total	--	63,552	50,339	--	113,891
White fir:					
Sawtimber	--	33,027	14,857	--	47,884
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	5,755	--	--	5,755
Total	--	38,782	14,857	--	53,639
Spruce:					
Sawtimber	--	9,595	--	--	9,595
Poletimber	9,596	--	--	--	9,596
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	9,596	9,595	--	--	19,191

(con.)

Table 7. (con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
- - - - - Acres - - - - -					
Aspen:					
Sawtimber	9,596	9,595	--	--	19,191
Poletimber	--	14,066	19,191	--	33,257
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	9,596	23,661	19,191	--	52,448
Cottonwood:					
Sawtimber	--	9,595	--	--	9,595
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	9,596	--	--	9,596
Total	--	19,191	--	--	19,191
All types:					
Sawtimber	9,596	163,551	491,996	--	665,143
Poletimber	9,596	52,448	92,126	--	154,170
Sapling and seedling	--	--	12,359	--	12,359
Nonstocked	--	24,947	16,514	--	41,461
Total	19,192	240,946	612,995	--	873,133

Table 8--Area of timberland outside National Forests by stand volume and ownership class in northwestern New Mexico, 1987

Stand volume per acre ¹	Ownership class			Total
	Other public	Private	Acres	
Less than 1,500 board feet	15,391	235,992		251,383
1,500 to 4,999 board feet	15,299	396,609		411,908
5,000 to 9,999 board feet	13,974	157,882		171,856
10,000 board feet or more	--	82,650		82,650
All classes	44,664	873,133		917,797

¹International 4-inch rule.

Table 9--Area of timberland outside National Forests by forest type and area condition class in northwestern New Mexico, 1987

Forest type	Area condition class											Nonstocked	All classes
	10	20	30	40	50	60	70	80	90	90	90		
Douglas-fir	--	--	--	--	15,198	34,765	33,211	5,755	15,331	5,262	109,522		
Ponderosa pine	--	--	--	--	118,418	142,592	106,175	--	158,922	11,252	537,359		
Spruce-subalpine fir	--	5,976	--	9,596	21,553	19,191	--	--	47,978	9,596	113,890		
White fir	--	--	--	8,081	4,186	9,940	14,858	--	19,191	5,755	62,011		
Spruce	--	--	--	13,781	--	--	9,595	--	--	--	23,376		
Aspen	--	--	--	--	4,470	38,382	--	--	9,596	--	52,448		
Cottonwood	--	--	--	--	--	9,596	--	--	--	9,595	19,191		
All types	--	5,976	--	31,458	163,825	244,870	173,435	5,755	251,018	41,460	917,797		

Table 10--Number of growing-stock trees on timberland outside National Forests by species and diameter class in northwestern New Mexico, 1987

Species	Diameter class (inches at breast height)																	All classes
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+			
Douglas-fir	8,755	6,052	6,114	3,852	2,507	1,551	1,077	692	326	271	108	54	113	--	4	31,476		
Ponderosa pine	20,614	22,965	11,044	7,276	4,734	2,730	2,237	1,706	1,163	992	584	366	240	130	113	76,894		
Whitebark pine	--	--	--	--	--	--	67	--	--	35	58	--	--	--	--	160		
Limb pine	--	--	--	--	--	64	--	--	--	--	--	--	--	--	--	64		
Subalpine fir	22,838	11,213	3,275	4,185	877	1,535	270	167	--	107	30	--	--	--	--	44,497		
White fir	8,373	5,380	2,854	1,926	2,116	1,136	698	229	413	138	44	10	--	44	23	23,384		
Engelmann spruce	16,351	9,637	4,506	3,548	1,905	1,871	1,033	173	346	37	94	49	--	18	21	39,589		
Total softwoods	76,931	55,247	27,793	20,787	12,139	8,887	5,382	2,967	2,248	1,580	918	479	353	192	161	216,064		
Aspen	25,098	16,633	11,877	3,191	1,674	136	657	314	179	101	--	--	--	--	--	59,860		
Cottonwood	--	--	--	--	--	--	--	--	--	75	--	--	--	17	--	92		
Total hardwoods	25,098	16,633	11,877	3,191	1,674	136	657	314	179	176	--	--	--	17	--	59,952		
All species	102,029	71,880	39,670	23,978	13,813	9,023	6,039	3,281	2,427	1,756	918	479	353	209	161	276,016		

Table 11--Number of cull and salvable dead trees on timberland outside National Forests by ownership class, and softwoods and hardwoods in northwestern New Mexico, 1987

Ownership class and species group	Cull trees			Salvable dead trees	Total
	Rough	Rotten	Total		
----- Thousand trees -----					
Other public:					
Softwoods	--	26	26	371	397
Hardwoods	--	--	--	644	644
Total	--	26	26	1,015	1,041
Private:					
Softwoods	706	122	828	6,435	7,263
Hardwoods	355	1,831	2,186	5,163	7,349
Total	1,061	1,953	3,014	11,598	14,612
Total:					
Softwoods	706	148	854	6,806	7,660
Hardwoods	355	1,831	2,186	5,807	7,993
Total	1,061	1,979	3,040	12,613	15,653

Table 12--Net volume of growing stock on timberland outside National Forests by ownership class, forest type, and stand-size class in northwestern New Mexico, 1987

Ownership class	Forest type	Stand-size class				
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	All classes
----- Thousand cubic feet -----						
Other public:	Douglas-fir	11,362	--	--	--	11,362
	Ponderosa pine	8,916	--	--	--	8,916
	Spruce-subalpine fir	--	--	--	--	--
	White fir	16,884	--	--	--	16,884
	Spruce	--	11,290	--	--	11,290
	Aspen	--	--	--	--	--
	Cottonwood	--	--	--	--	--
	All types	37,162	11,290	--	--	48,452
Private:	Douglas-fir	90,334	21,357	--	757	112,448
	Ponderosa pine	337,527	16,995	251	1,558	356,331
	Spruce-subalpine fir	107,555	96,928	--	2,021	206,504
	White fir	112,806	--	--	1,345	114,151
	Spruce	24,828	7,248	--	--	32,076
	Aspen	41,541	20,375	--	--	61,916
	Cottonwood	4,316	--	--	--	4,316
	All types	718,907	162,903	251	5,681	887,742
Total:	Douglas-fir	101,696	21,357	--	757	123,810
	Ponderosa pine	346,443	16,995	251	1,558	365,247
	Spruce-subalpine fir	107,555	96,928	--	2,021	206,504
	White fir	129,690	--	--	1,345	131,035
	Spruce	24,828	18,538	--	--	43,366
	Aspen	41,541	20,375	--	--	61,916
	Cottonwood	4,316	--	--	--	4,316
	All types	756,069	174,193	251	5,681	936,194

Table 13--Net volume of sawtimber (International 4-inch rule) on timberland outside National Forests by ownership class, forest type, and stand-size class in northwestern New Mexico, 1987

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	
- - - - - Thousand board feet, International 4-inch rule - - - - -						
Other public:	Douglas-fir	36,675	--	--	--	36,675
	Ponderosa pine	36,248	--	--	--	36,248
	Spruce-subalpine fir	--	--	--	--	--
	White fir	52,963	--	--	--	52,963
	Spruce	--	27,139	--	--	27,139
	Aspen	--	--	--	--	--
	Cottonwood	--	--	--	--	--
	All types	125,886	27,139	--	--	153,025
Private:	Douglas-fir	334,434	22,146	--	3,657	360,237
	Ponderosa pine	1,579,814	38,567	977	8,793	1,628,151
	Spruce-subalpine fir	421,840	230,100	--	5,620	657,560
	White fir	480,125	--	--	6,161	486,286
	Spruce	114,305	21,973	--	--	136,278
	Aspen	177,567	24,937	--	--	202,504
	Cottonwood	20,288	--	--	--	20,288
	All types	3,128,373	337,723	977	24,231	3,491,304
Total:	Douglas-fir	371,109	22,146	--	3,657	396,912
	Ponderosa pine	1,616,062	38,567	977	8,793	1,664,399
	Spruce-subalpine fir	421,840	230,100	--	5,620	657,560
	White fir	533,088	--	--	6,161	539,249
	Spruce	114,305	49,112	--	--	163,417
	Aspen	177,567	24,937	--	--	202,504
	Cottonwood	20,288	--	--	--	20,288
	All types	3,254,259	364,862	977	24,231	3,644,329

Table 14--Net volume of sawtimber (Scribner rule) on timberland outside National Forests by ownership class, forest type, and stand-size class in northwestern New Mexico, 1987

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	
- - - - - Thousand board feet, Scribner rule - - - - -						
Other public:	Douglas-fir	28,013	--	--	--	28,013
	Ponderosa pine	31,218	--	--	--	31,218
	Spruce-subalpine fir	--	--	--	--	--
	White fir	43,978	--	--	--	43,978
	Spruce	--	21,741	--	--	21,741
	Aspen	--	--	--	--	--
	Cottonwood	--	--	--	--	--
	All types	103,209	21,741	--	--	124,950
Private:	Douglas-fir	263,753	17,381	--	2,813	283,947
	Ponderosa pine	1,366,754	33,155	765	7,742	1,408,416
	Spruce-subalpine fir	335,239	181,867	--	4,220	521,326
	White fir	399,847	--	--	5,240	405,087
	Spruce	94,583	18,629	--	--	113,212
	Aspen	147,464	20,446	--	--	167,910
	Cottonwood	18,057	--	--	--	18,057
	All types	2,625,697	271,478	765	20,015	2,917,955
Total:	Douglas-fir	291,766	17,381	--	2,813	311,960
	Ponderosa pine	1,397,972	33,155	765	7,742	1,439,634
	Spruce-subalpine fir	335,239	181,867	--	4,220	521,326
	White fir	443,825	--	--	5,240	449,065
	Spruce	94,583	40,370	--	--	134,953
	Aspen	147,464	20,446	--	--	167,910
	Cottonwood	18,057	--	--	--	18,057
	All types	2,728,906	293,219	765	20,015	3,042,905

Table 15--Net volume of growing stock on timberland outside National Forests by species and ownership class in northwestern New Mexico, 1987

Species	Ownership class		
	Other public	Private	Total
- - - - - Thousand cubic feet - - - - -			
Douglas-fir	15,685	130,512	146,197
Ponderosa pine	9,004	351,996	361,000
Whitebark pine	--	4,845	4,845
Limber pine	--	820	820
Subalpine fir	--	80,380	80,380
White fir	12,044	84,473	96,517
Engelmann spruce	7,009	130,731	137,740
Total softwoods	43,742	783,757	827,499
Aspen	4,710	99,669	104,379
Cottonwood	--	4,316	4,316
Total hardwoods	4,710	103,985	108,695
All species	48,452	887,742	936,194

Table 16--Net volume of sawtimber (International ¼-inch rule) on timberland outside National Forests by species and ownership class in northwestern New Mexico, 1987

Species	Ownership class		
	Other public	Private	Total
- Thousand board feet, International ¼-inch rule -			
Douglas-fir	51,704	534,611	586,315
Ponderosa pine	35,630	1,628,670	1,664,300
Whitebark pine	--	25,101	25,101
Limber pine	--	3,322	3,322
Subalpine fir	--	236,966	236,966
White fir	46,412	299,570	345,982
Engelmann spruce	19,279	509,021	528,300
Total softwoods	153,025	3,237,261	3,390,286
Aspen	--	233,755	233,755
Cottonwood	--	20,288	20,288
Total hardwoods	--	254,043	254,043
All species	153,025	3,491,304	3,644,329

Table 17--Net volume of sawtimber (Scribner rule) on timberland outside National Forests by species and ownership class in northwestern New Mexico, 1987

Species	Ownership class		
	Other public	Private	Total
- - - Thousand board feet, Scribner rule - - -			
Douglas-fir	39,804	417,504	457,308
Ponderosa pine	30,788	1,417,075	1,447,863
Whitebark pine	--	22,055	22,055
Limber pine	--	2,653	2,653
Subalpine fir	--	186,394	186,394
White fir	39,159	256,012	295,171
Engelmann spruce	15,199	407,943	423,142
Total softwoods	124,950	2,709,636	2,834,586
Aspen	--	190,262	190,262
Cottonwood	--	18,057	18,057
Total hardwoods	--	208,319	208,319
All species	124,950	2,917,955	3,042,905

Table 18--Net volume of growing stock on timberland outside National Forests by species and diameter class in northwestern New Mexico, 1987

Species	Diameter class (inches at breast height)														All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		
	Thousand cubic feet														
Douglas-fir	8,379	15,829	19,968	18,161	19,667	20,598	11,685	12,228	6,618	3,167	9,528	--	369	146,197	
Ponderosa pine	15,537	26,274	30,476	29,226	36,592	39,896	35,619	41,966	31,398	24,775	20,246	13,183	15,812	361,000	
Whitebark pine	--	--	--	820	1,154	--	--	1,009	2,682	--	--	--	--	4,845	
Lumber pine	--	--	--	--	--	--	--	--	--	--	--	--	--	820	
Subalpine fir	7,544	23,353	8,483	23,189	5,690	6,040	--	4,925	1,156	--	--	--	--	80,380	
White fir	4,837	8,057	14,978	16,440	13,449	5,426	15,639	6,499	2,214	862	--	3,860	4,256	96,517	
Engelmann spruce	9,521	19,883	18,245	27,494	24,794	5,844	14,888	1,803	5,619	4,325	--	2,001	3,322	137,739	
Total softwoods	45,818	93,396	92,150	115,330	101,346	77,804	77,831	68,430	49,687	33,129	29,774	19,044	23,759	827,498	
Aspen	24,517	20,140	17,554	2,748	15,250	11,286	7,256	5,628	--	--	--	--	--	104,379	
Cottonwood	--	--	--	--	--	--	--	2,919	--	--	--	1,398	--	4,317	
Total hardwoods	24,517	20,140	17,554	2,748	15,250	11,286	7,256	8,547	--	--	--	1,398	--	108,696	
All species	70,335	113,536	109,704	118,078	116,596	89,090	85,087	76,977	49,687	33,129	29,774	20,442	23,759	936,194	

Table 19--Net volume of sawtimber (International 4-inch rule) on timberland outside National Forests by species and diameter class in northwestern New Mexico, 1987

Species	Diameter class (inches at breast height)														All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+				
	Thousand board feet, International 4-inch rule														
Douglas-fir	66,142	75,484	93,934	106,778	63,220	67,859	37,488	18,139	55,121	--	2,151	586,316			
Ponderosa pine	99,503	127,033	179,968	209,831	196,263	237,160	180,399	143,726	118,392	77,594	94,431	1,664,300			
Whitebark pine	--	--	5,552	--	--	5,225	14,324	--	--	--	--	25,101			
Lumber pine	--	3,322	--	--	--	--	--	--	--	--	--	3,322			
Subalpine fir	32,354	113,190	29,057	31,133	--	25,272	5,960	--	--	--	--	236,966			
White fir	46,261	72,919	61,519	24,735	68,552	27,386	9,036	3,394	--	15,139	17,041	345,982			
Engelmann spruce	69,862	134,169	127,629	30,343	77,084	9,312	29,020	22,503	--	10,600	17,777	528,299			
Total softwoods	314,122	526,117	497,659	402,820	405,119	372,214	276,227	187,762	173,513	103,333	131,400	3,390,286			
Aspen	XXXXX	14,901	84,733	63,391	40,340	30,390	--	--	--	--	--	233,755			
Cottonwood	XXXXX	--	--	--	--	13,890	--	--	--	6,398	--	20,288			
Total hardwoods	XXXXX	14,901	84,733	63,391	40,340	44,280	--	--	--	6,398	--	254,043			
All species	314,122	541,018	582,392	466,211	445,459	416,494	276,227	187,762	173,513	109,731	131,400	3,644,329			

Table 20--Net volume of sawtimber (Scribner rule) on timberland outside National Forests by species and diameter class in northwestern New Mexico, 1987

Species	Diameter class (inches at breast height)														All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+				
	----- Thousand board feet, Scribner rule -----														
Douglas-fir	44,454	54,942	71,968	84,685	51,165	55,627	31,075	15,141	46,419	--	--	1,832	457,308		
Ponderosa pine	77,346	103,099	152,513	182,687	174,203	211,073	160,555	127,916	105,369	69,058	84,044	1,447,863			
Whitebark pine	--	--	4,672	--	--	4,634	12,749	--	--	--	--	22,055			
Limber pine	--	2,653	--	--	--	--	--	--	--	--	--	2,653			
Subalpine fir	25,126	86,590	23,061	25,412	--	21,172	5,033	--	--	--	--	186,394			
White fir	38,830	58,599	51,639	21,287	60,739	24,373	8,042	3,021	--	13,474	15,167	295,171			
Engelmann spruce	54,804	102,346	101,631	24,661	63,860	7,785	24,462	19,136	--	9,097	15,361	423,143			
Total softwoods	240,560	408,229	405,484	338,732	349,967	324,664	241,916	165,214	151,788	91,629	116,404	2,834,587			
Aspen	XXXXX	11,571	67,252	52,131	33,580	25,728	--	--	--	--	--	190,262			
Cottonwood	XXXXX	--	--	--	--	12,362	--	--	--	5,694	--	18,056			
Total hardwoods	XXXXX	11,571	67,252	52,131	33,580	38,090	--	--	--	5,694	--	208,318			
All species	240,560	419,800	472,736	390,863	383,547	362,754	241,916	165,214	151,788	97,323	116,404	3,042,905			

Table 21--Net volume of timber on timberland outside National Forests by class of timber, and softwoods and hardwoods in northwestern New Mexico, 1987

Class of timber	Softwoods	Hardwoods	All classes
- - - - - Thousand cubic feet - - - - -			
Sawtimber trees:			
Sawlog portion	656,350	44,387	700,737
Upper-stem portion	31,935	2,098	34,033
Total	688,285	46,485	734,770
Poletimber trees	139,214	62,210	201,424
All growing-stock trees	827,499	108,695	936,194
Sound cull trees	3,810	845	4,655
Rotten cull trees	3,997	5,662	9,659
Salvable dead trees	49,616	19,309	68,925
All timber	884,922	134,511	1,019,433

Table 22--Net volume of growing stock on timberland outside National Forests by forest type and species in northwestern New Mexico, 1987

Forest type	Species											
	Douglas- fir	Ponderosa pine	Whitebark pine	Limber pine	Subalpine fir	White fir	Engelmann spruce	Total softwoods	Aspen	Cotton- wood	Total hardwoods	All species
	----- Thousand cubic feet -----											
Douglas-fir	76,818	18,448	--	820	1,602	6,809	5,738	110,235	13,575	--	13,575	123,810
Ponderosa pine	18,065	332,673	--	--	--	171	--	350,909	14,338	--	14,338	365,247
Spruce-subalpine fir	7,194	--	4,845	--	70,295	--	95,958	178,292	28,212	--	28,212	206,504
White fir	39,720	9,879	--	--	--	70,698	3,166	123,463	7,571	--	7,571	131,034
Spruce	2,266	--	--	--	1,057	2,047	32,878	38,248	5,118	--	5,118	43,366
Aspen	2,133	--	--	--	7,426	16,791	1	26,351	35,565	--	35,565	61,916
Cottonwood	--	--	--	--	--	--	--	--	4,317	--	4,317	4,317
All types	146,196	361,000	4,845	820	80,380	96,516	137,741	827,498	104,379	4,317	108,696	936,194

Table 23--Net volume of sawtimber (International 4-inch rule) on timberland outside National Forests by forest type and species in northwestern New Mexico, 1987

Forest type	Species											
	Douglas- fir	Ponderosa pine	Whitebark pine	Limber pine	Subalpine fir	White fir	Engelmann spruce	Total softwoods	Aspen	Cotton- wood	Total hardwoods	All species
	----- Thousand board feet, International 4-inch rule -----											
Douglas-fir	279,068	62,686	--	3,322	4,076	27,009	20,751	396,912	--	--	--	396,912
Ponderosa pine	63,607	1,553,413	--	--	--	507	--	1,617,527	46,871	--	46,871	1,664,398
Spruce-subalpine fir	26,975	--	25,101	--	195,023	--	346,804	593,903	63,656	--	63,656	657,559
White fir	194,177	48,201	--	--	--	270,583	16,380	529,341	9,910	--	9,910	539,251
Spruce	10,790	--	--	--	--	8,263	144,364	163,417	--	--	--	163,417
Aspen	11,699	--	--	--	37,867	39,620	--	89,186	113,318	--	113,318	202,504
Cottonwood	--	--	--	--	--	--	--	--	20,288	--	20,288	20,288
All types	586,316	1,664,300	25,101	3,322	236,966	345,982	528,299	3,390,286	233,755	20,288	254,043	3,644,329

Table 24--Net volume of sawtimber (Scribner rule) on timberland outside National Forests by forest type and species in northwestern New Mexico, 1987

Forest type	Species										All species	
	Douglas-fir	Ponderosa pine	Whitebark pine	Limber pine	Subalpine fir	White fir	Engelmann spruce	Total softwoods	Aspen	Cottonwood		Total hardwoods
	-- -- -- -- -- Thousand board feet, Scribner rule -- -- -- -- --											
Douglas-fir	212,307	54,556	--	2,653	3,011	23,128	16,305	311,960	--	--	--	311,960
Ponderosa pine	50,257	1,351,237	--	--	--	423	--	1,401,917	37,717	--	37,717	1,439,634
Spruce-subalpine fir	20,562	--	22,055	--	152,536	--	274,826	469,979	51,347	--	51,347	521,326
White fir	155,823	42,070	--	--	--	230,149	13,233	441,275	7,790	--	7,790	449,065
Spruce	8,820	--	--	--	--	7,354	118,779	134,953	--	--	--	134,953
Aspen	9,539	--	--	--	30,847	34,116	--	74,502	93,408	--	93,408	167,910
Cottonwood	--	--	--	--	--	--	--	--	--	18,057	18,057	18,057
All types	457,308	1,447,863	22,055	2,653	186,394	295,170	423,143	2,834,586	190,262	18,057	208,319	3,042,905

Table 25--Net annual growth of growing stock on timberland outside National Forests by species and ownership class in northwestern New Mexico, 1987

Species	Ownership class		
	Other public	Private	Total
- - - - - Thousand cubic feet - - - - -			
Douglas-fir	748	3,125	3,873
Ponderosa pine	180	8,089	8,269
Whitebark pine	--	52	52
Limber pine	--	9	9
Subalpine fir	--	1,330	1,330
White fir	168	2,321	2,489
Engelmann spruce	170	3,015	3,185
Total softwoods	1,266	17,941	19,207
Aspen	90	4,037	4,127
Cottonwood	--	153	153
Total hardwoods	90	4,190	4,280
All species	1,356	22,131	23,487

Table 26--Net annual growth of sawtimber (International 4-inch rule) on timberland outside National Forests by species and ownership class in northwestern New Mexico, 1987

Species	Ownership class		
	Other public	Private	Total
- Thousand board feet, International 4-inch rule -			
Douglas-fir	1,079	10,935	12,014
Ponderosa pine	1,266	40,609	41,875
Whitebark pine	--	304	304
Limber pine	--	54	54
Subalpine fir	--	3,651	3,651
White fir	2,221	25,920	28,141
Engelmann spruce	507	10,597	11,104
Total softwoods	5,073	92,070	97,143
Aspen	--	3,231	3,231
Cottonwood	--	665	665
Total hardwoods	--	3,896	3,896
All species	5,073	95,966	101,039

Table 27--Net annual growth of sawtimber (Scribner rule) on timberland outside National Forests by species and ownership class in northwestern New Mexico, 1987

Species	Ownership class			Total
	Other public	Private		
	- - - Thousand board feet, Scribner rule - -			
Douglas-fir	924	8,484		9,408
Ponderosa pine	955	33,846		34,801
Whitebark pine	--	273		273
Limber pine	--	46		46
Subalpine fir	--	3,238		3,238
White fir	1,863	21,909		23,772
Engelmann spruce	422	9,087		9,509
Total softwoods	4,164	76,883		81,047
Aspen	--	2,832		2,832
Cottonwood	--	595		595
Total hardwoods	--	3,427		3,427
All species	4,164	80,310		84,474

Table 28--Net annual growth of growing stock on timberland outside National Forests by species and diameter class in northwestern New Mexico, 1987

Species	Diameter class (inches at breast height)														All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		
	----- Thousand cubic feet -----														
Douglas-fir	1,460	640	599	474	349	360	-89 ⁽¹⁾	177	91	48	-237	--	1	3,873	
Ponderosa pine	2,054	1,002	1,008	732	685	637	613	526	351	296	171	101	93	8,269	
Whitebark pine	--	--	--	--	18	--	--	9	25	--	--	--	--	52	
Limber pine	--	--	--	9	--	--	--	--	--	--	--	--	--	9	
Subalpine fir	269	409	148	223	135	64	--	77	5	--	--	--	--	1,330	
White fir	425	257	387	427	424	98	304	72	11	4	--	36	44	2,489	
Engelmann spruce	529	586	318	832	441	62	242	34	74	36	--	13	19	3,186	
Total softwoods	4,737	2,894	2,460	2,697	2,052	1,221	1,070	895	557	384	-66	150	157	19,208	
Aspen	2,613	571	374	29	260	134	105	40	--	--	--	--	--	4,126	
Cottonwood	--	--	--	--	--	--	--	119	--	--	--	34	--	153	
Total hardwoods	2,613	571	374	29	260	134	105	159	--	--	--	34	--	4,279	
All species	7,350	3,465	2,834	2,726	2,312	1,355	1,175	1,054	557	384	-66	184	157	23,487	

¹Net annual growth will be negative when annual mortality exceeds gross annual growth.

Table 29--Net annual growth of sawtimber (International 4-inch rule) on timberland outside National Forests by species and diameter class in northwestern New Mexico, 1987

Species	Diameter class (inches at breast height)														All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+				
	----- Thousand board feet, International 4-inch rule -----														
Douglas-fir	4,883	2,754	2,080	2,160	-411 ⁽¹⁾	1,070	549	291	-1,366	--	--	5	12,015		
Ponderosa pine	16,244	4,374	4,191	3,931	3,775	3,224	2,122	1,786	1,036	618	573	41,874			
Whitebark pine	--	--	104	--	--	50	149	--	--	--	--	303			
Limber pine	--	54	--	--	--	--	--	--	--	--	--	54			
Subalpine fir	614	1,551	732	331	--	396	27	--	--	--	--	3,651			
White fir	21,794	2,147	1,995	423	1,151	254	38	16	--	144	179	28,141			
Engelmann spruce	1,437	4,791	2,388	322	1,234	174	386	195	--	73	105	11,105			
Total softwoods	44,972	15,671	11,490	7,167	5,749	5,168	3,271	2,288	-330	835	862	97,143			
Aspen	XXXXX	186	1,590	728	534	193	--	--	--	--	--	3,231			
Cottonwood	XXXXX	--	--	--	--	506	--	--	--	159	--	665			
Total hardwoods	XXXXX	186	1,590	728	534	699	--	--	--	159	--	3,896			
All species	44,972	15,857	13,080	7,895	6,283	5,867	3,271	2,288	-330	994	862	101,039			

¹Net annual growth will be negative when annual mortality exceeds gross annual growth.

Table 30--Net annual growth of sawtimber (Scribner rule) on timberland outside National Forests by species and diameter class in northwestern New Mexico, 1987

Species	Diameter class (inches at breast height)													All classes
	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 22.9	23.0- 24.9	25.0- 26.9	27.0- 28.9	29.0+			
	- - - - - Thousand board feet, Scribner rule - - - - -													
Douglas-fir	3,482	2,196	1,718	1,818	-304 ⁽¹⁾	915	471	250	-1,143	--	4	9,407		
Ponderosa pine	11,664	3,875	3,826	3,646	3,460	2,869	1,889	1,590	922	550	510	34,801		
Whitebark pine	--	--	93	--	--	47	133	--	--	--	--	273		
Limber pine	--	46	--	--	--	--	--	--	--	--	--	46		
Subalpine fir	572	1,391	622	287	--	344	23	--	--	--	--	3,239		
White fir	18,001	1,903	1,823	396	1,087	226	34	15	--	128	159	23,772		
Engelmann spruce	1,344	3,973	2,034	278	1,068	151	336	169	--	64	91	9,508		
Total softwoods	35,063	13,384	10,116	6,425	5,311	4,552	2,886	2,024	-221	742	764	81,046		
Aspen	XXXXX	160	1,381	645	475	171	--	--	--	--	--	2,832		
Cottonwood	XXXXX	--	--	--	--	454	--	--	--	142	--	596		
Total hardwoods	XXXXX	160	1,381	645	475	625	--	--	--	142	--	3,428		
All species	35,063	13,544	11,497	7,070	5,786	5,177	2,886	2,024	-221	884	764	84,474		

¹Net annual growth will be negative when annual mortality exceeds gross annual growth.

Table 31--Annual mortality of growing stock on timberland outside National Forests by species and ownership class in northwestern New Mexico, 1987

Species	Ownership class		
	Other public	Private	Total
- - - - - Thousand cubic feet - - - - -			
Douglas-fir	--	513	513
Ponderosa pine	--	70	70
Whitebark pine	--	--	--
Limber pine	--	--	--
Subalpine fir	--	694	694
White fir	--	--	--
Engelmann spruce	--	--	--
Total softwoods	--	1,277	1,277
Aspen	--	--	--
Cottonwood	--	--	--
Total hardwoods	--	--	--
All species	--	1,277	1,277

Table 32--Annual mortality of sawtimber (International 4-inch rule) on timberland outside National Forests by species and ownership class in northwestern New Mexico, 1986

Species	Ownership class		
	Other public	Private	Total
- Thousand board feet, International 4-inch rule -			
Douglas-fir	--	2,895	2,895
Ponderosa pine	--	269	269
Whitebark pine	--	--	--
Limber pine	--	--	--
Subalpine fir	--	1,203	1,203
White fir	--	--	--
Engelman spruce	--	--	--
Total softwoods	--	4,367	4,367
Aspen	--	--	--
Cottonwood	--	--	--
Total hardwoods	--	--	--
All species	--	4,367	4,367

Table 33--Annual mortality of sawtimber (Scribner rule) on timberland outside National Forests by species and ownership class in northwestern New Mexico, 1986

Species	Ownership class		
	Other public	Private	Total
- - - - Thousand board feet, Scribner rule - - - -			
Douglas-fir	--	2,403	2,403
Ponderosa pine	--	204	204
Whitebark pine	--	--	--
Limber pine	--	--	--
Subalpine fir	--	898	898
White fir	--	--	--
Engelman spruce	--	--	--
Total softwoods	--	3,505	3,505
Aspen	--	--	--
Cottonwood	--	--	--
Total hardwoods	--	--	--
All species	--	3,505	3,505

Table 34--Annual mortality of growing stock on timberland outside National Forests by species and diameter class in northwestern New Mexico, 1986

Species	Diameter class (inches at breast height)														All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		
	- - - - - Thousand cubic feet - - - - -														
Douglas-fir	--	--	--	--	--	--	220	--	--	--	--	293	--	--	513
Ponderosa pine	--	--	70	--	--	--	--	--	--	--	--	--	--	--	70
Whitebark pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Limber pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Subalpine fir	--	437	--	257	--	--	--	--	--	--	--	--	--	--	694
White fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Engelmann spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total softwoods	--	437	70	257	--	--	220	--	--	--	--	293	--	--	1,277
Aspen	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
All species	--	437	70	257	--	--	220	--	--	--	--	293	--	--	1,277

Table 35--Annual mortality of sawtimber (International 1/4-inch rule) on timberland outside National Forests by species and diameter class in northwestern New Mexico, 1986

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	--- Thousand board feet, International 1/4-inch rule ---											
Douglas-fir	--	--	--	--	1,201	--	--	--	1,694	--	--	2,895
Ponderosa pine	269	--	--	--	--	--	--	--	--	--	--	269
Whitebark pine	--	--	--	--	--	--	--	--	--	--	--	--
Limber pine	--	--	--	--	--	--	--	--	--	--	--	--
Subalpine fir	--	1,203	--	--	--	--	--	--	--	--	--	1,203
White fir	--	--	--	--	--	--	--	--	--	--	--	--
Engelmann spruce	--	--	--	--	--	--	--	--	--	--	--	--
Total softwoods	269	1,203	--	--	1,201	--	--	--	1,694	--	--	4,367
Aspen	XXXXX	--	--	--	--	--	--	--	--	--	--	--
Cottonwood	XXXXX	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	XXXXX	--	--	--	--	--	--	--	--	--	--	--
All species	269	1,203	--	--	1,201	--	--	--	1,694	--	--	4,367

Table 36--Annual mortality of sawtimber (Scribner rule) on timberland outside National Forests by species and diameter class in northwestern New Mexico, 1986

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	----- Thousand board feet, Scribner rule -----											
Douglas-fir	--	--	--	--	977	--	--	--	1,426	--	--	2,403
Ponderosa pine	204	--	--	--	--	--	--	--	--	--	--	204
Whitebark pine	--	--	--	--	--	--	--	--	--	--	--	--
Limber pine	--	--	--	--	--	--	--	--	--	--	--	--
Subalpine fir	--	898	--	--	--	--	--	--	--	--	--	898
White fir	--	--	--	--	--	--	--	--	--	--	--	--
Engelmann spruce	--	--	--	--	--	--	--	--	--	--	--	--
Total softwoods	204	898	--	--	977	--	--	--	1,426	--	--	3,505
Aspen	XXXX	--	--	--	--	--	--	--	--	--	--	--
Cottonwood	XXXX	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	XXXX	--	--	--	--	--	--	--	--	--	--	--
All species	204	898	--	--	977	--	--	--	1,426	--	--	3,505

Table 37--Annual mortality of growing stock on timberland outside National Forests by species and cause of death in northwestern New Mexico, 1986

Species	Cause of death							Total
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	
	--	--	--	--	Thousand cubic feet	--	--	--
Douglas-fir	--	--	--	--	--	--	--	513
Ponderosa pine	--	--	--	--	--	--	--	70
Whitebark pine	--	--	--	--	--	--	--	--
Limber pine	--	--	--	--	--	--	--	--
Subalpine fir	--	308	--	--	--	--	--	386
White fir	--	--	--	--	--	--	--	--
Engelmann spruce	--	--	--	--	--	--	--	--
Total softwoods	--	308	--	--	--	--	--	969
Aspen	--	--	--	--	--	--	--	--
Cottonwood	--	--	--	--	--	--	--	--
Total hardwoods	--	--	--	--	--	--	--	--
All species	--	308	--	--	--	--	--	969
								1,277

¹Because many destructive agents often attack trees in concert or in succession, it is often difficult to identify the actual causal agent. When the primary cause of death cannot be precisely determined, it is listed as unknown.

Table 38--Annual mortality of sawtimber (International ¼-inch rule) on timberland outside National Forests by species and cause of death in northwestern New Mexico, 1986

Species	Cause of death								Total
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	
----- Thousand board feet, International ¼-inch rule -----									
Douglas-fir	--	--	--	--	--	--	--	2,895	2,895
Ponderosa pine	--	--	--	--	--	--	--	269	269
Whitebark pine	--	--	--	--	--	--	--	--	--
Limber pine	--	--	--	--	--	--	--	--	--
Subalpine fir	--	--	--	--	--	--	--	1,203	1,203
White fir	--	--	--	--	--	--	--	--	--
Engelmann spruce	--	--	--	--	--	--	--	--	--
Total softwoods	--	--	--	--	--	--	--	4,367	4,367
Aspen	--	--	--	--	--	--	--	--	--
Cottonwood	--	--	--	--	--	--	--	--	--
Total hardwoods	--	--	--	--	--	--	--	--	--
All species	--	--	--	--	--	--	--	4,367	4,367

Table 39--Annual mortality of sawtimber (Scribner rule) on timberland outside National Forests by species and cause of death in northwestern New Mexico, 1986

Species	Cause of death								Total
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	
----- Thousand board feet, Scribner rule -----									
Douglas-fir	--	--	--	--	--	--	--	2,403	2,403
Ponderosa pine	--	--	--	--	--	--	--	204	204
Whitebark pine	--	--	--	--	--	--	--	--	--
Limber pine	--	--	--	--	--	--	--	--	--
Subalpine fir	--	--	--	--	--	--	--	898	898
White fir	--	--	--	--	--	--	--	--	--
Engelmann spruce	--	--	--	--	--	--	--	--	--
Total softwoods	--	--	--	--	--	--	--	3,505	3,505
Aspen	--	--	--	--	--	--	--	--	--
Cottonwood	--	--	--	--	--	--	--	--	--
Total hardwoods	--	--	--	--	--	--	--	--	--
All species	--	--	--	--	--	--	--	3,505	3,505

Woodland Tables

Table 40--Area of woodland outside National Forests by forest type and ownership class in northwestern New Mexico, 1987

Forest type	Ownership class		
	Other public	Private	Total
- - - - - Acres - - - - -			
Pinyon-juniper	912,168	1,899,778	2,811,946
Juniper	77,363	147,180	224,543
Total woodland softwoods	989,531	2,046,958	3,036,489
Oak	10,957	105,251	116,208
Total woodland hardwoods	10,957	105,251	116,208
All types	1,000,488	2,152,209	3,152,697

Table 41--Area of woodland outside National Forests by ownership class, forest type, and productivity class in northwestern New Mexico, 1987

Ownership class	Forest type	Productivity class		
		High	Low	All classes
- - - - - Acres - - - - -				
Other public:	Pinyon-juniper	641,448	270,720	912,168
	Juniper	70,592	6,771	77,363
	Oak	10,957	--	10,957
	Total	722,997	277,491	1,000,488
Private:	Pinyon-juniper	1,494,602	405,176	1,899,778
	Juniper	87,111	60,070	147,181
	Oak	105,250	--	105,250
	Total	1,686,963	465,246	2,152,209
Total:	Pinyon-juniper	2,136,050	675,896	2,811,946
	Juniper	157,703	66,841	224,544
	Oak	116,207	--	116,207
	Total	2,409,960	742,737	3,152,697

Table 42--Area of woodland outside National Forests by ownership class, forest type, and volume class in northwestern New Mexico, 1987

Ownership class	Forest type	Volume class				Acres	All classes
		0 - 500 cu ft/acre	500-1,000 cu ft/acre	1,000+ cu ft/acre			
Other public:	Pinyon-juniper	610,469	235,157	66,543	912,169		
	Juniper	50,280	20,312	6,771	77,363		
	Oak	10,956	--	--	10,956		
	Total	671,705	255,469	73,314	1,000,488		
Private:	Pinyon-juniper	1,073,532	610,021	216,226	1,899,779		
	Juniper	135,097	12,083	--	147,180		
	Oak	47,851	27,932	29,467	105,250		
	Total	1,256,480	650,036	245,693	2,152,209		
Total:	Pinyon-juniper	1,684,001	845,178	282,769	2,811,948		
	Juniper	185,377	32,395	6,771	224,543		
	Oak	58,807	27,932	29,467	116,206		
	Total	1,928,185	905,505	319,007	3,152,697		

Table 43--Number of trees on woodland outside National Forests by ownership class, species, and diameter class in northwestern New Mexico, 1987

Ownership class and species	Two-inch diameter at root collar class																All classes
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		
	----- Thousand trees -----																
Other public:																	
Pinyon	33,100	22,947	16,785	11,128	6,165	3,036	1,591	882	264	221	--	68	--	32	--	96,219	
Juniper	11,199	7,600	10,124	8,649	8,036	8,565	7,232	6,070	3,836	3,388	1,617	1,224	544	229	154	78,467	
Oak	822	8,545	675	203	100	33	--	--	--	--	--	--	--	--	--	10,378	
Total	45,121	39,092	27,584	19,980	14,301	11,634	8,823	6,952	4,100	3,609	1,617	1,292	544	261	154	185,064	
Private:																	
Pinyon	78,692	55,924	48,195	31,025	17,406	10,755	5,389	3,155	1,906	896	121	58	--	112	--	253,634	
Juniper	32,706	16,012	18,741	16,488	15,652	12,126	11,671	9,397	6,683	4,125	2,824	2,538	1,253	1,053	988	152,257	
Oak	50,735	43,092	14,729	2,962	354	--	--	30	--	--	--	--	--	--	--	111,902	
Total	162,133	115,028	81,665	50,475	33,412	22,881	17,060	12,582	8,589	5,021	2,945	2,596	1,253	1,165	988	517,793	
Total:																	
Pinyon	111,792	78,871	64,980	42,153	23,571	13,791	6,980	4,037	2,170	1,117	121	126	--	144	--	349,853	
Juniper	43,905	23,612	28,865	25,137	23,688	20,691	18,903	15,467	10,519	7,513	4,441	3,762	1,797	1,282	1,142	230,724	
Oak	51,557	51,637	15,404	3,165	454	33	--	30	--	--	--	--	--	--	--	122,280	
Total	207,254	154,120	109,249	70,455	47,713	34,515	25,883	19,534	12,689	8,630	4,562	3,888	1,797	1,426	1,142	702,857	

Table 44--Net volume on woodland outside National Forests by species and ownership class in northwestern New Mexico, 1987

Species	Ownership class			Total
	Other public	Private		
	- - - - - Thousand cubic feet - - - - -			
Douglas-fir	--	2,764		2,764
Ponderosa pine	6,530	35,243		41,773
White fir	--	449		449
Cottonwood	--	1,357		1,357
Pinyon/juniper	406,126	962,841		1,368,967
Woodland hardwoods	3,004	53,425		56,429
All species	415,660	1,056,079		1,471,739

Table 45--Net volume of woodland species on woodland outside National Forests by ownership class, species, and diameter class in northwestern New Mexico, 1987

Ownership class and species	Two-inch diameter at root collar class														All classes		
	Thousand cubic feet																
	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+			
Other public:																	
Pinyon	9,381	19,165	28,667	28,450	21,588	17,685	14,436	6,862	4,699	--	2,808	--	1,302	--	155,043		
Juniper	1,347	7,186	12,519	18,868	31,281	32,875	37,024	29,295	30,244	16,029	15,909	9,471	5,416	3,619	251,083		
Oak	1,550	637	331	369	117	--	--	--	--	--	--	--	--	--	3,004		
Total	12,278	26,988	41,517	47,687	52,986	50,560	51,460	36,157	34,943	16,029	18,717	9,471	6,718	3,619	409,130		
Private:																	
Pinyon	22,811	58,442	79,930	79,275	81,457	65,976	50,231	41,166	28,023	3,372	1,611	--	7,930	--	520,224		
Juniper	3,328	12,697	23,011	37,563	41,051	53,839	50,948	48,472	36,417	28,262	35,275	20,368	24,087	27,298	442,616		
Oak	19,387	23,350	8,986	1,523	--	--	179	--	--	--	--	--	--	--	53,425		
Total	45,526	94,489	111,927	118,361	122,508	119,815	101,358	89,638	64,440	31,634	36,886	20,368	32,017	27,298	1,016,265		
Total:																	
Pinyon	32,192	77,607	108,597	107,725	103,045	83,661	64,667	48,028	32,722	3,372	4,419	--	9,232	--	675,267		
Juniper	4,675	19,883	35,530	56,431	72,332	86,714	87,972	77,767	66,661	44,291	51,184	29,839	29,503	30,917	693,699		
Oak	20,937	23,987	9,317	1,892	117	--	179	--	--	--	--	--	--	--	56,429		
Total	57,804	121,477	153,444	166,048	175,494	170,375	152,818	125,795	99,383	47,663	55,603	29,839	38,735	30,917	1,425,395		

Table 46--Net volume of woodland species on woodland outside National Forests by ownership class, forest type, and productivity class in northwestern New Mexico, 1987

Ownership class	Forest type	Productivity class		
		High	Low	All classes
- - - - Thousand cubic feet - - - - -				
Other public:	Pinyon-juniper	288,333	90,681	379,014
	Juniper	26,939	1,709	28,648
	Oak	1,468	--	1,468
	Total	316,740	92,390	409,130
Private:	Pinyon-juniper	761,665	160,288	921,953
	Juniper	14,019	17,398	31,417
	Oak	62,895	--	62,895
	Total	838,579	177,686	1,016,265
Total:	Pinyon-juniper	1,049,998	250,969	1,300,967
	Juniper	40,958	19,107	60,065
	Oak	64,363	--	64,363
	Total	1,155,319	270,076	1,425,395

Table 47--Net volume of woodland species on woodland outside National Forests by ownership class, forest type, and volume class in northwestern New Mexico, 1987

Ownership class	Forest type	Volume class			
		0 - 500 cu ft/acre	500-1,000 cu ft/acre	1,000+ cu ft/acre	All classes
- - - - - Thousand cubic feet - - - - -					
Other public:	Pinyon-juniper	153,957	150,966	74,091	379,014
	Juniper	9,459	11,289	7,900	28,648
	Oak	1,468	--	--	1,468
	Total	164,884	162,255	81,991	409,130
Private:	Pinyon-juniper	277,855	384,152	259,946	921,953
	Juniper	24,087	7,330	--	31,417
	Oak	9,570	12,644	40,681	62,895
	Total	311,512	404,126	300,627	1,016,265
Total:	Pinyon-juniper	431,812	535,118	334,037	1,300,967
	Juniper	33,546	18,619	7,900	60,065
	Oak	11,038	12,644	40,681	64,363
	Total	476,396	566,381	382,618	1,425,395

Table 48--Net dead volume of woodland species on woodland outside National Forests by ownership class, species, and diameter class in northwestern New Mexico, 1987

Ownership class and species	Two-inch diameter at root collar class																All classes
	Thousand cubic feet																
	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+			
Other public:																	
Pinyon	379	1,979	4,529	5,019	4,768	3,317	3,319	290	1,110	3,188	562	--	130	--		28,590	
Juniper	48	246	1,619	2,860	6,620	7,682	8,415	6,166	6,216	4,165	2,394	1,839	1,924	661		50,855	
Oak	172	308	26	102	98	--	--	--	--	--	--	--	144	--		850	
Total	599	2,533	6,174	7,981	11,486	10,999	11,734	6,456	7,326	7,353	2,956	1,839	2,198	661		80,295	
Private:																	
Pinyon	913	5,210	10,226	12,832	11,818	8,500	7,719	6,512	4,955	1,460	2,493	--	219	--		72,857	
Juniper	99	803	2,144	5,554	7,673	13,476	12,997	11,190	11,946	7,708	9,418	5,095	4,089	5,842		98,034	
Oak	1,472	1,061	477	--	--	--	9	--	--	--	--	--	--	--		3,019	
Total	2,484	7,074	12,847	18,386	19,491	21,976	20,725	17,702	16,901	9,168	11,911	5,095	4,308	5,842		173,910	
Total:																	
Pinyon	1,292	7,189	14,755	17,851	16,586	11,817	11,038	6,802	6,065	4,648	3,055	--	349	--		101,447	
Juniper	147	1,049	3,763	8,414	14,293	21,158	21,412	17,356	18,162	11,873	11,812	6,934	6,013	6,503		148,589	
Oak	1,644	1,369	503	102	98	--	9	--	--	--	--	--	144	--		3,869	
Total	3,083	9,607	19,021	26,367	30,977	32,975	32,459	24,158	24,227	16,521	14,867	6,934	6,506	6,503		254,205	

Table 49--Net dead volume of woodland species on woodland outside National Forests by ownership class, forest type, and productivity class in northwestern New Mexico, 1987

Ownership class	Forest type	Productivity class		
		High	Low	All classes
- - - - Thousand cubic feet - - - -				
Other public:	Pinyon-juniper	56,411	18,509	74,920
	Juniper	4,941	399	5,340
	Oak	35	--	35
	Total	61,387	18,908	80,295
Private:	Pinyon-juniper	126,840	40,627	167,467
	Juniper	1,031	1,891	2,922
	Oak	3,521	--	3,521
	Total	131,392	42,518	173,910
Total:	Pinyon-juniper	183,251	59,136	242,387
	Juniper	5,972	2,290	8,262
	Oak	3,556	--	3,556
	Total	192,779	61,426	254,205

Table 50--Net dead volume of woodland species on woodland outside National Forests by ownership class, forest type, and volume class in northwestern New Mexico, 1987

Ownership class	Forest type	Volume class			
		0 - 500 cu ft/acre	500-1,000 cu ft/acre	1,000+ cu ft/acre	All classes
- - - - - Thousand cubic feet - - - - -					
Other public:	Pinyon-juniper	30,549	24,417	19,954	74,920
	Juniper	2,296	1,963	1,081	5,340
	Oak	35	--	--	35
	Total	32,880	26,380	21,035	80,295
Private:	Pinyon-juniper	48,818	72,494	46,154	167,466
	Juniper	1,291	1,632	--	2,923
	Oak	126	828	2,567	3,521
	Total	50,235	74,954	48,721	173,910
Total:	Pinyon-juniper	79,367	96,911	66,108	242,386
	Juniper	3,587	3,595	1,081	8,263
	Oak	161	828	2,567	3,556
	Total	83,115	101,334	69,756	254,205

Table 51--Net annual growth on woodland outside National Forests by species and ownership class in northwestern New Mexico, 1986

Species	Ownership class		
	Other public	Private	Total
- - - - Thousand cubic feet - - - -			
Douglas-fir	--	43	43
Ponderosa pine	181	508	689
White fir	--	56	56
Cottonwood	--	114	114
Pinyon/juniper	5,264	13,196	18,460
Woodland hardwoods	143	2,209	2,352
All species	5,588	16,126	21,714

Table 52--Net annual growth of woodland species on woodland outcrops by ownership class, species, and diameter class in northwestern New Mexico, 1987

Ownership class and species	Two-inch diameter class												All classes	
	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9		27.0-28.9
- - - - - Net - - - - -														
Other public:														
Pinyon	463	454	566	432	273	134	137	--	8	--	6	--	--	2,568
Juniper	107	274	278	296	405	325	373	143	120	70	32	12	--	2,696
Oak	98	18	17	9	1	--	--	--	--	--	--	--	--	143
Total	668	746	861	737	679	459	410	143	128	70	38	12	--	5,407
Total	2,892	2,723	2,283	1,792	1,606	1,260	948	194	223	125	155	110	--	15,405
Total:														
Pinyon	1,785	2,056	2,157	1,589	1,344	846	916	13	19	--	35	--	--	10,990
Juniper	371	731	769	896	940	873	742	324	332	195	158	122	--	7,470
Oak	1,404	682	218	44	1	--	--	--	--	--	--	--	--	2,352
Total	3,560	3,469	3,144	2,529	2,285	1,719	1,558	337	351	195	193	122	--	20,812

Table 53--Net annual growth of woodland species on woodland outside National Forests by ownership class, forest type, and productivity class in northwestern New Mexico, 1986

Ownership class	Forest type	Productivity class		
		High	Low	All classes
- - - - Thousand cubic feet - - - -				
Other public:	Pinyon-juniper	3,774	1,129	4,903
	Juniper	391	25	416
	Oak	88	--	88
	Total	4,253	1,154	5,407
Private:	Pinyon-juniper	11,171	1,652	12,823
	Juniper	146	178	324
	Oak	2,258	--	2,258
	Total	13,575	1,830	15,405
Total:	Pinyon-juniper	14,945	2,781	17,726
	Juniper	537	203	740
	Oak	2,346	--	2,346
	Total	17,828	2,984	20,812

Table 54--Net annual growth of woodland species on woodland outside National Forests by ownership class, forest type, and volume class in northwestern New Mexico, 1986

Ownership class	Forest type	Volume class			All classes
		0 - 500 cu ft/acre	500-1,000 cu ft/acre	1,000+ cu ft/acre	
- - - - - Thousand cubic feet - - - - -					
Other public:	Pinyon-juniper	2,013	1,915	974	4,902
	Juniper	103	224	89	416
	Oak	89	--	--	89
	Total	2,205	2,139	1,063	5,407
Private:	Pinyon-juniper	4,732	5,550	2,541	12,823
	Juniper	290	34	--	324
	Oak	751	440	1,067	2,258
	Total	5,773	6,024	3,608	15,405
Total:	Pinyon-juniper	6,745	7,465	3,515	17,725
	Juniper	393	258	89	740
	Oak	840	440	1,067	2,347
	Total	7,978	8,163	4,671	20,812

Table 55--Annual mortality on woodland outside National Forests by species and ownership class in northwestern New Mexico, 1986

Species	Ownership class		
	Other public	Private	Total
- - - - Thousand cubic feet - - - -			
Douglas-fir	--	--	--
Ponderosa pine	--	--	--
White fir	--	--	--
Cottonwood	--	--	--
Pinyon/juniper	201	83	284
Woodland hardwoods	7	--	7
All species	208	83	291

Table 56--Number of pinyon Christmas trees on woodland outside National Forests by ownership class, grade, and height class in northwestern New Mexico, 1987

Ownership class	Christmas-tree grade	Height class			All classes
		0' - 5'	6' - 10'	11' - 15'	
- - - - - Thousand trees - - - - -					
Other public:	Premium	30	362	64	456
	Standard	1,823	2,877	354	5,054
	Utility	1,461	4,324	393	6,178
	Total	3,314	7,563	811	11,688
Private:	Premium	952	1,452	26	2,430
	Standard	2,738	4,031	1,050	7,819
	Utility	4,869	8,957	2,543	16,369
	Total	8,559	14,440	3,619	26,618
Total:	Premium	982	1,814	90	2,886
	Standard	4,561	6,908	1,404	12,873
	Utility	6,330	13,281	2,936	22,547
	Total	11,873	22,003	4,430	38,306

Table 57--Number of fenceposts on woodland outside National Forests by ownership class, species, and type of post in northwestern New Mexico, 1987

Ownership class	Species	Type of post		
		Line	Corner	Total
- - - - Thousand fenceposts - - - -				
Other public:	Pinyon	--	--	--
	Juniper	10,707	6,274	16,981
	Oak	438	68	506
	Total	11,145	6,342	17,487
Private:	Pinyon	--	--	--
	Juniper	20,220	11,570	31,790
	Oak	10,311	2,460	12,771
	Total	30,531	14,030	44,561
Total:	Pinyon	--	--	--
	Juniper	30,927	17,844	48,771
	Oak	10,749	2,528	13,277
	Total	41,676	20,372	62,048

County Tables

Table 58--Area of timberland outside National Forests in northwestern New Mexico by county, 1987

County	Area
- - Acres - -	
Bernalillo	15,430
Cibola	98,250
Los Alamos	1,923
McKinley	103,367
Rio Arriba	310,534
Sandoval	96,557
San Juan	125,807
Santa Fe	36,024
Taos	118,563
Valencia	11,342
Total	917,797

Table 59--Net volume of growing stock and sawtimber on timberland outside National Forests in northwestern New Mexico by county, 1987

County	Growing stock		Sawtimber	
	Thousand cubic feet	Thousand board feet International 1/4-inch rule	Thousand board feet Scribner rule	
Bernalillo	19,005	67,468	55,726	
Cibola	89,290	331,855	275,040	
Los Alamos	2,993	9,331	7,648	
McKinley	64,343	278,311	238,172	
Rio Arriba	333,974	1,301,745	1,088,102	
Sandoval	116,166	415,721	344,878	
San Juan	122,911	570,956	489,916	
Santa Fe	30,476	110,144	89,206	
Taos	144,555	514,783	418,029	
Valencia	12,481	44,015	36,188	
Total	936,194	3,644,329	3,042,905	

Table 60--Net annual growth of growing stock and sawtimber on timberland outside National Forests in northwestern New Mexico by county, 1986

County	Growing stock		Sawtimber	
	Thousand cubic feet	Thousand board feet International 1/4-inch rule	Thousand board feet Scribner rule	
Bernalillo	480	2,238	1,870	
Cibola	2,403	10,308	8,602	
Los Alamos	75	368	303	
McKinley	1,533	5,159	4,452	
Rio Arriba	8,132	35,802	29,999	
Sandoval	2,895	15,059	12,483	
San Juan	2,727	11,862	10,061	
Santa Fe	813	3,896	3,157	
Taos	4,101	15,099	12,506	
Valencia	328	1,248	1,041	
Total	23,487	101,039	84,474	

Table 61--Annual mortality of growing stock and sawtimber on timberland outside National Forests in northwestern New Mexico by county, 1986

County	Growing stock		Sawtimber	
	Thousand cubic feet	Thousand board feet International 1/4-inch rule	Thousand board feet Scribner rule	
Bernalillo	25	86	69	
Cibola	214	758	598	
Los Alamos	3	9	8	
McKinley	46	156	126	
Rio Arriba	508	1,726	1,390	
Sandoval	175	594	478	
San Juan	10	35	28	
Santa Fe	41	138	111	
Taos	243	824	664	
Valencia	12	41	33	
Total	1,277	4,367	3,505	

Table 62--Area, net volume, net annual growth, and net annual mortality of woodland species on woodland outside National Forests in northwestern New Mexico by county

County	Area (1987)	Net volume (1987)	Net annual growth (1986)	Annual mortality (1986)
	-- Acres --	----- Thousand cubic feet -----		
Bernalillo	79,619	35,110	771	(¹)
Cibola	613,111	286,165	4,469	188
Los Alamos	1,811	832	15	(¹)
McKinley	722,195	353,221	4,839	39
Rio Arriba	584,817	294,448	4,255	45
Sandoval	307,633	120,050	1,535	6
San Juan	476,283	208,911	2,813	1
Santa Fe	205,798	52,857	869	1
Taos	125,996	61,465	1,052	1
Valencia	35,434	12,336	194	10
Total	3,152,697	1,425,395	20,812	291

¹Less than .5 thousand cubic feet.

Van Hooser, Dwane D. 1987. Timberland and woodland resources outside National Forests in northwestern New Mexico, 1987. Resour. Bull. INT-46. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 62 p.

Presents land area, timberland and woodland area, associated volume, and components of change for the forest lands outside the National Forests in northwestern New Mexico.

KEYWORDS: forest survey, inventory volume, pinyon-juniper

INTERMOUNTAIN RESEARCH STATION

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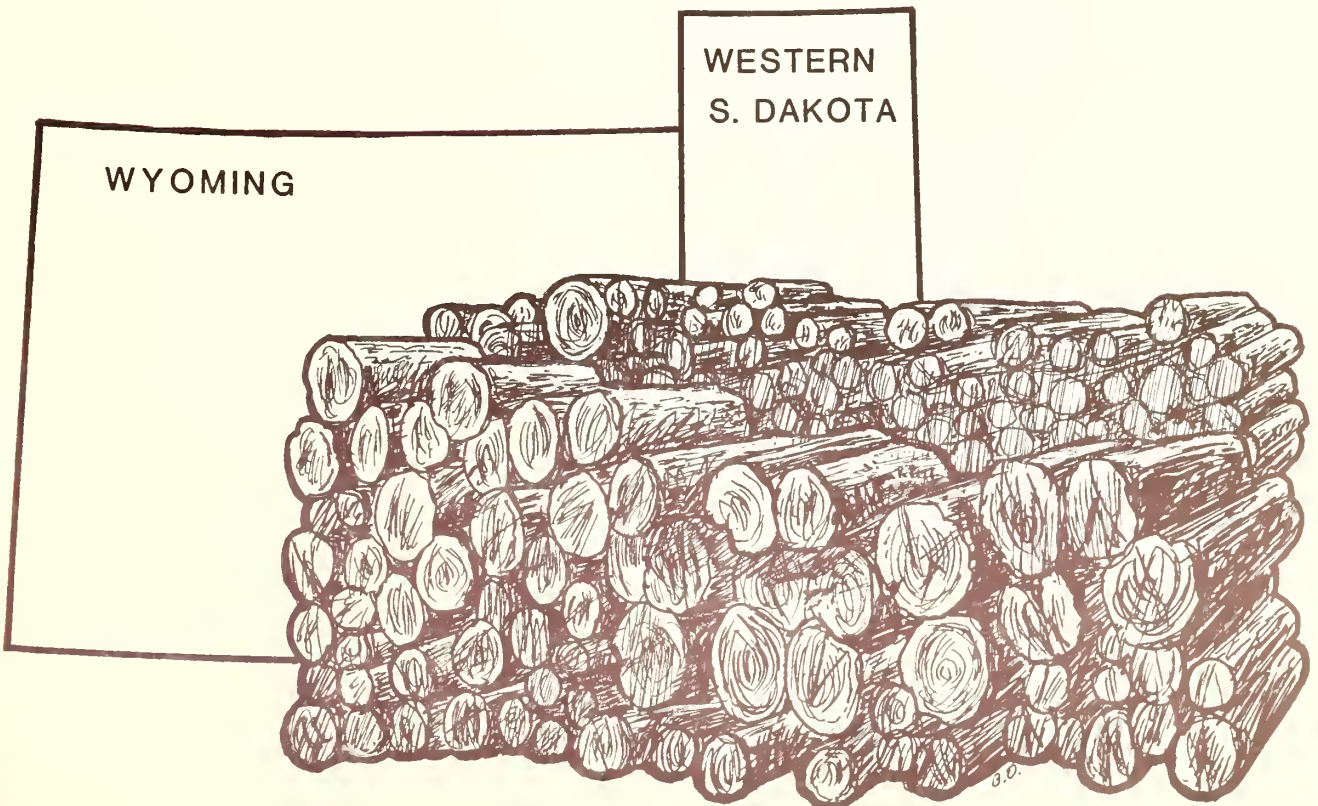
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Wyoming and Western South Dakota's 1983 Fuelwood Harvest

William H. McLain



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RESEARCH SUMMARY

The estimated fuelwood harvests in Wyoming and western South Dakota in 1983 were 143,000 cords (10 million cubic feet) and 46,000 cords (3.5 million cubic feet), respectively.

In Wyoming, the fuelwood harvest volume was one-third the volume of sawlogs and other industrial roundwood products harvested. The volume of live timber trees harvested for fuelwood was only 16,000 cords (1.1 million cubic feet), only 3 percent of the total harvest of roundwood products in 1983.

In western South Dakota, the fuelwood harvest volume was 15 percent of the industrial roundwood harvest. The volume of live timber trees harvested for fuelwood was only 5,200 cords (379,000 cubic feet), less than 2 percent of the total harvest of roundwood products in 1983.

Wyoming and Western South Dakota's 1983 Fuelwood Harvest

William H. McLain

INTRODUCTION

The Forest Survey Unit at the Intermountain Research Station is charged with making comprehensive surveys and analyses of the forest resource situation in the Rocky Mountain States (fig. 1). Periodic annual estimates and descriptions of wood harvests are part of this mission.

In 1984, tree harvest data for calendar year 1983 were collected for Wyoming and western South Dakota to coin-

cide with the 1983 forest inventories of those States. The inventories provide the data to estimate and describe the volume, growth, and mortality of the forests' trees; the tree harvest data are used to assess and describe the changes in the forests' tree volumes due to harvesting. The fuelwood (firewood) harvest, one segment of tree harvesting, is the focus of this report.

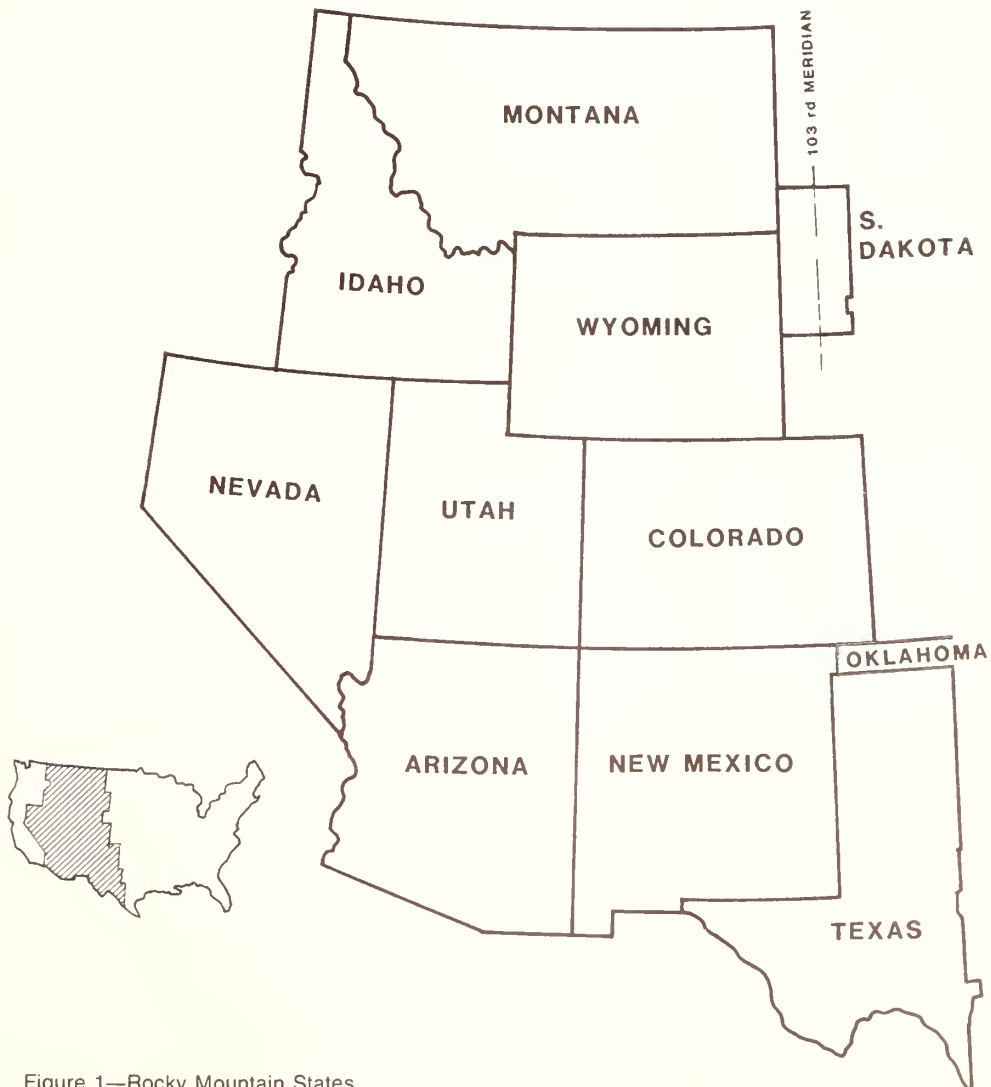


Figure 1—Rocky Mountain States.

Residential use of firewood in the United States declined from 1880 until the mid-1970's (USDA Forest Service 1982). For over 10 years, since the 1973 oil embargo, the use of fuelwood for home heating (and industrial energy production) has increased, sometimes dramatically (McLain and Booth 1985). Consequently, more elaborate data-gathering efforts were used to estimate the 1983 fuelwood harvest in Wyoming and South Dakota than were used in previous studies.

As in past studies, operators of primary wood processing plants, such as sawmills, were canvassed by mailed questionnaires to obtain harvest data for timber products¹ and fuelwood. For this study, potential commercial fuelwood operators were also canvassed by mail and the citizenry polled by mail and telephone.

RESULTS FOR WYOMING

In 1983 an estimated 143,000 cords of fuelwood (tables 1 to 3) were harvested in Wyoming. At a conversion rate of 72.516 cubic feet² of wood per cord, this amounts to over 10 million cubic feet, equivalent to one-third the 1983 Wyoming harvest of sawlogs and other industrial roundwood products (30 million cubic feet) (McLain in press). This is considerably larger than the fuelwood harvest estimates for 1962 and 1969 (the 1969 estimate included posts and miscellaneous farm timbers) of 0.1 and 0.5 million cubic feet (Choate 1963; Setzer 1971).

Table 1—Total volume of fuelwood harvested in Wyoming by land class/owner and county, 1983, in cords

County	Land class and owner					Total
	National Forest	Bureau of Land Management	Other public ¹	Private	Nonforest ²	
----- Cords -----						
Albany	16,816	2,915	—	2,589	—	22,320
Big Horn	2,612	80	—	—	—	2,692
Carbon	16,122	1,358	—	1,458	—	18,938
Converse	2,262	905	—	2,715	—	5,882
Crook	2,530	—	—	265	—	2,795
Fremont	10,809	100	—	7,240	9,050	27,199
Goshen	—	—	—	2,262	—	2,262
Hot Springs	—	—	—	1,810	—	1,810
Johnson	7,758	200	—	3,674	—	11,632
Laramie	905	—	—	1,584	60	2,549
Lincoln	4,246	—	163	—	—	4,410
Natrona	—	9,729	1,412	1,014	—	12,156
Park	3,568	1,358	—	679	—	5,604
Platte	—	—	—	154	—	154
Sheridan	10,181	—	—	—	—	10,181
Sublette	7,327	—	—	452	—	7,780
Sweetwater	—	955	—	—	—	955
Teton	2,838	—	—	679	—	3,516
Weston	—	—	—	226	—	226
Total	87,976	17,599	1,576	26,801	9,110	143,061

¹Lands managed by the State of Wyoming and lands managed by Federal agencies other than the Forest Service and the Bureau of Land Management.

²Includes orchards, city parks, urban areas, and windbreaks.

¹Timber products, also termed industrial roundwood products, are round sections cut from trees for industrial or consumer use. Timber products generally include sawlogs, house logs, utility poles, pulpwood, posts, building poles, mine timbers, and excelsior bolts.

²Standard conversion rate used in Blackhills area by USDA Forest Service; applied to western Wyoming also, for lack of anything better.

Table 2—Total volume of fuelwood harvested in Wyoming by land class/owner and species, 1983, in cords

Species	Land class and owner					Total
	National Forest	Bureau of Land Management	Other public	Nonforest	Private	
----- Cords -----						
True firs	522	—	—	—	—	522
Spruce	1,970	—	—	—	50	2,020
Lodgepole pine	59,843	3,518	1,448	—	6,754	71,563
Limber pine	—	—	—	—	54	54
Ponderosa pine	18,167	12,896	15	—	736	31,814
Douglas-fir	—	280	—	—	—	280
Cottonwood	—	452	113	60	14,783	15,409
Aspen	6,082	452	—	—	4,364	10,899
Other hardwoods	1,390	—	—	9,050	60	10,501
Total	87,976	17,599	1,576	9,110	26,801	143,061

Table 3—Total volume of fuelwood harvested in Wyoming by species and county, 1983, in cords

County	Species									Total
	True firs	Spruce	Lodgepole pine	Limber pine	Ponderosa pine	Douglas-fir	Cottonwood	Aspen	Other hardwoods	
----- Cords -----										
Albany	452	100	16,308	—	4,781	—	452	226	—	22,320
Big Horn	70	—	1,638	—	905	80	—	—	—	2,692
Carbon	—	1,408	13,458	—	452	—	—	3,620	—	18,938
Converse	—	—	2,715	—	1,358	—	1,810	—	—	5,882
Crook	—	—	1,131	—	148	—	—	65	1,451	2,795
Fremont	—	—	10,004	—	905	—	4,525	2,715	9,050	27,199
Goshen	—	—	—	—	—	—	2,262	—	—	2,262
Hot Springs	—	—	—	—	—	—	1,810	—	—	1,810
Johnson	—	—	2,102	54	5,204	200	3,620	452	—	11,632
Laramie	—	—	—	—	905	—	60	1,584	—	2,549
Lincoln	—	—	2,713	—	905	—	113	679	—	4,410
Natrona	—	—	2,072	—	10,083	—	—	—	—	12,156
Park	—	—	4,725	—	—	—	679	200	—	5,604
Platte	—	—	77	—	—	—	77	—	—	154
Sheridan	—	452	4,299	—	4,978	—	—	452	—	10,181
Sublette	—	—	6,816	—	59	—	—	905	—	7,780
Sweetwater	—	—	50	—	905	—	—	—	—	955
Teton	—	60	3,456	—	—	—	—	—	—	3,516
Weston	—	—	—	—	226	—	—	—	—	226
Total	522	2,020	71,563	54	31,814	280	15,409	10,899	10,501	143,061

The Wyoming fuelwood harvest is a significant proportion (25 percent) of the total State's roundwood production (industrial roundwood and fuelwood) of 40 million cubic feet. However, it is not so significant that it is a drain on the growing-stock³ inventory of Wyoming forests or in competition with the forest products industry for wood fiber. Most of the fuelwood harvest was dead trees or nontimber trees (pinyon, juniper, and all hardwoods except cottonwood and aspen).

The fuelwood harvest of standing live trees of timber species⁴ from forest land (excludes orchards, city parks, urban areas, and windbreaks) was under 16,000 cords (1.1 million cubic feet), 11 percent of the total fuelwood harvest, less than 4 percent of the roundwood harvest of live trees (29.5 million cubic feet), and only 3 percent of total 1983 roundwood production (40.4 million cubic feet—fig. 2). Of the remaining 127,000 cords of fuelwood harvested,

117,000 were from dead trees of timber species and 10,500 were from nontimber trees.

Personal consumption accounted for 96 percent (138,000 cords) of the fuelwood cut. Commercial operators reported harvesting 5,000 cords.

Lodgepole pine represented 50 percent of the harvest with 71,500 cords cut (tables 2 and 3, fig. 3), followed by ponderosa pine (22 percent), cottonwood (11 percent), aspen (8 percent), and nontimber hardwoods such as oak and elm (7 percent).

National Forests produced 61 percent (88,000 cords) of the fuelwood harvest (tables 1 and 2), private lands 19 percent, and lands managed by the Bureau of Land Management, U.S. Department of the Interior, 12 percent.

The leading counties in fuelwood production were Fremont with 19 percent (27,000 cords) (tables 1 and 3, fig. 4), Albany 16 percent, and Carbon 13 percent.

INDUSTRIAL ROUNDWOOD HARVEST

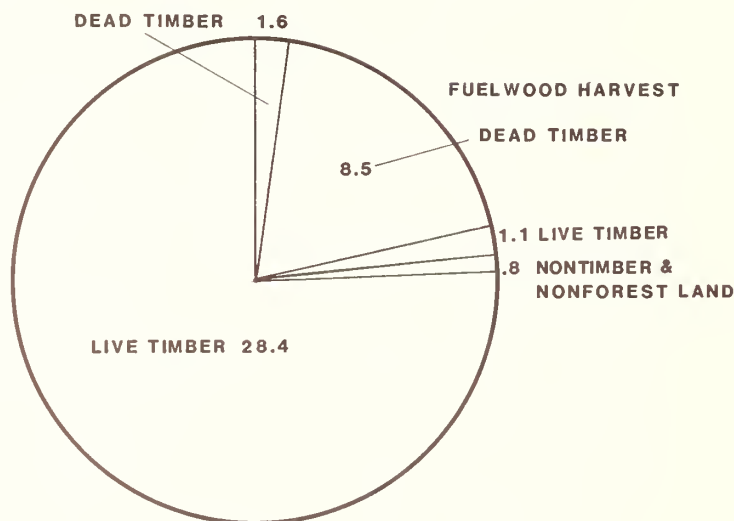


Figure 2—A comparison of the tree class composition of the fuelwood harvest and the industrial roundwood harvest of Wyoming, 1983, in million cubic feet. Timber: tree species traditionally harvested for lumber products, such as ponderosa pine, Douglas-fir, and lodgepole pine. Nontimber: trees other than timber trees (pinyon, juniper, and all hardwoods except cottonwood and aspen). Nonforest land: orchards, city parks, urban areas, and windbreaks.

³Growing-stock volume is the net cubic-foot volume of wood in live trees from a stump 1 foot high to a 4.0-inch diameter top, outside bark. Such trees must be timber trees, those traditionally harvested for lumber products (excludes pinyon, juniper, ornamentals, and fruit trees), must have a central stem at least 5 inches in diameter at breast height (d.b.h.), and must meet specified standards of quality and vigor, thus excluding cull trees.

⁴Includes tree species traditionally harvested for lumber products, such as ponderosa pine, Douglas-fir, lodgepole pine, cottonwood, and aspen. Excludes pinyon, juniper, and miscellaneous hardwoods such as oaks, shade trees, ornamentals, and fruit trees.

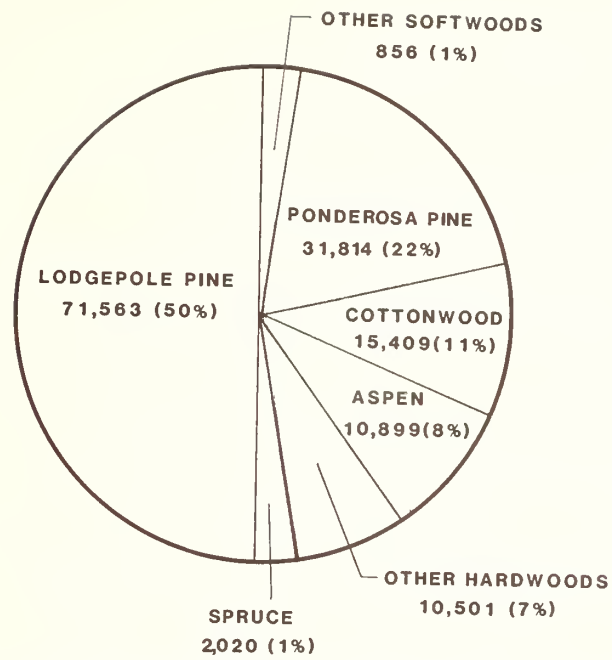


Figure 3—Species distribution of the fuelwood harvest in Wyoming, 1983, in cords and percentage.

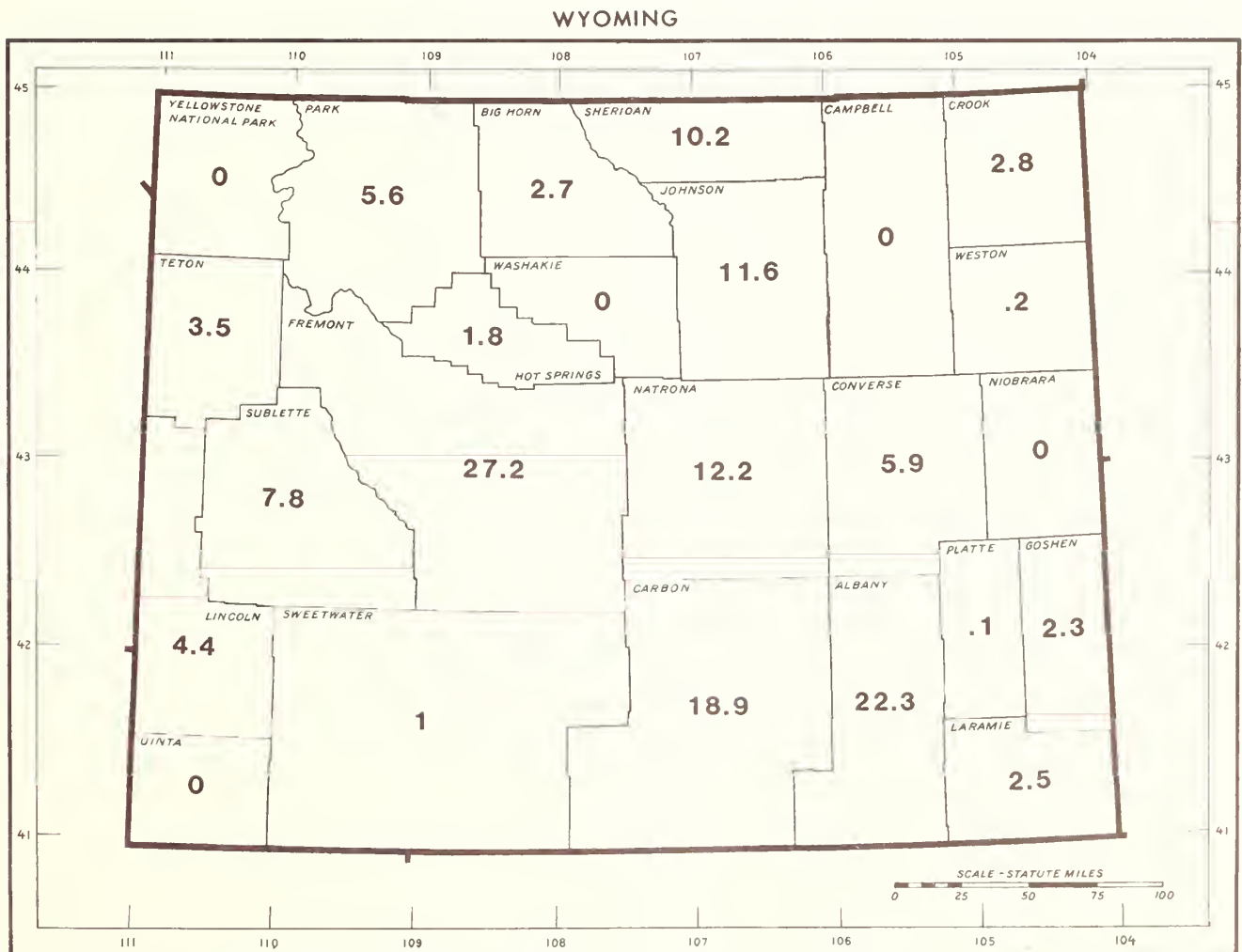


Figure 4—Wyoming fuelwood harvest by county in thousands of cords, 1983.

RESULTS FOR WESTERN SOUTH DAKOTA

More than 46,000 cords of fuelwood were estimated to have been cut in western South Dakota in 1983 (tables 4-6). This converts to 3.3 million cubic feet at 72.516 cubic feet/cord, equivalent to 15 percent of the volume of the

1983 industrial roundwood harvest of 23.1 million cubic feet (McLain in press), up from the 1969 and 1974 fuelwood harvest estimates of 2.4 and 1.7 million cubic feet (Setzer 1971; Setzer and Barrett 1977). (The 1969 estimate included poles, piling, posts, and fuelwood; the 1974 estimate, posts and fuelwood.)

Table 4—Total volume of fuelwood harvested in western South Dakota by owner and county, 1983, in cords

County	Owner				Total
	National Forest	Bureau of Land Management	State	Private	
----- Cords -----					
Butte	—	—	—	2,336	2,336
Custer	1,875	—	519	1,817	4,211
Fall River	—	—	—	5,825	5,825
Harding	649	—	—	—	649
Lawrence	7,534	—	—	3,667	11,201
Meade	3,760	389	—	1,787	5,937
Pennington	6,347	—	—	9,864	16,212
Total	20,166	389	519	25,297	46,371

Table 5—Total volume of fuelwood harvested in western South Dakota by species and owner, 1983, in cords

Species	Owner				Total
	National Forest	Bureau of Land Management	State	Private	
----- Cords -----					
Ponderosa pine	17,630	260	519	17,460	35,868
Cottonwood	—	—	—	3,878	3,878
Aspen	1,562	—	—	130	1,692
Other hardwoods	973	130	—	3,829	4,932
Total	20,166	389	519	25,297	46,371

Table 6—Total volume of fuelwood harvested in western South Dakota by species and county, 1983, in cords

County	Species				Total
	Ponderosa pine	Cottonwood	Aspen	Other hardwoods	
----- Cords -----					
Butte	—	1,168	—	1,168	2,336
Custer	3,951	—	—	260	4,211
Fall River	3,212	1,639	—	973	5,825
Harding	649	—	—	—	649
Lawrence	8,632	32	1,303	1,233	11,201
Meade	4,639	519	130	649	5,937
Pennington	14,784	519	260	649	16,212
Total	35,868	3,878	1,692	4,932	46,371

Only 5,200 cords (379,000 cubic feet) or 11 percent of the fuelwood came from live timber trees. This was less than 2 percent of the total roundwood production of live timber trees, 23.3 million cubic feet. Dead timber trees accounted for 78 percent of the fuelwood harvest, 36,200 cords. Nontimber trees contributed over 10 percent (4,900 cords) to fuelwood production (fig. 5).

The harvest for personal use was just under 44,000 cords (94 percent). The remaining 2,700 cords were cut by commercial firewood operators.

Ponderosa pine at 36,000 cords (77 percent) was the most heavily harvested species, followed by 4,900 cords of nontimber species such as oak, ash, birch, and fruit trees (tables 5 and 6).

More than half (25,000 cords) of the fuelwood was cut on privately owned land (tables 4 and 5). National Forest land produced 20,000 cords (43 percent).

Pennington with 16,000 cords (35 percent) and Lawrence with 11,000 cords (24 percent) led in the production by county (tables 4 and 6, fig. 6).

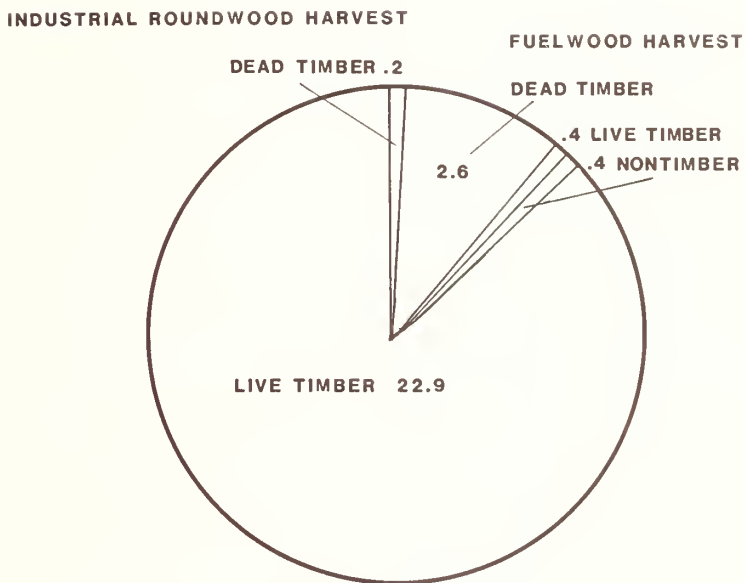


Figure 5—A comparison of the tree class composition of the fuelwood harvest and the industrial roundwood harvest of western South Dakota, 1983, in million cubic feet. Timber: tree species traditionally harvested for lumber products, such as ponderosa pine, Douglas-fir, and lodgepole pine. Nontimber: trees other than timber trees (pinyon, juniper, and all hardwoods except cottonwood and aspen).

SOUTH DAKOTA

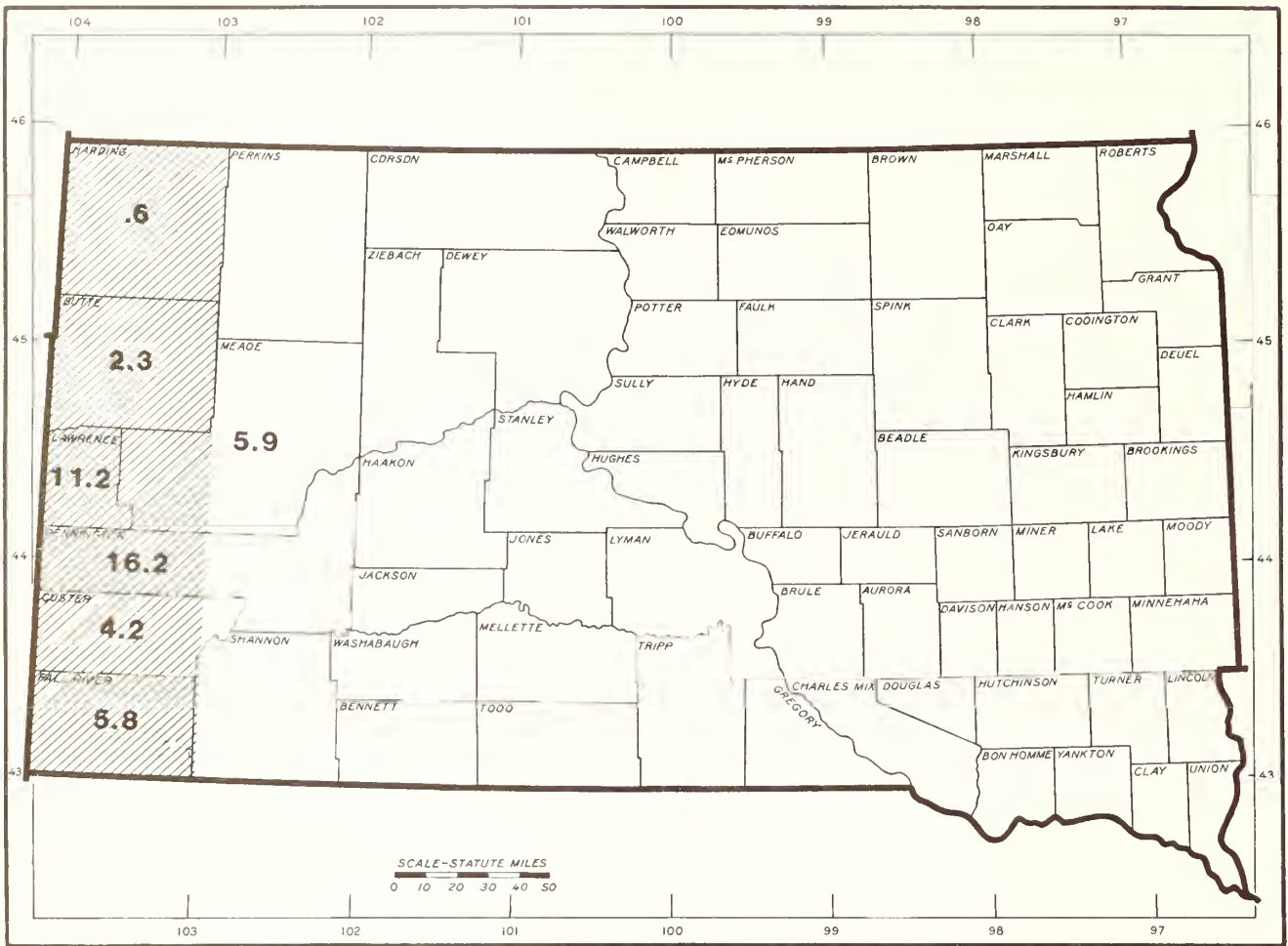


Figure 6—Fuelwood harvest by county, western South Dakota, in thousands of cords, 1983.

SURVEY PROCEDURES

Fuelwood harvest data were collected from two distinct groups: commercial operators who harvest fuelwood and other roundwood products to sell to consumers or retail outlets; and members of households who harvest fuelwood and consume it. These two populations were surveyed in different ways.

Fuelwood Harvest by Commercial Operators

We attempted a 100 percent canvass of commercial operators to obtain the data from this population. Commercial fuelwood operators comprised multiproduct roundwood harvesters and those who harvest strictly, or predominantly, fuelwood.

We canvassed primary wood processing plants, such as sawmills, to obtain the multiproduct roundwood data that included fuelwood. These plants (mills and yards) were identified from "The 1980-81 Wyoming Timber Industries Directory," updated by the Wyoming Timber Industry Association and the Wyoming State Forestry Division,

from a directory of sawmills supplied and updated by the South Dakota Department of Agriculture/Division of Forestry, and from information supplied by National Forest personnel in Wyoming and South Dakota. None of the mills that reported receiving roundwood harvested in Wyoming (43) reported receiving fuelwood, and only one mill receiving roundwood from South Dakota (18) reported fuelwood as a product.

Most of the commercial fuelwood harvest was reported by individuals and businesses identified from bidders lists supplied by National Forest, Bureau of Land Management, and State forestry personnel. Of those identified as potential 1983 commercial fuelwood harvesters, 31 responded as harvesting in Wyoming and five as harvesting in South Dakota in 1983.

Fuelwood Harvest by Members of Households for Personal Use

To obtain personal-use fuelwood harvest estimates, we surveyed residents of 400 households in Wyoming and 400 in South Dakota. The populations sampled consisted of all

residential listings in all Wyoming telephone books and in those South Dakota telephone directories that covered the population in the area of the State likely to have harvested in South Dakota west of the 103d meridian (western South Dakota). A random number generator⁵ was used to select the sample, which was distributed throughout the telephone books proportional to the populations of households (residences) within the books.

Of the 400 households surveyed in each State, 86 in Wyoming and 71 in South Dakota reported fuelwood harvests for 1983.

The following procedure was used to expand the sample statistics to obtain the estimate of the total volume of fuelwood harvested by all the households in Wyoming and the households within and adjacent to the area west of the 103d meridian in South Dakota:⁶

n = number of households in sample

nc = number of households in sample that harvested fuelwood

$\sum X$ = reported harvest by nc in cords

\bar{X} = mean harvest, in cords, by nc^2

$$\bar{X} = \frac{\sum X}{nc}$$

N = estimated population of residences (households) in all the telephone books in Wyoming (western South Dakota)

$$NC = N^{nc}$$

⁶ VOL = estimated volume of fuelwood harvested by N

$$VOL = NC(\bar{X})$$

P = Bureau of Census estimate of the population of households in Wyoming (western South Dakota)

K = population adjustment factor; used to expand the estimate of harvest by the telephone book population to the estimate of harvest by the population of Wyoming (western South Dakota)

$$K = \frac{P}{N}$$

⁶ $TOT VOL$ = estimate of the total volume harvested by members of households (in Wyoming (western South Dakota)) for personal consumption

$$TOT VOL = VOL(K)$$

$$\text{or: } TOT VOL = \frac{P}{n} \sum X.$$

Table cells are found by merely multiplying reported volumes by the expansion factor:

$$\text{Expansion factor} = \frac{TOT VOL}{\sum X} = \frac{P}{n}$$

For the 1983 harvest of fuelwood by households, the following were computed:

Wyoming

$$n = 400$$

$$nc = 86$$

$$\sum X = 320.129$$

$$\bar{X} = 3.7224$$

$$N = 169,427$$

$$NC = 36,427$$

$$VOL = 135,596$$

$$P = 181,000$$

$$K = 1.0683$$

$$TOT VOL = 144,858.$$

$$\text{Expansion factor} = 452.5$$

Western South Dakota

$$n = 400$$

$$nc = 71$$

$$\sum X = 312.879$$

$$\bar{X} = 4.40675$$

$$N = 53,802$$

$$NC = 9,550$$

$$VOL = 42,084$$

$$P = 51,917$$

$$K = 0.964964$$

$$TOT VOL = 40,609.$$

$$\text{Expansion factor} = 129.792$$

The variances, standard errors, and confidence intervals of the estimates of the total volumes harvested by households are found as follows:

$VAR TOT VOL$ = variance of the total volume

$$VAR TOT VOL = \frac{(X)^2(NC)(N-NC)}{n} + \frac{(NC)^2(VAR)}{nc} K^2$$

Std. error $TOT VOL$ = standard error of the total volume

$$= \sqrt{VAR TOT VOL}$$

For 95 percent confidence interval of the estimate of the total volume:

$$TOT VOL \pm 2 (\text{std. error } TOT VOL).$$

For the 1983 harvests of fuelwood by households, the following statistics were calculated:

Wyoming

$$VAR TOT VOL = 322,074,000$$

$$\text{Std. error } TOT VOL = 17,946$$

$$95 \text{ percent confidence interval} = \pm 35,892$$

Western South Dakota

$$VAR TOT VOL = 46,891,700$$

$$\text{Std. error } TOT VOL = 6,848$$

$$95 \text{ percent confidence interval} = \pm 13,696.$$

⁵Copies of the program used to select the actual sample are available from Gordon D. Booth, Statistics/Computer Science Group, Intermountain Research Station.

⁶This is not necessarily the volume harvested in Wyoming and western South Dakota. Some of the fuelwood harvest reported by the populations sampled took place in Utah, Montana, and Colorado. These "outside" harvest volumes were included in calculations of the means (\bar{X}) and are thus included in all computations involving X . This does not, however, affect the calculation of the harvest volume in Wyoming and western South Dakota.

REFERENCES

- Choate, Grover A. 1963. The forests of Wyoming. Resour. Bull. INT-2. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 45 p.
- McLain, William H. [In press.] Wyoming and western South Dakota timber production and mill residue—1983. Resour. Bull. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station.
- McLain, William H.; Booth, Gordon D. 1985. Colorado's 1982 fuelwood harvest. Resour. Bull. INT-36. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 11 p.
- Setzer, Theodore S. 1971. Estimates of timber products output and plant residues, Wyoming and South Dakota, 1969. Res. Note INT-136. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 6 p.
- Setzer, Theodore S.; Barrett, Michael K. 1977. Western South Dakota timber production and mill residues, 1974. Res. Note INT-233. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 5 p.
- U.S. Department of Agriculture, Forest Service. 1982. An analysis of the timber situation in the United States 1952-2030. For. Resour. Rep. 23. Washington, DC: U.S. Department of Agriculture, Forest Service. 499 p.

McLain, William H. 1987. Wyoming and western South Dakota's 1983 fuelwood harvest. Resour. Bull. INT-47. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 10 p.

The estimated fuelwood harvests in Wyoming and western South Dakota in 1983 were 143,000 cords (10 million cubic feet) and 46,000 cords (3.5 million cubic feet), respectively. In Wyoming, the fuelwood harvest volume was one-third the volume of sawlogs and other industrial roundwood products harvested. In western South Dakota, the fuelwood harvest volume was 15 percent of the industrial roundwood. Survey participants were commercial operators and households.

KEYWORDS: firewood, roundwood, timber products

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Colorado's Timber Resources

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PREFACE

Forest Survey is a continuing nationwide undertaking conducted by the Forest Service, U.S. Department of Agriculture, with the primary objective of providing an assessment of the renewable resources on the Nation's forest lands. This requires periodic State-by-State resource inventories. Originally, Forest Survey was authorized by the McSweeney-McNary Act of 1928. The current authorization is through the Renewable Resources Research Act of 1978.

The Intermountain Research Station with headquarters in Ogden, UT, administers the forest resource inventories for the Rocky Mountain States of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, Wyoming, western South Dakota, western Texas, and Oklahoma's Panhandle. These inventories provide information on the extent and condition of State and privately owned forest lands, volume of timber, and rates of timber growth and mortality. These data, when combined with similar information for Federal lands, provide a basis for forest policies and programs and for the orderly development and use of the resources.

ACKNOWLEDGMENTS

This report is the result of the combined efforts of numerous people on the Forest Survey staff. In addition to the photo interpretation and field crews, several individuals played key roles in the reduction of basic data into information describing the extent, nature, and condition of the forest resources in Colorado: Dennis Collins supervised the data collection; Sharon Woudenberg and Shirley Waters compiled the data and made summaries; and Susan Brown and Velma Inama transformed the data summaries into tables of information. Also, we acknowledge the Colorado State Forest Service for its cooperation and assistance in collecting the inventory data. And we extend a special note of gratitude to the private land owners who allowed the field crews access to the sample locations on their properties.

RESEARCH SUMMARY

Presents highlights of the forest resources of Colorado as of 1983. Describes the extent, condition, and location of the resources, and discusses levels of some nontimber use of forest lands. Includes statistical tables: area by land classes, ownership, growing-stock and sawtimber volumes, growth, mortality, roundwood products output, and utilization.

HIGHLIGHTS

Area

- About 21 million acres of Colorado's land area is forest land (31 percent), most of it in the western two-thirds of the State.
- Around 15 million acres are timberland and 6 million acres are woodland.
- Nearly three-fourths of the forest land is publicly owned. Most of it is in the seven National Forests.
- Much of the privately owned forest land is woodland.
- Spruce is the dominant forest type covering some 4.4 million acres, followed (not surprisingly) by aspen with about 3.5 million acres.
- About half of Colorado's timberlands are classed as sawtimber stands.
- Productivity of the timberlands is relatively low, with only about a third having the potential to produce over 50 cubic feet of wood per acre per year.

Inventory

- Volume in growing-stock trees is estimated to be about 17 billion cubic feet. Three-fourths of it is on public lands.
- Nearly 13 percent of the total volume is in live cull and salvageable dead trees.
- Roughly a third of the volume is in Engelmann spruce. Lodgepole pine and aspen combined make up another third.
- Nearly 70 percent of the growing-stock volume is in trees less than 15 inches diameter at breast height (d.b.h.).
- About 77.6 million cubic feet of mortality in 1982 left a net growth of some 273 million cubic feet.
- Net growth per acre was 25 cubic feet per year compared to the average potential of 42 cubic feet.
- Because harvest levels have been less than net growth, the volume of growing-stock inventory has been increasing.

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Colorado's Timber Resources

Robert E. Benson
Alan W. Green

INTRODUCTION

Colorado's forest lands serve a diverse and vital role. For many travelers from the East, the forested slopes of the front range are the first view of the Rocky Mountain West, whether traveling by highway, rail, or air. These forested mountains are a treasured visual resource at all times of the year both for visitors and for the many residents massed along the urbanized front range. In winter, Colorado's mountains host national and international skiers at some of the largest ski area complexes in the Nation.

Along with esthetic and recreational values, the forested areas are a vital source of water, providing irrigation for the extensive agriculture in the eastern part of the State. West of the Continental Divide, watersheds feed the Colorado River system, which is the lifeblood for much of the arid Southwest and southern California.

Historically, Colorado's forest industry has not been a major factor on the national scene, but the timber products served local uses that had vital national significance. Forests provided the timbers and lumber for the early mining booms and later supplied the trees, timbers, and lumber for railroads and farms and ranches as the Mountain West was developed. Currently, Colorado forests supply both industrial material, primarily sawlogs (McLain 1985), and an expanding home fuelwood market (McLain and Booth 1985).

In addition to these uses, Colorado forests also provide wildlife habitat and grazing for domestic livestock, both in the timberlands and woodlands.

This report describes the current condition of the timberlands, based on surveys conducted in 1981 through 1983.

Colorado consists of 66.6 million acres, of which 66.3 million is land and 0.3 million is water (table 1). In 1983 about 27 million acres (roughly 41 percent of the land area) was publicly owned.

Table 1--Total land and water area by ownership class, Colorado, 1983

Ownership class	Area
	- - Thousand acres - -
Land:	
Public:	
National Forest	14,430.8
Other public:	
Bureau of Land Management	8,333.0
National Parks ¹	610.3
Miscellaneous Federal	271.6
State	3,022.9
County and municipal	316.2
Total other public	<u>12,554.0</u>
Total public	<u>26,984.8</u>
Private	<u>39,315.9</u>
Total land area	<u>66,300.7</u>
Census water	<u>317.5</u>
Total land and water ²	<u>66,618.2</u>

¹National Park area is included in this table and tables 2 and 3 only. No volume tables are included for National Parks.

²U.S. Bureau of the Census, land and water area of the United States, 1980.

THE TIMBERLAND

How Much, Where, and Who Owns It

Colorado's forests:
15 million acres of
timberlands and 6 million
acres of woodlands.

Nearly a third of the State's 66.6 million acres are forested. Included are over 15 million acres classed as timberlands, capable of producing industrial roundwood timber products, and 6 million acres of woodlands that include pinyon, juniper, and miscellaneous hardwood forest types (table 2). The forested lands extend throughout the western two-thirds of the State. The timberlands are concentrated along the "backbone" of the Rockies, running roughly north-south through the central portion of the State (fig. 1).

Table 2--Total land area by major land class and ownership class, Colorado, 1983

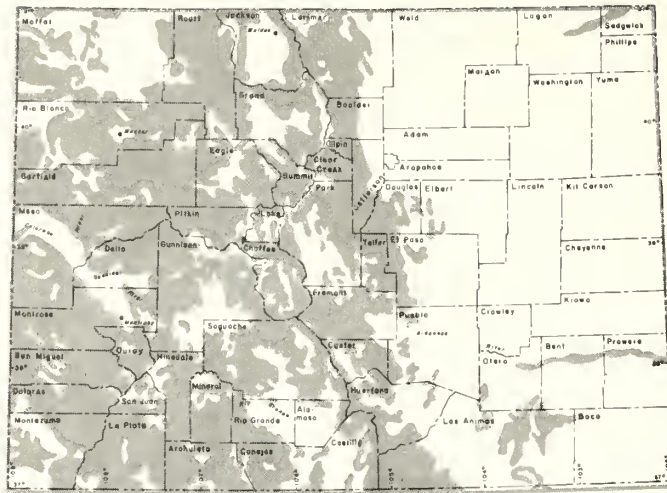
Land class	Ownership class			Total
	National Forest	Other public	Nonindustrial private	
- - - - - Thousand acres - - - - -				
Timberland:				
Deferred	752.2	--	--	752.2
Reserved	632.9	233.9	--	866.8
Nonreserved	8,953.3 ¹	1,515.0	3,365.2	13,833.5
Total	10,338.4	1,748.9	3,365.2	15,452.5
Woodland: ²				
Reserved	--	212.1	--	212.1
Nonreserved	12.5	3,183.2	2,625.4	5,821.1
Total	12.5	3,395.3	2,625.4	6,033.2
Total forest land:				
Deferred	752.2	--	--	752.2
Reserved	632.9	446.0	--	1,078.9
Nonreserved	8,965.8	4,698.2	5,990.6	19,654.6
Total	10,350.9	5,144.2	5,990.6	21,485.7
Nonforest land ³	4,079.9	7,409.8	33,325.3	44,815.0
Total land area	14,430.8	12,554.0	39,315.9	66,300.7

¹Includes 1,447.5 thousand acres of 0-19 productivity class (noncommercial timberland).

²Woodland area is reported on this table and tables 1 and 5 only. No volume tables will be included in this report for woodland.

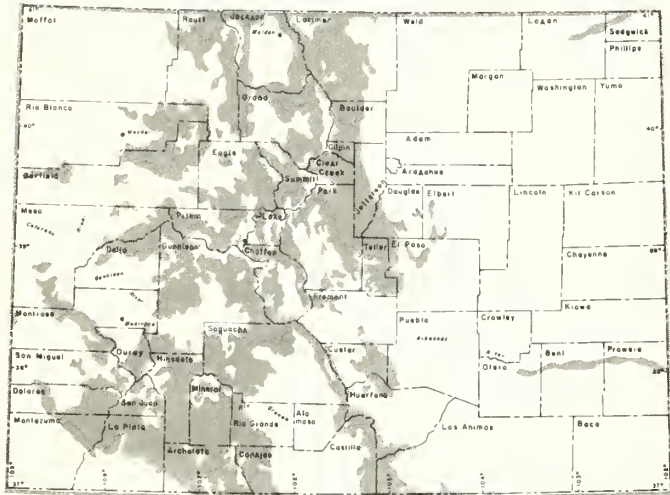
³Includes 612.1 thousand acres of National grasslands and all of Eastern Colorado that was administratively determined to be nonforest land.

FOREST LAND



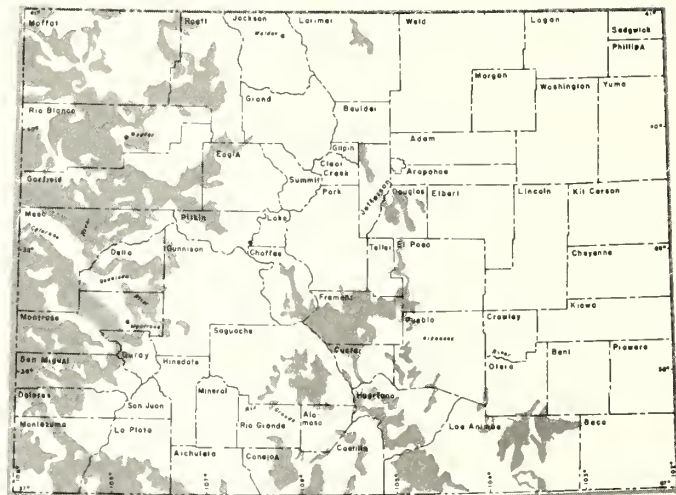
A.

TIMBERLAND



B.

WOODLAND



C.

Figure 1—Geographical distribution of forest land in Colorado.

Most of the forest is publicly owned.

Most of Colorado's forests are administered by public agencies and, not surprisingly, the seven National Forests in the State are the primary keepers (tables 2 and 3). The other big public land custodian is the U.S. Department of the Interior, Bureau of Land Management (BLM).

Nearly half of the private forest land is woodland.

Private owners have nearly 60 percent of the land in the State but that includes three-fourths of the nonforest land, largely representing the agricultural lands in the State's eastern third. While private owners have over a fourth of the forest land, nearly half of it is woodland.

Table 3--Area of forest land by forest type, ownership class, and land class, Colorado, 1983

Forest type	Ownership class and land class											
	National Forest			Other public			Nonindustrial private			All owners		
	Deferred	Reserved	Nonreserved	Reserved	Nonreserved	Reserved	Nonreserved	Reserved	Nonreserved	Deferred	Reserved	Nonreserved
	----- Thousand acres -----											
Douglas-fir	31.2	17.5	849.1	28.2	448.7	--	430.9	31.2	45.7	1,728.7	1,805.6	
Ponderosa pine	24.3	1.8	1,144.2	25.4	302.8	--	1,273.4	24.3	27.2	2,720.4	2,771.9	
Lodgepole pine	169.1	29.8	1,507.0	62.9	190.5	--	284.9	169.1	92.7	1,982.4	2,244.2	
Limber pine	0.1	0.3	26.9	0.8	6.2	--	31.3	0.1	1.1	64.4	65.6	
Spruce-subalpine fir	--	--	--	85.4	124.5	--	137.1	--	85.4	261.6	347.0	
White fir	1.3	--	6.5	0.8	20.0	--	92.7	1.3	0.8	119.2	121.3	
Spruce	445.3	552.7	3,101.9	11.1	90.1	--	230.7	445.3	563.8	3,422.7	4,431.8	
Aspen	80.9	30.8	2,317.7	16.7	325.3	--	785.4	80.9	47.5	3,428.4	3,556.8	
Cottonwood	--	--	--	2.6	6.9	--	98.8	--	2.6	105.7	108.3	
Total timberland	752.2	632.9	8,953.3 ¹	233.9	1,515.0	--	3,365.2	752.2	866.8	13,833.5	15,452.5	
Pinyon-juniper	--	--	9.6	185.9	3,074.4	--	1,567.6	--	185.9	4,651.6	4,837.5	
Juniper	--	--	--	1.6	44.4	--	406.4	--	1.6	450.8	452.4	
Oak	--	--	2.7	21.8	64.0	--	638.5	--	21.8	705.2	727.0	
Riparian	--	--	--	0.2	0.2	--	3.4	--	0.2	3.6	3.8	
Other west hardwoods	--	--	0.2	2.6	0.2	--	9.5	--	2.6	9.9	12.5	
Total woodland ²	--	--	12.5	212.1	3,183.2	--	2,625.4	--	212.1	5,821.1	6,033.2	
All types	752.2	632.9	8,965.8	446.0	4,698.2	--	5,990.6	752.2	1,078.9	19,654.6	21,485.7	

¹Includes 1,447.5 thousand acres of 0-19 productivity class (noncommercial timberland).

²Woodland area is reported on this table and tables 2 and 14 only. No volume tables will be included in this report for woodland.

The “reserved” category represents forest area already set aside for nontimber use such as wilderness. For National Forests this also includes areas currently under study for wilderness (“deferred”), which is all on timberlands. The reserved areas on other public lands are divided nearly equally between timberland and woodland. Currently, the reserved category accounts for about 8 percent of the total forest land.

Timberland Types and Owners

Five major forest types occur in Colorado.

Spruce is the most extensive and most is publicly owned but . . .

The timberlands of Colorado have been classified by forest type, which is based on and named for the tree species that dominates the stand. This provides a good indication of the kinds of potential timber products growing on an area and, generally, the type of forest management involved in harvesting. There are, however, a mix of tree species in most forest types, and habitat conditions also vary, so a given forest type may contain a variety of timber resources and management needs.

Spruce—Comprised primarily of Engelmann spruce (*Picea engelmannii*), this is the single most extensive forest type, occupying about 4.4 million acres. Added to this is another 347,000 acres of the closely associated mix of spruce and subalpine fir (*Abies lasiocarpa*). Minor amounts of blue spruce (*Picea pungens*) are sometimes mixed in these and other forest types. Over 90 percent of the spruce type is on National Forests, primarily growing at high elevations that are wet sites with heavy snowpacks. About a million acres (23 percent) of the type are reserved from commercial use:

	Nonreserved	Reserved and deferred
	----- Thousand acres -----	
National Forest	3,101.9	998.0
Other public	90.1	11.1
Private	230.7	—
Total	3,422.7	1,009.1

aspen has more “available” acres.

Aspen—The aspen type extends over 3.5 million acres. Although second largest in total area, it actually has more acres “available” for commercial use than the spruce type. Golden mountainsides of quaking aspen (*Populus tremuloides*) punctuated with dark conifer crowns are a familiar autumn scene on postcards and travel brochures of Colorado, and one of its most famous resort towns bears the tree’s name. Aspen’s range extends into the lower middle elevations and a fairly large portion, 785,000 acres, is privately owned:

	Nonreserved	Reserved and deferred
	----- Thousand acres -----	
National Forest	2,317.7	111.7
Other public	325.3	16.7
Private	785.4	—
Total	3,428.4	128.4

Ponderosa pine has been the most important species historically.

Ponderosa Pine—Historically, the key species in this type, ponderosa pine (*Pinus ponderosa*), has been the most important. It provides lumber and timbers from low-elevation stands and is easily reached from towns, mines, and ranches in the valleys. Nearly half the type is privately owned, and little of the type in public ownership is reserved from commercial use:

	Nonreserved	Reserved and deferred
	----- Thousand acres -----	
National Forest	1,144.2	26.1
Other public	302.8	25.4
Private	1,273.4	—
Total	2,720.4	51.5

Lodgepole Pine—This is a familiar type at upper middle and high elevations. Traditionally, lodgepole pine (*Pinus contorta*) has been the “king” of small roundwood prod-

Lodgepole pine, the “king” of small round-wood products, and . . .

ucts such as fenceposts and corral rails. It was named for the use native Americans found it suited for, namely in their lodges and teepees. Over 85 percent of the lodgepole pine is publicly owned, primarily on National Forests, and about 12 percent is reserved from commercial use:

	Nonreserved	Reserved and deferred
- - - - Thousand acres - - - -		
National Forest	1,507.0	198.9
Other public	190.5	62.9
Private	284.9	—
Total	1,982.4	261.8

Douglas-fir are also important commercially.

Douglas-fir—Extending over 1.8 million acres, this type occupies sites slightly more moist and at higher elevations than ponderosa pine. However, it is also a common component in the pine and other types. Commercially it is one of the more important types. About three-fourths of the type is in public ownership, and just over 4 percent is reserved from commercial use:

	Nonreserved	Reserved and deferred
- - - - Thousand acres - - - -		
National Forest	849.1	48.7
Other public	448.7	28.2
Private	430.9	—
Total	1,728.7	76.9

Other types are important for wildlife habitat, fuelwood, or industrial wood products.

Other—The white fir, cottonwood, and limber pine types are scattered throughout lower and middle elevations. Because cottonwood (*Populus deltoides* east and *P. fremontii* west of the Continental Divide) grows almost exclusively along stream courses, it plays an important role in protecting the riparian zone and providing wildlife habitat. Some use is made for industrial wood products, and it is also an important source of fuelwood (McLain 1985; McLain and Booth 1985). White fir (*Abies concolor*) is limited to the southern part of the State and is often found growing in rocky terrain in association with Douglas-fir (*Pseudotsuga menziesii*). Detailed data on ownership and land class for forest types are presented in the appendix.

Productivity

Colorado’s forest land is comparatively low in productivity but . . .

In terms of wood-growing potential Colorado’s forest land has generally low productivity (fig. 2). About a third of the land is considered moderately productive—capable of producing 50 feet of wood per acre per year, or more. The bulk, however, is less productive, and 12 percent is in the lowest potential category, under 20 cubic feet per acre per year. This reflects the general topography and climate of the forest areas: much of it is at high elevations with a short, cool growing season, and for the middle and lower elevations the “sunbelt” climate of summer means limited rainfall. But wood growth potential alone does not indicate the important and even critical role of other forest resources and uses.

some of the major forest types are moderately productive.

Some differences in productivity exist among forest types. Fairly large proportions of the spruce, aspen, and Douglas-fir types are moderately productive, but the lodgepole pine and ponderosa pine types have only a small portion in this category:

Forest type	Potential for growing 50 ft ³ /yr or more
	Percent of type
Spruce	57
Douglas-fir	37
Aspen	35
Ponderosa pine	15
Lodgepole pine	14

Detailed data on forest type, stand size, and productivity class are in the appendix, tables 14 through 38.

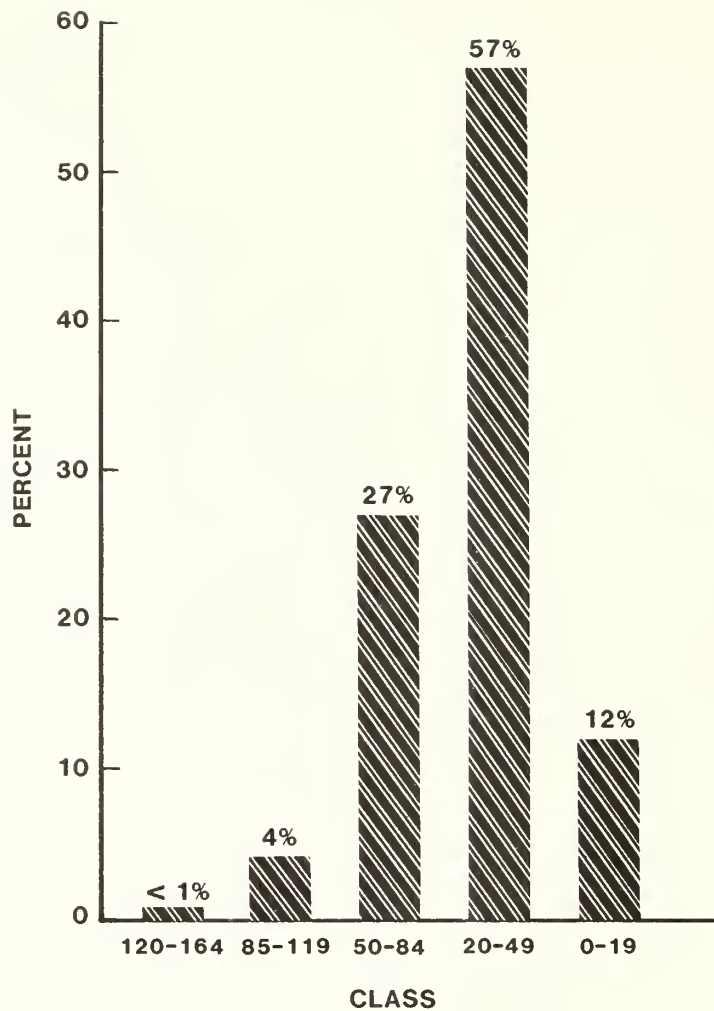


Figure 2—Distribution of Colorado's timberland by productivity class.

Stand-size Classes

Sawtimber stands dominate.

Sawtimber stands occupy about half of Colorado's timberlands. Just under a quarter are poletimber stands and the remainder is about equally divided among seedling-saplings, nonstocked, and lands not yet classified as to timber size (fig. 3). (Lands in the 0-19 cubic feet per acre per year productivity class were previously excluded from the "commercial forest land" category and have not been classified by size in available National Forest data.) National Forests have a smaller proportion of their lands in sawtimber stands. However, all of the areas not classified as to size are on the National Forests, and likely a portion of these are sawtimber size. Similarly, National Forests have a somewhat smaller proportion of pole stands than do other public and private lands. Area by stand-size class and ownership is summarized in table 4 and presented in detail in the appendix tables.

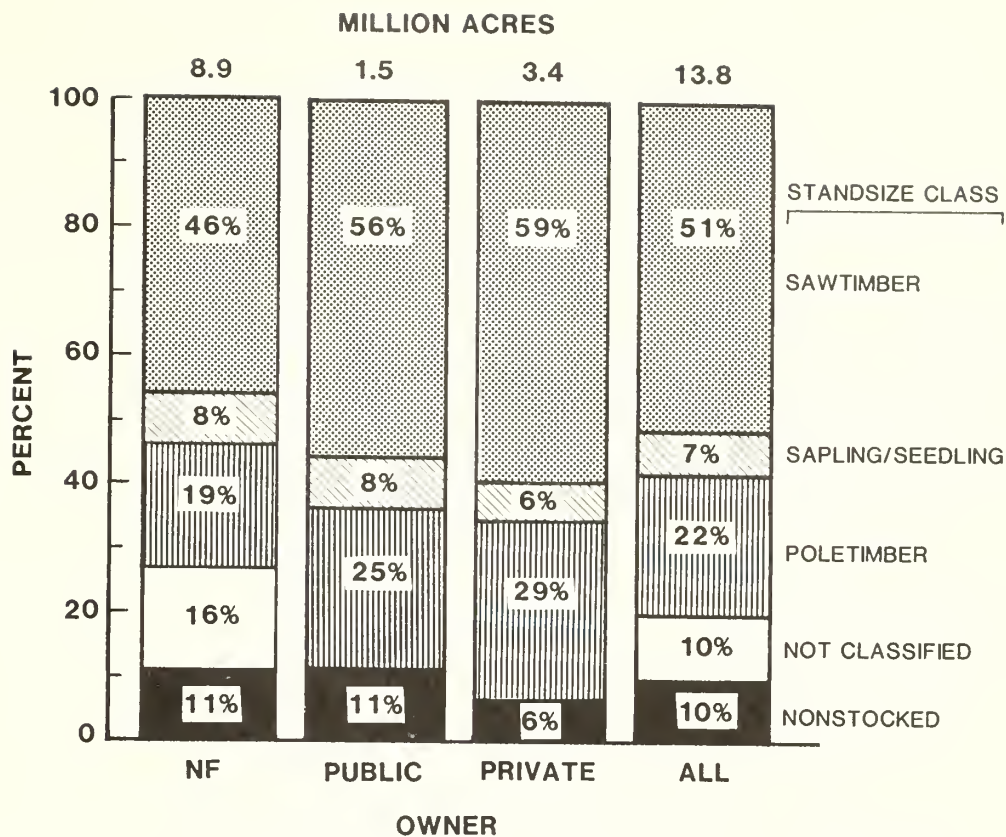


Figure 3—Area of timberland by stand-size class and owner.

Table 4--Area of timberland by stand-size class and ownership class, Colorado, 1983

Stand-size class	Ownership class			Total
	National Forest	Other public	Nonindustrial private	
----- Thousand acres -----				
Sawtimber stands	4,143.9	853.4	1,998.1	6,995.4
Poletimber stands	1,718.1	376.2	958.6	3,052.9
Sapling and seedling stands	696.5	120.6	211.2	1,028.3
Nonstocked areas	947.3	164.8	197.3	1,309.4
Total	7,505.8¹	1,515.0	3,365.2	12,386.0

¹Does not include 1,447.5 thousand acres of productivity class 0-19 as this information was not available by stand-size class for this report.

THE WOODPILE

The volume, type, and size of the timber available for commercial use is of continuing concern to many in Colorado. The wood industry of the State is largely dependent on this resource as are forest managers who must plan harvesting to be compatible with other resource concerns such as recreation and watershed protection. Often the access needed to manage a broad range of resources is provided by roads first built for timber harvesting. This section focuses on characteristics of the forest relating to growth and harvest of timber crops.

Access and availability for harvest are important concerns.

Volume

Growing-stock volume amounts to 17 billion cubic feet.

The estimated 17 billion cubic feet of growing stock on Colorado's timberlands are distributed among owners in about the same proportion as area—National Forests have about two-thirds of the volume, other public lands just over 9 percent, and a fourth is in private ownership (fig. 4). These are based on net volumes after defect has been deducted from the total volume of live growing-stock trees.

Half of this volume is in softwood sawlogs.

The volume in the sawlog portion of softwood sawtimber trees totals 9.7 billion cubic feet, about half the total volume on all Colorado timberlands. Upper stem portions and hardwood sawtimber trees account for another 10 percent of the volume. About a fourth of the volume—5.2 billion cubic feet—is in poletimber trees of growing-stock quality. The remaining 2.4 billion cubic feet, nearly 13 percent of the volume, is in live cull and salvable dead trees (table 5).

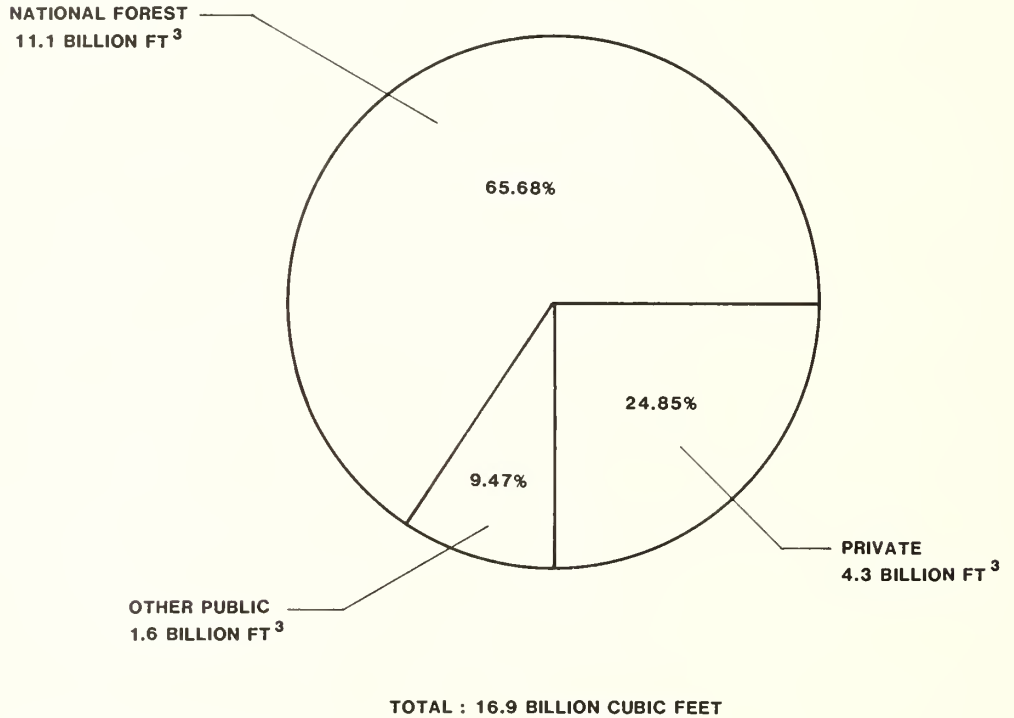


Figure 4—Net volume of growing stock by ownership class, 1982.

Table 5--Net volume of timber on timberland by class of timber, and softwoods and hardwoods, Colorado, 1983

Class of timber	Softwoods	Hardwoods	All classes
- - - - - Million cubic feet - - - - -			
Sawtimber trees:			
Sawlog portion	9,713.3	755.8	10,469.1
Upper-stem portion	1,024.1	244.0	1,268.1
Total	10,737.4	999.8	11,737.2
Poletimber trees	3,167.6	1,993.4	5,161.0
All growing-stock trees	13,905.0	2,993.2	16,898.2
Sound cull trees	249.5	110.0	359.5
Rotten cull trees	282.1	486.5	768.6
Salvable dead trees	1,156.4	144.9	1,301.3
All timber	15,593.0	3,734.6	19,327.6

By Species—Engelmann spruce accounts for about a third of the net growing-stock volume. Another third is composed of lodgepole pine (18 percent) and aspen (17 percent). Douglas-fir, ponderosa pine, and subalpine fir account for most of the rest (fig. 5). The bulk (over 80 percent) of the volume of high-altitude species—Engelmann spruce, subalpine fir, and lodgepole—is on the National Forests. Over half (55 percent) of the total hardwood volume is also on National Forest lands (fig. 6). Private lands have about a fourth of the total volume and nearly two-thirds of the ponderosa pine volume. Douglas-fir volume is about evenly divided among ownerships, and aspen volume is divided about the same as total volume—56 percent National Forest, 35 percent private, and 9 percent other public (table 6). These proportions are all based on net cubic foot volume of growing stock.

Engelmann spruce accounts for a third of the net growing-stock volume and...

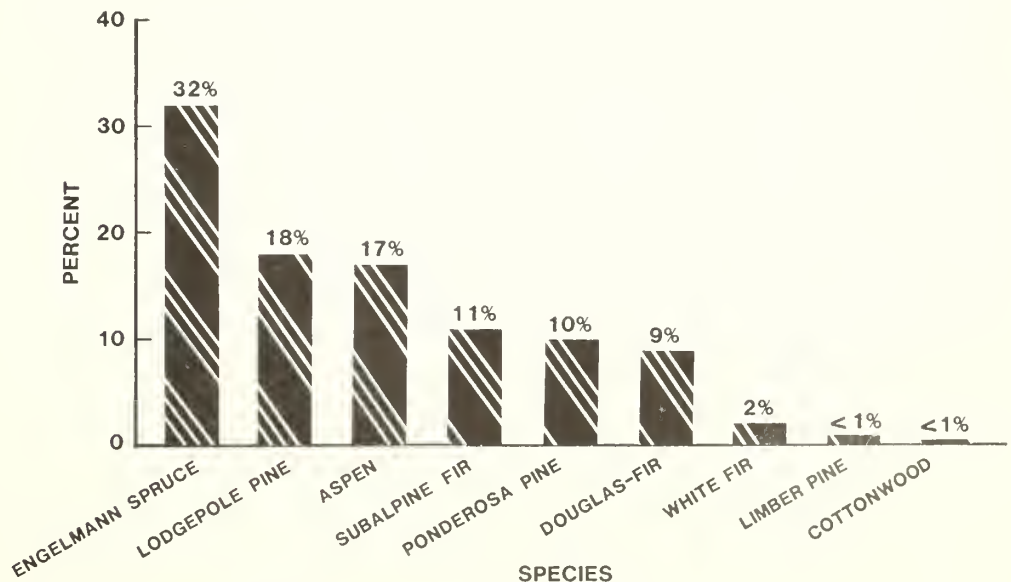
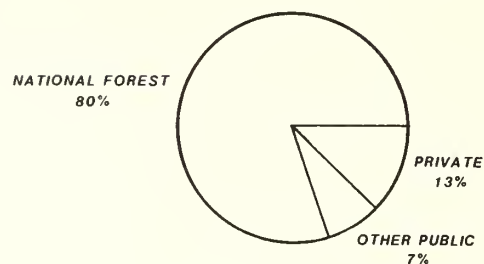
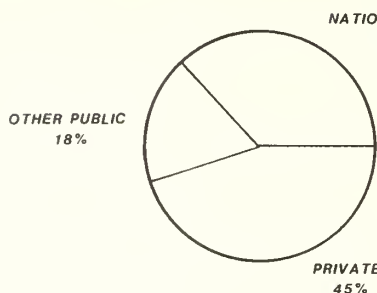


Figure 5—Distribution of net growing-stock volume by species, 1982.

MID TO LOW ELEVATION - SOFTWOOD

HIGHER ELEVATION - SOFTWOOD



HARDWOODS

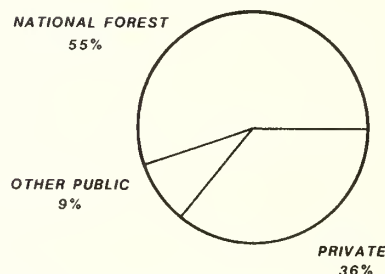


Figure 6—Percentage of growing-stock volume (cubic foot) by ownership class for three species groups.

Table 6--Net volume of growing stock on timberland by ownership class and species, Colorado, 1983

Species	Ownership class			Total
	National Forest	Other public	Nonindustrial private	
----- Million cubic feet -----				
Douglas-fir	515.8	442.4	548.5	1,506.7
Ponderosa pine	465.5	175.8	1,026.4	1,667.7
Lodgepole pine	2,228.0	320.3	535.7	3,084.0
Limber pine	7.4	8.7	38.1	54.2
Subalpine fir	1,488.6	120.5	181.2	1,790.3
White fir	190.4	21.7	93.2	305.3
Engelmann spruce	4,539.5	233.3	640.9	5,413.7
Other softwoods	50.5	6.7	25.9	83.1
Total softwoods	9,485.7	1,329.4	3,089.9	13,905.0
Aspen	1,630.5	266.6	996.1	2,893.2
Cottonwood	6.6	5.7	87.3	99.6
Other hardwoods	0.4	--	--	0.4
Total hardwoods	1,637.5	272.3	1,083.4	2,993.2
All species	11,123.2	1,601.7	4,173.3	16,898.2

over 40 percent of the sawtimber volume.

Some notable differences among forest types exist when considering sawtimber volumes. Engelmann spruce has 32 percent of the cubic volume but over 42 percent of the sawtimber volume, while aspen with 17 percent of the cubic volume has only 8 percent of the sawtimber volume. This in part reflects tree size, with spruce stands heavy toward larger trees and aspen having relatively few sawtimber trees. Moreover, because of merchantability standards aspen and other hardwood species must be 11 inches diameter at breast height (d.b.h.) to be considered sawtimber size, while spruce and the other coniferous species need only attain 9 inches d.b.h. to be classed as sawtimber. For other major species, growing-stock cubic volume and sawtimber volume (table 7) are proportioned about equally.

Volume by diameter class is important because...

By Tree Size—Most of the growing-stock volume (over 69 percent) is in trees less than 15 inches d.b.h., but there is considerable variation in diameter distribution among major species (table 8). Lodgepole pine, aspen, and subalpine fir have a high proportion in the 8-inch and 10-inch diameter classes, while Engelmann spruce, ponderosa pine, and Douglas-fir all have a fairly large portion of their volume in mid-diameter and large-diameter classes, up to 30 inches d.b.h. and larger (fig. 7). These tree sizes give some idea of the utilization potential and processing requirements for Colorado timber.

tree size is an indicator of potential use.

Traditionally, smaller size trees, particularly lodgepole pine, have been important for posts, corral rails, and similar small roundwood products. Ponderosa pine and Douglas-fir also provide these products in lower elevation areas outside of lodgepole range. Aspen is also occasionally used for corral rails and other "aboveground" uses, but it is considerably less durable than the pines. Ponderosa pine, Douglas-fir, and Engelmann spruce have provided most of the sawlog products, but lodgepole pine also became an important source with the adoption of high-speed mills geared to efficient processing of small logs. Detailed data on sawlog volume by diameter and total number of trees by diameter class are provided in the appendix tables.

Table 7--Net volume of sawtimber (International ¼-inch rule) on timberland by ownership class and species, Colorado, 1983

Species	Ownership class			Total
	National Forest	Other public	Nonindustrial private	
- - - Million board feet, International ¼-inch rule - - -				
Douglas-fir	2,142.1	1,722.3	2,038.7	5,903.1
Ponderosa pine	2,040.0	738.2	3,956.5	6,734.7
Lodgepole pine	7,123.0	747.8	1,252.2	9,123.0
Limber pine	29.7	25.8	123.7	179.2
Subalpine fir	5,110.2	379.2	437.6	5,927.0
White fir	924.2	72.6	299.9	1,296.7
Engelmann spruce	21,941.4	880.5	2,581.0	25,402.9
Other softwoods	174.4	21.1	83.1	278.6
Total softwoods	39,485.0	4,587.5	10,772.7	54,845.2
Aspen	2,989.0	402.1	1,505.5	4,896.6
Cottonwood	31.3	13.6	252.5	297.4
Other hardwoods	0.2	--	--	0.2
Total hardwoods	3,020.5	415.7	1,758.0	5,194.2
All species	42,505.5	5,003.2	12,530.7	60,039.4

Table 8--Net volume of growing stock on timberland by species and diameter class, Colorado, 1983

Species	Diameter class (inches at breast height)													All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
----- Million cubic feet -----														
Douglas-fir	102.6	188.6	211.7	208.7	184.5	170.7	125.3	95.4	72.7	40.8	34.4	23.4	47.9	1,506.7
Ponderosa pine	63.2	154.2	189.9	248.9	278.3	214.8	137.3	93.7	68.7	60.0	37.8	42.7	78.2	1,667.7
Lodgepole pine	462.2	726.0	708.2	544.5	356.2	158.9	85.3	31.0	6.5	3.8	0.5	0.9	--	3,084.0
Limber pine	4.9	8.9	6.6	11.8	5.4	4.8	5.5	2.7	0.6	0.1	0.9	1.1	0.9	54.2
Subalpine fir	285.0	331.2	332.0	248.1	178.8	156.7	113.0	68.7	37.3	24.1	10.0	4.1	1.3	1,790.3
White fir	16.4	30.7	30.7	35.2	35.0	31.5	18.8	20.1	17.5	19.3	10.2	18.7	21.2	305.3
Engelmann spruce	286.3	486.0	629.3	723.5	679.6	632.6	545.8	421.0	346.5	252.7	171.0	106.2	133.2	5,413.7
Other softwoods	10.1	11.3	17.9	13.1	13.0	10.5	3.6	1.1	1.6	0.3	0.3	0.3	--	83.1
Total softwoods	1,230.7	1,936.9	2,126.3	2,033.8	1,730.8	1,380.5	1,034.6	733.7	551.4	401.1	265.1	197.4	282.7	13,905.0
Aspen	533.0	705.1	717.8	427.6	260.5	132.9	70.0	28.6	10.7	6.7	--	0.3	--	2,893.2
Cottonwood	5.2	11.3	20.7	11.1	2.9	11.8	6.1	6.1	5.2	--	0.6	1.0	17.6	99.6
Other hardwoods	--	0.2	0.2	(1)	--	--	--	(1)	--	--	--	--	--	0.4
Total hardwoods	538.2	716.6	738.7	438.7	263.4	144.7	76.1	34.7	15.9	6.7	0.6	1.3	17.6	2,993.2
All species	1,768.9	2,653.5	2,865.0	2,472.5	1,994.2	1,525.2	1,110.7	768.4	567.3	407.8	265.7	198.7	300.3	16,898.2

(1) Less than 0.05 million cubic feet.

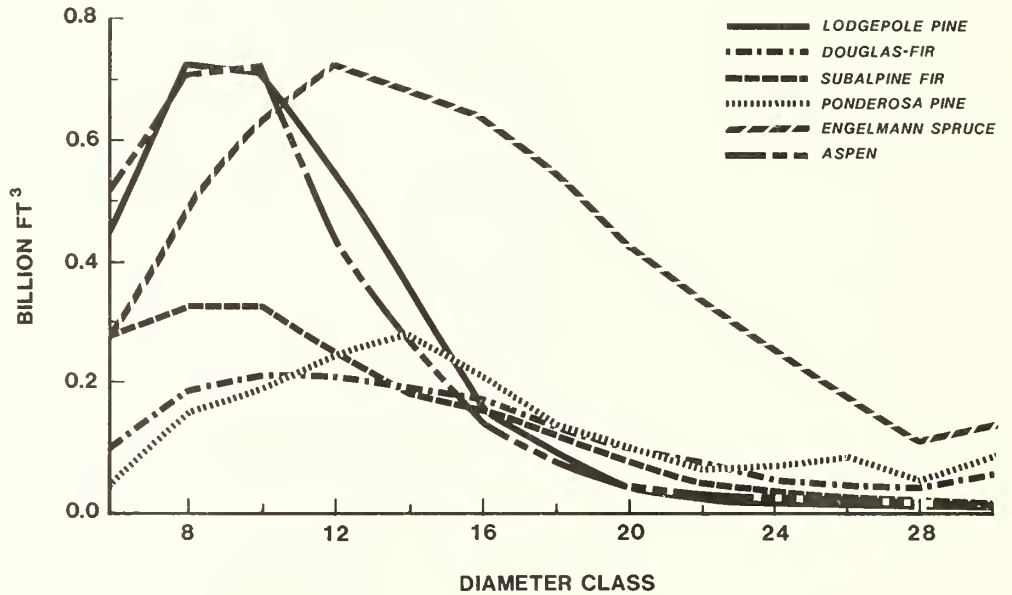


Figure 7—Distribution of growing-stock volume by diameter class of six principal species.

Impacts and Changes

Changes in the forest resource are a reflection of...

You can never walk through the same forest twice: a simple way to say the forest is in a continual state of change. The vegetation grows and dies, and the other physical components are continually being modified. The changes can be "natural" or "human induced" and come sometimes slowly and subtly, sometimes suddenly and drastically. The latter are the most spectacular and, whether from logging, fire, or weather, impact all components of the forest environment.

In terms of wood production, the amount of new wood grown over some specified period is thought to be a good indicator of the nature and condition of the timberlands. By convention, the growth is expressed in some unit of volume per year.

growth, mortality, and removals.

There are three major factors that affect the forest in terms of future wood volumes: how much **grows**, how much **dies**, and how much is **removed**.

Net growth was over 272 million cubic feet in 1982.

Net Growth—In 1982 Colorado's timberlands grew about 350.4 million cubic feet of wood including 1.4 billion board feet (International 1/4-inch rule) of sawtimber. Unfortunately, during that same year, trees containing some 77.6 million cubic feet (275 million board feet of sawtimber) died from one cause or another. That was about 22 percent of the year's growth. This left a net increase in wood volume of about 272.8 million cubic feet.

This net growth, however, exceeds the estimated harvest in both sawtimber and growing-stock volume, so there is a net annual increase in inventory of about 1.5 percent in growing-stock and 1.9 percent in sawtimber volumes. The hardwood inventory is increasing at a faster rate than inventory for softwoods. The timber harvest volume indicated should be considered an estimate that probably somewhat understates total removal from growing stock (table 9). Harvest data are based on volume of wood received by wood-using plants and on green fuelwood harvest. Trees damaged in harvest, logs missed in yarding, and other growing-stock reductions through thinnings, clearing for roads, powerlines, and so forth, are not measured by these harvest figures.

Table 9--Net growth, removal, and change in growing stock in Colorado by ownership, 1982

	Owner class			Total
	National Forest	Other public	Private	
	- - - - - Million cubic feet - - - - -			
Net growth	162.4	27.9	82.6	272.8
Harvest ¹	17.3	1.2	5.8	24.3
Net change	145.1	26.7	77.1	248.5
Percent of inventory				
Harvest	-0.16%	-0.07%	-0.14%	0.14%
Change	+1.30%	+1.67%	+1.85%	+1.47%

¹Estimated from McLain (1985) and McLain and Booth (1985). Growing-stock harvest includes sawlog volumes and green (live) fuelwood.

Actual growth is less than "potential" overall...

but private lands are producing slightly better.

When the productive potential of the timberland is compared to actual growth, it appears that all ownerships are growing timber at less than potential, averaging 25 cubic feet per acre per year total (gross) growth compared to the average productive potential of 42 cubic feet per acre per year for all lands (fig. 8). Productivity is fairly similar for all ownerships, but private lands are producing somewhat better, with gross growth about 63 percent of potential and net about 53 percent. This compares to 57 percent gross and 42 percent net for National Forest and other public lands.

In absolute terms, National Forests are incurring considerably more mortality and growth and producing more harvest than are other ownerships. However, in proportion to their total inventory, net growth and harvest are quite similar among all owners, with harvest considerably less than net growth, and less than 1 percent of growing-stock inventory (table 10).

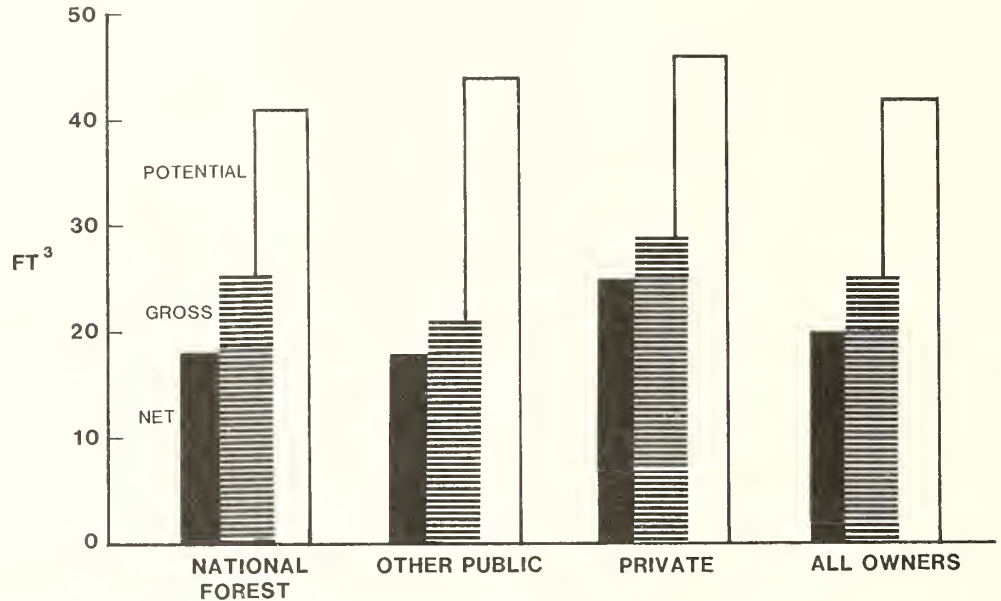


Figure 8—Annual growth per acre per year of growing stock: potential, gross, and net, by ownership class, 1982.

Table 10--Summary of components of change, Colorado timberland, 1982

Component	Growing stock			Sawtimber		
	Total	Softwood	Hardwood	Total	Softwood	Hardwood
	- - Million cubic feet - -			- - - - Million board feet, - - - International ¼-inch rule		
Gross growth	350.4	257.3	93.1	1,534	1,243	291
Mortality	77.6	60.4	17.2	275	252	23
Net growth	272.8	196.9	75.9	1,259	991	268
Timber harvest ¹	24.3	20.8	3.5	123.6	108.4	15.2
Net change	248.5	176.1	72.4	1,135.4	882.6	252.8
Change as percent of inventory	+1.47%	+1.27%	+2.42%	+1.89%	+1.61%	+4.91%

¹Estimated from McLain (1985) and McLain and Booth (1985). Growing-stock harvest includes sawlog volumes and green (live) fuelwood. Sawtimber volume includes only sawlogs. Other removals such as damaged or other growing stock not removed, and thinnings, land clearing, etc., not included.

Insects and disease are major killers.

Mortality—Insects and disease are the two leading identified causes of mortality, each contributing about one-fourth of the total. Weather accounts for an additional 11 percent of all mortality. Fire, animal damage, logging, and suppression are relatively minor, but the exact cause or causes for nearly a third of the losses could not be identified. Many destructive agents attack trees in concert or in succession, making it difficult to identify the actual causal agent. When the primary cause of death cannot be determined, it is listed as unknown.

Cause of death	Percent of growing-stock mortality
Insects	25
Disease	25
Weather	11
Animal	2
Suppression	2
Logging	2
Fire	1
Unknown	32

The mortality rate for a few species is higher than average.

In total, mortality amounted to about 0.46 percent of the inventory volume. The loss for most species was considerably less, but subalpine fir with 1.1 percent mortality, white fir with 0.7 percent, and aspen with 0.6 percent are all suffering a higher rate of mortality than the average. Detailed data on cause of death by species for growing stock and sawtimber are presented in the appendix.

The timber growth picture has improved...

Removals—In their 1964 survey report Miller and Choate noted that increased management and harvest levels could better help capture the growth potential of Colorado's forest land. Even though figure 9 data are crude and are an average of both "healthy," vigorous stands and stands still deteriorating, it appears that some progress has been made toward improving the timber growth picture. Currently, the harvest level is substantially below growth indicating a potential for again expanding the harvest.

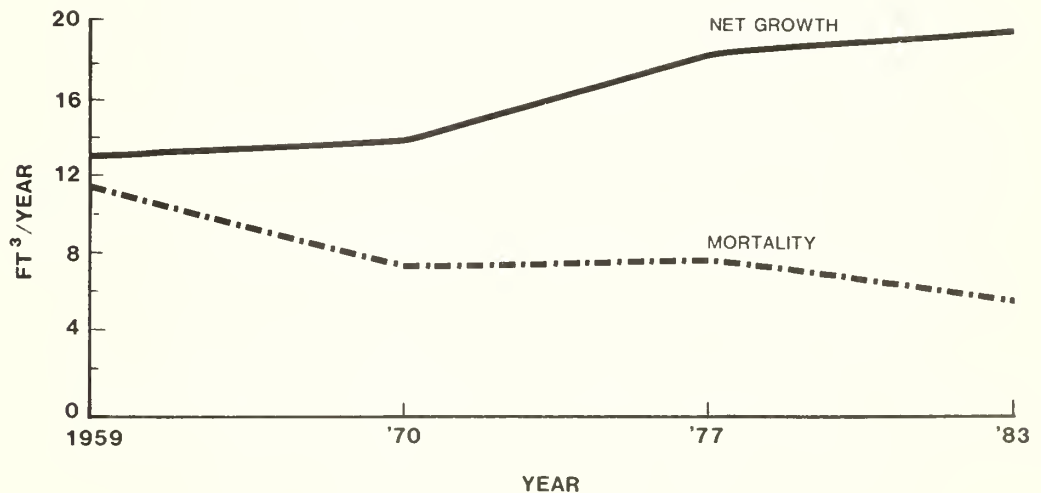


Figure 9—Comparison of net growth and mortality on timberland, 1959-1970, 1977, and 1983.

with harvest levels peaking in 1970.

Nearly 20 million cubic feet of roundwood products were removed in 1982...

but fuelwood harvest was twice that amount...

most of it dead material.

Figure 10 shows general trends of Colorado timber harvest for intermittent years over the past 3 decades. Methods of reporting were not completely comparable from year to year, but it is evident the harvest level peaked about 1970 and has since declined. Data on volume removals from growing-stock trees are available for only two other points in time (1970 and 1976), but product output gives a general picture of the downward trend.

In 1982 removals from growing stock amounted to about 25 million cubic feet (table 11). Of that amount, 78.4 percent (19.5 million cubic feet) were roundwood products. Another 4.0 million cubic feet went for fuelwood and roughly 1.4 million cubic feet were left at the logging sites as residues. However, the total volume of wood harvested is significantly greater than the figures indicate because harvest of dead trees is not included. And there was a lot of dead wood removed from the forest.

Of the approximately 1.3 billion cubic feet of volume available in salvable dead trees, about 31.5 million cubic feet was harvested in 1982. That represents only 2.4 percent of the total, but it is a substantial amount and of some interest because nearly all of it (95 percent) was for fuelwood (McLain and Booth 1985). That brought the total fuelwood harvest from timberlands to 34.9 million cubic feet. If you add to that amount the 6.5 million cubic feet of fuelwood removed from other forest land, principally the woodlands, the total fuelwood harvest statewide was about 42.4 million cubic feet, more than twice the industrial roundwood harvest for the same year.

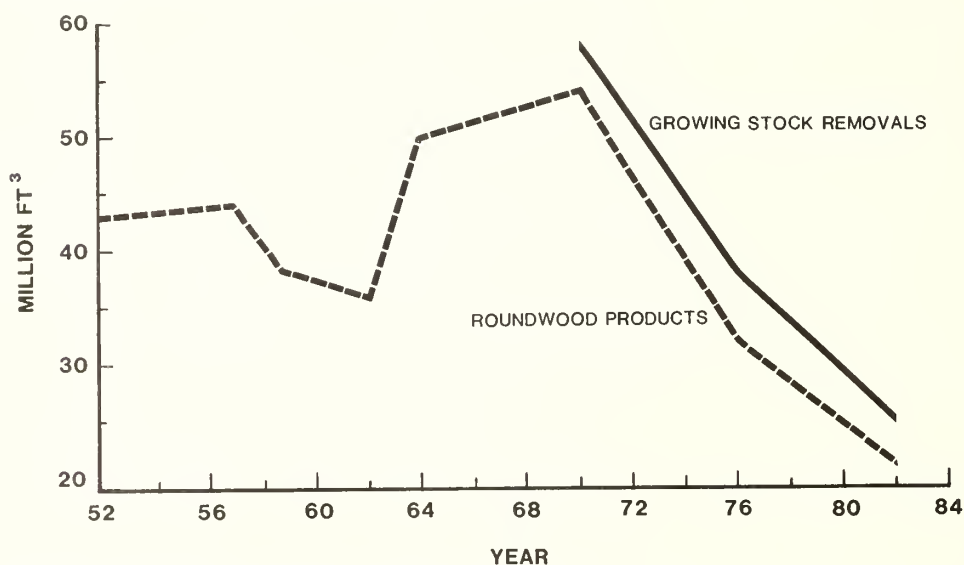


Figure 10—Products output and growing-stock removals, selected years.

Table 11--Annual removals from growing stock and sawtimber on timberland in Colorado by source, 1982

Source	Growing stock Thousand cubic feet	Sawtimber	
		Thousand board feet (Scribner rule)	Thousand board feet (International 1/4-inch rule)
Roundwood products			
Sawlogs	18,606	89,352	106,562
Other industrial	939	2,684	3,190
Total	19,545	92,036	109,752
Fuelwood	3,970	18,708	22,301
Logging residues	1,425	2,101	2,396
Total removals	24,940	112,845	134,449

Three principal softwood species were cut, mostly from public lands.

“Paper changes” . . .

biological and physical changes . . .

and changes in inventory techniques prevent direct comparison to earlier surveys but . . .

overall, forest area has declined since 1959.

Spruce, ponderosa pine, and lodgepole pine were the principal softwood species harvested. Hardwoods accounted for only about 15 percent of the growing-stock removals and most of it was aspen (table 12). Over 76 percent of those removals came from public lands, primarily the National Forests (table 13).

Some General Trends—During the past several decades there have been two surveys of Colorado forest lands and several additional assessments of their status in intervening years. During this period there have been several important changes in Colorado’s forest resource. Some of these are “paper changes” such as change in classifications of forest land and in definitions used in describing the forest resource. These changes are nevertheless important in that they determine the status and availability of forest resources for various uses. In addition, there are physical and biological changes due to growth, harvest, and other resource use activities.

Because of changes in definitions, and because of sampling errors, improvements in analysis techniques, and other factors, it is not possible to make precise comparisons of past surveys and analyses. However, comparison of some items provides insight into changes, even with approximations instead of precisely comparable data. Following are some comparisons of data from various analyses of Colorado forests made in recent decades.

The only previous field survey, reported in 1964 (Miller and Choate), showed about 22.6 million acres of forest land of which about 12.3 million was classed as commercial, using then-existing standards. Since then, area of forest land has appeared to decrease slightly (1970 and 1977 acreage estimates were based on adjustments to original data;

Table 12--Annual removals from growing stock and sawtimber on timberland in Colorado by species, 1982¹

Species	Growing stock Thousand cubic feet	Sawtimber	
		Thousand board feet (Scribner rule)	Thousand board feet (International ¼-inch rule)
Spruce	8,060.8	37,173.0	44,297.1
Ponderosa pine	7,321.7	33,494.3	39,901.2
Lodgepole pine	3,657.4	15,447.0	18,403.0
Douglas-fir	1,301.3	5,991.8	7,140.0
Fir	857.9	3,597.3	4,286.7
Other softwoods	12.0	53.0	63.2
Total softwoods	21,211.1	95,756.4	114,091.2
Aspen	3,400.1	15,593.9	18,578.3
Cottonwood	328.5	1,501.8	1,788.9
Total hardwoods	3,728.6	17,095.7	20,367.2
Total all species	24,939.7	112,852.1	134,458.4

¹Includes fuelwood.

Table 13--Annual removals from growing stock and sawtimber on timberlands in Colorado by ownership group, 1982

Ownership group	Growing stock Thousand cubic feet	Sawtimber	
		Thousand board feet (Scribner rule)	Thousand board feet (International ¼-inch rule)
Forest Service	17,860.2	81,900.7	97,590.9
Other public	1,217.4	5,391.8	6,424.1
Private	5,862.1	25,559.7	30,443.3
Total volume	24,939.7	112,852.2	134,458.3

USDA FS 1973, 1982). Commercial forest land declined slightly, but the 1983 survey shows an increase due to the reclassification of some low-productivity Forest Service lands and the elimination of the term "commercial forest land."

	Forest land	Timberland
	----- Million acres -----	
1959	22.6	12.3
1970	22.5	12.3
1977	22.3	12.1
1983	21.5	13.8

During the period of these analyses, definitions and classifications of land shifted as areas were classified for wilderness study and other land-use categories were changed. Details of these are available in previous reports (Green and Setzer 1974; Green and Van Hooser 1983; Miller and Choate 1964).

Bearing in mind the sampling errors and definitional changes involved, figure 11 gives a general approximation of trends in timber volumes. Several features are of interest. The decline in growing-stock volume as estimated for 1970 reflects changes in status of land and definitions of commercial forests. There were also a relatively high level of harvest and large-scale losses to the Engelmann spruce bark beetle epidemic that devastated large areas of the forest. Another feature is that since 1970 growing-stock volume has continued to increase, and a larger proportion of the volume is in growing stock. This is one indication that rot, cull, and mortality are declining.

The downward trend in growing-stock volume seems reversed since 1970...

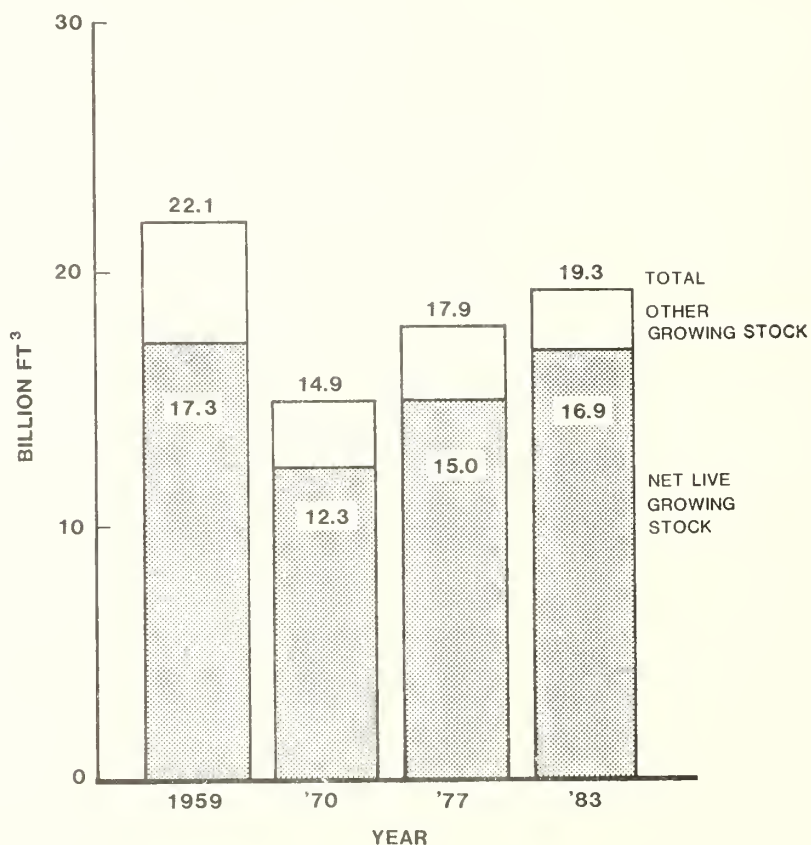


Figure 11—Comparison of total and growing-stock volumes of timber on timberland, 1959, 1970, 1977, and 1983.

due in part to lower mortality and increased growth.

Primary wood processing is a multimillion-dollar industry.

Another expression of this is in figure 9, which shows growth and mortality components for 4 years. In the first survey reported in 1959 (Miller), net growth was low, and mortality nearly equaled net growth. In the 1983 survey, mortality has dropped substantially to 5.6 cubic feet per acre per year, and net growth increased to nearly 20 cubic feet per acre per year. The intervening analyses, which used various adjustments to estimate growth and mortality, indicate a fairly consistent trend.

For a number of Colorado residents the importance of the forestry resource is in the employment generated. The most recent survey of primary forest industry employment, in 1982, showed about \$24 million in primary wood products (mostly lumber) were produced, and the estimated employment in this primary processing was about 1,000 to 1,500 (estimated from industrial roundwood volumes used and about five to six persons employed per million board feet processed; ratios developed by Charles Keegan, Bureau of Business and Economics Research, University of Montana). This does not include secondary manufacture of wood products such as furniture, prefabrication, and so on. For 1982, McLain (1985) reported 84 operating sawmills, five houselog plants, three post and pole yards, and one each excelsior plant, pole treating plant, and shake mill.

OTHER USES

This report has focused on the timber resource, but often management and harvest of timber must be planned to protect other resources such as water, wildlife, and recreation.

Recreation

Recreational use of Colorado's forest lands is increasing.

Outdoor recreation has grown rapidly throughout the Nation, and Colorado has certainly shared in this boom. Because there are many different forest land owners, both public and private, comprehensive data on that portion of outdoor recreation that occurs on forest land are generally not available. Data from two major Federal agencies—the USDA Forest Service and USDI National Park Service—give some idea of use levels and trends. Figure 12 shows that recreation on forests climbed rapidly into the late 1970's and since then has held fairly constant at about 20 million visitor days (one visitor for 12 hours). National Parks have leveled off at just under 6 million visits. Periodic data are also available for some other public land owners. The Corps of Engineers showed about 4 million visits in 1982 and State Parks about 6 to 7 million.

Much of the Corps of Engineers' recreation is related to water recreation in reservoirs, and National and State Parks include various geological and historical attractions that may not be directly related to forest land. However, the 20 million visits to

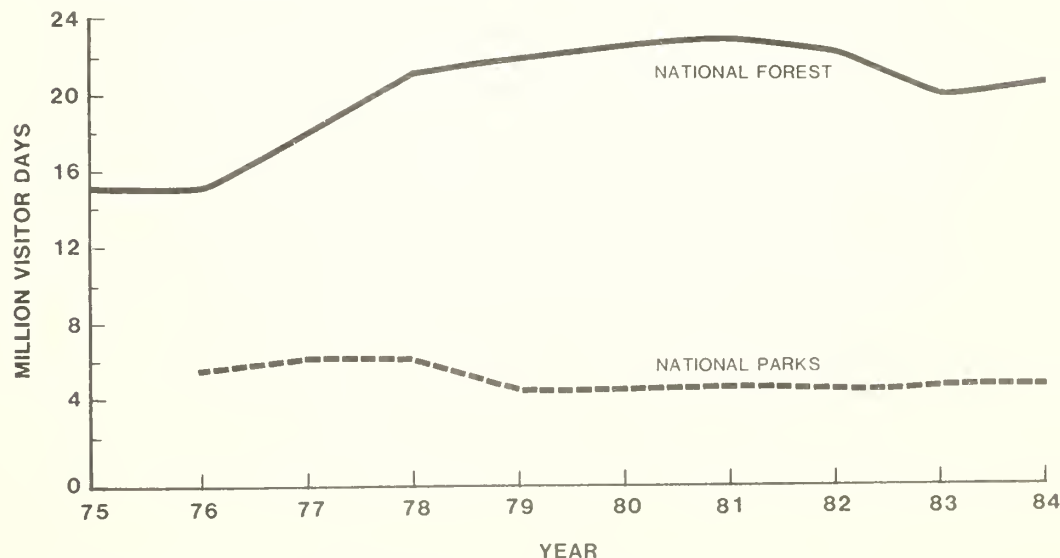


Figure 12—Recreation visits to National Forests and National Parks, 1975-84.

National Forests indicate that forests play a major role in the State's outdoor recreation picture. During the past decade, the principal activities on National Forests have been:

Camping	20 to 25 percent
Mechanized travel	22 to 25 percent
Winter sports	13 to 20 percent
Hiking, climbing	5 to 7 percent
Other: (wildlife observing, photography, sightseeing, and so forth)	29 to 32 percent

Grazing

Domestic livestock depend upon Colorado's forest lands...

Forest lands are also an important source for grazing domestic livestock. From the late 1970's to 1984, just under 1 million animal unit months of grazing have been provided in Colorado's National Forest System lands. This constitutes about 10 percent of all National Forest grazing nationwide and is of considerable importance locally to cattle-owners and sheepowners who depend on these lands for summer grazing.

as do diverse wildlife populations.

The wildlife associated with these lands is also of considerable interest. In 1982 the estimated populations of several major species on National Forest lands were:

Elk	105,950
Deer (mule deer)	182,715
Black bear	6,339
Bighorn sheep	3,676
Antelope	2,907

These animals are of prime importance to tourists and are a basic part of the compelling nature of Colorado's back country.

A CLOSING NOTE

Colorado's timberlands are the centerpiece of its attraction both as a place to live and a place to visit. Residents and visitors alike are apt to look at the forests more as an integral part of spectacular landscapes than as a source of lumber, packing crates, and bathroom tissue.

Although Colorado's forest industry historically has not been a major factor on the national scene, it has economic significance locally, and in the past it has served local uses of vital national significance. And the inventory volume in Colorado's timberlands is sufficient to support increased harvest levels and an expansion of forest industries.

However, the store of other values generated by the forests tends to temper plans for any sudden major expansion of industry requiring significant increases in timber harvests. In addition to the recreation and esthetic values, the forests of Colorado are vital watersheds that feed the major river systems flowing east and west from the State. The river systems are the lifeblood for agriculture and an increasing population in the arid Southwest and southern California.

TERMINOLOGY

Acceptable trees—Growing-stock trees meeting specified standards of size and quality but not qualifying as desirable trees.

Area condition class—A classification of timberland reflecting the degree to which the site is being utilized by growing-stock trees and other conditions affecting current and prospective timber growth (see Stocking):

Class 10—Areas fully stocked with desirable trees and not overstocked.

Class 20—Areas fully stocked with desirable trees but overstocked with all live trees.

Class 30—Areas medium to fully stocked with desirable trees and with less than 30 percent of the area controlled by other trees, or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees, or both.

- Class 40—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees, or conditions that ordinarily prevent occupancy by desirable trees, or both.
- Class 50—Areas poorly stocked with desirable trees but fully stocked with growing-stock trees.
- Class 60—Areas poorly stocked with desirable trees but with medium to full stocking of growing-stock trees.
- Class 70—Areas nonstocked or poorly stocked with desirable trees and poorly stocked with growing-stock trees.
- Class 80—Low-risk old-growth stands.
- Class 90—High-risk old-growth stands.
- Nonstocked—Areas less than 10 percent stocked with growing-stock trees.
- Basal area**—The cross-sectional area of a tree expressed in square feet. For timber species the calculation is based on diameter at breast height (d.b.h.); for woodland species it is based on diameter at root collar (d.r.c.).
- Cord**—A pile of stacked wood equivalent to 128 cubic feet of wood and air space having standard dimensions of 4 by 4 by 8 feet.
- Cull trees**—Live trees that are unmerchantable now or prospectively (see Rough trees and Rotten trees).
- Cull volume**—Portions of a tree's volume that are not usable for wood products because of rot, form, missing material, or other cubic-foot defect. Form and sound defects include severe sweep and crook, forks, extreme form reduction, large deformities, and dead material.
- Deferred forest land**—Forest lands within the National Forest System that are under study for possible inclusion in the Wilderness System.
- Desirable trees**—Growing-stock trees (1) having no serious defect in quality to limit present or prospective use for timber products, (2) of relatively high vigor, and (3) containing no pathogens that may result in death or serious deterioration within the next decade.
- Diameter at breast height (d.b.h.)**—Diameter of the stem measured at 4.5 feet above the ground.
- Diameter at root collar (d.r.c.)**—Diameter equivalent at the point nearest the ground line that represents the basal area of the tree stem or stems.
- Diameter classes**—Tree diameters, either d.b.h. or d.r.c., grouped into 2-inch classes labeled by the midpoint of the class.
- Farmer-owned lands**—Lands owned by a person who operates a farm and who either does the work or directly supervises the work.
- Forest industry lands**—Lands owned by companies or individuals operating a primary wood-processing plant.
- Forest lands**—Lands at least 10 percent stocked by forest trees of any size, including lands that formerly had such tree cover and that will be naturally or artificially regenerated. The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width at least 120 feet wide to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 feet wide.
- Forest trees**—Woody plants having a well-developed stem or stems, usually more than 12 feet in height at maturity, with a generally well-defined crown.
- Forest type**—A classification of forest land based upon and named for the tree species presently forming a plurality of live-tree stocking.
- Growing-stock trees**—Live sawtimber trees, poletimber trees, saplings, and seedlings of timber species meeting specified standards of quality and vigor; excludes cull trees.
- Growing-stock volume**—Net cubic-foot volume in live growing-stock trees from a 1-foot stump to a minimum 4.0-inch top (of central stem) outside bark or to the point where the central stem breaks into limbs.
- Growth**—See definition for Net annual growth.
- Hardwood trees**—Dicotyledonous trees, usually broad-leaved and deciduous.
- High-risk old-growth stands**—Timber stands over 100 years old in which the majority of the trees are not expected to survive more than 10 years.

Indian lands—Indian lands held in trust by the Federal Government.

Industrial wood—All commercial roundwood products except fuelwood.

Land area—The area of dry land and land temporarily or partially covered by water such as marshes, swamps, and river flood plains, streams, sloughs, estuaries, and canals less than 120 feet wide; and lakes, reservoirs, and ponds less than 1 acre in size.

Logging residues—The unused portions of growing-stock trees cut or killed by logging.

Low-risk old-growth stands—Timber stands over 100 years old in which the majority of the trees are expected to survive more than 10 years.

Miscellaneous Federal lands—Lands administered by Federal agencies other than the U.S. Department of Agriculture, Forest Service, or U.S. Department of the Interior, Bureau of Land Management.

Mortality—The net volume of growing-stock trees that have died from natural causes during a specified period.

National Forest lands—Public lands administered by the U.S. Department of Agriculture, Forest Service.

National Resource lands—Public lands administered by the U.S. Department of the Interior, Bureau of Land Management.

Net annual growth—The net average annual increase in the volume of trees during a specified period.

Net volume in board feet—The gross board-foot volume in the sawlog portion of growing-stock trees, less deductions for cull volume.

Net volume in cubic feet—Gross cubic-foot volume in the merchantable portion of trees less deductions for cull volume. For timber species, volume is computed for the merchantable stem from a 1-foot stump to a minimum 4.0-inch top diameter outside bark, or to the point where the central stem breaks into limbs. For woodland species, volume is computed outside bark (o.b.) for all woody material above d.r.c. that is larger than 1.5 inches in diameter (o.b.).

Nonforest lands—Lands that do not currently qualify as forest land.

Nonindustrial private—All private ownerships except forest industry.

Nonstocked areas—Forest land less than 10 percent stocked with live trees.

Old-growth stands—Stands of timber species over 100 years old.

Other private lands—Privately owned lands other than forest industry or farmer-owned.

Other public lands—Public lands administered by agencies other than the U.S. Department of Agriculture, Forest Service.

Other removals—The net volume of growing-stock trees removed from the inventory by cultural operations such as timber-stand improvement, by land clearing, and by changes in land use, such as a shift to wilderness.

Poletimber stands—Stands at least 10 percent stocked with growing-stock trees, in which half or more of the stocking is sawtimber or poletimber trees or both, with poletimber stocking exceeding that of sawtimber (see definition for Stocking).

Poletimber trees—Live trees of timber species at least 5.0 inches d.b.h. but smaller than sawtimber size.

Potential growth—The average net annual cubic-foot growth per acre at culmination of mean annual growth attainable in fully stocked natural stands.

Primary wood-processing plants—Plants using roundwood products such as sawlogs, pulpwood bolts, veneer logs, and so forth.

Productivity class—A classification of forest land that reflects biological potential. For timberland, the index used is the potential net annual growth at culmination of mean annual increment in fully stocked natural stands. For woodland, site characteristics such as soil depth and aspect, which affect the land's ability to produce wood, are used. Furthermore, woodland is classified as high site where sustained wood production is likely, or low site where the continuous production of wood is unlikely.

Removals—The net volume of growing-stock trees removed from the inventory by harvesting, cultural operations, land clearings, or changes in land use.

Reserved forest land—Forest land withdrawn from tree utilization through statute or administrative designation.

Residues:
 Coarse residues—Plant residues suitable for chipping, such as slabs, edgings, and ends.
 Fine residues—Plant residues not suitable for chipping, such as sawdust, shavings, and veneer clippings.
 Plant residues—Wood materials from primary manufacturing plants that are not used for any product.

Rotten trees—Live poletimber or sawtimber trees with more than 67 percent of their total volume cull (cubic-foot) and with more than half of the cull volume attributable to rotten or missing material.

Rough trees—Live poletimber or sawtimber trees with more than 67 percent of their total volume cull (cubic-foot) and with less than half of the cull volume attributable to rotten or missing material.

Roundwood—Logs, bolts, or other round sections cut from trees.

Salvable dead trees—Standing or down dead trees that are currently merchantable by regional standards.

Saplings—Live trees of timber species 1.0 to 4.9 inches d.b.h. or woodland species 1.0 to 2.9 inches d.r.c.

Sapling and seedling stands—Timberland stands at least 10 percent stocked on which more than half of the stocking is saplings or seedlings or both.

Sawlog portion—That part of the bole of sawtimber trees between a 1-foot stump and the sawlog top.

Sawlog top—The point on the bole of sawtimber trees above which a sawlog cannot be produced. The minimum sawlog top is 7.0 inches diameter o.b. for softwoods, and 9.0 inches diameter o.b. for hardwoods.

Sawtimber stands—Stands at least 10 percent stocked with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Sawtimber trees—Live trees of timber species meeting regional size and defect specifications. Softwood trees must be at least 9.0 inches d.b.h. and hardwood trees 11.0 inches d.b.h.

Sawtimber volume—Net volume in board feet of the sawlog portion of live sawtimber trees.

Seedlings—Established live trees of timber species less than 1.0 inch d.b.h. or woodland species less than 1.0 inch d.r.c.

Softwood trees—Monocotyledonous trees, usually evergreen, having needle or scalelike leaves.

Standard error—An expression of the degree of confidence that can be placed on an estimated total or average obtained by statistical sampling methods. Standard errors do not include technique errors that could occur in photo classification of areas, field measurements, or compilation of data.

Stand-size classes—A classification of forest land based on the predominant size of trees present (see Sawtimber stands, Poletimber stands, and Sapling and seedling stands).

State, county, and municipal lands—Lands administered by States, counties, and local public agencies, or lands leased by these governmental units for more than 50 years.

Stocking—An expression of the extent to which growing space is effectively utilized by present or potential growing-stock trees of timber species. Percentage stocking is the ratio of actual stocking to full stocking for comparable sites and stands, using basal area as the basis for comparison.

Timberland—Forest land where timber species make up at least 10 percent stocking.

Timber species—Tree species traditionally used for industrial wood products. In the Rocky Mountain States, these include aspen and cottonwood hardwood species and all softwood species except pinyon and juniper.

Timber stand improvement—Treatments such as thinning, pruning, release cutting, girdling, weeding, or poisoning of unwanted trees aimed at improving growing conditions for the remaining trees.

- Upper-stem portion**—That part of the main stem or fork of sawtimber trees above the sawlog top to a minimum top diameter of 4.0 inches outside bark or to the point where the main stem or fork breaks into limbs.
- Water**—Streams, sloughs, estuaries, and canals more than 120 feet wide, and lakes, reservoirs, and ponds more than 1 acre in size at mean high water level.
- Wilderness**—An area of undeveloped land currently included in the Wilderness System, managed so as to preserve its natural conditions and retain its primeval character and influence.
- Woodland**—Forest land where timber species make up less than 10 percent stocking.
- Woodland species dead volume**—Net volume of dead woodland trees and dead net volume portion of live woodland tree species.
- Woodland species live volume**—Net cubic-foot volume in live woodland tree species.
- Woodland species**—Tree species not usually converted into industrial wood products. Common uses are fuelwood, fenceposts, and Christmas trees.

REFERENCES

- Clawson, Marion; Van Doren, Carlton, eds. 1984. Statistics on outdoor recreation. Washington, DC: Resources for the Future, Inc. 368 p.
- Green, Alan W.; Setzer, Theodore S. 1974. The Rocky Mountain timber situation. Resour. Bull. INT-10. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 78 p.
- Green, Alan W.; Van Hooser, Dwane D. 1983. Forest resources of the Rocky Mountain States. Resour. Bull. INT-33. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 127 p.
- McLain, William H.; Booth, Gordon D. 1985. Colorado's 1982 fuelwood harvest. Resour. Bull. INT-36. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 11 p.
- McLain, William H. 1985. Colorado's industrial roundwood production and mill residues, 1982. Resour. Bull. INT-35. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 13 p.
- Miller, Robert C.; Choate, Grover A. 1964. The forest resource of Colorado. Resour. Bull. INT-3. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain and Intermountain Forest and Range Experiment Stations. 54 p.
- Miller, Robert C. 1959. Lumber production in Colorado, 1957. Forest Survey Release Number 1. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 9 p.
- Setzer, Theodore S.; Wilson, Alvin K. 1966. Timber products in the Rocky Mountain States. Resour. Bull. INT-9. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 89 p.
- Spencer, John S., Jr.; Farrenkopf, Thomas O. 1964. Timber products output in Colorado, Wyoming and Western South Dakota, 1962. Res. Pap. INT-14. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 18 p.
- U.S. Department of Agriculture, Forest Service. 1973. The outlook for timber in the United States. For. Resour. Rep. 20. Washington, DC: U.S. Department of Agriculture, Forest Service. 367 p.
- U.S. Department of Agriculture, Forest Service. 1978. Forest statistics of the U.S. Washington, DC: U.S. Department of Agriculture, Forest Service. 133 p.
- U.S. Department of Agriculture, Forest Service. 1982. An analysis of the timber situation in the United States 1952-2030. For. Resour. Rep. 23. Washington, DC: U.S. Department of Agriculture, Forest Service. 499 p.
- U.S. Department of Agriculture, Forest Service. 1985. Report of the Forest Service, 1984. Washington, DC: U.S. Department of Agriculture, Forest Service. 153 p.
- U.S. Department of Agriculture, Forest Service. [Various years.] Grazing statistical summary. Washington, DC: U.S. Department of Agriculture, Forest Service.
- U.S. Department of the Interior, National Parks Service. [Various years.] Statistical abstract. Denver, CO: U.S. Department of the Interior, National Park Service, Statistical Office, National Service Center.

APPENDIX: TABLES 14-38

Table 14--Area of other public and privately owned forest land, excluding National Forest, with percent standard error, Colorado, 1983

Item	Softwoods		Hardwoods		All types	
	Thousand acres	Percent standard error	Thousand acres	Percent standard error	Thousand acres	Percent standard error
Timberland	3,663.8	± 2.3	1,216.4	± 4.8	4,880.2	± 1.8
Woodland ¹	5,092.8	± 1.8	715.8	±10.4	5,808.6	± 1.9
Reserved forest land: ²						
Timberland	214.6		19.3		233.9	
Woodland ¹	187.5		24.6		212.1	
Total forest land	9,158.7		1,976.1		11,134.8	

¹Woodland area is reported on this table and tables 4 and 5 only. No volume tables will be included in this report for woodland.

²Reserved land areas are estimated from aerial photos without field verification. Therefore, standard errors are not calculated.

Table 15--Net volume, net annual growth, and annual mortality of growing stock and sawtimber on other public and privately owned timberland, excluding National Forest, with percent standard error, Colorado

Item	Softwoods		Hardwoods		All types	
	Volume	Percent standard error	Volume	Percent standard error	Volume	Percent standard error
Net volume, 1983:						
Growing stock (Million cubic feet)	4,419.3	± 3.8	1,355.7	± 7.3	5,775.0	± 3.3
Sawtimber ¹ (Million board feet)	15,360.2	± 4.5	2,173.7	±13.3	17,533.9	± 4.3
Sawtimber ² (Million board feet)	13,037.1	± 4.5	1,849.2	±13.3	14,886.3	± 4.3
Net annual growth, 1982:						
Growing stock (Thousand cubic feet)	81,802	± 5.8	28,641	±10.7	110,443	± 5.1
Sawtimber ¹ (Thousand board feet)	330,402	± 6.9	123,512	±23.2	453,914	± 8.2
Sawtimber ² (Thousand board feet)	279,262	± 6.9	105,961	±23.1	385,223	± 8.2
Annual mortality, 1982:						
Growing stock (Thousand cubic feet)	10,548	±14.6	9,842	±19.3	20,390	±12.3
Sawtimber ¹ (Thousand board feet)	39,381	±17.5	11,093	±39.5	50,474	±16.9
Sawtimber ² (Thousand board feet)	33,464	±17.4	9,418	±39.3	42,882	±16.8

¹International ¼-inch rule.

²Scribner rule.

Table 16--Area of timberland by forest type, stand-size class, and productivity class, Colorado, 1983

Forest type and stand-size class	Productivity class					Total acres
	120-164	85-119	50-84	20-49	0-19	
----- Thousand acres -----						
Douglas-fir:						
Sawtimber	--	24.4	438.4	661.2	10.7	1,134.7
Poletimber	--	--	97.0	214.3	--	311.3
Sapling and seedling	--	--	14.4	27.3	--	41.7
Nonstocked	--	--	22.4	94.3	5.7	122.4
Total	--	24.4	572.2	997.1	16.4	1,610.1
Ponderosa pine:						
Sawtimber	5.8	18.7	272.3	1,371.7	9.0	1,677.5
Poletimber	--	--	30.1	243.1	--	273.2
Sapling and seedling	--	--	0.4	25.2	5.8	31.4
Nonstocked	--	--	41.8	485.0	19.5	546.3
Total	5.8	18.7	344.6	2,125.0	34.3	2,528.4
Lodgepole pine:						
Sawtimber	--	16.3	163.0	625.7	--	805.0
Poletimber	--	8.2	40.7	620.0	20.7	689.6
Sapling and seedling	--	--	13.3	198.1	--	211.4
Nonstocked	--	--	--	39.5	--	39.5
Total	--	24.5	217.0	1,483.3	20.7	1,745.5
Limber pine:						
Sawtimber	--	--	--	37.6	16.9	54.5
Poletimber	--	--	--	1.4	--	1.4
Sapling and seedling	--	--	--	1.2	--	1.2
Nonstocked	--	--	--	--	1.0	1.0
Total	--	--	--	40.2	17.9	58.1
Spruce-subalpine fir:						
Sawtimber	--	11.4	67.0	75.8	4.5	158.7
Poletimber	--	--	28.5	15.1	--	43.6
Sapling and seedling	--	5.8	14.9	23.9	--	44.6
Nonstocked	--	--	1.4	5.8	7.5	14.7
Total	--	17.2	111.8	120.6	12.0	261.6

(con.)

Table 16--(con.)

Forest type and stand-size class	Productivity class					Total acres
	120-164	85-119	50-84	20-49	0-19	
----- Thousand acres -----						
White fir:						
Sawtimber	1.4	8.8	28.3	33.7	--	72.2
Poletimber	--	--	11.3	6.1	--	17.4
Sapling and seedling	--	10.3	9.2	6.3	--	25.8
Nonstocked	--	3.8	--	--	--	3.8
Total	1.4	22.9	48.8	46.1	--	119.2
Spruce:						
Sawtimber	2.3	198.5	1,115.7	873.8	7.2	2,197.5
Poletimber	--	5.1	120.1	158.6	--	283.8
Sapling and seedling	--	24.9	112.6	99.7	--	237.2
Nonstocked	--	14.0	57.6	115.5	--	187.1
Total	2.3	242.5	1,406.0	1,247.6	7.2	2,905.6
Aspen:						
Sawtimber	--	94.2	295.0	417.0	7.6	813.8
Poletimber	--	29.7	486.3	855.7	36.7	1,408.4
Sapling and seedling	--	1.0	94.2	293.4	46.4	435.0
Nonstocked	--	2.2	72.8	308.8	10.8	394.6
Total	--	127.1	948.3	1,874.9	101.5	3,051.8
Cottonwood:						
Sawtimber	--	--	70.9	10.6	--	81.5
Poletimber	--	--	24.2	--	--	24.2
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	95.1	10.6	--	105.7
All types:						
Sawtimber	9.5	372.3	2,450.6	4,107.1	55.9	6,995.4
Poletimber	--	43.0	838.2	2,114.3	57.4	3,052.9
Sapling and seedling	--	42.0	259.0	675.1	52.2	1,028.3
Nonstocked	--	20.0	196.0	1,048.9	44.5	1,309.4
Total	9.5	477.3	3,743.8	7,945.4	210.0	12,386.0 ¹

¹Does not include 1,447.5 thousand acres of productivity class 0-19 for National Forest lands as this information was not available by stand-size class for this report.

Table 17--Area of National Forest timberland by forest type, stand-size class, and productivity class, Colorado, 1983

Forest type and stand-size class	Productivity class					Total acres
	120-164	85-119	50-84	20-49	0-19	
----- Thousand acres -----						
Douglas-fir:						
Sawtimber	--	7.2	247.3	243.1		497.6
Poletimber	--	--	87.0	83.7		170.7
Sapling and seedling	--	--	8.7	2.8		11.5
Nonstocked	--	--	13.8	36.9		50.7
Total	--	7.2	356.8	366.5	118.6	730.5 ¹
Ponderosa pine:						
Sawtimber	--	--	69.1	463.2		532.3
Poletimber	--	--	18.0	82.6		100.6
Sapling and seedling	--	--	0.4	10.3		10.7
Nonstocked	--	--	22.5	286.1		308.6
Total	--	--	110.0	842.2	192.0	952.2 ¹
Lodgepole pine:						
Sawtimber	--	9.1	75.8	520.5		605.4
Poletimber	--	--	27.5	409.5		437.0
Sapling and seedling	--	--	13.3	176.3		189.6
Nonstocked	--	--	--	38.1		38.1
Total	--	9.1	116.6	1,144.4	236.9	1,270.1 ¹
Limber pine:						
Sawtimber	--	--	--	19.4		19.4
Poletimber	--	--	--	--		--
Sapling and seedling	--	--	--	1.2		1.2
Nonstocked	--	--	--	--		--
Total	--	--	--	20.6	6.3	20.6 ¹
Spruce-subalpine fir:						
Sawtimber	--	--	--	--		--
Poletimber	--	--	--	--		--
Sapling and seedling	--	--	--	--		--
Nonstocked	--	--	--	--		--
Total	--	--	--	--	--	--

(con.)

Table 17--(con.)

Forest type and stand-size class	Productivity class					Total acres
	120-164	85-119	50-84	20-49	0-19	
----- Thousand acres -----						
White fir:						
Sawtimber	--	--	0.1	0.1		0.2
Poletimber	--	--	2.7	3.6		6.3
Sapling and seedling	--	--	--	--		--
Nonstocked	--	--	--	--		--
Total	--	--	2.8	3.7	--	6.5 ¹
Spruce:						
Sawtimber	2.3	177.4	953.6	776.6		1,909.9
Poletimber	--	0.4	119.4	139.3		259.1
Sapling and seedling	--	24.9	112.6	91.2		228.7
Nonstocked	--	14.0	57.6	115.5		187.1
Total	2.3	216.7	1,243.2	1,122.6	517.1	2,584.8 ¹
Aspen:						
Sawtimber	--	38.7	203.5	336.9		579.1
Poletimber	--	11.0	241.9	491.5		744.4
Sapling and seedling	--	--	53.5	201.3		254.8
Nonstocked	--	2.2	64.1	296.5		362.8
Total	--	51.9	563.0	1,326.2	376.6	1,941.1 ¹
Cottonwood:						
Sawtimber	--	--	--	--		--
Poletimber	--	--	--	--		--
Sapling and seedling	--	--	--	--		--
Nonstocked	--	--	--	--		--
Total	--	--	--	--	--	--
All types:						
Sawtimber	2.3	232.4	1,549.4	2,359.8		4,143.9
Poletimber	--	11.4	496.5	1,210.2		1,718.1
Sapling and seedling	--	24.9	188.5	483.1		696.5
Nonstocked	--	16.2	158.0	773.1		947.3
Total	2.3	284.9	2,392.4	4,826.2	1,447.5	7,505.8 ¹

¹Does not include the 0-19 productivity class totals as this information was not available by stand-size class for this report.

Table 18--Area of other publicly owned timberland by forest type, stand-size class, and productivity class, Colorado, 1983

Forest type and stand-size class	Productivity class					Total acres
	120-164	85-119	50-84	20-49	0-19	
- - - - - Thousand acres - - - - -						
Douglas-fir:						
Sawtimber	--	17.2	88.6	218.5	3.9	328.2
Poletimber	--	--	2.9	36.2	--	39.1
Sapling and seedling	--	--	5.7	20.7	--	26.4
Nonstocked	--	--	4.7	44.6	5.7	55.0
Total	--	17.2	101.9	320.0	9.6	448.7
Ponderosa pine:						
Sawtimber	5.8	0.7	28.4	166.2	5.2	206.3
Poletimber	--	--	0.7	14.8	--	15.5
Sapling and seedling	--	--	--	1.9	5.8	7.7
Nonstocked	--	--	0.5	53.3	19.5	73.3
Total	5.8	0.7	29.6	236.2	30.5	302.8
Lodgepole pine:						
Sawtimber	--	2.2	27.5	45.9	--	75.6
Poletimber	--	0.7	7.8	86.0	8.8	103.3
Sapling and seedling	--	--	--	10.2	--	10.2
Nonstocked	--	--	--	1.4	--	1.4
Total	--	2.9	35.3	143.5	8.8	190.5
Limber pine:						
Sawtimber	--	--	--	1.8	2.0	3.8
Poletimber	--	--	--	1.4	--	1.4
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	1.0	1.0
Total	--	--	--	3.2	3.0	6.2
Spruce-subalpine fir:						
Sawtimber	--	11.4	33.4	17.3	4.5	66.6
Poletimber	--	--	17.5	10.1	--	27.6
Sapling and seedling	--	5.8	2.5	14.2	--	22.5
Nonstocked	--	--	1.4	5.8	0.6	7.8
Total	--	17.2	54.8	47.4	5.1	124.5

(con.)

Table 18--(con.)

Forest type and stand-size class	Productivity class					Total acres
	120-164	85-119	50-84	20-49	0-19	
----- Thousand acres -----						
White fir:						
Sawtimber	1.4	2.2	3.5	6.5	--	13.6
Poletimber	--	--	(1)	2.5	--	2.5
Sapling and seedling	--	0.4	0.4	2.8	--	3.6
Nonstocked	--	0.3	--	--	--	0.3
Total	1.4	2.9	3.9	11.8	--	20.0
Spruce:						
Sawtimber	--	3.0	23.4	46.0	2.2	74.6
Poletimber	--	--	0.7	11.1	--	11.8
Sapling and seedling	--	--	--	3.7	--	3.7
Nonstocked	--	--	--	--	--	--
Total	--	3.0	24.1	60.8	2.2	90.1
Aspen:						
Sawtimber	--	13.7	40.5	18.2	7.6	80.0
Poletimber	--	8.4	54.8	87.8	21.8	172.8
Sapling and seedling	--	1.0	6.8	18.9	19.8	46.5
Nonstocked	--	--	2.9	12.3	10.8	26.0
Total	--	23.1	105.0	137.2	60.0	325.3
Cottonwood:						
Sawtimber	--	--	3.4	1.3	--	4.7
Poletimber	--	--	2.2	--	--	2.2
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	5.6	1.3	--	6.9
All types:						
Sawtimber	7.2	50.4	248.7	521.7	25.4	853.4
Poletimber	--	9.1	86.6	249.9	30.6	376.2
Sapling and seedling	--	7.2	15.4	72.4	25.6	120.6
Nonstocked	--	0.3	9.5	117.4	37.6	164.8
Total	7.2	67.0	360.2	961.4	119.2	1,515.0

¹Less than 0.05 thousand acres.

Table 19--Area of nonindustrial privately owned timberland by forest type, stand-size class, and productivity class, Colorado, 1983

Forest type and stand-size class	Productivity class					Total acres
	120-164	85-119	50-84	20-49	0-19	
----- Thousand acres -----						
Douglas-fir:						
Sawtimber	--	--	102.5	199.6	6.8	308.9
Poletimber	--	--	7.1	94.4	--	101.5
Sapling and seedling	--	--	--	3.8	--	3.8
Nonstocked	--	--	3.9	12.8	--	16.7
Total	--	--	113.5	310.6	6.8	430.9
Ponderosa pine:						
Sawtimber	--	18.0	174.8	742.3	3.8	938.9
Poletimber	--	--	11.4	145.7	--	157.1
Sapling and seedling	--	--	--	13.0	--	13.0
Nonstocked	--	--	18.8	145.6	--	164.4
Total	--	18.0	205.0	1,046.6	3.8	1,273.4
Lodgepole pine:						
Sawtimber	--	5.0	59.7	59.3	--	124.0
Poletimber	--	7.5	5.4	124.5	11.9	149.3
Sapling and seedling	--	--	--	11.6	--	11.6
Nonstocked	--	--	--	--	--	--
Total	--	12.5	65.1	195.4	11.9	284.9
Limber pine:						
Sawtimber	--	--	--	16.4	14.9	31.3
Poletimber	--	--	--	--	--	--
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	--	16.4	14.9	31.3
Spruce-subalpine fir:						
Sawtimber	--	--	33.6	58.5	--	92.1
Poletimber	--	--	11.0	5.0	--	16.0
Sapling and seedling	--	--	12.4	9.7	--	22.1
Nonstocked	--	--	--	--	6.9	6.9
Total	--	--	57.0	73.2	6.9	137.1

(con.)

Table 19--(con.)

Forest type and stand-size class	Productivity class					Total acres
	120-164	85-119	50-84	20-49	0-19	
----- Thousand acres -----						
White fir:						
Sawtimber	--	6.6	24.7	27.1	--	58.4
Poletimber	--	--	8.6	--	--	8.6
Sapling and seedling	--	9.9	8.8	3.5	--	22.2
Nonstocked	--	3.5	--	--	--	3.5
Total	--	20.0	42.1	30.6	--	92.7
Spruce:						
Sawtimber	--	18.1	138.7	51.2	5.0	213.0
Poletimber	--	4.7	--	8.2	--	12.9
Sapling and seedling	--	--	--	4.8	--	4.8
Nonstocked	--	--	--	--	--	--
Total	--	22.8	138.7	64.2	5.0	230.7
Aspen:						
Sawtimber	--	41.8	51.0	61.9	--	154.7
Poletimber	--	10.3	189.6	276.4	14.9	491.2
Sapling and seedling	--	--	33.9	73.2	26.6	133.7
Nonstocked	--	--	5.8	--	--	5.8
Total	--	52.1	280.3	411.5	41.5	785.4
Cottonwood:						
Sawtimber	--	--	67.5	9.3	--	76.8
Poletimber	--	--	22.0	--	--	22.0
Sapling and seedling	--	--	--	--	--	--
Nonstocked	--	--	--	--	--	--
Total	--	--	89.5	9.3	--	98.8
All types:						
Sawtimber	--	89.5	652.5	1,225.6	30.5	1,998.1
Poletimber	--	22.5	255.1	654.2	26.8	958.6
Sapling and seedling	--	9.9	55.1	119.6	26.6	211.2
Nonstocked	--	3.5	28.5	158.4	6.9	197.3
Total	--	125.4	991.2	2,157.8	90.8	3,365.2

Table 20--Number of growing-stock trees on timberland by species and diameter class, Colorado, 1983

Species	Diameter class (inches at breast height)														All classes	
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9		29.0+
	----- Thousand trees -----															
Douglas-fir	61,354	66,208	52,673	41,400	24,250	15,422	8,640	5,969	3,323	1,918	1,163	551	381	205	299	283,756
Ponderosa pine	31,963	48,108	47,087	41,439	27,778	22,049	14,833	8,325	4,096	2,003	1,177	841	424	394	460	250,977
Lodgepole pine	136,721	172,636	164,411	103,710	55,490	27,440	12,739	4,260	1,714	468	97	47	6	7	--	679,746
Limber pine	3,649	5,309	2,817	2,079	727	879	294	210	212	93	12	1	11	19	10	16,322
Subalpine fir	200,292	134,730	82,272	53,943	32,827	15,435	7,999	4,999	2,748	1,296	619	351	123	48	17	537,699
White fir	30,464	14,951	11,585	6,818	4,016	2,752	1,600	1,042	462	375	282	234	103	171	140	74,995
Engelmann spruce	229,843	132,627	96,429	78,262	57,666	40,489	25,620	16,674	10,708	6,388	4,114	2,540	1,468	776	721	704,325
Other softwoods	4,530	3,785	3,883	2,517	2,521	1,181	824	489	129	31	50	6	7	5	--	19,958
Total softwoods	698,816	578,354	461,157	330,168	205,275	125,647	72,549	41,968	23,392	12,572	7,514	4,571	2,523	1,625	1,647	2,567,778
Aspen	302,806	287,026	241,040	129,008	73,237	27,880	11,570	4,535	1,774	571	201	97	--	4	--	1,079,749
Cottonwood	9,593	--	4,640	2,699	2,511	881	178	581	273	161	122	--	8	9	174	21,830
Other hardwoods	191	--	73	36	39	1	--	--	--	--	--	--	--	--	--	340
Total hardwoods	312,590	287,026	245,753	131,743	75,787	28,762	11,748	5,116	2,047	732	323	97	8	13	174	1,101,919
All species	1,011,406	865,380	706,910	461,911	281,062	154,409	84,297	47,084	25,439	13,304	7,837	4,668	2,531	1,638	1,821	3,669,697

Table 21--Net volume of sawtimber (Scribner rule) on timberland by ownership class and species, Colorado, 1983

Species	Ownership class			Total
	National Forest	Other public	Nonindustrial private	
	- - - - - Million board feet, Scribner rule - - - - -			
Douglas-fir	1,906.7	1,455.7	1,727.6	5,090.0
Ponderosa pine	1,815.5	630.7	3,359.0	5,805.2
Lodgepole pine	6,339.6	638.7	1,067.8	8,046.1
Limber pine	26.5	21.9	105.3	153.7
Subalpine fir	4,548.2	320.3	372.4	5,240.9
White fir	822.6	61.7	254.2	1,138.5
Engelmann spruce	19,527.9	744.8	2,189.9	22,462.6
Other softwoods	155.2	17.8	69.3	242.3
Total softwoods	35,142.2	3,891.6	9,145.5	48,179.3
Aspen	2,660.2	342.1	1,279.1	4,281.4
Cottonwood	27.8	11.8	216.2	255.8
Other hardwoods	0.2	--	--	0.2
Total hardwoods	2,688.2	353.9	1,495.3	4,537.4
All species	37,830.4	4,245.5	10,640.8	52,716.7

Table 22--Net volume of sawtimber (International 1/4-inch rule) on timberland by species and diameter class, Colorado, 1983

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
----- Million board feet, International 1/4-inch rule -----												
Douglas-fir	743.1	928.9	912.8	879.5	664.7	520.2	406.6	231.6	198.2	138.4	279.1	5,903.1
Ponderosa pine	547.9	990.1	1,327.5	1,090.2	724.7	515.6	328.2	308.4	203.2	239.7	459.2	6,734.7
Lodgepole pine	3,148.2	2,628.2	1,814.4	839.6	460.3	172.3	32.8	20.0	2.4	4.8	--	9,123.0
Limber pine	27.6	47.0	23.9	22.1	26.4	13.0	3.2	0.3	5.2	5.4	5.1	179.2
Subalpine fir	1,506.4	1,247.2	932.5	831.8	608.3	370.5	208.1	134.0	55.3	23.1	9.8	5,927.0
White fir	106.0	158.4	174.5	163.2	102.8	107.7	94.5	107.7	59.7	99.6	122.6	1,296.7
Engelmann spruce	3,100.0	3,800.5	3,671.5	3,472.6	3,023.0	2,343.0	1,993.4	1,491.1	1,024.9	648.1	834.8	25,402.9
Other softwoods	74.2	57.4	61.0	50.5	17.8	5.8	7.6	1.4	1.4	1.5	--	278.6
Total softwoods	9,253.4	9,857.7	8,918.1	7,349.5	5,628.0	4,048.1	3,074.4	2,294.5	1,550.3	1,160.6	1,710.6	54,845.2
Aspen	XXXX	2,173.1	1,366.5	714.3	384.5	162.3	56.3	37.6	--	2.0	--	4,896.6
Cottonwood	XXXX	56.3	14.4	58.4	28.9	28.3	23.6	--	2.5	4.6	80.4	297.4
Other hardwoods	XXXX	0.1	--	--	--	0.1	--	--	--	--	--	0.2
Total hardwoods	XXXX	2,229.5	1,380.9	772.7	413.4	190.7	79.9	37.6	2.5	6.6	80.4	5,194.2
All species	9,253.4	12,087.2	10,299.0	8,122.2	6,041.4	4,238.8	3,154.3	2,332.1	1,552.8	1,167.2	1,791.0	60,039.4

Table 23--Net volume of sawtimber (Scribner rule) on timberland by species and diameter class, Colorado, 1983

Species	Diameter class (inches at breast height)											29.0+	All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		
	----- Million board feet, Scribner rule -----												
Douglas-fir	659.2	806.6	772.3	739.9	559.3	446.0	354.4	204.7	176.1	123.1	248.4	5,090.0	
Ponderosa pine	418.9	827.2	1,146.1	952.0	637.2	456.5	291.2	273.9	180.6	213.1	408.5	5,805.2	
Lodgepole pine	2,787.9	2,311.2	1,592.8	740.6	406.9	153.3	29.2	17.8	2.1	4.3	--	8,046.1	
Limber pine	23.7	40.6	20.5	18.7	22.3	11.0	2.7	0.3	4.6	4.7	4.6	153.7	
Subalpine fir	1,336.9	1,100.5	823.5	732.5	537.1	328.5	184.1	119.2	49.3	20.6	8.7	5,240.9	
White fir	93.6	139.1	151.0	140.9	90.4	93.4	83.3	95.8	53.1	88.7	109.2	1,138.5	
Engelmann spruce	2,755.4	3,352.5	3,231.8	3,056.3	2,663.2	2,072.3	1,773.1	1,326.1	912.1	576.9	742.9	22,462.6	
Other softwoods	63.6	50.5	53.5	43.7	15.5	5.0	6.8	1.2	1.2	1.3	--	242.3	
Total softwoods	8,139.2	8,628.2	7,791.5	6,424.6	4,931.9	3,566.0	2,724.8	2,039.0	1,379.1	1,032.7	1,522.3	48,179.3	
Aspen	XXXX	1,905.2	1,187.2	623.1	337.7	143.8	49.2	33.4	--	1.8	--	4,281.4	
Cottonwood	XXXX	45.3	12.2	49.9	24.9	24.8	20.9	--	2.2	4.1	71.5	255.8	
Other hardwoods	XXXX	0.1	--	--	--	0.1	--	--	--	--	--	0.2	
Total hardwoods	XXXX	1,950.6	1,199.4	673.0	362.6	168.7	70.1	33.4	2.2	5.9	71.5	4,537.4	
All species	8,139.2	10,578.8	8,990.9	7,097.6	5,294.5	3,734.7	2,794.9	2,072.4	1,381.3	1,038.6	1,593.8	52,716.7	

Table 24--Net annual growth of growing stock on timberland by ownership class and species, Colorado, 1982

Species	Ownership class			Total
	National Forest	Other public	Nonindustrial private	
- - - - - Thousand cubic feet - - - - -				
Douglas-fir	5,236	6,405	10,512	22,153
Ponderosa pine	5,654	1,775	19,678	27,107
Lodgepole pine	32,572	7,219	14,858	54,649
Limber pine	77	163	588	828
Subalpine fir	18,679	982	2,818	22,479
White fir	2,507	262	1,074	3,843
Engelmann spruce	49,091	3,432	11,563	64,086
Other softwoods	1,325	143	330	1,798
Total softwoods	115,141	20,381	61,421	196,943
Aspen	47,146	7,283	18,610	73,039
Cottonwood	103	197	2,551	2,851
Other hardwoods	11	--	--	11
Total hardwoods	47,260	7,480	21,161	75,901
All species	162,401	27,861	82,582	272,844

Table 25--Net annual growth of sawtimber (International 4-inch rule) on timberland by ownership class and species, Colorado, 1982

Species	Ownership class			Total
	National Forest	Other public	Nonindustrial private	
- - - Thousand board feet, International 4-inch rule - - -				
Douglas-fir	33,079	24,413	47,289	104,781
Ponderosa pine	31,995	10,498	107,781	150,274
Lodgepole pine	162,490	18,644	19,312	200,446
Limber pine	429	576	1,570	2,575
Subalpine fir	110,368	5,572	16,454	132,394
White fir	10,432	3,003	7,551	20,986
Engelmann spruce	306,301	14,629	51,638	372,568
Other softwoods	5,850	506	966	7,322
Total softwoods	660,944	77,841	252,561	991,346
Aspen	144,055	19,918	90,781	254,754
Cottonwood	513	446	12,367	13,326
Other hardwoods	12	--	--	12
Total hardwoods	144,580	20,364	103,148	268,092
All species	805,524	98,205	355,709	1,259,438

Table 26--Net annual growth of sawtimber (Scribner rule) on timberland by ownership class and species, Colorado, 1982

Species	Ownership class			Total
	National Forest	Other public	Nonindustrial private	
- - - - - Thousand board feet, Scribner rule - - - - -				
Douglas-fir	29,441	20,654	39,952	90,047
Ponderosa pine	28,477	8,504	91,097	128,078
Lodgepole pine	144,617	16,315	16,813	177,745
Limber pine	381	492	1,298	2,171
Subalpine fir	98,227	4,797	14,467	117,491
White fir	9,284	2,548	6,234	18,066
Engelmann spruce	272,607	12,090	42,680	327,377
Other softwoods	5,207	458	863	6,528
Total softwoods	588,241	65,858	213,404	867,503
Aspen	128,210	17,149	78,310	223,669
Cottonwood	457	376	10,126	10,959
Other hardwoods	10	--	--	10
Total hardwoods	128,677	17,525	88,436	234,638
All species	716,918	83,383	301,840	1,102,141

Table 27--Net annual growth of growing stock on timberland by species and diameter class, Colorado, 1982

Species	Diameter class (inches at breast height)														All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		
	----- Thousand cubic feet -----														
Douglas-fir	5,768	4,493	3,145	3,197	1,569	1,469	1,162	423	372	55	201	104	195	22,153	
Ponderosa pine	3,406	4,121	4,098	4,900	4,566	2,437	1,525	800	520	477	317	143	-203	27,107	
Lodgepole pine	28,265	13,718	8,270	3,505	853	257	-296	8	42	20	2	5	--	54,649	
Limber pine	222	187	86	134	72	44	46	15	2	1	6	9	4	828	
Subalpine fir	13,273	3,637	3,234	2,010	-294	512	91	-101	-28	144	-35	27	9	22,479	
White fir	1,212	829	113	468	430	380	235	166	183	134	-64	-6	-237	3,843	
Engelmann spruce	14,736	8,718	9,779	9,354	6,543	5,136	2,978	2,170	2,059	907	584	581	541	64,086	
Other softwoods	1,206	172	219	141	103	-84	16	10	10	1	1	3	--	1,798	
Total softwoods	68,088	35,875	28,944	23,709	13,842	10,151	5,757	3,491	3,160	1,739	1,012	866	309	196,943	
Aspen	35,177	15,292	12,474	6,176	2,515	719	386	207	76	16	--	1	--	73,039	
Cottonwood	861	376	688	325	83	291	68	180	43	-263	11	2	186	2,851	
Other hardwoods	--	4	6	1	--	--	--	(1)	--	--	--	--	--	11	
Total hardwoods	36,038	15,672	13,168	6,502	2,598	1,010	454	387	119	-247	11	3	186	75,901	
All species	104,126	51,547	42,112	30,211	16,440	11,161	6,211	3,878	3,279	1,492	1,023	869	495	272,844	

¹Less than 0.05 thousand cubic feet.

Table 28--Net annual growth of sawtimber (International 4-inch rule) on timberland by species and diameter class, Colorado, 1982

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	----- Thousand board feet, International 4-inch rule -----											
Douglas-fir	52,276	18,902	9,515	8,658	6,790	2,689	2,457	377	1,242	645	1,230	104,781
Ponderosa pine	54,324	30,381	27,487	14,789	9,023	4,826	3,895	3,117	2,118	1,111	-797	150,274
Lodgepole pine	173,266	20,690	5,812	1,804	-1,494	2	228	103	11	24	--	200,446
Limber pine	695	730	414	265	265	90	2	3	34	53	24	2,575
Subalpine fir	116,496	12,363	-602	3,267	879	-628	-199	829	-221	152	58	132,394
White fir	11,046	3,111	2,688	2,057	1,378	784	1,001	777	-376	-90	-1,390	20,986
Engelmann spruce	190,739	53,962	37,503	28,833	16,864	12,305	14,019	6,536	4,208	3,948	3,651	372,568
Other softwoods	6,201	735	545	-372	85	53	49	7	6	13	--	7,322
Total softwoods	605,043	140,874	83,362	59,301	33,790	20,121	21,452	11,749	7,022	5,856	2,776	991,346
Aspen	XXXXX	232,092	14,461	4,508	2,024	1,196	369	96	--	8	--	254,754
Cottonwood	XXXXX	10,590	412	1,334	293	735	181	-1,175	50	9	897	13,326
Other hardwoods	XXXXX	7	--	--	--	5	--	--	--	--	--	12
Total hardwoods	XXXXX	242,689	14,873	5,842	2,317	1,936	550	-1,079	50	17	897	268,092
All species	605,043	383,563	98,235	65,143	36,107	22,057	22,002	10,670	7,072	5,873	3,673	1,259,438

Table 29--Net annual growth of sawtimber (Scribner rule) on timberland by species and diameter class, Colorado, 1982

Species	Diameter class (inches at breast height)											All classes
	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 22.9	23.0- 24.9	25.0- 26.9	27.0- 28.9	29.0+	
	----- Thousand board feet, Scribner rule -----											
Douglas-fir	46,361	15,589	7,577	6,981	5,655	2,409	2,312	378	1,113	577	1,095	90,047
Ponderosa pine	42,113	27,321	24,579	13,258	8,073	4,311	3,473	2,779	1,887	992	-708	128,078
Lodgepole pine	153,881	18,079	5,015	1,638	-1,198	3	204	92	10	21	--	177,745
Limber pine	584	614	347	223	221	77	2	3	30	49	21	2,171
Subalpine fir	103,406	10,604	-383	2,863	1,001	-547	-182	738	-196	135	52	117,491
White fir	9,543	2,701	2,272	1,727	1,212	653	905	701	-334	-77	-1,237	18,066
Engelmann spruce	169,065	46,252	32,354	25,048	14,745	10,959	12,543	5,891	3,757	3,513	3,250	327,377
Other softwoods	5,570	644	468	-343	76	46	44	6	5	12	--	6,528
Total softwoods	530,523	121,804	72,229	51,395	29,785	17,911	19,301	10,588	6,272	5,222	2,473	867,503
Aspen	XXXX	203,516	12,754	4,133	1,786	1,063	325	85	--	7	--	223,669
Cottonwood	XXXX	8,433	377	1,228	271	674	165	-1,040	45	8	798	10,959
Other hardwoods	XXXX	6	--	--	--	4	--	--	--	--	--	10
Total hardwoods	XXXX	211,955	13,131	5,361	2,057	1,741	490	-955	45	15	798	234,638
All species	530,523	333,759	85,360	56,756	31,842	19,652	19,791	9,633	6,317	5,237	3,271	1,102,141

Table 30--Annual mortality of growing stock on timberland by ownership class and species, Colorado, 1982

Species	Ownership class				Total
	National Forest	Other public	Nonindustrial private		
	Thousand cubic feet				
Douglas-fir	1,995	292	1,144		3,431
Ponderosa pine	2,609	688	929		4,226
Lodgepole pine	9,252	1,126	1,402		11,780
Limber pine	20	--	--		20
Subalpine fir	17,105	786	1,174		19,065
White fir	1,034	128	1,037		2,199
Engelmann spruce	17,711	730	1,100		19,541
Other softwoods	147	12	--		159
Total softwoods	49,873	3,762	6,786		60,421
Aspen	7,368	857	8,722		16,947
Cottonwood	--	--	263		263
Other hardwoods	2	--	--		2
Total hardwoods	7,370	857	8,985		17,212
All species	57,243	4,619	15,771		77,633

Table 31--Annual mortality of sawtimber (International 1/4-inch rule) on timberland by ownership class and species, Colorado, 1982

Species	Ownership class			Total
	National Forest	Other public	Nonindustrial private	
	- - - Thousand board feet, International 1/4-inch rule - - -			
Douglas-fir	9,527	1,256	3,597	14,380
Ponderosa pine	10,210	3,626	2,677	16,513
Lodgepole pine	36,123	2,656	6,162	44,941
Limber pine	147	--	--	147
Subalpine fir	60,374	2,308	5,457	68,139
White fir	5,229	386	3,288	8,903
Engelmann spruce	89,966	2,837	5,131	97,934
Other softwoods	722	--	--	722
Total softwoods	212,298	13,069	26,312	251,679
Aspen	12,238	402	9,516	22,156
Cottonwood	--	--	1,175	1,175
Other hardwoods	--	--	--	--
Total hardwoods	12,238	402	10,691	23,331
All species	224,536	13,471	37,003	275,010

Table 32--Annual mortality of sawtimber (Scribner rule) on timberland by ownership class and species, Colorado, 1982

Species	Ownership class				Total
	National Forest	Other public	Nonindustrial private	Thousand board feet, Scribner rule	
Douglas-fir	8,479	1,032	3,101	12,612	
Ponderosa pine	9,086	3,212	2,322	14,620	
Lodgepole pine	32,150	2,264	5,243	39,657	
Limber pine	131	--	--	131	
Subalpine fir	53,733	1,950	4,419	60,102	
White fir	4,653	336	2,871	7,860	
Engelmann spruce	80,070	2,389	4,325	86,784	
Other softwoods	643	--	--	643	
Total softwoods	188,945	11,183	22,281	222,409	
Aspen	10,892	340	8,038	19,270	
Cottonwood	--	--	1,040	1,040	
Other hardwoods	--	--	--	--	
Total hardwoods	10,892	340	9,078	20,310	
All species	199,837	11,523	31,359	242,719	

Table 33--Annual mortality of growing stock on timberland by species and diameter class, Colorado, 1982

Species	Diameter class (inches at breast height)													29.0+	All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9			
	----- Thousand cubic feet -----														
Douglas-fir	91	343	857	149	594	345	78	421	187	255	1	49	61	3,431	
Ponderosa pine	124	434	694	508	286	661	355	173	178	52	1	157	603	4,226	
Lodgepole pine	1,008	1,919	2,354	2,287	2,190	1,025	843	154	--	(1)	--	--	--	11,780	
Limber pine	2	3	7	3	2	1	1	1	(1)	--	--	(1)	--	20	
Subalpine fir	2,635	3,169	3,527	2,356	3,136	1,608	1,258	1,000	276	--	100	--	--	19,065	
White fir	228	111	603	248	182	99	1	95	1	--	128	141	362	2,199	
Engelmann spruce	901	1,182	2,120	2,529	2,670	2,826	2,986	1,862	515	991	611	196	152	19,541	
Other softwoods	12	--	--	--	--	147	--	--	--	--	--	--	--	159	
Total softwoods	5,001	7,161	10,162	8,080	9,060	6,712	5,522	3,706	1,157	1,298	841	543	1,178	60,421	
Aspen	5,699	4,027	3,036	1,592	1,100	946	404	106	--	37	--	--	--	16,947	
Cottonwood	--	--	--	--	--	--	--	--	--	263	--	--	--	263	
Other hardwoods	--	1	1	--	--	--	--	--	--	--	--	--	--	2	
Total hardwoods	5,699	4,028	3,037	1,592	1,100	946	404	106	--	300	--	--	--	17,212	
All species	10,700	11,189	13,199	9,672	10,160	7,658	5,926	3,812	1,157	1,598	841	543	1,178	77,633	

¹Less than 0.05 thousand cubic feet.

Table 34--Annual mortality of sawtimber (International 4-inch rule) on timberland by species and diameter class, Colorado, 1982

Species	Diameter class (inches at breast height)												All classes
	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 22.9	23.0- 24.9	25.0- 26.9	27.0- 28.9	29.0+		
	----- Thousand board feet, International 4-inch rule -----												
Douglas-fir	2,841	677	3,079	1,864	426	2,307	1,025	1,507	5	292	357	14,380	
Ponderosa pine	1,701	1,900	1,298	3,411	1,965	989	714	285	9	825	3,416	16,513	
Lodgepole pine	11,617	11,063	11,473	5,339	4,528	920	--	1	--	--	--	44,941	
Limber pine	65	27	21	12	9	6	5	--	--	2	--	147	
Subalpine fir	16,706	12,018	16,469	8,544	6,645	5,552	1,619	--	586	--	--	68,139	
White fir	2,182	1,116	786	544	5	557	7	--	753	834	2,119	8,903	
Engelmann spruce	11,274	13,606	14,696	16,117	16,906	10,681	2,963	5,881	3,670	1,189	951	97,934	
Other softwoods	--	--	--	722	--	--	--	--	--	--	--	722	
Total softwoods	46,386	40,407	47,822	36,553	30,484	21,012	6,333	7,674	5,023	3,142	6,843	251,679	
Aspen	XXXXX	8,071	6,014	4,817	2,428	632	--	194	--	--	--	22,156	
Cottonwood	XXXXX	--	--	--	--	--	--	1,175	--	--	--	1,175	
Other hardwoods	XXXXX	--	--	--	--	--	--	--	--	--	--	--	
Total hardwoods	XXXXX	8,071	6,014	4,817	2,428	632	--	1,369	--	--	--	23,331	
All species	46,386	48,478	53,836	41,370	32,912	21,644	6,333	9,043	5,023	3,142	6,843	275,010	

Table 35--Annual mortality of sawtimber (Scribner rule) on timberland by species and diameter class, Colorado, 1982

Species	Diameter class (inches at breast height)													All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+			
	----- Thousand board feet, Scribner rule -----													
Douglas-fir	2,528	603	2,728	1,658	361	1,937	879	1,336	4	260	318	12,612		
Ponderosa pine	1,509	1,650	1,155	3,011	1,747	878	635	254	8	733	3,040	14,620		
Lodgepole pine	10,322	9,664	10,173	4,744	3,934	819	--	1	--	--	--	39,657		
Limber pine	58	24	19	11	8	5	4	--	--	2	--	131		
Subalpine fir	14,864	10,691	14,407	7,590	5,651	4,936	1,441	--	522	--	--	60,102		
White fir	1,942	957	673	484	4	496	6	--	670	742	1,886	7,860		
Engelmann spruce	10,025	11,999	12,970	14,256	15,000	9,495	2,634	5,234	3,267	1,058	846	86,784		
Other softwoods	--	--	--	643	--	--	--	--	--	--	--	643		
Total softwoods	41,248	35,588	42,125	32,397	26,705	18,566	5,599	6,825	4,471	2,795	6,090	222,409		
Aspen	XXXX	6,967	5,280	4,127	2,161	562	--	173	--	--	--	19,270		
Cottonwood	XXXX	--	--	--	--	--	--	1,040	--	--	--	1,040		
Other hardwoods	XXXX	--	--	--	--	--	--	--	--	--	--	--		
Total hardwoods	XXXX	6,967	5,280	4,127	2,161	562	--	1,213	--	--	--	20,310		
All species	41,248	42,555	47,405	36,524	28,866	19,128	5,599	8,038	4,471	2,795	6,090	242,719		

Table 36--Annual mortality of growing stock on timberland by cause of death and species, Colorado, 1982

Species	Cause of death								Total
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	
	----- Thousand cubic feet -----								
Douglas-fir	206	554	26	--	2,595	--	--	50	3,431
Ponderosa pine	1,302	659	--	--	2,038	--	--	227	4,226
Lodgepole pine	1,612	3,164	611	1,025	1,831	56	1,100	2,381	11,780
Limber pine	--	--	--	--	--	--	--	20	20
Subalpine fir	11,692	4,863	146	--	370	934	--	1,060	19,065
White fir	1,059	--	--	--	581	108	111	340	2,199
Engelmann spruce	3,342	4,431	139	--	801	150	--	10,678	19,541
Other softwoods	--	--	--	12	--	--	--	147	159
Total softwoods	19,213	13,671	922	1,037	8,216	1,248	1,211	14,903	60,421
Aspen	62	5,642	247	439	692	--	--	9,865	16,947
Cottonwood	--	--	--	--	--	--	--	263	263
Other hardwoods	--	--	--	--	--	--	--	2	2
Total hardwoods	62	5,642	247	439	692	--	--	10,130	17,212
All species	19,275	19,313	1,169	1,476	8,908	1,248	1,211	25,033	77,633

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Presents highlights of the forest resources of Colorado as of 1983. Describes the forest resources, their extent, condition, and location. Includes statistical tables: area by land classes, ownership, growing-stock and sawtimber volumes, growth, mortality, roundwood products output, and utilization.

KEYWORDS: timberland, timber volume, sawlog volume, harvest

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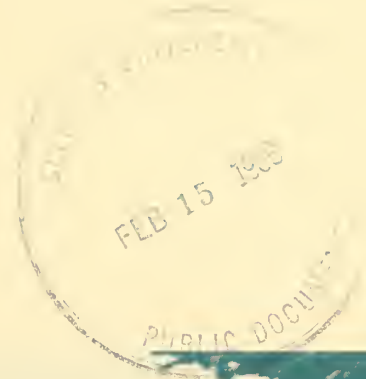
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Resource Bulletin
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Colorado's State and Private Timber Resources, 1983

Alan W. Green
Roger C. Conner



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PREFACE

The primary objective of Forest Survey—a continuing, nationwide undertaking of the Forest Service, U.S. Department of Agriculture—is to provide an assessment of the renewable resources for forest and rangelands of the Nation. Fundamental to the accomplishment of the objective are the periodic State-by-State resource inventories. Originally, Forest Survey was authorized by the McSweeney-McNary Act of 1928. The current authorization is through the Renewable Resources Research Act of 1978.

The Intermountain Research Station with headquarters in Ogden, UT, conducts the forest resource inventories for the Rocky Mountain States of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, western South Dakota, Utah, Wyoming, western Texas, and Oklahoma's Panhandle. These inventories provide information on the extent and condition of State and privately owned forest lands and most other lands not in the National Forest System, volume of timber, and rates of timber growth, removals, and mortality.

These data, when combined with similar information on National Forest lands, provide a basis for forming forest policies and programs and for the orderly development and use of the resources.

ACKNOWLEDGMENTS

This report is the result of the combined efforts of numerous people on the Forest Survey staff. In addition to the photo interpretation and field crews, several individuals played key roles in the reduction of basic data into information describing the extent, nature, and condition of the forest resources in Colorado: Dennis Collins supervised the data collection; Sharon Woudenberg and Shirley Waters compiled the data and made summaries; and Susan Brown and Velma Inama transformed the data summaries into tables of information. Also, we acknowledge the Colorado State Forest Service for their cooperation and assistance in collecting the inventory data. And we extend a special note of gratitude to the private land owners who allowed the field crews access to the sample locations on their properties.

RESEARCH SUMMARY

The State and private forest land base in Colorado amounts to 6.4 million acres, of which 3.6 million are classified as timberland. These acres support over 4.5 billion cubic feet of growing stock including 13.5 billion board feet of sawtimber. Net annual growth was nearly 89 million cubic feet in 1982. This report highlights additional information on total land area, timberland area, timber inventory, annual growth, mortality, and removals.

October 1987

Intermountain Research Station
324 25th Street
Ogden, UT 84401

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Colorado's State and Private Timber Resources, 1983

Alan W. Green
Roger C. Conner

INTRODUCTION

This bulletin presents some of the findings from the most recent Forest Survey of Colorado's State and privately owned resources. The two-phase survey began with prefield work in June 1981. The field phase involved, in whole or in part, the summers of 1981, 1982, and 1984 with the bulk of the data collected in 1982.

The data in this report pertain only to the State and private timberland resources within the four survey units

covering the western two-thirds of the State shown in figure 1. The eastern unit was administratively designated nonforest and was not sampled. Information on the State and privately owned woodland resources will be presented in a separate report. In addition, data for lands administered by various public agencies such as National Forest System and Bureau of Land Management, U.S. Department of the Interior, will be included in a subsequent, comprehensive Statewide report.

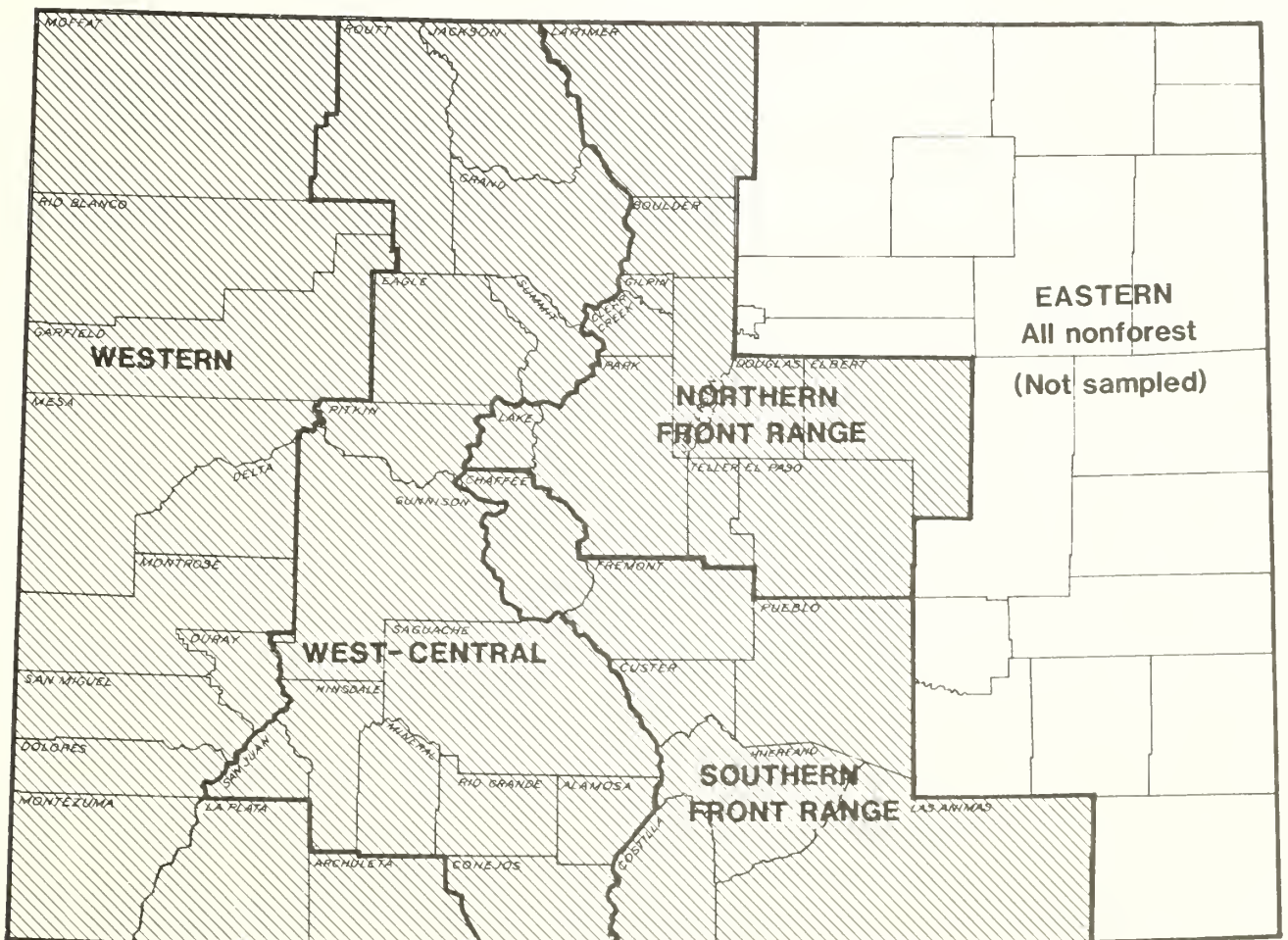


Figure 1—Colorado counties and survey units.

Colorado encompasses just over 66.3 million acres of land. Nearly three-fifths of this area is privately owned and an additional 5 percent is administered and managed by the State (fig. 2).

Only 15 percent of the State and privately owned land is forest land. Timberland accounts for just over 56 percent

of this area with the remaining 44 percent classified as woodland (fig. 3). Most of the timberland area is concentrated in the central portion of the State along the Rockies (fig. 4).

Data for this report are found in the Forest Survey Tables and the County Tables at the end of this publication.

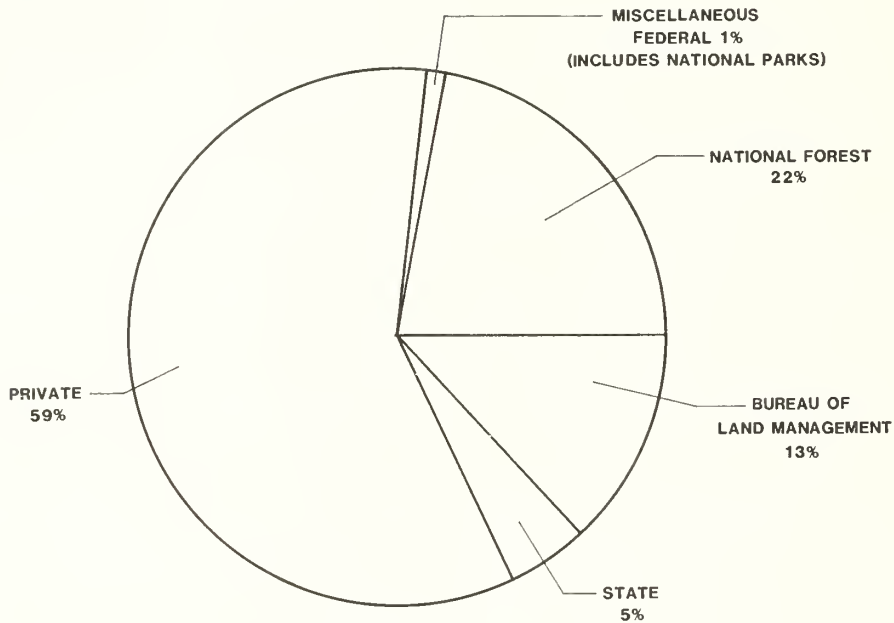


Figure 2—Distribution of land area in Colorado by ownership class.

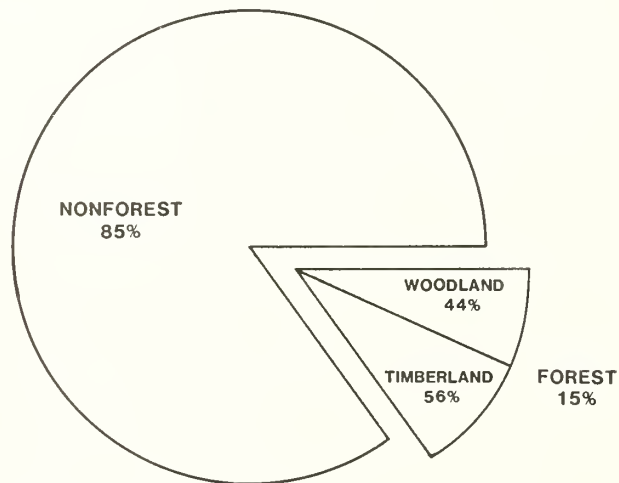


Figure 3—Distribution of State and private land area by land type.

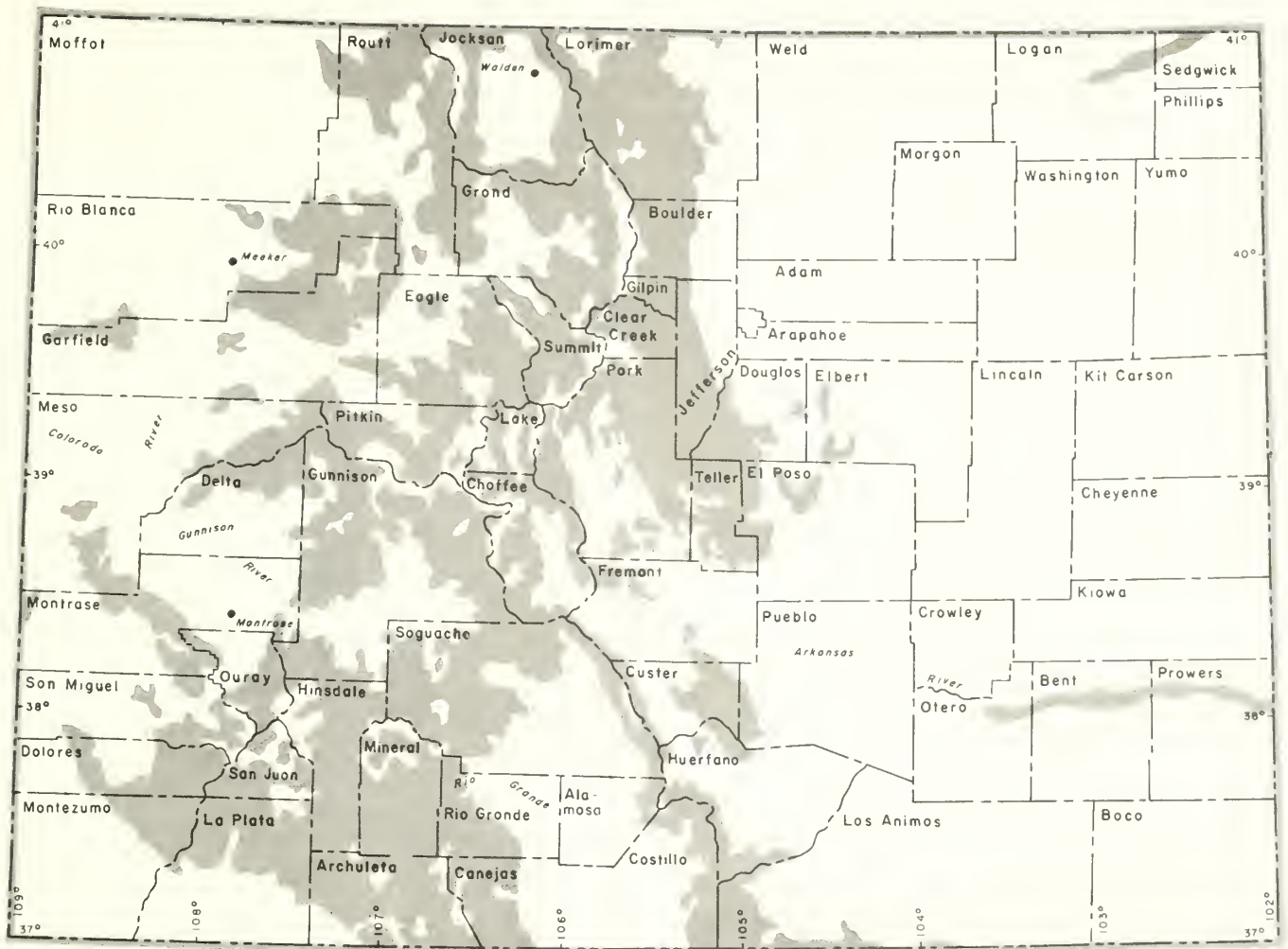


Figure 4—Geographical distribution of timberland in Colorado.

HIGHLIGHTS

Area

Approximately 3.4 million acres of the private forest land and 254,000 acres of State forest land are timberland (see table 4). None of the private timberland is reserved, and just over 7 percent of the State timberland is reserved.

Ponderosa pine is the major timber forest type in Colorado and occupies over 1.3 million acres or 37 percent of the timberland area, followed by aspen covering about 846,000 acres (fig. 5).

Most of the State and privately owned timberland is low in productivity. Over two-thirds of the area cannot produce 50 cubic feet of wood per acre per year (fig. 6). Nearly 83 percent, or 1.1 million acres, of the ponderosa pine type is in this category. Only a small portion of Colorado's timberlands, about 139,000 acres, is considered highly productive.

About half the timberlands are in such a condition that they contribute little to net growth. Roughly 31 percent is either nonstocked or poorly stocked, and 17 percent is occupied by old-growth stands that are usually slow growing (fig. 7).

Of the estimated 1.1 billion growing-stock trees, 82 percent are less than 9 inches diameter at breast height (d.b.h.). Approximately 491 million growing-stock trees are classified as saplings, and another 424 million are pole-timber (fig. 8). Ponderosa pine (*Pinus ponderosa*) accounts for over a third of the 160 million sawtimber trees.

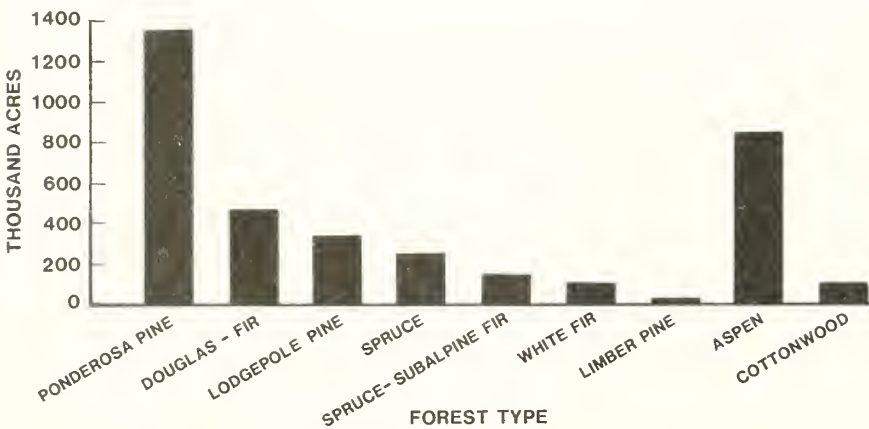


Figure 5—Area of State and private timberland by forest type.

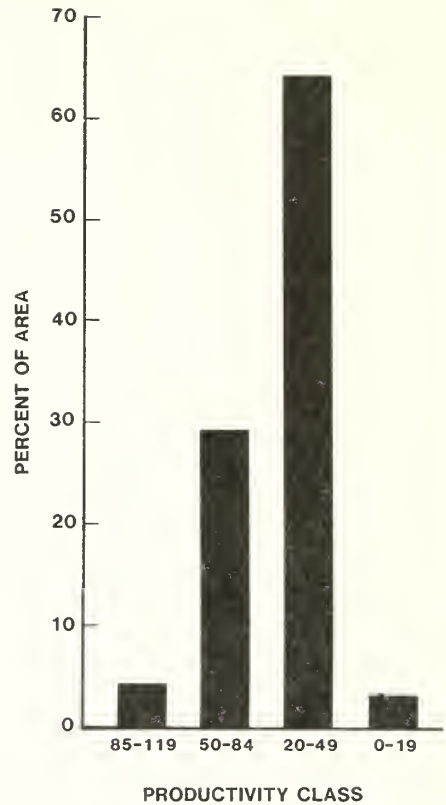


Figure 6—Distribution of State and private timberland by productivity class.

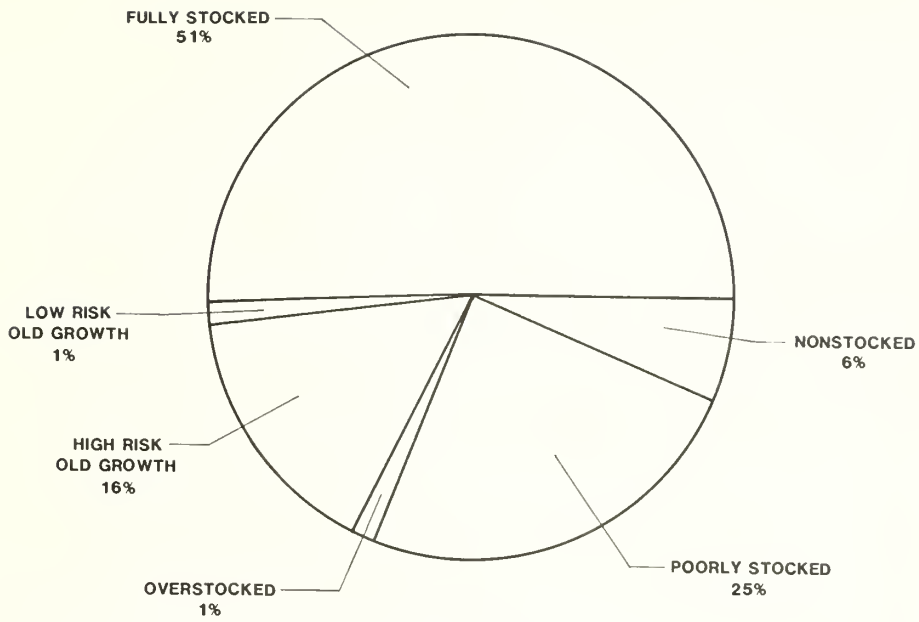


Figure 7—Distribution of State and private timberland by area condition class.

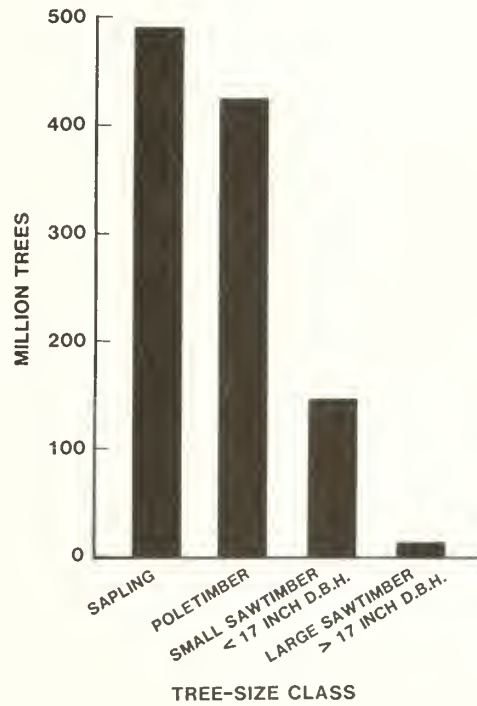


Figure 8—Number of growing-stock trees on State and private timberland by tree-size class.

Volume

Timberlands contain over 4.5 billion cubic feet of net volume, of which 74 percent is in softwood species. Sawtimber volume totals nearly 13.5 billion board feet (International 1/4-inch rule) with ponderosa pine species accounting for 31 percent. Engelmann spruce (*Picea engelmannii*) contributes over a fifth of the sawtimber volume.

Aspen (*Populus tremuloides*) makes up nearly a quarter of the cubic foot volume but only 12 percent of the sawtimber volume (fig. 9).

About 71 percent of the softwood growing-stock volume is in trees less than 15 inches d.b.h., and nearly three-fourths of the sawtimber volume is in trees less than 17 inches d.b.h. (fig. 10).

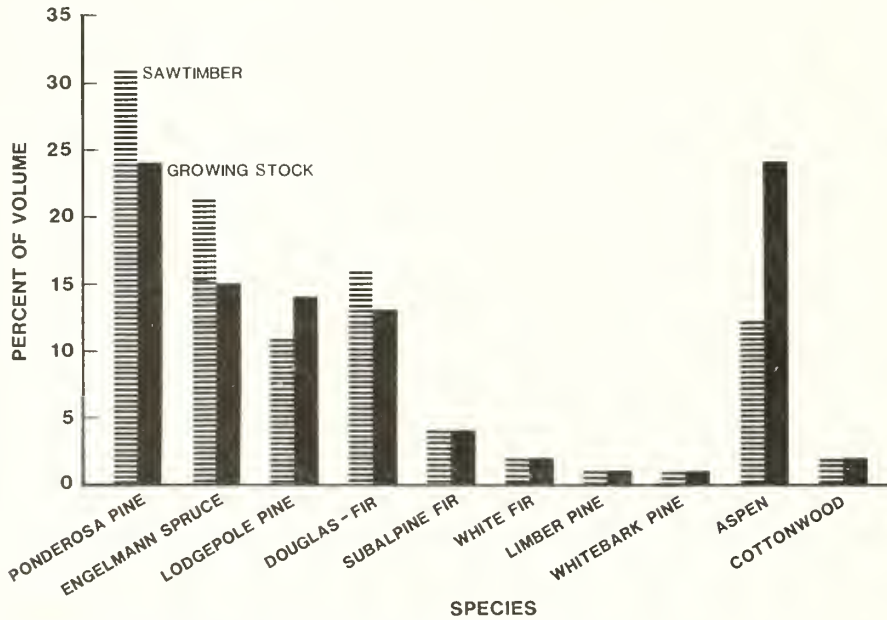


Figure 9—Distribution of growing-stock and sawtimber volume on State and private timberland by species.

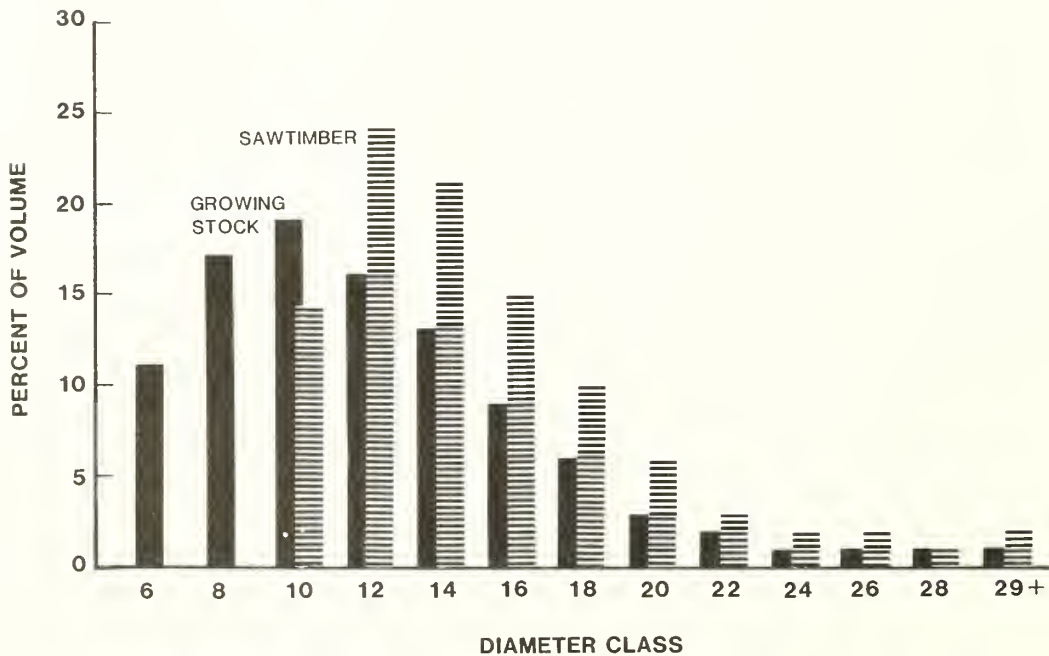


Figure 10—Distribution of growing-stock and sawtimber volume on State and private timberland by diameter class.

Components of Change

Growth—In 1982 the growing-stock volume on a typical acre of State and private timberland was, on the average, increasing by just under 29.4 cubic feet per year. This same acre, however, averaged a loss of around 5 cubic feet annually to mortality, giving a net gain of 24.4 cubic feet. The result was a total net annual growth of about 89

million cubic feet from a gross of 106 million. That represents a loss of about 16 percent (fig. 11).

Ponderosa pine and aspen account for nearly 41 million cubic feet or 46 percent of the net annual growth and in nearly equal amounts. Douglas-fir (*Pseudotsuga menziesii*), lodgepole pine (*Pinus contorta*), and Engelmann spruce combine for an additional 45 percent (fig. 12).

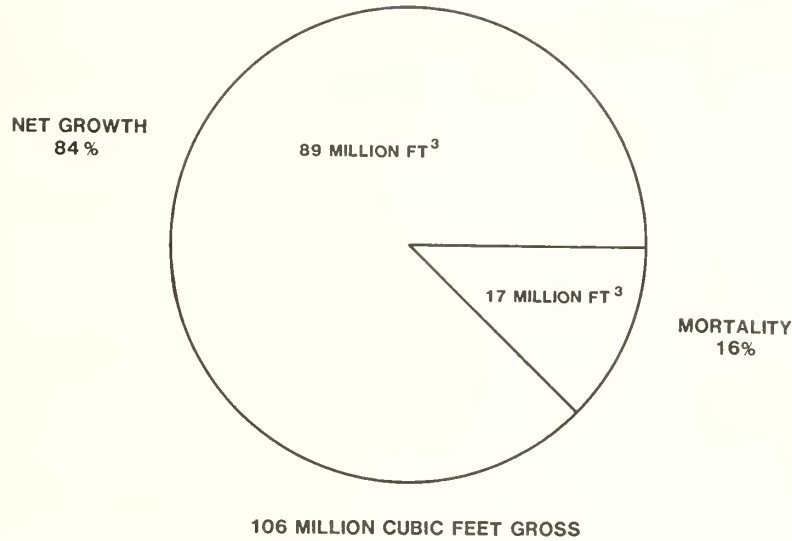


Figure 11—Net annual growth and annual mortality on State and private timberland, 1982.

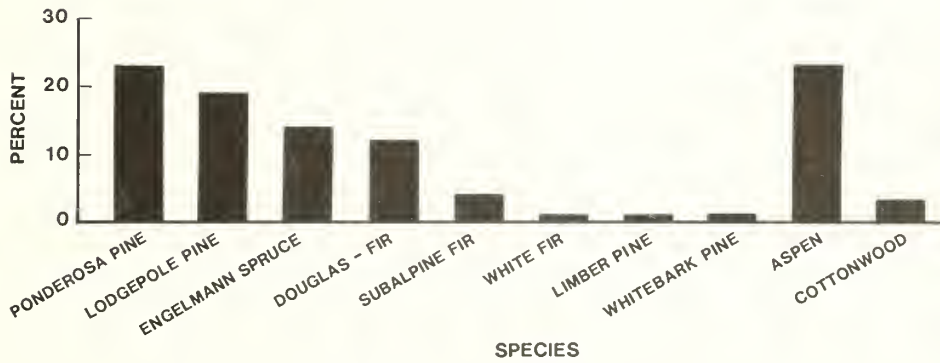


Figure 12—Distribution of net annual growth on State and private timberland by species.

Mortality—Aspen alone accounted for 55 percent of the 16.8 million cubic feet of total annual mortality. The remainder was distributed nearly evenly among the softwood species (table 35). Over half the mortality from known causes is due to disease (27 percent), weather (13 percent), and insects (12 percent). Mortality from “unknown” causes accounts for over two-fifths of the total volume (fig. 13). (Because many destructive agents attack trees in concert or in succession, it is often difficult to identify the actual causal agent. When the primary cause of death cannot be precisely determined, it is listed as “unknown.”)

Removals—Nearly 3.3 million cubic feet (17.7 million board feet, International ¼-inch rule) of industrial roundwood was harvested from private lands in 1982. Another 1 million cubic feet was harvested from State lands (fig. 14). Sawlogs accounted for almost 88 percent of the industrial roundwood harvested from private lands (McLain 1985).

Fuelwood harvest of timber species from State and private land totaled nearly 259,000 cords or 20.7 million cubic feet. Less than 1 percent of this was from State land. Ponderosa pine accounted for 121,000 cords (9.7 million cubic feet), and cottonwood contributed over



Figure 13—Distribution of annual mortality from growing stock on State and private timberland by cause.

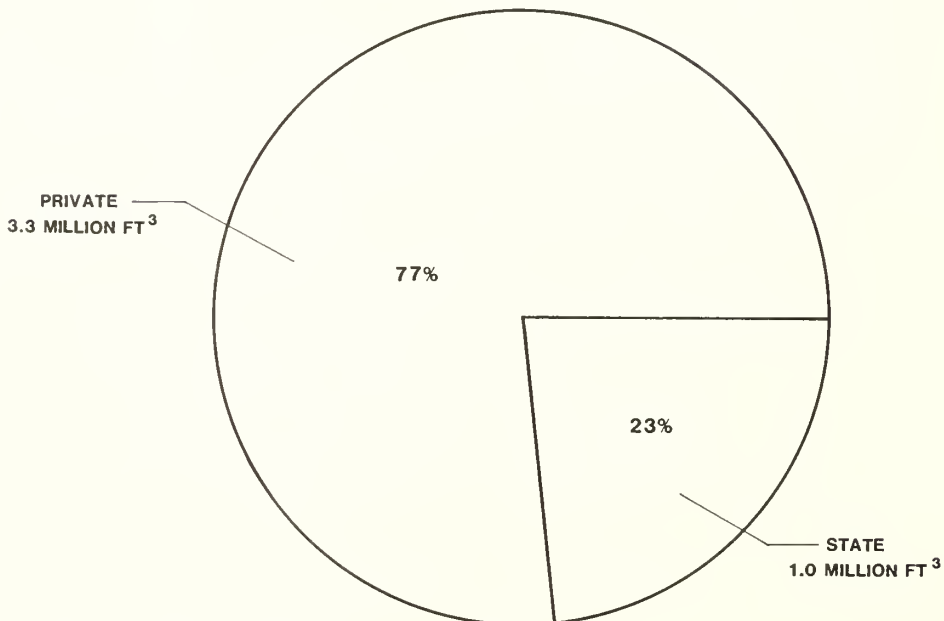
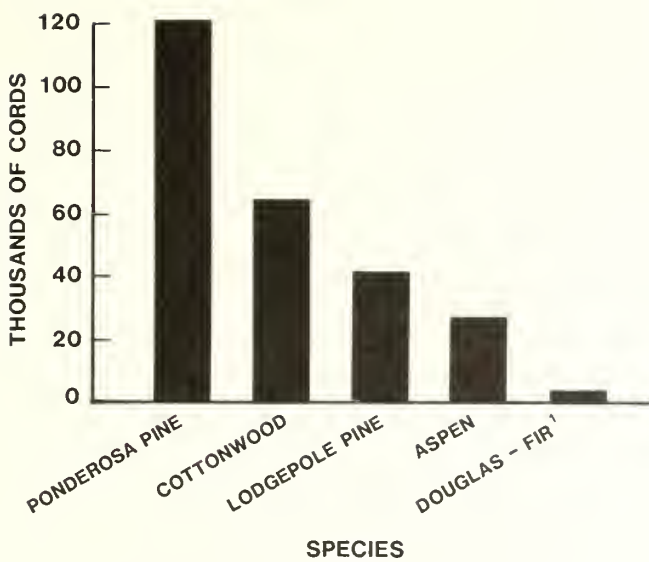


Figure 14—Volume of industrial roundwood harvested from State and private land, 1982.



¹ (INCLUDES 125 CORDS OF TRUE FIRS AND 281 CORDS OF SPRUCE)

Figure 15—Fuelwood harvested from timber species on State and private land, 1982.

64,000 cords (5.1 million cubic feet) to the total harvest (fig. 15). Nearly 84 percent of the total fuelwood harvest was from dead trees (McLain and Booth 1985).

HOW THE INVENTORY WAS CONDUCTED

The inventory was designed to provide reliable statistics primarily at the State and sample area levels.

Prefield

Primary area estimates were based on the classification of 187,765 sample points systematically placed on the latest aerial photographs available. The photo points, adjusted to meet known land areas, were used to stratify and compute area expansion factors for the field sample data.

Field

Land classification and estimates for timber characteristics and volume were based on observations and measurements recorded at 3,340 ground sample locations, of which 1,216 were forested. Of the forested locations, 973 were classified as timberland. Sample trees were selected using a 5-point cluster, which included 1/300-acre fixed radius plots for trees less than 5 inches d.b.h., and 40 basal area factor variable radius plots for trees 5 inches d.b.h. or larger.

Compilation

All photo and field data were loaded onto tape and stored for computer editing, computation, and tabulation. Final estimates from these data were based on statistical summaries, a portion of which is included in this bulletin.

Volume and defect were computed using equations developed by Edminster and others (1980, 1981), Kemp (1958), Chojnacky (1985), Meyers (1964), and Meyers and others (1972).

DATA RELIABILITY

Individual cells within tables should be used with caution. Some are based on small sample sizes, which may result in high sampling errors. The standard error percentages shown in tables 1 and 2 were calculated at the 67 percent confidence level.

TERMINOLOGY

Acceptable trees—Growing-stock trees meeting specified standards of size and quality, but not qualifying as desirable trees.

Area condition class—A classification of timberland reflecting the degree to which the site is being utilized by growing-stock trees and other conditions affecting current and prospective timber growth (see Stocking):

Class 10—Areas fully stocked with desirable trees and not overstocked.

Class 20—Areas fully stocked with desirable trees but overstocked with all live trees.

Class 30—Areas medium to fully stocked with desirable trees and with less than 30 percent of the area controlled by other trees, or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees, or both.

Class 40—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees, or conditions that ordinarily prevent occupancy by desirable trees, or both.

Class 50—Areas poorly stocked with desirable trees but fully stocked with growing-stock trees.

Class 60—Areas poorly stocked with desirable trees but with medium to full stocking of growing-stock trees.

Class 70—Areas nonstocked or poorly stocked with desirable trees and poorly stocked with growing-stock trees.

Class 80—Low-risk old-growth stands.

Class 90—High-risk old-growth stands.

Nonstocked—Areas less than 10 percent stocked with growing-stock trees.

Basal area—The cross-sectional area of a tree expressed in square feet. For timber species the calculation is based on diameter at breast height (d.b.h.); for woodland species it is based on diameter at root collar (d.r.c.).

Cord—A pile of stacked wood equivalent to 128 cubic feet of wood and air space having standard dimensions of 4 by 4 by 8 feet.

Cull trees—Live trees that are unmerchantable now or prospectively (see Rough trees and Rotten trees).

Cull volume—Portions of a tree's volume that are not usable for wood products because of rot, form, missing material, or other cubic-foot defect. Form and sound defects include severe sweep and crook, forks, extreme form reduction, large deformities, and dead material.

- Deferred forest land**—Forest lands within the National Forest System that are under study for possible inclusion in the Wilderness System.
- Desirable trees**—Growing-stock trees (1) having no serious defect in quality to limit present or prospective use for timber products, (2) of relatively high vigor, and (3) containing no pathogens that may result in death or serious deterioration within the next decade.
- Diameter at breast height (d.b.h.)**—Diameter of the stem measured at 4.5 feet above the ground.
- Diameter at root collar (d.r.c.)**—Diameter equivalent at the point nearest the ground line that represents the basal area of the tree stem or stems.
- Diameter classes**—Tree diameters, either d.b.h. or d.r.c., grouped into 2-inch classes labeled by the midpoint of the class.
- Farmer-owned lands**—Lands owned by a person who operates a farm and who either does the work or directly supervises the work.
- Forest industry lands**—Lands owned by companies or individuals operating a primary wood-processing plant.
- Forest lands**—Lands at least 10 percent stocked by forest trees of any size, including lands that formerly had such tree cover and that will be naturally or artificially regenerated. The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelter-belt strips of timber must have a crown width at least 120 feet wide to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 feet wide.
- Forest trees**—Woody plants having a well-developed stem or stems, usually more than 12 feet in height at maturity, with a generally well-defined crown.
- Forest type**—A classification of forest land based upon and named for the tree species presently forming a plurality of live-tree stocking.
- Growing-stock trees**—Live sawtimber trees, poletimber trees, saplings, and seedlings of timber species meeting specified standards of quality and vigor; excludes cull trees.
- Growing-stock volume**—Net cubic-foot volume in live growing-stock trees from a 1-foot stump to a minimum 4.0-inch top (of central stem) outside bark or to the point where the central stem breaks into limbs.
- Growth**—See definition for Net annual growth.
- Hardwood trees**—Dicotyledonous trees, usually broad-leaved and deciduous.
- High-risk old-growth stands**—Timber stands over 100 years old in which the majority of the trees are not expected to survive more than 10 years.
- Indian lands**—Indian lands held in trust by the Federal Government.
- Industrial wood**—All commercial roundwood products except fuelwood.
- Land area**—The area of dry land and land temporarily or partially covered by water such as marshes, swamps, and river flood plains, streams, sloughs, estuaries, and canals less than 120 feet wide; and lakes, reservoirs, and ponds less than 1 acre in size.
- Logging residues**—The unused portions of growing-stock trees cut or killed by logging.
- Low-risk old-growth stands**—Timber stands over 100 years old in which the majority of the trees are expected to survive more than 10 years.
- Miscellaneous Federal lands**—Lands administered by Federal agencies other than the Forest Service, U.S. Department of Agriculture, or Bureau of Land Management, U.S. Department of the Interior.
- Mortality**—The net volume of growing-stock trees that have died from natural causes during a specified period.
- National Forest lands**—Public lands administered by the Forest Service, U.S. Department of Agriculture.
- National Resource lands**—Public lands administered by the Bureau of Land Management, U.S. Department of the Interior.
- Net annual growth**—The net average annual increase in the volume of trees during a specified period.
- Net volume in board feet**—The gross board-foot volume in the sawlog portion of growing-stock trees, less deductions for cull volume.
- Net volume in cubic feet**—Gross cubic-foot volume in the merchantable portion of trees less deductions for cull volume. For timber species, volume is computed for the merchantable stem from a 1-foot stump to a minimum 4.0-inch top diameter outside bark, or to the point where the central stem breaks into limbs. For woodland species, volume is computed outside bark (o.b.) for all woody material above d.r.c. that is larger than 1.5 inches in diameter (o.b.).
- Nonforest lands**—Lands that do not currently qualify as forest land.
- Nonindustrial private**—All private ownerships except forest industry.
- Nonstocked areas**—Forest land less than 10 percent stocked with live trees.
- Old-growth stands**—Stands of timber species over 100 years old.
- Other private land**—Privately owned land other than forest industry or farmer-owned.
- Other public land**—Public land administered by agencies other than the Forest Service, U.S. Department of Agriculture.
- Other removals**—The net volume of growing-stock trees removed from the inventory by cultural operations such as timber-stand improvement, by land clearing, and by changes in land use, such as a shift to wilderness.
- Poletimber stands**—Stands at least 10 percent stocked with growing-stock trees, in which half or more of the stocking is sawtimber or poletimber trees or both, with poletimber stocking exceeding that of sawtimber (see definition for Stocking).
- Poletimber trees**—Live trees of timber species at least 5.0 inches d.b.h. but smaller than sawtimber size.
- Potential growth**—The average net annual cubic-foot growth per acre at culmination of mean annual growth attainable in fully stocked natural stands.
- Primary wood-processing plants**—Plants using roundwood products such as sawlogs, pulpwood bolts, veneer logs, and so forth.
- Productivity class**—A classification of forest land in terms of potential growth.

Removals—The net volume of growing-stock trees removed from the inventory by harvesting, cultural operations, land clearings, or changes in land use.

Reserved forest lands—Forest lands withdrawn from tree utilization through statute or administrative designation.

Residues:

Coarse residues—Plant residues suitable for chipping, such as slabs, edgings, and ends.

Fine residues—Plant residues not suitable for chipping, such as sawdust, shavings, and veneer clippings.

Plant residues—Wood materials from primary manufacturing plants that are not used for any product.

Rotten trees—Live poletimber or sawtimber trees with more than 67 percent of their total volume cull (cubic-foot) and with more than half of the cull volume attributable to rotten or missing material.

Rough trees—Live poletimber or sawtimber trees with more than 67 percent of their total volume cull (cubic-foot) and with less than half of the cull volume attributable to rotten or missing material.

Roundwood—Logs, bolts, or other round sections cut from trees.

Salvable dead trees—Standing or down dead trees that are currently merchantable by regional standards.

Saplings—Live trees of timber species 1.0 to 4.9 inches d.b.h. or woodland species 1.0 to 2.9 inches d.r.c.

Sapling and seedling stands—Timberland stands at least 10 percent stocked on which more than half of the stocking is saplings or seedlings or both.

Sawlog portion—That part of the bole of sawtimber trees between a 1-foot stump and the sawlog top.

Sawlog top—The point on the bole of sawtimber trees above which a sawlog cannot be produced. The minimum sawlog top is 7.0 inches diameter o.b. for softwoods and 9.0 inches diameter o.b. for hardwoods.

Sawtimber stands—Stands at least 10 percent stocked with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Sawtimber trees—Live trees of timber species meeting regional size and defect specifications. Softwood trees must be at least 9.0 inches d.b.h. and hardwood trees 11.0 inches d.b.h.

Sawtimber volume—Net volume in board feet of the sawlog portion of live sawtimber trees.

Seedlings—Established live trees of timber species less than 1.0 inch d.b.h. or woodland species less than 1.0 inch d.r.c.

Softwood trees—Monocotyledonous trees, usually evergreen, having needle or scalelike leaves.

Standard error—An expression of the degree of confidence that can be placed on an estimated total or average obtained by statistical sampling methods. Standard errors do not include technique errors that could occur in photo classification of areas, field measurements, or compilation of data.

Stand-size classes—A classification of forest land based on the predominant size of trees present (see Sawtimber stands, Poletimber stands, and Sapling and seedling stands).

State, county, and municipal lands—Lands administered by States, counties, and local public agencies, or lands

leased by these governmental units for more than 50 years.

Stocking—An expression of the extent to which growing space is effectively utilized by present or potential growing-stock trees of timber species. Percentage stocking is the ratio of actual stocking to full stocking for comparable sites and stands, using basal area as the basis for comparison.

Timberlands—Forest lands where timber species make up at least 10 percent stocking.

Timber species—Tree species traditionally used for industrial wood products. In the Rocky Mountain States, these include aspen and cottonwood hardwood species and all softwood species except pinyon and juniper.

Timber stand improvement—Treatments such as thinning, pruning, release cutting, girdling, weeding, or poisoning of unwanted trees aimed at improving growing conditions for the remaining trees.

Upper-stem portion—That part of the main stem or fork of sawtimber trees above the sawlog top to a minimum top diameter of 4.0 inches o.b. or to the point where the main stem or fork breaks into limbs.

Water—Streams, sloughs, estuaries, and canals more than 120 feet wide, and lakes, reservoirs, and ponds more than 1 acre in size at mean high water level.

Wilderness—An area of undeveloped land currently included in the Wilderness System, managed so as to preserve its natural conditions and retain its primeval character and influence.

Woodlands—Forest lands where timber species make up less than 10 percent stocking.

Woodland species dead volume—Net volume of dead woodland trees and dead net volume portion of live woodland tree species.

Woodland species live volume—Net cubic-foot volume in live woodland tree species.

Woodland species—Tree species not usually converted into industrial wood products. Common uses are fuelwood, fenceposts, and Christmas trees.

REFERENCES

- Chojnacky, David C. 1985. Pinyon-juniper volume equations for the central Rocky Mountain States. Res. Pap. INT-339. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 27 p.
- Edminster, Carleton B.; Mowrer, H. Todd; Hinds, Thomas E. 1981. Volume tables and point-sampling factors for aspen in Colorado. Res. Pap. RM-232. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 16 p.
- Edminster, Carleton B.; Beeson, Robert T.; Metcalf, Gary E. 1980. Volume tables and point-sampling factors for ponderosa pine in the Front Range of Colorado. Res. Pap. RM-218. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 14 p.
- Kemp, Paul D. 1958. Volume tables. Unpublished report on file at: U.S. Department of Agriculture, Forest Service, Intermountain Research Station, Ogden, UT.

- McLain, William H. 1985. Colorado's industrial roundwood production and mill residues, 1982. Resour. Bull. INT-35. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 13 p.
- McLain, William H.; Booth, Gordon D. 1985. Colorado's 1982 fuelwood harvest. Resour. Bull. INT-36. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 11 p.
- Meyers, Clifford A. 1964. Volume tables and point-sampling factors for lodgepole pine in Colorado and Wyoming. Res. Pap. RM-6. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 16 p.
- Meyers, Clifford A.; Edminster, Carleton B. 1972. Volume tables and point-sampling factors for Engelmann spruce in Colorado and Wyoming. Res. Pap. RM-95. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 23 p.

FOREST SURVEY TABLES

Table 1--Area of State and privately owned forest land with percent standard error, Colorado, 1983

Item	Softwoods		Hardwoods		All types	
	Thousand acres	Percent standard error	Thousand acres	Percent standard error	Thousand acres	Percent standard error
Timberland	2,655.2	± 3.1	945.2	± 5.9	3,600.4	± 2.4
Woodland	2,103.4	± 4.2	683.2	±10.7	2,786.6	± 3.8
Reserved forest land: ¹						
Timberland	15.3		3.6		18.9	
Woodland	4.5		2.4		6.9	
Total forest land	4,778.4		1,634.4		6,412.8	

¹Reserved land areas are estimated from aerial photos without field verification; therefore, standard errors are not calculated.

Table 2--Net volume, net annual growth, and annual mortality of growing stock and sawtimber on State and privately owned timberland with percent standard error, Colorado

Item	Softwoods		Hardwoods		All species	
	Volume	Percent standard error	Volume	Percent standard error	Volume	Percent standard error
Net volume, 1983:						
Growing stock (Million cubic feet)	3,340.8	± 4.8	1,159.3	± 8.2	4,500.1	± 4.1
Sawtimber ¹ (Million board feet)	11,589.5	± 5.8	1,867.7	±15.0	13,457.2	± 5.4
Sawtimber ² (Million board feet)	9,838.7	± 5.8	1,588.7	±15.0	11,427.4	± 5.4
Net annual growth, 1982:						
Growing stock (Thousand cubic feet)	66,165	± 6.6	22,807	±12.7	88,972	± 5.9
Sawtimber ¹ (Thousand board feet)	273,505	± 8.0	110,320	±25.7	383,825	± 9.4
Sawtimber ² (Thousand board feet)	231,144	± 8.0	94,598	±25.6	325,742	± 9.5
Annual mortality, 1982:						
Growing stock (Thousand cubic feet)	7,346	±19.3	9,414	±20.1	16,760	±14.5
Sawtimber ¹ (Thousand board feet)	28,392	±22.1	11,082	±39.6	39,474	±20.3
Sawtimber ² (Thousand board feet)	24,043	±21.9	9,408	±39.3	33,451	±20.2

¹International ¼-inch rule.

²Scribner rule.

Table 3--Total land and water area by ownership class, Colorado, 1983

Ownership class	Area
	- - Thousand acres - -
Land:	
Public:	
National Forest	14,430.8
National Parks ¹	610.3
Other:	
Bureau of Land Management	8,333.0
Miscellaneous Federal	271.6
State	3,022.9
County and municipal	<u>316.2</u>
Total other public	<u>11,943.7</u>
Total public	<u>26,984.8</u>
Private	<u>39,315.9</u>
Total land area	<u>66,300.7</u>
Census water	<u>317.5</u>
Total land and water ²	<u>66,618.2</u>

¹Not included with miscellaneous Federal, a component of other public, for purpose of clarity.

²U.S. Bureau of the Census, land and water area of the United States, 1980.

Table 4--Total land area on State and privately owned land by major land class and ownership class, Colorado, 1983

Land class	Ownership class		Total
	State	Nonindustrial private	
----- Thousand acres -----			
Timberland:			
Reserved	18.9	--	18.9
Nonreserved	235.2	3,365.2	3,600.4
Total	254.1	3,365.2	3,619.3
Woodland:			
Reserved	6.9	--	6.9
Nonreserved	161.2	2,625.4	2,786.6
Total	168.1	2,625.4	2,793.5
Total forest land:			
Reserved	25.8	--	25.8
Nonreserved	396.4	5,990.6	6,387.0
Total	422.2	5,990.6	6,412.8
Nonforest land ¹	2,600.7	33,325.3	35,926.0
Total land area	3,022.9	39,315.9	42,338.8

¹Includes all of Eastern Colorado which was administratively determined to be nonforest land.

Table 5--Area of forest land on State and privately owned land by forest type, ownership class, and land class, Colorado, 1983

Forest type	Ownership class and land class						Total
	State		Nonindustrial private		All owners		
	Reserved	Nonreserved	Reserved	Nonreserved	Reserved	Nonreserved	
----- Thousand acres -----							
Douglas-fir	4.9	23.7	--	430.9	4.9	454.6	459.5
Ponderosa pine	6.3	63.6	--	1,273.4	6.3	1,337.0	1,343.3
Lodgepole pine	3.9	45.4	--	284.9	3.9	330.3	334.2
Limber pine	--	2.6	--	31.3	--	33.9	33.9
Spruce subalpine-fir	--	16.7	--	137.1	--	153.8	153.8
White fir	--	5.9	--	92.7	--	98.6	98.6
Spruce	0.2	16.3	--	230.7	0.2	247.0	247.2
Aspen	1.5	58.8	--	785.4	1.5	844.2	845.7
Cottonwood	2.1	2.2	--	98.8	2.1	101.0	103.1
Total timberland	18.9	235.2	--	3,365.2	18.9	3,600.4	3,619.3
Pinyon-juniper	4.5	98.3	--	1,567.6	4.5	1,665.9	1,670.4
Juniper	--	31.1	--	406.4	--	437.5	437.5
Oak	2.4	31.4	--	638.5	2.4	669.9	672.3
Riparian	--	0.2	--	3.4	--	3.6	3.6
Other west hardwoods	--	0.2	--	9.5	--	9.7	9.7
Total woodland	6.9	161.2	--	2,625.4	6.9	2,786.6	2,793.5
Total all types	25.8	396.4	--	5,990.6	25.8	6,387.0	6,412.8

Table 6--Cubic feet of net volume in trees on State and privately owned forest land by species and ownership class, Colorado, 1983

Species	Ownership class		
	State	Nonindustrial private	Total
----- Million cubic feet -----			
Douglas-fir	28.6	548.7	577.3
Ponderosa pine	46.1	1,026.7	1,072.8
Lodgepole pine	93.7	535.7	629.4
Whitebark pine	1.0	25.9	26.9
Limber pine	2.4	38.1	40.5
Subalpine fir	19.7	181.3	201.0
White fir	6.3	93.2	99.5
Engelmann spruce	53.1	640.9	694.0
Aspen	74.1	1,000.5	1,074.6
Cottonwood	2.0	87.2	89.2
Total timberland species	327.0	4,178.2	4,505.2
Pinyon/juniper	57.1	977.2	1,034.3
Woodland hardwoods	8.5	147.2	155.7
Total woodland species	65.6	1,124.4	1,190.0
Total all species	392.6	5,302.6	5,695.2

Table 7--Cubic feet of net annual growth in trees on State and privately owned forest land by species and ownership class, Colorado, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
- - - - - Thousand cubic feet - - - - -			
Douglas-fir	598	10,634	11,232
Ponderosa pine	902	19,682	20,584
Lodgepole pine	1,937	14,858	16,795
Whitebark pine	13	330	343
Limber pine	37	588	625
Subalpine fir	338	2,818	3,156
White fir	40	1,074	1,114
Engelmann spruce	883	11,562	12,445
Aspen	1,601	18,730	20,331
Cottonwood	50	2,552	2,602
Total timberland species	6,399	82,828	89,227
Pinyon/juniper	581	9,672	10,253
Woodland hardwoods	263	5,519	5,782
Total woodland species	844	15,191	16,035
Total all species	7,243	98,019	105,262

Table 8--Cubic feet of annual mortality in trees on State and privately owned forest land by species and ownership class, Colorado, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
- - - - - Thousand cubic feet - - - - -			
Douglas-fir	48	1,144	1,192
Ponderosa pine	37	929	966
Lodgepole pine	205	1,402	1,607
Whitebark pine	--	--	--
Limber pine	--	--	--
Subalpine fir	129	1,173	1,302
White fir	119	1,037	1,156
Engelmann spruce	23	1,100	1,123
Aspen	429	8,730	9,159
Cottonwood	--	263	263
Total timberland species	990	15,778	16,768
Pinyon/juniper	133	1,950	2,083
Woodland hardwoods	45	717	762
Total woodland species	178	2,667	2,845
Total all species	1,168	18,445	19,613

Table 9--Area of State and privately owned timberland by forest type, stand-size class, and productivity class, Colorado, 1983

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
----- Thousand acres -----					
Douglas-fir:					
Sawtimber	--	106.4	213.1	7.3	326.8
Poletimber	--	8.1	98.0	--	106.1
Sapling and seedling	--	--	3.9	--	3.9
Nonstocked	--	3.9	13.9	--	17.8
Total	--	118.4	328.9	7.3	454.6
Ponderosa pine:					
Sawtimber	18.6	181.3	779.2	4.0	983.1
Poletimber	--	12.1	152.1	--	164.2
Sapling and seedling	--	--	13.7	--	13.7
Nonstocked	--	19.3	156.7	--	176.0
Total	18.6	212.7	1,101.7	4.0	1,337.0
Lodgepole pine:					
Sawtimber	7.2	71.7	68.3	--	147.2
Poletimber	8.2	7.1	139.2	12.7	167.2
Sapling and seedling	--	--	15.9	--	15.9
Nonstocked	--	--	--	--	--
Total	15.4	78.8	223.4	12.7	330.3
Limber pine:					
Sawtimber	--	--	17.0	16.9	33.9
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	17.0	16.9	33.9
Spruce-subalpine fir:					
Sawtimber	--	37.8	62.8	--	100.6
Poletimber	--	12.0	7.2	--	19.2
Sapling and seedling	--	14.8	11.9	--	26.7
Nonstocked	--	--	--	7.3	7.3
Total	--	64.6	81.9	7.3	153.8

(con.)

Table 9 (con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
- - - - - Thousand acres - - - - -					
White fir:					
Sawtimber	8.8	25.6	28.6	--	63.0
Poletimber	--	8.6	--	--	8.6
Sapling and seedling	10.2	9.2	3.8	--	23.2
Nonstocked	3.8	--	--	--	3.8
Total	22.8	43.4	32.4	--	98.6
Spruce:					
Sawtimber	18.7	147.0	55.5	7.1	228.3
Poletimber	4.7	--	9.2	--	13.9
Sapling and seedling	--	--	4.8	--	4.8
Nonstocked	--	--	--	--	--
Total	23.4	147.0	69.5	7.1	247.0
Aspen:					
Sawtimber	46.6	54.0	64.4	--	165.0
Poletimber	12.6	204.1	297.5	16.7	530.9
Sapling and seedling	--	35.6	78.6	27.8	142.0
Nonstocked	--	6.3	--	--	6.3
Total	59.2	300.0	440.5	44.5	844.2
Cottonwood:					
Sawtimber	--	68.7	10.1	--	78.8
Poletimber	--	22.2	--	--	22.2
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	90.9	10.1	--	101.0
All types:					
Sawtimber	99.9	692.5	1,299.0	35.3	2,126.7
Poletimber	25.5	274.2	703.2	29.4	1,032.3
Sapling and seedling	10.2	59.6	132.6	27.8	230.2
Nonstocked	3.8	29.5	170.6	7.3	211.2
Total	139.4	1,055.8	2,305.4	99.8	3,600.4

Table 10--Area of State owned timberland by forest type, stand-size class, and productivity class, Colorado, 1983

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
- - - - - Thousand acres - - - - -					
Douglas-fir:					
Sawtimber	--	3.9	13.5	0.5	17.9
Poletimber	--	1.0	3.6	--	4.6
Sapling and seedling	--	--	0.1	--	0.1
Nonstocked	--	--	1.1	--	1.1
Total	--	4.9	18.3	0.5	23.7
Ponderosa pine:					
Sawtimber	0.6	6.5	36.9	0.2	44.2
Poletimber	--	0.7	6.4	--	7.1
Sapling and seedling	--	--	0.7	--	0.7
Nonstocked	--	0.5	11.1	--	11.6
Total	0.6	7.7	55.1	0.2	63.6
Lodgepole pine:					
Sawtimber	2.2	12.0	9.0	--	23.2
Poletimber	0.7	1.7	14.7	0.8	17.9
Sapling and seedling	--	--	4.3	--	4.3
Nonstocked	--	--	--	--	--
Total	2.9	13.7	28.0	0.8	45.4
Limber pine:					
Sawtimber	--	--	0.6	2.0	2.6
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	0.6	2.0	2.6
Spruce-subalpine fir:					
Sawtimber	--	4.2	4.3	--	8.5
Poletimber	--	1.0	2.2	--	3.2
Sapling and seedling	--	2.4	2.2	--	4.6
Nonstocked	--	--	--	0.4	0.4
Total	--	7.6	8.7	0.4	16.7

(con.)

Table 10 (con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
- - - - - Thousand acres - - - - -					
White fir:					
Sawtimber	2.2	0.9	1.5	--	4.6
Poletimber	--	--	--	--	--
Sapling and seedling	0.3	0.4	0.3	--	1.0
Nonstocked	0.3	--	--	--	0.3
Total	2.8	1.3	1.8	--	5.9
Spruce:					
Sawtimber	0.6	8.3	4.3	2.1	15.3
Poletimber	--	--	1.0	--	1.0
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	0.6	8.3	5.3	2.1	16.3
Aspen:					
Sawtimber	4.8	3.0	2.5	--	10.3
Poletimber	2.3	14.5	21.1	1.8	39.7
Sapling and seedling	--	1.7	5.4	1.2	8.3
Nonstocked	--	0.5	--	--	0.5
Total	7.1	19.7	29.0	3.0	58.8
Cottonwood:					
Sawtimber	--	1.2	0.8	--	2.0
Poletimber	--	0.2	--	--	0.2
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	1.4	0.8	--	2.2
All types:					
Sawtimber	10.4	40.0	73.4	4.8	128.6
Poletimber	3.0	19.1	49.0	2.6	73.7
Sapling and seedling	0.3	4.5	13.0	1.2	19.0
Nonstocked	0.3	1.0	12.2	0.4	13.9
Total	14.0	64.6	147.6	9.0	235.2

Table 11--Area of nonindustrial privately owned timberland by forest type, stand-size class, and productivity class, Colorado, 1983

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
- - - - - Thousand acres - - - - -					
Douglas-fir:					
Sawtimber	--	102.5	199.6	6.8	308.9
Poletimber	--	7.1	94.4	--	101.5
Sapling and seedling	--	--	3.8	--	3.8
Nonstocked	--	3.9	12.8	--	16.7
Total	--	113.5	310.6	6.8	430.9
Ponderosa pine:					
Sawtimber	18.0	174.8	742.3	3.8	938.9
Poletimber	--	11.4	145.7	--	157.1
Sapling and seedling	--	--	13.0	--	13.0
Nonstocked	--	18.8	145.6	--	164.4
Total	18.0	205.0	1,046.6	3.8	1,273.4
Lodgepole pine:					
Sawtimber	5.0	59.7	59.3	--	124.0
Poletimber	7.5	5.4	124.5	11.9	149.3
Sapling and seedling	--	--	11.6	--	11.6
Nonstocked	--	--	--	--	--
Total	12.5	65.1	195.4	11.9	284.9
Limber pine:					
Sawtimber	--	--	16.4	14.9	31.3
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	16.4	14.9	31.3
Spruce-subalpine fir:					
Sawtimber	--	33.6	58.5	--	92.1
Poletimber	--	11.0	5.0	--	16.0
Sapling and seedling	--	12.4	9.7	--	22.1
Nonstocked	--	--	--	6.9	6.9
Total	--	57.0	73.2	6.9	137.1

(con.)

Table 11 (con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
- - - - - Thousand acres - - - - -					
White fir:					
Sawtimber	6.6	24.7	27.1	--	58.4
Poletimber	--	8.6	--	--	8.6
Sapling and seedling	9.9	8.8	3.5	--	22.2
Nonstocked	3.5	--	--	--	3.5
Total	20.0	42.1	30.6	--	92.7
Spruce:					
Sawtimber	18.1	138.7	51.2	5.0	213.0
Poletimber	4.7	--	8.2	--	12.9
Sapling and seedling	--	--	4.8	--	4.8
Nonstocked	--	--	--	--	--
Total	22.8	138.7	64.2	5.0	230.7
Aspen:					
Sawtimber	41.8	51.0	61.9	--	154.7
Poletimber	10.3	189.6	276.4	14.9	491.2
Sapling and seedling	--	33.9	73.2	26.6	133.7
Nonstocked	--	5.8	--	--	5.8
Total	52.1	280.3	411.5	41.5	785.4
Cottonwood:					
Sawtimber	--	67.5	9.3	--	76.8
Poletimber	--	22.0	--	--	22.0
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	89.5	9.3	--	98.8
All types:					
Sawtimber	89.5	652.5	1,225.6	30.5	1,998.1
Poletimber	22.5	255.1	654.2	26.8	958.6
Sapling and seedling	9.9	55.1	119.6	26.6	211.2
Nonstocked	3.5	28.5	158.4	6.9	197.3
Total	125.4	991.2	2,157.8	90.8	3,365.2

Table 12--Area of State and privately owned timberland by stand volume and ownership class, Colorado, 1983

Stand volume per acre ¹	Ownership class			Total
	State	Nonindustrial private		
	----- Thousand acres -----			
Less than 1,500 board feet	81.8	1,181.9		1,263.7
1,500 to 4,999 board feet	82.3	1,248.8		1,331.1
5,000 to 9,999 board feet	47.9	683.5		731.4
10,000 board feet or more	23.2	251.0		274.2
All classes	235.2	3,365.2		3,600.4

¹International 1/4-inch rule.

Table 13--Area of State and privately owned timberland by forest type and area condition class, Colorado, 1983

Forest type	Area condition class										Nonstocked	All classes
	10	20	30	40	50	60	70	80	90			
	----- Thousand acres -----											
Douglas-fir	--	--	--	7.7	70.3	153.7	68.7	7.7	128.7	17.8	454.6	
Ponderosa pine	--	--	--	--	96.0	371.7	493.1	3.9	196.3	176.0	1,337.0	
Lodgepole pine	--	8.2	3.9	47.2	119.6	74.1	31.3	5.4	40.6	--	330.3	
Limber pine	--	--	--	--	--	--	9.7	--	24.2	--	33.9	
Spruce-subalpine fir	--	--	7.1	3.8	61.4	12.1	8.8	27.2	26.1	7.3	153.8	
White fir	--	--	--	--	--	27.9	54.8	--	12.1	3.8	98.6	
Spruce	--	27.2	--	--	26.7	40.4	72.5	7.1	73.1	--	247.0	
Aspen	--	--	8.2	9.9	371.9	269.0	137.3	--	41.6	6.3	844.2	
Cottonwood	--	--	--	--	--	36.4	24.5	--	40.1	--	101.0	
All types	--	35.4	19.2	68.6	745.9	985.3	900.7	51.3	582.8	211.2	3,600.4	

Table 14--Number of growing stock trees on State and privately owned timberland by species and diameter class, Colorado, 1983

Species	Diameter class (inches at breast height)																All classes
	1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 22.9	23.0- 24.9	25.0- 26.9	27.0- 28.9	29.0+		
	----- Thousand trees -----																
Douglas-fir	10,774	25,962	26,889	17,770	9,111	5,745	3,416	2,559	1,267	713	407	139	118	25	44	104,939	
Ponderosa pine	17,858	29,910	32,591	29,949	19,840	15,293	10,843	5,909	2,763	926	287	307	102	140	164	166,882	
Lodgepole pine	11,985	30,751	40,345	23,870	10,669	5,518	2,505	449	235	--	--	--	--	--	--	126,327	
Whitebark pine	1,053	727	1,142	913	800	434	227	235	46	17	--	--	--	--	--	5,594	
Limber pine	1,100	3,467	2,121	1,531	376	656	176	171	187	87	12	--	10	18	8	9,920	
Subalpine fir	18,485	21,949	15,215	8,437	5,081	1,552	363	402	111	75	90	--	--	--	--	71,760	
White fir	16,054	3,460	6,905	3,235	1,864	1,083	620	361	59	139	76	51	--	75	6	33,988	
Engelmann spruce	50,377	25,780	13,307	14,856	9,490	7,392	3,874	2,040	1,455	808	276	316	260	74	65	130,370	
Total softwoods	127,686	142,006	138,515	100,561	57,231	37,673	22,024	12,126	6,123	2,765	1,148	813	490	332	287	649,780	
Aspen	113,860	98,097	98,335	48,208	29,128	10,179	4,790	1,697	527	46	86	--	--	--	--	404,953	
Cottonwood	9,593	--	4,352	2,562	2,334	840	116	480	244	161	113	--	--	--	167	20,962	
Total hardwoods	123,453	98,097	102,687	50,770	31,462	11,019	4,906	2,177	771	207	199	--	--	--	167	425,915	
All species	251,139	240,103	241,202	151,331	88,693	48,692	26,930	14,303	6,894	2,972	1,347	813	490	332	454	1,075,695	

Table 15--Number of cull and salvable dead trees on State and privately owned timberland by ownership class, and softwoods and hardwoods, Colorado, 1983

Ownership class and species group	Cull trees			Salvable dead trees	All dead trees
	Sound	Rotten	Total		
----- Thousand trees -----					
State:					
Softwoods	78	97	175	2,650	2,825
Hardwoods	--	511	511	2,116	2,627
Total	78	608	686	4,766	5,452
Nonindustrial private:					
Softwoods	1,452	1,771	3,223	25,764	28,987
Hardwoods	--	5,723	5,723	32,799	38,522
Total	1,452	7,494	8,946	58,563	67,509
Total:					
Softwoods	1,530	1,868	3,398	28,414	31,812
Hardwoods	--	6,234	6,234	34,915	41,149
Total	1,530	8,102	9,632	63,329	72,961

Table 16--Net volume of growing stock on State and privately owned timberland by ownership class, forest type, and stand-size class, Colorado, 1983

Ownership class	Forest type	Stand-size class				
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	All classes
----- Million cubic feet -----						
State:	Douglas-fir	23.9	5.5	(¹)	0.1	29.5
	Ponderosa pine	39.2	5.7	0.3	0.8	46.0
	Lodgepole pine	62.7	26.8	--	--	89.5
	Limber pine	1.4	--	--	--	1.4
	Spruce-subalpine fir	20.9	8.0	3.2	0.1	32.2
	White fir	5.5	--	0.3	--	5.8
	Spruce	38.6	1.4	--	--	40.0
	Aspen	25.5	52.6	2.6	--	80.7
	Cottonwood	1.4	0.3	--	--	1.7
	All types	219.1	100.3	6.4	1.0	326.8
Nonindustrial private:	Douglas-fir	430.9	116.4	1.2	0.9	549.4
	Ponderosa pine	888.7	125.0	4.8	14.5	1,033.0
	Lodgepole pine	298.0	223.2	--	--	521.2
	Limber pine	22.8	--	--	--	22.8
	Spruce-subalpine fir	230.5	63.7	16.2	1.5	311.9
	White fir	76.9	13.1	7.8	--	97.8
	Spruce	505.2	17.8	0.7	--	523.7
	Aspen	323.0	651.9	57.3	--	1,032.2
	Cottonwood	52.2	29.1	--	--	81.3
	All types	2,828.2	1,240.2	88.0	16.9	4,173.3
Total:	Douglas-fir	454.8	121.9	1.2	1.0	578.9
	Ponderosa pine	927.9	130.7	5.1	15.3	1,079.0
	Lodgepole pine	360.7	250.0	--	--	610.7
	Limber pine	24.2	--	--	--	24.2
	Spruce-subalpine fir	251.4	71.7	19.4	1.6	344.1
	White fir	82.4	13.1	8.1	--	103.6
	Spruce	543.8	19.2	0.7	--	563.7
	Aspen	348.5	704.5	59.9	--	1,112.9
	Cottonwood	53.6	29.4	--	--	83.0
	All types	3,047.3	1,340.5	94.4	17.9	4,500.1

¹Less than 0.05 million cubic feet.

Table 17--Net volume of sawtimber (International 4-inch rule) on State and privately owned timberland by ownership class, forest type, and stand-size class, Colorado, 1983

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	
- - - - Million board feet, International 4-inch rule - - - -						
State:	Douglas-fir	87.7	13.4	0.1	0.2	101.4
	Ponderosa pine	157.2	10.3	0.9	3.6	172.0
	Lodgepole pine	197.1	31.6	--	--	228.7
	Limber pine	5.3	--	--	--	5.3
	Spruce-subalpine fir	76.3	14.9	9.3	0.4	100.9
	White fir	18.1	--	0.9	--	19.0
	Spruce	148.6	1.6	--	--	150.2
	Aspen	77.2	62.4	3.6	--	143.2
	Cottonwood	5.6	0.2	--	--	5.8
	All types	773.1	134.4	14.8	4.2	926.5
Nonindustrial private:	Douglas-fir	1,598.6	276.5	2.2	3.4	1,880.7
	Ponderosa pine	3,600.2	217.1	17.2	66.3	3,900.8
	Lodgepole pine	965.1	196.3	--	--	1,161.4
	Limber pine	74.4	--	--	--	74.4
	Spruce-subalpine fir	824.9	112.2	43.5	5.8	986.4
	White fir	236.1	17.7	19.0	--	272.8
	Spruce	2,072.8	25.8	2.1	--	2,100.7
	Aspen	1,076.7	785.2	62.3	--	1,924.2
	Cottonwood	214.2	15.1	--	--	229.3
	All types	10,663.0	1,645.9	146.3	75.5	12,530.7
Total:	Douglas-fir	1,686.3	289.9	2.3	3.6	1,982.1
	Ponderosa pine	3,757.4	227.4	18.1	69.9	4,072.8
	Lodgepole pine	1,162.2	227.9	--	--	1,390.1
	Limber pine	79.7	--	--	--	79.7
	Spruce-subalpine fir	901.2	127.1	52.8	6.2	1,087.3
	White fir	254.2	17.7	19.9	--	291.8
	Spruce	2,221.4	27.4	2.1	--	2,250.9
	Aspen	1,153.9	847.6	65.9	--	2,067.4
	Cottonwood	219.8	15.3	--	--	235.1
	All types	11,436.1	1,780.3	161.1	79.7	13,457.2

Table 18--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by ownership class, forest type, and stand-size class, Colorado, 1983

Ownership class	Forest type	Stand-size class				
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	All classes
- - - - - Million board feet, Scribner rule - - - - -						
State:	Douglas-fir	74.3	11.3	0.1	0.1	85.8
	Ponderosa pine	133.3	8.4	0.7	3.1	145.5
	Lodgepole pine	168.1	27.1	--	--	195.2
	Limber pine	4.5	--	--	--	4.5
	Spruce-subalpine fir	64.1	12.5	8.0	0.3	84.9
	White fir	15.4	--	0.8	--	16.2
	Spruce	126.5	1.4	--	--	127.9
	Aspen	65.5	53.1	3.0	--	121.6
	Cottonwood	4.8	0.2	--	--	5.0
	All types	656.5	114.0	12.6	3.5	786.6
Nonindustrial private:	Douglas-fir	1,356.4	233.4	1.8	2.9	1,594.5
	Ponderosa pine	3,064.9	176.6	14.8	55.6	3,311.9
	Lodgepole pine	821.9	168.0	--	--	989.9
	Limber pine	63.1	--	--	--	63.1
	Spruce-subalpine fir	696.5	95.5	37.2	5.0	834.2
	White fir	200.1	14.9	16.1	--	231.1
	Spruce	1,762.3	22.0	1.8	--	1,786.1
	Aspen	914.3	667.2	52.9	--	1,634.4
	Cottonwood	183.5	12.1	--	--	195.6
	All types	9,063.0	1,389.7	124.6	63.5	10,640.8
Total:	Douglas-fir	1,430.7	244.7	1.9	3.0	1,680.3
	Ponderosa pine	3,198.2	185.0	15.5	58.7	3,457.4
	Lodgepole pine	990.0	195.1	--	--	1,185.1
	Limber pine	67.6	--	--	--	67.6
	Spruce-subalpine fir	760.6	108.0	45.2	5.3	919.1
	White fir	215.5	14.9	16.9	--	247.3
	Spruce	1,888.8	23.4	1.8	--	1,914.0
	Aspen	979.8	720.3	55.9	--	1,756.0
	Cottonwood	188.3	12.3	--	--	200.6
	All types	9,719.5	1,503.7	137.2	67.0	11,427.4

Table 19--Net volume of growing stock on State and privately owned timberland by ownership class and species, Colorado, 1983

Species	Ownership class		Total
	State	Nonindustrial private	
- - - - - Million cubic feet - - - - -			
Douglas-fir	28.6	548.5	577.1
Ponderosa pine	46.1	1,026.4	1,072.5
Lodgepole pine	93.7	535.7	629.4
Whitebark pine	1.0	25.9	26.9
Limber pine	2.3	38.1	40.4
Subalpine fir	19.8	181.2	201.0
White fir	6.3	93.2	99.5
Engelmann spruce	53.1	640.9	694.0
Total softwoods	250.9	3,089.9	3,340.8
Aspen	73.9	996.1	1,070.0
Cottonwood	2.0	87.3	89.3
Total hardwoods	75.9	1,083.4	1,159.3
All species	326.8	4,173.3	4,500.1

Table 20--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by ownership class and species, Colorado, 1983

Species	Ownership class		Total
	State	Nonindustrial private	
- - Million board feet, International ¼-inch rule - - -			
Douglas-fir	106.1	2,038.7	2,144.8
Ponderosa pine	175.4	3,956.5	4,131.9
Lodgepole pine	252.1	1,252.2	1,504.3
Whitebark pine	2.8	83.1	85.9
Limber pine	7.5	123.7	131.2
Subalpine fir	51.8	437.6	489.4
White fir	22.5	299.9	322.4
Engelmann spruce	198.6	2,581.0	2,779.6
Total softwoods	816.8	10,772.7	11,589.5
Aspen	102.7	1,505.5	1,608.2
Cottonwood	7.0	252.5	259.5
Total hardwoods	109.7	1,758.0	1,867.7
All species	926.5	12,530.7	13,457.2

Table 21--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by ownership class and species, Colorado, 1983

Species	Ownership class		Total
	State	Nonindustrial private	
- - - - - Million board feet, Scribner rule - - - - -			
Douglas-fir	89.8	1,727.6	1,817.4
Ponderosa pine	148.4	3,359.0	3,507.4
Lodgepole pine	215.0	1,067.8	1,282.8
Whitebark pine	2.3	69.3	71.6
Limber pine	6.4	105.3	111.7
Subalpine fir	43.9	372.4	416.3
White fir	19.2	254.2	273.4
Engelmann spruce	168.2	2,189.9	2,358.1
Total softwoods	693.2	9,145.5	9,838.7
Aspen	87.3	1,279.1	1,366.4
Cottonwood	6.1	216.2	222.3
Total hardwoods	93.4	1,495.3	1,588.7
All species	786.6	10,640.8	11,427.4

Table 22--Net volume of growing stock on State and privately owned timberland by species and diameter class, Colorado, 1983

Species	Diameter class (inches at breast height)											All classes		
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9		27.0-28.9	29.0+
	----- Million cubic feet -----													
Douglas-fir	48.3	77.4	82.9	79.2	74.4	73.3	48.1	38.0	25.7	10.1	9.4	2.5	7.8	577.1
Ponderosa pine	53.7	120.5	142.3	179.3	211.3	156.9	91.6	42.6	14.3	19.4	7.7	11.9	21.0	1,072.5
Lodgepole pine	110.7	164.4	145.0	111.8	70.1	16.4	11.0	--	--	--	--	--	--	629.4
Whitebark pine	1.8	3.1	5.7	5.3	3.8	5.2	1.4	0.6	--	--	--	--	--	26.9
Limber pine	3.5	6.7	3.6	9.1	3.3	4.0	4.8	2.4	0.4	--	0.9	1.0	0.7	40.4
Subalpine fir	43.3	41.3	55.4	27.7	8.1	12.2	4.4	3.5	5.1	--	--	--	--	201.0
White fir	9.6	14.4	13.1	14.3	13.6	11.1	1.9	6.3	3.8	3.7	--	7.0	0.7	99.5
Engelmann spruce	29.0	78.1	93.0	123.8	93.1	68.7	66.4	46.4	21.6	25.7	25.4	10.9	11.9	694.0
Total softwoods	299.9	505.9	541.0	550.5	477.7	347.8	229.6	139.8	70.9	58.9	43.4	33.3	42.1	3,340.8
Aspen	191.4	252.6	297.0	154.7	105.7	45.0	17.6	1.4	4.6	--	--	--	--	1,070.0
Cottonwood	4.9	10.7	19.2	10.5	1.8	9.3	5.1	6.1	4.8	--	--	--	16.9	89.3
Total hardwoods	196.3	263.3	316.2	165.2	107.5	54.3	22.7	7.5	9.4	--	--	--	16.9	1,159.3
All species	496.2	769.2	857.2	715.7	585.2	402.1	252.3	147.3	80.3	58.9	43.4	33.3	59.0	4,500.1

Table 23--Net volume of sawtimber (International 4-inch rule) on State and privately owned timberland by species and diameter class, Colorado, 1983

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	----- Million board feet, International 4-inch rule -----											
Douglas-fir	284.1	350.7	366.1	374.6	252.9	206.3	140.5	56.3	52.7	14.7	45.9	2,144.8
Ponderosa pine	461.4	749.3	1,022.0	797.5	476.0	226.3	76.0	104.0	41.5	63.8	114.1	4,131.9
Lodgepole pine	499.8	511.2	351.3	85.1	56.9	--	--	--	--	--	--	1,504.3
Whitebark pine	17.6	19.8	15.7	23.6	6.5	2.7	--	--	--	--	--	85.9
Limber pine	12.6	35.8	14.3	18.0	23.1	11.6	2.1	--	4.7	5.1	3.9	131.2
Subalpine fir	197.3	128.5	38.3	59.7	21.9	17.6	26.1	--	--	--	--	489.4
White fir	41.5	61.5	64.3	52.6	8.6	27.5	16.5	16.0	--	30.6	3.3	322.4
Engelmann spruce	325.0	566.5	451.1	341.0	333.5	236.4	114.4	138.1	140.5	63.1	70.0	2,779.6
Total softwoods	1,839.3	2,423.3	2,323.1	1,752.1	1,179.4	728.4	375.6	314.4	239.4	177.3	237.2	11,589.5
Aspen	XXXXX	732.8	529.3	227.5	89.2	6.6	22.8	--	--	--	--	1,608.2
Cottonwood	XXXXX	53.5	8.8	45.6	24.0	28.3	22.0	--	--	--	77.3	259.5
Total hardwoods	XXXXX	786.3	538.1	273.1	113.2	34.9	44.8	--	--	--	77.3	1,867.7
All species	1,839.3	3,209.6	2,861.2	2,025.2	1,292.6	763.3	420.4	314.4	239.4	177.3	314.5	13,457.2

Table 24--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by species and diameter class, Colorado, 1983

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	----- Million board feet, Scribner rule -----											
Douglas-fir	251.8	303.1	305.0	307.5	205.5	173.5	120.9	49.4	46.7	13.1	40.9	1,817.4
Ponderosa pine	349.1	617.5	877.4	693.5	416.6	199.4	67.0	92.0	36.8	56.6	101.5	3,507.4
Lodgepole pine	434.5	433.0	295.1	71.5	48.7	--	--	--	--	--	--	1,282.8
Whitebark pine	13.5	17.1	13.4	19.9	5.4	2.3	--	--	--	--	--	71.6
Limber pine	10.5	30.8	12.1	15.2	19.4	9.8	1.8	--	4.1	4.5	3.5	111.7
Subalpine fir	172.5	108.6	31.8	48.8	17.7	14.6	22.3	--	--	--	--	416.3
White fir	36.3	53.1	53.4	42.9	7.0	22.2	14.1	14.3	--	27.2	2.9	273.4
Engelmann spruce	286.5	481.1	373.3	277.8	274.1	198.9	101.1	122.0	124.9	56.1	62.3	2,358.1
Total softwoods	1,554.7	2,044.3	1,961.5	1,477.1	994.4	620.7	327.2	277.7	212.5	157.5	211.1	9,838.7
Aspen	XXXX	628.4	445.6	191.6	75.7	5.6	19.5	--	--	--	--	1,366.4
Cottonwood	XXXX	42.9	7.3	38.6	20.5	24.8	19.4	--	--	--	68.8	222.3
Total hardwoods	XXXX	671.3	452.9	230.2	96.2	30.4	38.9	--	--	--	68.8	1,588.7
All species	1,554.7	2,715.6	2,414.4	1,707.3	1,090.6	651.1	366.1	277.7	212.5	157.5	279.9	11,427.4

Table 25--Net volume of timber on State and privately owned timberland by class of timber, and softwoods and hardwoods, Colorado, 1983

Class of timber	Million cubic feet		
	Softwoods	Hardwoods	All classes
Sawtimber trees:			
Saw-log portion	2,216.1	287.3	2,503.4
Upper-stem portion	319.0	96.1	415.1
Total	2,535.1	383.4	2,918.5
Poletimber trees	805.7	775.9	1,581.6
All growing stock trees	3,340.8	1,159.3	4,500.1
Sound cull trees	2.2	--	2.2
Rotten cull trees	8.7	14.3	23.0
Salvable dead trees	170.2	87.1	257.3
All timber	3,521.9	1,260.7	4,782.6

Table 26--Net volume of growing stock on State and privately owned timberland by forest type and species, Colorado, 1983

Forest type	Species										Total hardwoods	All species	
	Douglas-fir	Ponderosa pine	Lodgepole pine	Whitebark pine	Limber pine	Subalpine fir	White fir	Engelmann spruce	Total softwoods	Aspen			Cottonwood
Douglas-fir	406.6	53.3	8.7	3.3	16.5	15.8	20.7	37.6	562.5	16.4	--	16.4	578.9
Ponderosa pine	58.3	983.6	7.7	--	1.1	--	4.9	1.7	1,057.3	19.5	2.2	21.7	1,079.0
Lodgepole pine	6.7	2.8	565.8	--	0.5	5.4	0.9	15.7	597.8	12.9	--	12.9	610.7
Limber pine	3.8	--	--	0.5	13.3	--	2.7	--	20.3	3.9	--	3.9	24.2
Spruce-subalpine fir	28.4	--	18.1	17.5	6.3	135.0	--	135.0	340.3	3.8	--	3.8	344.1
White fir	28.0	7.1	0.5	--	0.4	--	46.8	1.9	84.7	18.9	--	18.9	103.6
Spruce	16.9	4.1	10.3	4.3	--	11.1	15.3	479.5	541.5	16.8	5.4	22.2	563.7
Aspen	28.4	20.3	18.3	1.3	2.3	33.7	8.2	22.6	135.1	977.8	--	977.8	1,112.9
Cottonwood	--	1.3	--	--	--	--	--	--	1.3	--	81.7	81.7	83.0
All types	577.1	1,072.5	629.4	26.9	40.4	201.0	99.5	694.0	3,340.8	1,070.0	89.3	1,159.3	4,500.1

Table 27--Net volume of sawtimber (International 1/4-inch rule) on State and privately owned timberland by forest type and species, Colorado, 1983

Forest type	Species												
	Douglas-fir	Ponderosa pine	Lodgepole pine	Whitebark pine	Limber pine	Subalpine fir	White fir	Engelmann spruce	Total softwoods	Aspen	Cottonwood	Total hardwoods	All species
	----- Million board feet, International 1/4-inch rule -----												
Douglas-fir	1,482.2	195.9	14.2	12.6	51.5	35.3	54.6	131.0	1,977.3	4.8	--	4.8	1,982.1
Ponderosa pine	215.6	3,785.4	18.9	--	--	--	13.4	5.3	4,038.6	28.0	6.2	34.2	4,072.8
Lodgepole pine	17.9	5.1	1,305.0	--	1.3	11.3	3.4	46.1	1,390.1	--	--	--	1,390.1
Limber pine	13.0	--	--	--	51.3	--	11.1	--	75.4	4.3	--	4.3	79.7
Spruce-subalpine fir	121.7	--	70.8	60.6	25.0	291.3	--	517.9	1,087.3	--	--	--	1,087.3
White fir	98.3	32.0	--	--	2.1	--	145.0	--	277.4	14.4	--	14.4	291.8
Spruce	71.3	22.1	40.4	10.5	--	27.5	68.8	1,978.6	2,219.2	7.2	24.5	31.7	2,250.9
Aspen	124.8	85.1	55.0	2.2	--	124.0	26.1	100.7	517.9	1,549.5	--	1,549.5	2,067.4
Cottonwood	--	6.3	--	--	--	--	--	--	6.3	--	228.8	228.8	235.1
All types	2,144.8	4,131.9	1,504.3	85.9	131.2	489.4	322.4	2,779.6	11,589.5	1,608.2	259.5	1,867.7	13,457.2

Table 28--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by forest type and species, Colorado, 1983

Forest type	Species												
	Douglas-fir	Ponderosa pine	Lodgepole pine	Whitebark pine	Limber pine	Subalpine fir	White fir	Engelmann spruce	Total softwoods	Aspen	Cottonwood	Total hardwoods	All species
	----- Million board feet, Scribner rule -----												
Douglas-fir	1,256.1	164.2	12.1	10.7	44.2	30.7	45.9	112.3	1,676.2	4.1	--	4.1	1,680.3
Ponderosa pine	181.7	3,214.1	16.4	--	--	--	11.5	4.3	3,428.0	23.9	5.5	29.4	3,457.4
Lodgepole pine	15.5	3.8	1,113.0	--	1.1	9.8	3.0	38.9	1,185.1	--	--	--	1,185.1
Limber pine	11.0	--	--	--	43.6	--	9.2	--	63.8	3.8	--	3.8	67.6
Spruce-subalpine fir	103.4	--	60.3	51.0	21.0	246.8	--	436.6	919.1	--	--	--	919.1
White fir	82.4	27.6	--	--	1.8	--	123.3	--	235.1	12.2	--	12.2	247.3
Spruce	61.9	19.6	34.3	8.0	--	23.7	58.2	1,680.4	1,886.1	6.2	21.7	27.9	1,914.0
Aspen	105.4	72.6	46.7	1.9	--	105.3	22.3	85.6	439.8	1,316.2	--	1,316.2	1,756.0
Cottonwood	--	5.5	--	--	--	--	--	--	5.5	--	195.1	195.1	200.6
All types	1,817.4	3,507.4	1,282.8	71.6	111.7	416.3	273.4	2,358.1	9,838.7	1,366.4	222.3	1,588.7	11,427.4

Table 29--Net annual growth of growing stock on State and privately owned timberland by ownership class and species, Colorado, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
- - - - - Thousand cubic feet - - - - -			
Douglas-fir	593	10,512	11,105
Ponderosa pine	902	19,678	20,580
Lodgepole pine	1,937	14,858	16,795
Whitebark pine	14	330	344
Limber pine	37	588	625
Subalpine fir	338	2,818	3,156
White fir	41	1,074	1,115
Engelmann spruce	882	11,563	12,445
Total softwoods	4,744	61,421	66,165
Aspen	1,596	18,610	20,206
Cottonwood	50	2,551	2,601
Total hardwoods	1,646	21,161	22,807
All species	6,390	82,582	88,972

Table 30--Net annual growth of sawtimber (International 4-inch rule) on State and privately owned timberland by ownership class and species, Colorado, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
- - Thousand board feet, International 4-inch rule - - -			
Douglas-fir	2,282	47,289	49,571
Ponderosa pine	5,028	107,781	112,809
Lodgepole pine	5,014	19,312	24,326
Whitebark pine	32	966	998
Limber pine	103	1,570	1,673
Subapline fir	3,491	16,454	19,945
White fir	1,115	7,551	8,666
Engelmann spruce	3,879	51,638	55,517
Total softwoods	20,944	252,561	273,505
Aspen	6,829	90,781	97,610
Cottonwood	343	12,367	12,710
Total hardwoods	7,172	103,148	110,320
All species	28,116	355,709	383,825

Table 31--Net annual growth of sawtimber (Scribner rule) on State and privately owned timberland by ownership class and species, Colorado, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
	----- Thousand board feet, Scribner rule -----		
Douglas-fir	1,914	39,952	41,866
Ponderosa pine	4,179	91,097	95,276
Lodgepole pine	4,396	16,813	21,209
Whitebark pine	29	863	892
Limber pine	85	1,298	1,383
Subalpine fir	3,064	14,467	17,531
White fir	960	6,234	7,194
Engelmann spruce	3,113	42,680	45,793
Total softwoods	17,740	213,404	231,144
Aspen	5,880	78,310	84,190
Cottonwood	282	10,126	10,408
Total hardwoods	6,162	88,436	94,598
All species	23,902	301,840	325,742

Table 32--Net annual growth of growing stock on State and privately owned timberland by species and diameter class, Colorado, 1982

Species	Diameter class (inches at breast height)														All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		
	----- Thousand cubic feet -----														
Douglas-fir	3,081	2,098	1,513	1,595	1,032	947	508	169	3	64	57	7	31	11,105	
Ponderosa pine	2,727	3,078	3,171	3,569	3,666	2,086	1,327	412	119	187	46	91	101	20,580	
Lodgepole pine	9,708	3,851	2,471	387	613	173	-408	--	--	--	--	--	--	16,795	
Whitebark pine	73	61	99	55	24	23	5	4	--	--	--	--	--	344	
Limber pine	179	133	51	108	53	35	38	12	(1)	--	5	8	3	625	
Subalpine fir	1,223	910	1,309	581	-509	81	-522	33	50	--	--	--	--	3,156	
White fir	340	369	-170	31	78	201	28	107	47	21	--	58	5	1,115	
Engelmann spruce	1,425	1,983	2,261	2,523	1,513	887	472	341	235	355	258	126	66	12,445	
Total softwoods	18,756	12,483	10,705	8,849	6,470	4,433	1,448	1,078	454	627	366	290	206	66,165	
Aspen	9,387	5,075	3,512	1,394	924	-260	139	5	30	--	--	--	--	20,206	
Cottonwood	795	362	642	308	62	246	55	180	37	-263	--	--	177	2,601	
Total hardwoods	10,182	5,437	4,154	1,702	986	-14	194	185	67	-263	--	--	177	22,807	
All species	28,938	17,920	14,859	10,551	7,456	4,419	1,642	1,263	521	364	366	290	383	88,972	

¹Less than 0.5 thousand cubic feet.

Table 33--Net annual growth of sawtimber (International 4-inch rule) on State and privately owned timberland by species and diameter class, Colorado, 1982

Species	Diameter class (inches at breast height)												All classes
	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 22.9	23.0- 24.9	25.0- 26.9	27.0- 28.9	29.0+		
	----- Thousand board feet, International 4-inch rule -----												
Douglas-fir	23,722	9,438	5,937	5,405	2,892	1,061	149	383	352	42	190	49,571	
Ponderosa pine	45,577	21,053	21,285	12,117	7,501	2,294	654	1,022	253	496	557	112,809	
Lodgepole pine	18,139	3,597	3,768	938	-2,116	--	--	--	--	--	--	24,326	
Whitebark pine	396	290	127	136	27	22	--	--	--	--	--	998	
Limber pine	230	571	282	207	217	71	2	--	28	48	17	1,673	
Subalpine fir	20,985	3,225	-2,501	413	-2,623	153	293	--	--	--	--	19,945	
White fir	5,684	441	546	900	111	405	188	88	--	279	24	8,666	
Engelmann spruce	17,404	14,342	8,246	4,693	2,519	1,849	1,440	2,170	1,640	802	412	55,517	
Total softwoods	132,137	52,957	37,690	24,809	8,528	5,855	2,726	3,663	2,273	1,667	1,200	273,505	
Aspen	XXXXX	92,564	5,302	-1,105	682	26	141	--	--	--	--	97,610	
Cottonwood	XXXXX	10,505	307	1,104	231	735	150	-1,175	--	--	853	12,710	
Total hardwoods	XXXXX	103,069	5,609	-1	913	761	291	-1,175	--	--	853	110,320	
All species	132,137	156,026	43,299	24,808	9,441	6,616	3,017	2,488	2,273	1,667	2,053	383,825	

Table 34--Net annual growth of sawtimber (Scribner rule) on State and privately owned timberland by species and diameter class, Colorado, 1982

Species	Diameter class (inches at breast height)														All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	Scribner rule			
	Thousand board feet														
Douglas-fir	20,973	7,589	4,674	4,251	2,285	956	243	369	320	37	169			41,866	
Ponderosa pine	34,917	19,000	19,053	10,876	6,712	2,053	585	914	226	443	497			95,276	
Lodgepole pine	15,963	2,955	3,185	862	-1,756	--	--	--	--	--	--			21,209	
Whitebark pine	379	252	105	112	25	19	--	--	--	--	--			892	
Limber pine	178	473	234	172	179	60	2	--	25	45	15			1,383	
Subalpine fir	18,446	2,540	-2,063	324	-2,113	142	255	--	--	--	--			17,531	
White fir	4,847	325	372	703	87	316	183	88	--	251	22			7,194	
Engelmann spruce	14,940	11,230	6,440	3,662	1,996	1,634	1,336	2,004	1,471	714	366			45,793	
Total softwoods	110,643	44,364	32,000	20,962	7,415	5,180	2,604	3,375	2,042	1,490	1,069			231,144	
Aspen	XXXX	79,700	4,614	-862	594	22	122	--	--	--	--			84,190	
Cottonwood	XXXXX	8,356	284	1,024	214	674	137	-1,041	--	--	760			10,408	
Total hardwoods	XXXXX	88,056	4,898	162	808	696	259	-1,041	--	--	760			94,598	
All species	110,643	132,420	36,898	21,124	8,223	5,876	2,863	2,334	2,042	1,490	1,829			325,742	

Table 35--Annual mortality of growing stock on State and privately owned timberland by ownership class and species, Colorado, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
- - - - - Thousand cubic feet - - - - -			
Douglas-fir	48	1,144	1,192
Ponderosa pine	37	929	966
Lodgepole pine	206	1,402	1,608
Subalpine fir	128	1,174	1,302
White fir	119	1,037	1,156
Engelmann spruce	22	1,100	1,122
Total softwoods	560	6,786	7,346
Aspen	429	8,722	9,151
Cottonwood	--	263	263
Total hardwoods	429	8,985	9,414
All species	989	15,771	16,760

Table 36--Annual mortality of sawtimber (International 4-inch rule) on State and privately owned timberland by ownership class and species, Colorado, 1982

Species	Ownership class		Total
	State	Nonindustrial private	
- - - Thousand board feet, International 4-inch rule - - -			
Douglas-fir	104	3,597	3,701
Ponderosa pine	146	2,677	2,823
Lodgepole pine	759	6,162	6,921
Subalpine fir	597	5,457	6,054
White fir	382	3,288	3,670
Engelmann spruce	92	5,131	5,223
Total softwoods	2,080	26,312	28,392
Aspen	391	9,516	9,907
Cottonwood	--	1,175	1,175
Total hardwoods	391	10,691	11,082
All species	2,471	37,003	39,474

Table 37--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland by ownership class and species, Colorado, 1982

Species	Ownership class		
	State	Nonindustrial private	Total
- - - - - Thousand board feet, Scribner rule - - - - -			
Douglas-fir	90	3,101	3,191
Ponderosa pine	126	2,322	2,448
Lodgepole pine	647	5,243	5,890
Subalpine fir	487	4,419	4,906
White fir	333	2,871	3,204
Engelmann spruce	79	4,325	4,404
Total softwoods	1,762	22,281	24,043
Aspen	330	8,038	8,368
Cottonwood	--	1,040	1,040
Total hardwoods	330	9,078	9,408
All species	2,092	31,359	33,451

Table 38--Annual mortality of growing stock on State and privately owned timberland by species and diameter class, Colorado, 1982

Species	Diameter class (inches at breast height)													All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	----- Thousand cubic feet -----													
Douglas-fir	--	244	543	71	--	--	--	150	184	--	--	--	--	1,192
Ponderosa pine	84	202	252	178	--	250	--	--	--	--	--	--	--	966
Lodgepole pine	--	134	112	854	--	--	508	--	--	--	--	--	--	1,608
Subalpine fir	--	94	--	--	617	--	591	--	--	--	--	--	--	1,302
White fir	177	73	479	246	181	--	--	--	--	--	--	--	--	1,156
Engelmann spruce	68	--	--	380	190	157	327	--	--	--	--	--	--	1,122
Total softwoods	329	747	1,386	1,729	988	407	1,426	150	184	--	--	--	--	7,346
Aspen	2,913	1,954	2,278	1,066	290	650	--	--	--	--	--	--	--	9,151
Cottonwood	--	--	--	--	--	--	--	--	--	263	--	--	--	263
Total hardwoods	2,913	1,954	2,278	1,066	290	650	--	--	--	263	--	--	--	9,414
All species	3,242	2,701	3,664	2,795	1,278	1,057	1,426	150	184	263	--	--	--	16,760

Table 39--Annual mortality of sawtimber (International 4-inch rule) on State and privately owned timberland by species and diameter class, Colorado, 1982

Species	Diameter class (inches at breast height)												All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		
	----- Thousand board feet, International 4-inch rule -----												
Douglas-fir	1,627	271	--	--	--	806	997	--	--	--	--	--	3,701
Ponderosa pine	754	791	--	1,278	--	--	--	--	--	--	--	--	2,823
Lodgepole pine	336	3,956	--	--	2,629	--	--	--	--	--	--	--	6,921
Subalpine fir	--	--	3,079	--	2,975	--	--	--	--	--	--	--	6,054
White fir	1,788	1,102	780	--	--	--	--	--	--	--	--	--	3,670
Engelmann spruce	--	1,809	935	767	1,712	--	--	--	--	--	--	--	5,223
Total softwoods	4,505	7,929	4,794	2,045	7,316	806	997	--	--	--	--	--	28,392
Aspen	XXXX	5,196	1,532	3,179	--	--	--	--	--	--	--	--	9,907
Cottonwood	XXXX	--	--	--	--	--	--	1,175	--	--	--	--	1,175
Total hardwoods	XXXX	5,196	1,532	3,179	--	--	--	1,175	--	--	--	--	11,082
All species	4,505	13,125	6,326	5,224	7,316	806	997	1,175	--	--	--	--	39,474

Table 40--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland by species and diameter class, Colorado, 1982

Species	Diameter class (inches at breast height)														All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	Thousand board feet, Scribner rule			
Douglas-fir	1,448	242	--	--	--	647	854	--	--	--	--	--	--	--	3,191
Ponderosa pine	671	664	--	1,113	--	--	--	--	--	--	--	--	--	--	2,448
Lodgepole pine	295	3,350	--	--	2,245	--	--	--	--	--	--	--	--	--	5,890
Subalpine fir	--	--	2,516	--	2,390	--	--	--	--	--	--	--	--	--	4,906
White fir	1,591	945	668	--	--	--	--	--	--	--	--	--	--	--	3,204
Engelmann spruce	--	1,515	768	628	1,493	--	--	--	--	--	--	--	--	--	4,404
Total softwoods	4,005	6,716	3,952	1,741	6,128	647	854	--	--	--	--	--	--	--	24,043
Aspen	XXXXX	4,408	1,292	2,668	--	--	--	--	--	--	--	--	--	--	8,368
Cottonwood	XXXXX	--	--	--	--	--	--	1,040	--	--	--	--	--	--	1,040
Total hardwoods	XXXXX	4,408	1,292	2,668	--	--	--	1,040	--	--	--	--	--	--	9,408
All species	4,005	11,124	5,244	4,409	6,128	647	854	1,040	--	--	--	--	--	--	33,451

Table 41--Annual mortality of growing stock on State and privately owned timberland by cause of death and species, Colorado, 1982

Species	Cause of death								Total	
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown ¹		
						Thousand cubic feet				
Douglas-fir	--	133	--	--	1,059	--	--	--	--	1,192
Ponderosa pine	492	252	--	--	178	--	--	44	--	966
Lodgepole pine	--	598	--	209	349	--	--	452	--	1,608
Subalpine fir	886	322	--	--	--	94	--	--	--	1,302
White fir	551	--	--	--	308	58	58	181	--	1,156
Engelmann spruce	--	158	--	--	--	--	--	964	--	1,122
Total softwoods	1,929	1,463	--	209	1,894	152	58	1,641	--	7,346
Aspen	--	3,015	76	248	341	--	--	5,471	--	9,151
Cottonwood	--	--	--	--	--	--	--	263	--	263
Total hardwoods	--	3,015	76	248	341	--	--	5,734	--	9,414
All species	1,929	4,478	76	457	2,235	152	58	7,375	--	16,760

¹Because many destructive agents often attack trees in concert or in succession, it is often difficult to identify the actual causal agent. When the primary cause of death cannot be precisely determined, it is listed as unknown.

Table 42--Annual mortality of sawtimber (International 1/4-inch rule) on State and privately owned timberland by cause of death and species, Colorado, 1982

Species	Cause of death								Total	
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown ¹		
	--	--	--	--	Thousand board feet, International 1/4-inch rule	--	--	--	--	--
Douglas-fir	--	271	--	--	3,430	--	--	--	--	3,701
Ponderosa pine	1,279	753	--	--	791	--	--	--	--	2,823
Lodgepole pine	--	1,938	--	844	1,807	--	--	2,332	--	6,921
Subalpine fir	4,431	1,623	--	--	--	--	--	--	--	6,054
White fir	1,787	--	--	--	1,103	--	--	780	--	3,670
Engelmann spruce	--	767	--	--	--	--	--	4,456	--	5,223
Total softwoods	7,497	5,352	--	844	7,131	--	--	7,568	--	28,392
Aspen	--	839	--	--	438	--	--	8,630	--	9,907
Cottonwood	--	--	--	--	--	--	--	1,175	--	1,175
Total hardwoods	--	839	--	--	438	--	--	9,805	--	11,082
All species	7,497	6,191	--	844	7,569	--	--	17,373	--	39,474

¹Because many destructive agents often attack trees in concert or in succession, it is often difficult to identify the actual causal agent. When the primary cause of death cannot be precisely determined, it is listed as unknown.

COUNTY TABLES

Table 44--Area of State and privately owned timberland by county and ownership class, Colorado, 1983

County	Ownership class		Total
	State	Nonindustrial private	
- - - - - Thousand acres - - - - -			
Alamosa	0.2	6.4	6.6
Archuleta	1.9	154.2	156.1
Boulder	0.7	88.7	89.4
Chaffee	3.2	32.9	36.1
Clear Creek	4.3	38.8	43.1
Conejos	12.1	18.6	30.7
Costilla	--	189.3	189.3
Custer	3.3	76.7	80.0
Delta	0.4	25.6	26.0
Dolores	3.0	29.7	32.7
Douglas	0.4	54.0	54.4
Eagle	2.3	51.9	54.2
Elbert	2.6	46.5	49.1
El Paso	3.8	80.6	84.4
Fremont	10.5	75.6	86.1
Garfield	--	135.6	135.6
Gilpin	0.5	31.5	32.0
Grand	15.8	98.8	114.6
Gunnison	3.8	115.0	118.8
Hinsdale	0.7	13.1	13.8
Huerfano	5.5	100.6	106.1
Jackson	62.9	58.4	121.3
Jefferson	1.9	143.9	145.8
Lake	0.1	24.9	25.0
La Plata	5.6	103.6	109.2
Larimer	17.2	217.0	234.2
Las Animas	15.7	368.0	383.7
Mesa	0.8	65.7	66.5
Mineral	0.4	13.2	13.6
Moffat	4.2	34.8	39.0
Montezuma	0.6	30.1	30.7
Montrose	1.0	37.3	38.3
Ouray	0.3	52.4	52.7
Park	9.0	153.6	162.6
Pitkin	0.1	27.2	27.3
Pueblo	4.6	62.5	67.1
Rio Blanco	8.6	53.3	61.9
Rio Grande	0.2	15.0	15.2
Routt	13.5	186.6	200.1
Saguache	2.9	45.0	47.9
San Juan	0.2	7.3	7.5
San Miguel	1.4	61.0	62.4
Summit	(¹)	33.0	33.0
Teller	9.0	107.3	116.3
All counties	235.2	3,365.2	3,600.4

¹Less than 0.05 thousand acres.

Table 45--Net volume of growing stock on State and privately owned timberland by county and ownership class, Colorado, 1983

County	Ownership class		
	State	Nonindustrial private	Total
- - - - - Million cubic feet - - - - -			
Alamosa	0.2	3.8	4.0
Archuleta	2.9	212.8	215.7
Boulder	0.8	98.2	99.0
Chaffee	4.1	38.4	42.5
Clear Creek	5.1	39.2	44.3
Conejos	26.8	28.3	55.1
Costilla	--	309.4	309.4
Custer	3.8	87.7	91.5
Delta	0.4	33.2	33.6
Dolores	4.3	41.0	45.3
Douglas	0.5	42.9	43.4
Eagle	3.9	100.3	104.2
Elbert	2.0	34.3	36.3
El Paso	2.2	67.5	69.7
Fremont	10.4	66.4	76.8
Garfield	--	187.9	187.9
Gilpin	0.3	31.8	32.1
Grand	25.7	168.9	194.6
Gunnison	7.1	223.1	230.2
Hinsdale	1.5	26.1	27.6
Huerfano	5.7	103.3	109.0
Jackson	113.6	98.1	211.7
Jefferson	1.8	134.3	136.1
Lake	0.1	33.8	33.9
La Plata	8.1	142.9	151.0
Larimer	15.9	208.3	224.2
Las Animas	12.9	360.0	372.9
Mesa	1.2	82.7	83.9
Mineral	1.1	27.8	28.9
Moffat	5.3	40.8	46.1
Montezuma	0.9	39.0	39.9
Montrose	1.3	49.5	50.8
Ouray	0.3	74.1	74.4
Park	7.8	135.1	142.9
Pitkin	(¹)	54.0	54.0
Pueblo	2.5	51.8	54.3
Rio Blanco	12.2	68.5	80.7
Rio Grande	0.2	23.0	23.2
Routt	19.4	284.1	303.5
Saguache	4.3	68.3	72.6
San Juan	0.4	16.1	16.5
San Miguel	1.9	85.6	87.5
Summit	(¹)	57.2	57.2
Teller	7.9	93.8	101.7
All counties	326.8	4,173.3	4,500.1

¹Less than 0.05 million cubic feet.

Table 46--Net volume of sawtimber (International ¼-inch rule) on State and privately owned timberland by county and ownership class, Colorado, 1983

County	Ownership class		
	State	Nonindustrial private	Total
- - - Million board feet, International ¼-inch rule - - -			
Alamosa	0.6	10.4	11.0
Archuleta	9.9	862.3	872.2
Boulder	2.3	296.8	299.1
Chaffee	13.4	118.4	131.8
Clear Creek	15.6	112.4	128.0
Conejos	68.7	84.4	153.1
Costilla	--	892.2	892.2
Custer	12.1	274.8	286.9
Delta	1.4	101.8	103.2
Dolores	13.6	123.6	137.2
Douglas	1.5	141.6	143.1
Eagle	8.5	232.3	240.8
Elbert	6.8	117.2	124.0
El Paso	7.0	223.6	230.6
Fremont	28.5	185.7	214.2
Garfield	--	631.1	631.1
Gilpin	0.8	92.0	92.8
Grand	59.9	441.1	501.0
Gunnison	19.2	532.2	551.4
Hinsdale	4.6	79.3	83.9
Huerfano	17.3	318.4	335.7
Jackson	303.2	226.4	529.6
Jefferson	6.6	462.3	468.9
Lake	0.3	81.0	81.3
La Plata	35.6	608.6	644.2
Larimer	47.8	624.0	671.8
Las Animas	41.9	1,142.5	1,184.4
Mesa	4.3	242.0	246.3
Mineral	3.2	76.2	79.4
Moffat	17.0	114.9	131.9
Montezuma	3.7	144.5	148.2
Montrose	4.6	151.9	156.5
Ouray	0.8	260.0	260.8
Park	21.6	370.9	392.5
Pitkin	(¹)	124.6	124.6
Pueblo	9.5	163.5	173.0
Rio Blanco	43.1	211.6	254.7
Rio Grande	0.6	67.7	68.3
Routt	42.1	606.7	648.8
Saguache	12.9	184.4	197.3
San Juan	0.6	47.5	48.1
San Miguel	6.6	277.9	284.5
Summit	(¹)	147.1	147.1
Teller	28.8	322.9	351.7
All counties	926.5	12,530.7	13,457.2

¹Less than 0.05 million board feet.

Table 47--Net volume of sawtimber (Scribner rule) on State and privately owned timberland by county and ownership class, Colorado, 1983

County	Ownership class		Total
	State	Nonindustrial private	
- - - - - Million board feet, Scribner rule - - - - -			
Alamosa	0.5	8.9	9.4
Archuleta	8.4	740.9	749.3
Boulder	1.9	249.5	251.4
Chaffee	11.3	100.0	111.3
Clear Creek	13.1	94.5	107.6
Conejos	58.2	71.8	130.0
Costilla	--	756.9	756.9
Custer	10.2	232.2	242.4
Delta	1.2	86.7	87.9
Dolores	11.6	105.7	117.3
Douglas	1.3	120.0	121.3
Eagle	7.3	196.8	204.1
Elbert	5.8	99.1	104.9
El Paso	5.9	189.7	195.6
Fremont	24.2	157.6	181.8
Garfield	--	539.3	539.3
Gilpin	0.7	77.4	78.1
Grand	51.0	375.4	426.4
Gunnison	16.2	451.0	467.2
Hinsdale	3.9	67.1	71.0
Huerfano	14.6	269.1	283.7
Jackson	258.1	192.6	450.7
Jefferson	5.6	392.6	398.2
Lake	0.3	69.2	69.5
La Plata	30.6	524.3	554.9
Larimer	40.1	524.0	564.1
Las Animas	35.3	963.1	998.4
Mesa	3.7	205.5	209.2
Mineral	2.7	64.6	67.3
Moffat	14.4	97.7	112.1
Montezuma	3.2	124.0	127.2
Montrose	3.9	129.3	133.2
Ouray	0.7	222.5	223.2
Park	18.1	310.1	328.2
Pitkin	(¹)	105.8	105.8
Pueblo	8.1	138.6	146.7
Rio Blanco	36.7	180.4	217.1
Rio Grande	0.5	57.6	58.1
Routt	35.8	516.4	552.2
Saguache	10.9	156.3	167.2
San Juan	0.5	40.3	40.8
San Miguel	5.7	237.2	242.9
Summit	(¹)	125.2	125.2
Teller	24.4	273.9	298.3
All counties	786.6	10,640.8	11,427.4

¹Less than 0.05 million board feet.

Table 48--Net annual growth of growing stock on State and privately owned timberland by county and ownership class, Colorado, 1982

County	Ownership class		Total
	State	Nonindustrial private	
- - - - - Thousand cubic feet - - - - -			
Alamosa	2	63	65
Archuleta	52	4,112	4,164
Boulder	21	2,327	2,348
Chaffee	73	778	851
Clear Creek	114	1,044	1,158
Conejos	451	417	868
Costilla	--	6,504	6,504
Custer	74	1,680	1,754
Delta	12	518	530
Dolores	59	535	594
Douglas	9	1,004	1,013
Eagle	76	1,936	2,012
Elbert	41	754	795
El Paso	51	1,553	1,604
Fremont	186	1,307	1,493
Garfield	--	3,265	3,265
Gilpin	11	838	849
Grand	574	3,335	3,909
Gunnison	132	4,282	4,414
Hinsdale	24	421	445
Huerfano	141	2,315	2,456
Jackson	2,110	2,070	4,180
Jefferson	37	2,996	3,033
Lake	3	744	747
La Plata	170	2,780	2,950
Larimer	402	5,176	5,578
Las Animas	193	5,875	6,068
Mesa	28	1,352	1,380
Mineral	15	464	479
Moffat	83	607	690
Montezuma	18	678	696
Montrose	22	740	762
Ouray	3	1,259	1,262
Park	163	2,868	3,031
Pitkin	(¹)	978	978
Pueblo	42	1,050	1,092
Rio Blanco	256	1,074	1,330
Rio Grande	4	354	358
Routt	451	6,499	6,950
Saguache	86	1,314	1,400
San Juan	7	244	251
San Miguel	32	1,315	1,347
Summit	(¹)	1,115	1,115
Teller	162	2,042	2,204
All counties	6,390	82,582	88,972

¹Less than 0.5 thousand cubic feet.

Table 49--Net annual growth of sawtimber (International ¼-inch rule) on State and privately owned timberland by county and ownership class, Colorado, 1982

County	Ownership class		Total
	State	Nonindustrial private	
- - - Thousand board feet, International ¼-inch rule - - -			
Alamosa	7	143	150
Archuleta	234	19,478	19,712
Boulder	45	6,801	6,846
Chaffee	544	4,572	5,116
Clear Creek	320	2,809	3,129
Conejos	1,556	1,348	2,904
Costilla	--	18,209	18,209
Custer	362	9,611	9,973
Delta	134	4,398	4,532
Dolores	478	5,306	5,784
Douglas	51	4,964	5,015
Eagle	293	5,293	5,586
Elbert	252	4,466	4,718
El Paso	360	8,207	8,567
Fremont	282	2,087	2,369
Garfield	--	22,408	22,408
Gilpin	29	2,222	2,251
Grand	2,111	15,422	17,533
Gunnison	412	13,541	13,953
Hinsdale	82	1,471	1,553
Huerfano	630	11,743	12,373
Jackson	10,774	7,804	18,578
Jefferson	215	15,864	16,079
Lake	13	3,297	3,310
La Plata	910	14,277	15,187
Larimer	1,199	15,757	16,956
Las Animas	579	15,860	16,439
Mesa	99	10,712	10,811
Mineral	50	1,406	1,456
Moffat	472	4,091	4,563
Montezuma	82	4,004	4,086
Montrose	141	5,592	5,733
Ouray	51	7,934	7,985
Park	687	12,106	12,793
Pitkin	(¹)	3,632	3,632
Pueblo	274	5,710	5,984
Rio Blanco	1,121	6,647	7,768
Rio Grande	16	1,101	1,117
Routt	1,732	23,040	24,772
Saguache	320	4,192	4,512
San Juan	35	864	899
San Miguel	163	9,226	9,389
Summit	(¹)	6,618	6,618
Teller	1,001	11,476	12,477
All counties	28,116	355,709	383,825

¹Less than 0.5 thousand board feet.

Table 50--Net annual growth of sawtimber (Scribner rule) on State and privately owned timberland by county and ownership class, Colorado, 1982

County	Ownership class		
	State	Nonindustrial private	Total
- - - - - Thousand board feet, Scribner rule - - - - -			
Alamosa	6	126	132
Archuleta	204	17,108	17,312
Boulder	38	5,628	5,666
Chaffee	451	3,802	4,253
Clear Creek	263	2,318	2,581
Conejos	1,322	1,148	2,470
Costilla	--	15,179	15,179
Custer	303	8,037	8,340
Delta	109	3,756	3,865
Dolores	416	4,596	5,012
Douglas	39	4,120	4,159
Eagle	250	4,512	4,762
Elbert	201	3,612	3,813
El Paso	287	6,756	7,043
Fremont	232	1,749	1,981
Garfield	--	19,336	19,336
Gilpin	23	1,824	1,847
Grand	1,814	13,256	15,070
Gunnison	352	11,538	11,890
Hinsdale	70	1,243	1,313
Huerfano	512	9,602	10,114
Jackson	9,256	6,705	15,961
Jefferson	176	13,205	13,381
Lake	12	2,893	2,905
La Plata	789	12,499	13,288
Larimer	966	12,810	13,776
Las Animas	504	13,603	14,107
Mesa	86	9,123	9,209
Mineral	42	1,185	1,227
Moffat	410	3,493	3,903
Montezuma	72	3,479	3,551
Montrose	123	4,793	4,916
Ouray	44	6,868	6,912
Park	564	10,015	10,579
Pitkin	(¹)	3,095	3,095
Pueblo	221	4,713	4,934
Rio Blanco	975	5,756	6,731
Rio Grande	14	941	955
Routt	1,492	19,799	21,291
Saguache	271	3,573	3,844
San Juan	29	726	755
San Miguel	142	8,015	8,157
Summit	(¹)	5,715	5,715
Teller	822	9,590	10,412
All counties	23,902	301,840	325,742

¹Less than 0.5 thousand board feet.

Table 51--Annual mortality of growing stock on State and privately owned timberland by county and ownership class, Colorado, 1982

County	Ownership class		Total
	State	Nonindustrial private	
- - - - - Thousand cubic feet - - - - -			
Alamosa	1	33	34
Archuleta	18	781	799
Boulder	1	147	148
Chaffee	12	110	122
Clear Creek	7	54	61
Conejos	125	117	242
Costilla	--	1,875	1,875
Custer	13	339	352
Delta	--	273	273
Dolores	37	378	415
Douglas	--	29	29
Eagle	22	614	636
Elbert	1	21	22
El Paso	1	51	52
Fremont	68	411	479
Garfield	--	1,219	1,219
Gilpin	(1)	43	43
Grand	54	401	455
Gunnison	40	1,272	1,312
Hinsdale	8	105	113
Huerfano	16	288	304
Jackson	281	222	503
Jefferson	1	133	134
Lake	(1)	4	4
La Plata	7	332	339
Larimer	18	251	269
Las Animas	23	637	660
Mesa	4	706	710
Mineral	5	122	127
Moffat	40	385	425
Montezuma	2	230	232
Montrose	7	434	441
Ouray	4	453	457
Park	16	285	301
Pitkin	(1)	281	281
Pueblo	14	196	210
Rio Blanco	58	550	608
Rio Grande	1	107	108
Routt	44	587	631
Saguache	20	388	408
San Juan	2	56	58
San Miguel	15	660	675
Summit	(1)	120	120
Teller	3	71	74
All counties	989	15,771	16,760

¹Less than 0.5 thousand cubic feet.

Table 52--Annual mortality of sawtimber (International ¼-inch rule) on State and privately owned timberland by county and ownership class, Colorado, 1982

County	Ownership class		Total
	State	Nonindustrial private	
- - - Thousand board feet, International ¼-inch rule - - -			
Alamosa	3	47	50
Archuleta	33	1,634	1,667
Boulder	6	544	550
Chaffee	33	304	337
Clear Creek	29	193	222
Conejos	387	405	792
Costilla	--	6,952	6,952
Custer	30	859	889
Delta	--	314	314
Dolores	38	425	463
Douglas	--	80	80
Eagle	41	1,836	1,877
Elbert	6	95	101
El Paso	2	175	177
Fremont	261	1,626	1,887
Garfield	--	1,529	1,529
Gilpin	--	155	155
Grand	125	1,106	1,231
Gunnison	109	3,443	3,552
Hinsdale	23	342	365
Huerfano	44	759	803
Jackson	805	459	1,264
Jefferson	5	433	438
Lake	--	8	8
La Plata	27	954	981
Larimer	57	784	841
Las Animas	57	1,756	1,813
Mesa	--	631	631
Mineral	17	442	459
Moffat	47	474	521
Montezuma	4	441	445
Montrose	14	607	621
Ouray	4	722	726
Park	45	774	819
Pitkin	--	679	679
Pueblo	13	393	406
Rio Blanco	38	664	702
Rio Grande	--	345	345
Routt	76	1,097	1,173
Saguache	38	932	970
San Juan	3	214	217
San Miguel	37	799	836
Summit	--	334	334
Teller	14	238	252
All counties	2,471	37,003	39,474

Table 53--Annual mortality of sawtimber (Scribner rule) on State and privately owned timberland by county and ownership class, Colorado, 1982

County	Ownership class		
	State	Nonindustrial private	Total
- - - - - Thousand board feet, Scribner rule - - - - -			
Alamosa	2	39	41
Archuleta	27	1,383	1,410
Boulder	5	475	480
Chaffee	29	266	295
Clear Creek	26	168	194
Conejos	327	342	669
Costilla	--	5,887	5,887
Custer	26	754	780
Delta	--	260	260
Dolores	32	352	384
Douglas	--	65	65
Eagle	35	1,543	1,578
Elbert	5	76	81
El Paso	1	145	146
Fremont	225	1,406	1,631
Garfield	--	1,257	1,257
Gilpin	--	135	135
Grand	106	930	1,036
Gunnison	92	2,903	2,995
Hinsdale	19	290	309
Huerfano	39	667	706
Jackson	677	386	1,063
Jefferson	4	357	361
Lake	--	8	8
La Plata	22	797	819
Larimer	50	685	735
Las Animas	51	1,563	1,614
Mesa	--	527	527
Mineral	14	372	386
Moffat	39	395	434
Montezuma	3	371	374
Montrose	11	506	517
Ouray	3	596	599
Park	38	651	689
Pitkin	--	575	575
Pueblo	11	343	354
Rio Blanco	31	552	583
Rio Grande	--	291	291
Routt	65	933	998
Saguache	33	786	819
San Juan	2	181	183
San Miguel	31	663	694
Summit	--	284	284
Teller	11	194	205
All counties	2,092	31,359	33,451

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Reports highlights of the comprehensive survey of Colorado's State and private timberland. Presents statistics on area, volume, growth, and mortality. Also describes forest types, volumes per acre, stocking, ownership, and harvest levels.

KEYWORDS: forest survey, timberland, inventory volume, harvest

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Forest Service

Intermountain
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Resource Bulletin
INT-50



Colorado's Woodland Resources on State and Private Land

Roger C. Conner
Alan W. Green



PREFACE

The primary objective of Forest Survey—a continuing, nationwide undertaking of the Forest Service, U.S. Department of Agriculture—is to provide an assessment of the renewable resources for the Nation's forests. Fundamental to the accomplishment of the objective are the periodic State-by-State resource inventories. Originally, Forest Survey was authorized by the McSweeney-McNary Act of 1928. The current authorization is through the Renewable Resources Research Act of 1978.

The Intermountain Research Station with headquarters in Ogden, UT, conducts the forest resource inventories for the Rocky Mountain States of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, western South Dakota, Utah, Wyoming, western Texas, and Oklahoma's Panhandle. These inventories provide information concerning the extent and condition of State and privately owned forest lands and most other lands not in the National Forest System.

These data, when combined with similar information for National Forest lands, provide a basis for forming forest policies and programs and for the orderly development and use of the resources.

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This report is the result of the combined efforts of numerous people on the Forest Survey staff. In addition to the photo interpretation and field crews, several individuals played key roles in the reduction of basic data into information describing the extent, nature, and condition of the forest resources in Colorado: Dennis Collins supervised the data collection; Sharon Woudenberg and Shirley Waters compiled the data and made summaries; and Susan Brown and Velma Inama transformed the data summaries into tables of information. Also, we acknowledge the Colorado State Forest Service for its cooperation and assistance in collecting the inventory data. And we extend a special note of gratitude to the private land owners who allowed the field crews access to the sample locations on their properties.

RESEARCH SUMMARY

Presents data pertaining to the 2.8 million acres of State and privately owned woodlands in Colorado. Summarizes the basic statistics of the woodlands and presents tables of area, volume, growth, and mortality estimates.

Also includes a brief discussion of the possible wood products available and of the extent of the resource readily accessible by existing roads.

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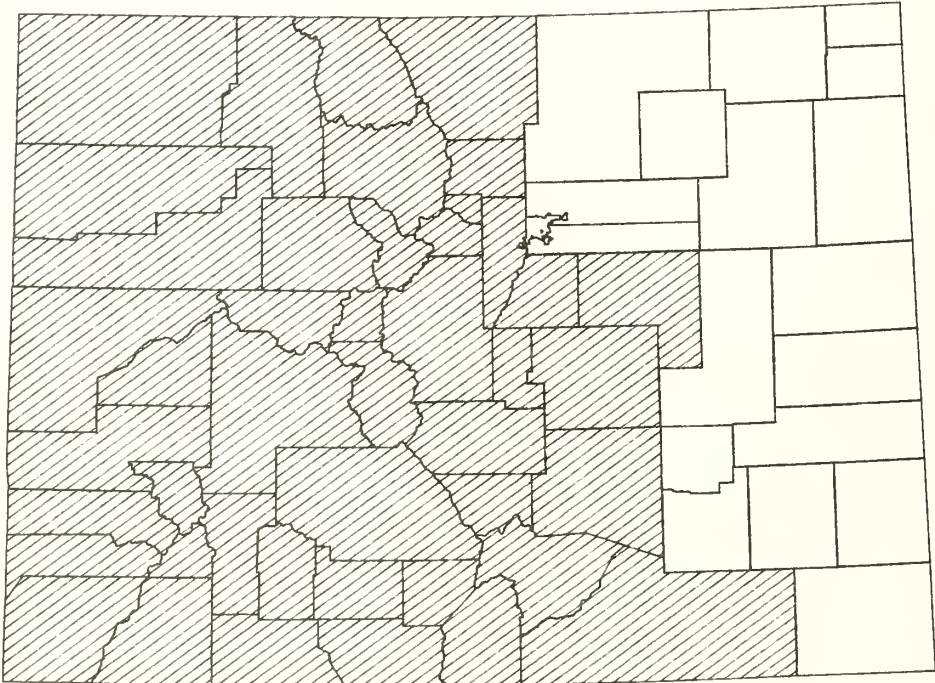


Figure 1—Counties covered by the Colorado inventory.

Colorado's Woodland Resources on State and Private Land

Roger C. Conner
Alan W. Green

INTRODUCTION

The latest inventory of Colorado's forests, completed in 1983, was confined to those counties covering the western two-thirds of the State (fig. 1). Because there is almost no forest land in eastern Colorado, it was administratively designated as "nonforest" and was not sampled. This marked the first time the State's woodlands—forest land where timber species make up less than 10 percent stocking—have been included in such an inventory, and reflects, at least in part, a changing attitude about the importance of these lands as a source of wood fiber. A "rekindling" of interest might be a more appropriate term, considering that during the late 1800's the woodlands were an important source of raw material for the economic development of the State. Mining, ranching, and the railroads required large quantities of mine props, fuelwood, fenceposts, and railroad ties, and in many cases the woodlands were the primary sources of such material (Buckman and Wolters 1987).

Woodlands occupy about 6 million of Colorado's 21.5 million acres of forest land and are found primarily in the western and south-central regions (fig. 2). The data in this report pertain only to the 2.8 million acres of State and privately owned woodland within those counties included in the inventory. For the Colorado inventory, Indian lands were considered a component of private lands.

The rest of the woodland—some 3.8 million acres—is on public lands. Nearly all of it is on lands managed by the USDI Bureau of Land Management (BLM), but about half a million acres of woodland are found within the National Forests (USDA Forest Service 1987). Although these lands were not included in the 1983 inventory, the nature and condition of the woodland resources on State and private land is likely to be fairly representative of the woodlands on public lands.

All tables mentioned in the text appear at the end of this publication.

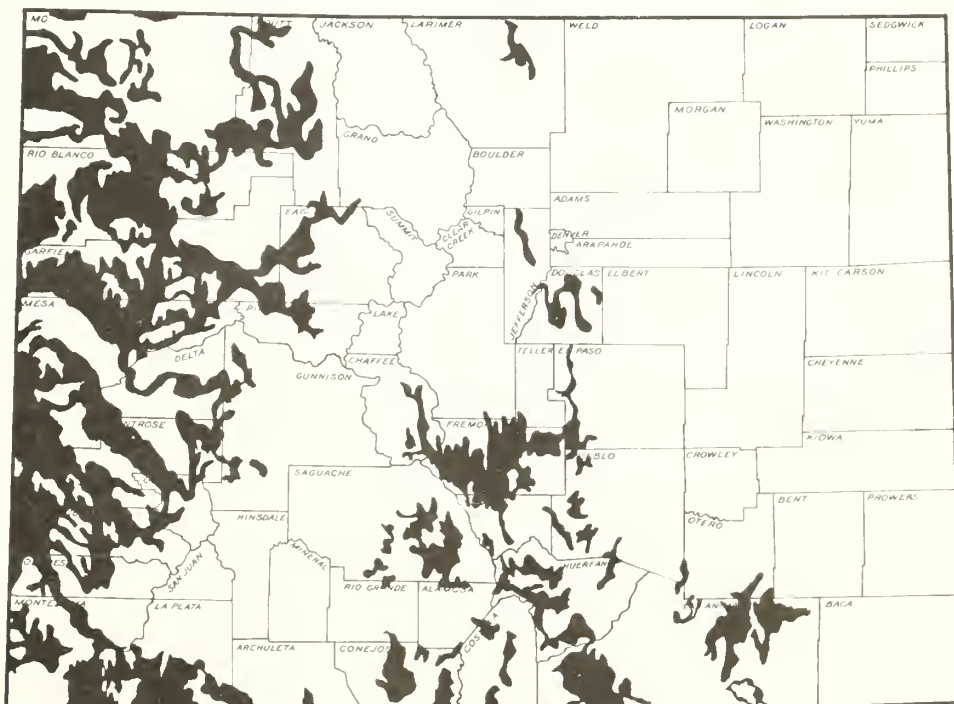


Figure 2—Geographical distribution of woodland in Colorado.

HIGHLIGHTS

Area

Those counties included in the inventory cover an area of over 46.2 million acres. About 22.9 million acres are State and privately owned, and of this over 6.4 million acres are forested. Woodlands account for 44 percent or 2.8 million acres of the State and privately owned forest land. Nearly all are privately owned (fig. 3).

Pinyon-juniper (P-J) is the major woodland forest type and occupies about 1.7 million acres, or roughly three-fifths of the woodland area. An additional 438,000 acres are pure juniper stands. The oak type is found on approximately 672,000 acres, about a quarter of the woodland area. Riparian and other western hardwood types account for less than 1 percent (fig. 4).

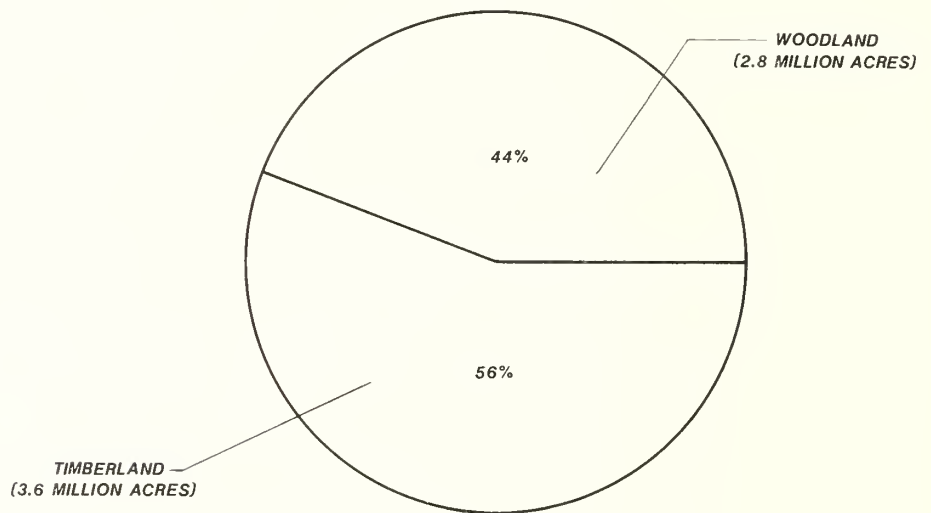


Figure 3—Distribution of State and private forest land by land class.

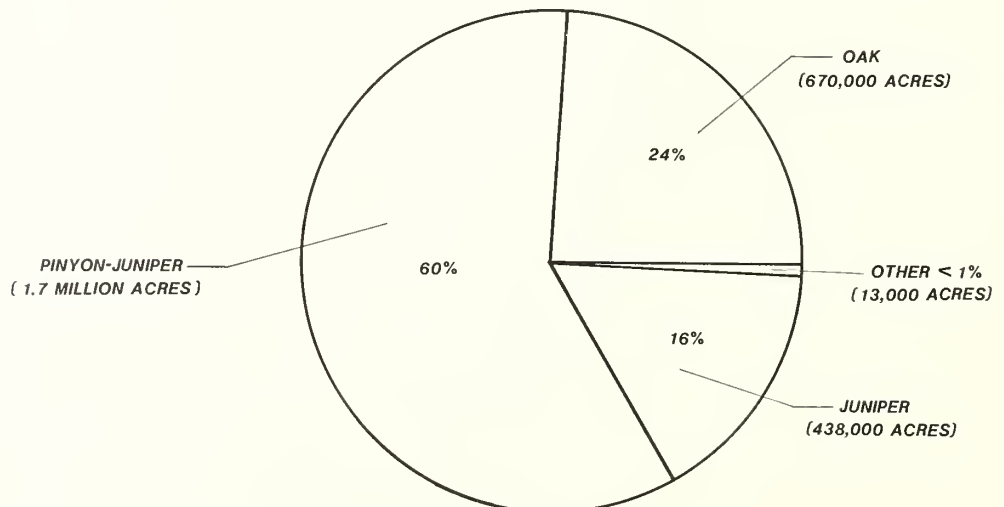


Figure 4—Distribution of State and private woodland area by forest type.

About two-thirds of the area, or 1.9 million acres, support less than 500 cubic feet of volume per acre. Only 352,000 acres, 13 percent, contain more than 1,000 cubic feet per acre. Nearly all of the oak type is in the lowest volume class. Typically, the oak stands in Colorado, specifically Gambel oak (*Quercus gambelii*), are characterized by dense clumps of small trees that have little volume (fig. 5).

Volume

Net live volume on State and private woodland amounted to nearly 1.1 billion cubic feet in 1982, and deadwood volume totaled 136 million cubic feet. Total volume averaged over 441 cubic feet per acre.

Juniper species (*Juniperus scopulorum*, *J. osteosperma*, *J. monosperma*) account for over half of the total volume. About 11 percent of this, or 75.4 million cubic feet, is deadwood, primarily on live trees. Pinyon (*Pinus edulis*) amounts to 431.3 million cubic feet, over a third of the total volume. Dead volume was just under 48 million cubic feet, about 11 percent of the total for pinyon (fig. 6).

Over half of the total net live volume, roughly 609 million cubic feet, is in trees less than 15 inches diameter at root collar (d.r.c.). Oak species, which account for roughly 70 percent of the 1.4 billion live trees and 47 percent of the trees over 3 inches d.r.c., accounted for just 11 percent of the total live volume, about 117 million cubic feet.

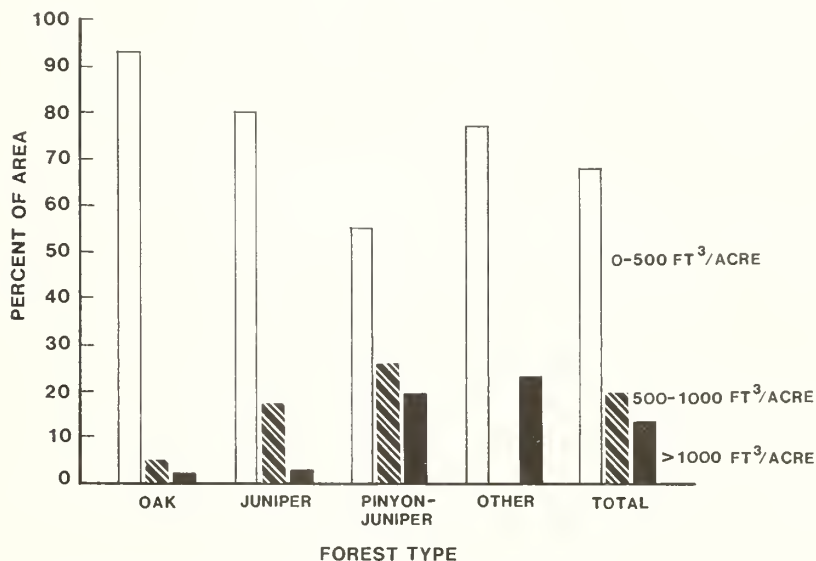


Figure 5—Distribution of State and private woodland area by forest type and volume class.

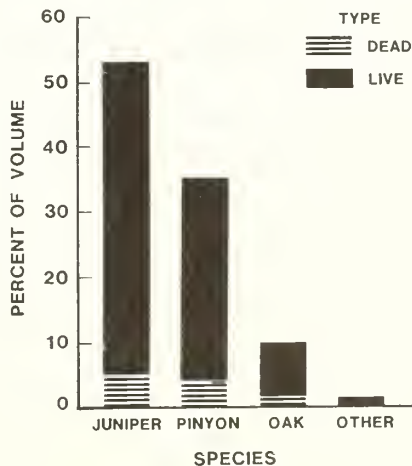


Figure 6—Total volume on State and private woodland by species, 1983.

Components of Change

Nearly three-fourths of the oak volume is in trees less than 7 inches d.r.c., and 58 percent or 67.9 million cubic feet is in the 4-inch class alone. Volume for pinyon and juniper species is distributed somewhat more evenly throughout the diameter classes (fig. 7).

On the average, the P-J forest type contains roughly 570 cubic feet of volume (live and dead) per acre while the pure juniper types contain about 344 cubic feet per acre. Oak types average just under 184 cubic feet of volume per acre. These average volumes by type are directly related to stand density, relative site quality, and tree diameter.

Growth—Total net annual growth on State and private woodlands was 15.2 million cubic feet in 1982 (appendix table 13). This is equivalent to adding about 190,000 cords of wood per year (80 cubic feet per cord) and is roughly 1.4 percent of the live volume. Pinyon, juniper, and oak species each contributed about a third of the growth even though oak accounted for only 11 percent of the live volume (fig. 8).

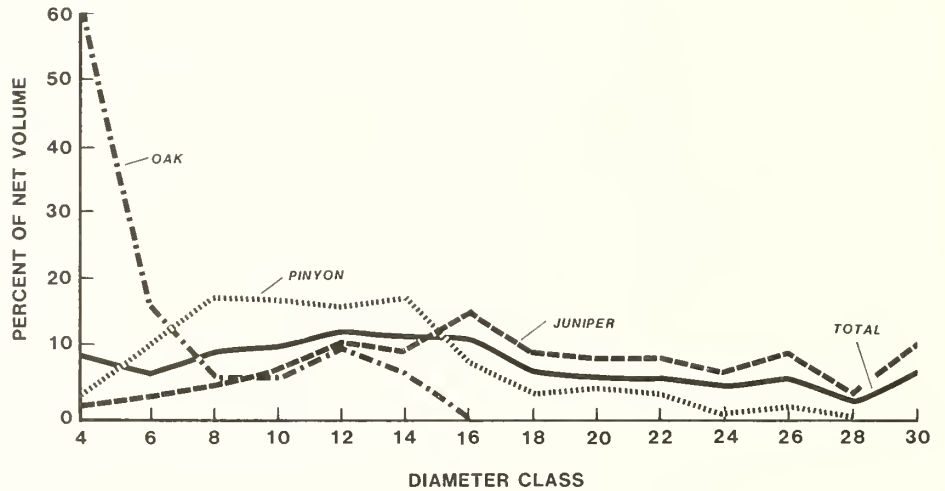


Figure 7—Net volume on State and private woodland by species and diameter class, 1983.

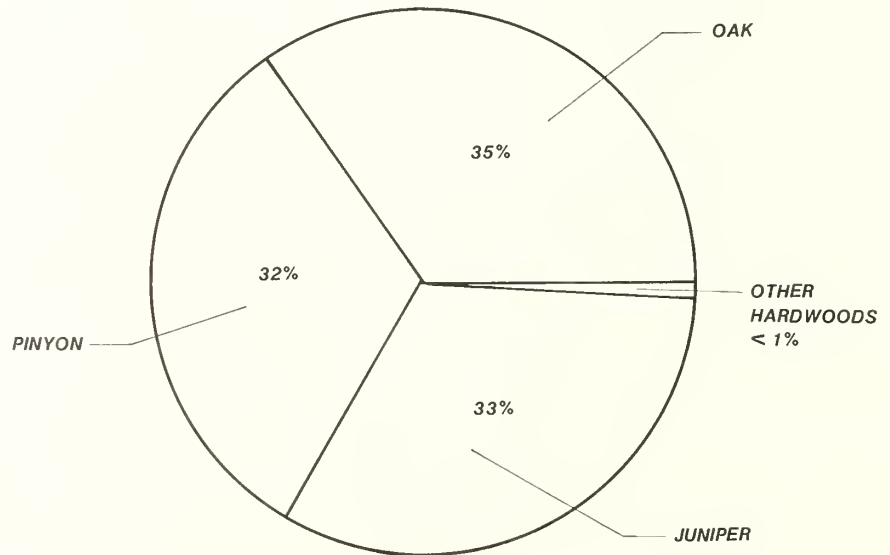


Figure 8—Distribution of net annual growth on State and private woodland by species, 1982.

Nearly three-quarters of the total net annual growth is in trees less than 11 inches d.r.c., and over a third—38 percent—is in the 4-inch d.r.c. class. The high proportion here is due primarily to the condition of Gambel oak, which accounts for about 77 percent of the trees in this diameter class. Over 83 percent of the net annual growth of pinyon is also in trees less than 11 inches d.r.c (fig. 9).

The oak forest type, through the benefit of a greater number of trees, averages a somewhat better growth rate per acre than the other types. Oak produces about 7.6 cubic feet of volume per year, while the P-J and juniper types average approximately 5 cubic feet and 4.1 cubic feet per acre per year, respectively (appendix table 13).

Average net annual growth on private woodlands in 1982 was about 5.5 cubic feet per acre. State owned woodlands averaged roughly 4.9 cubic feet per acre per year.

Mortality—Annual mortality of 2.3 million cubic feet offsets about 15 percent of the total growth for woodland (appendix table 8). Average mortality is less than 1 cubic foot per acre per year.

Pinyon and juniper species account for 73 percent or about 1.7 million cubic feet of the annual mortality, which is roughly proportional to their share of the net volume (fig. 10).

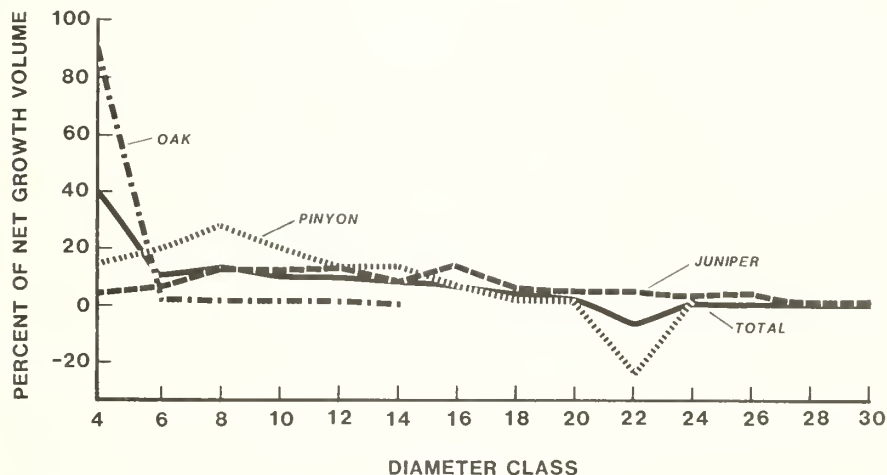


Figure 9—Net annual growth on State and private woodland by species and diameter class, 1982 (total excludes other hardwoods).

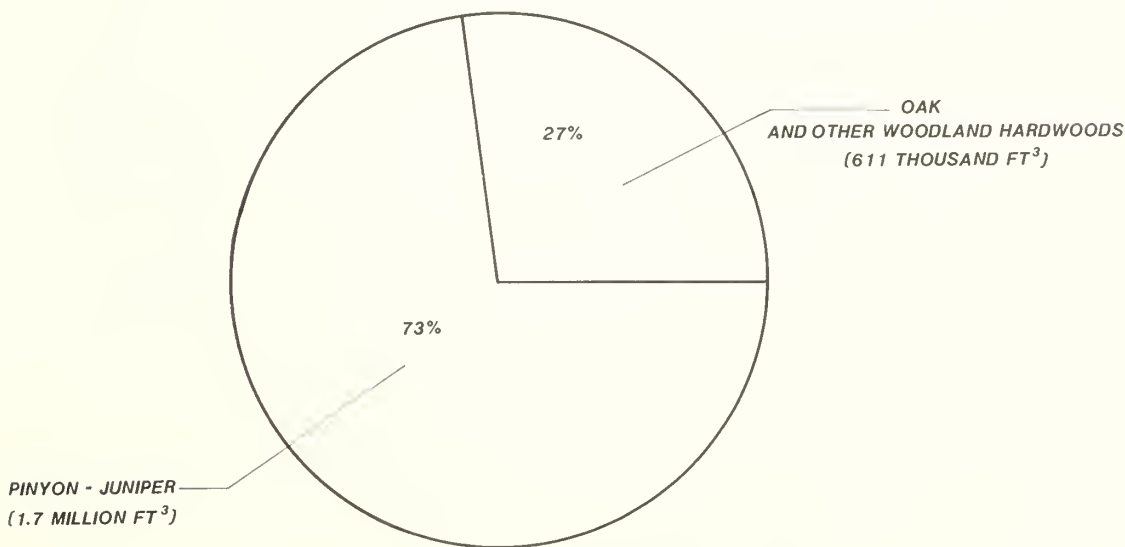


Figure 10—Distribution of annual mortality on State and private woodland by species group, 1982.

POTENTIAL WOOD PRODUCTS

Potential products from the woodlands include fuelwood, fenceposts, Christmas trees, and others.

Fuelwood

Historically, fuelwood has been a major wood product harvested from woodlands. Native Americans, explorers, pioneers, settlers, and even some early industries likely depended upon the resources for firewood or industrial fuel.

Today, woodlands remain a popular source of firewood for residential use and for some commercial operators. A recent survey of the fuelwood situation in Colorado reports an estimated 41,000 cords were harvested from woodland tree species in 1982 (McLain and Booth 1985).

As shown in figure 11, nearly 32,000 cords, or 2.6 million cubic feet, were harvested from woodland species on State and privately owned land. Over 70 percent of this harvest was from dead trees.

About 1.7 million cubic feet—68 percent of the total fuelwood harvest—came from pinyon, reportedly all of it from dead trees. Nearly all of the live volume of fuelwood harvested, over 9,000 cords, came from juniper species, and all was cut from private lands. Privately owned land also contributed all of the approximately 88,000 cubic feet of oaks and other hardwoods cut for fuelwood.

Deadwood harvested from woodland species represents about 1 percent of the 136 million cubic feet of salvable dead volume available (appendix table 15).

Posts

Woodland tree species, primarily juniper and oak, are often cut for fenceposts (fig. 12). An estimated 159 million usable corner and line posts are in trees on Colorado's State and private woodlands. Over a third of these, about 54 million, are the more desirable corner posts.

Approximately 70 percent of the posts are in juniper, and roughly 70.8 million of these are line posts. Oak contributes about 4 percent or 5.8 million, and nearly all of these are line posts.

Although pinyon is not commonly made into fenceposts, some use of it for this purpose was noted throughout the State. The estimated 43.6 million pinyon posts account for over a quarter of the total.

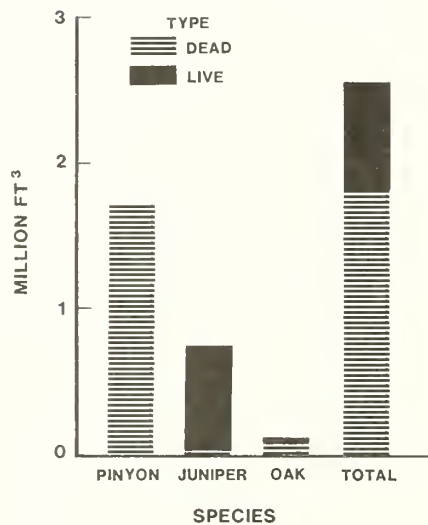


Figure 11—Live and dead fuelwood harvested from woodland species on State and private land, 1982.

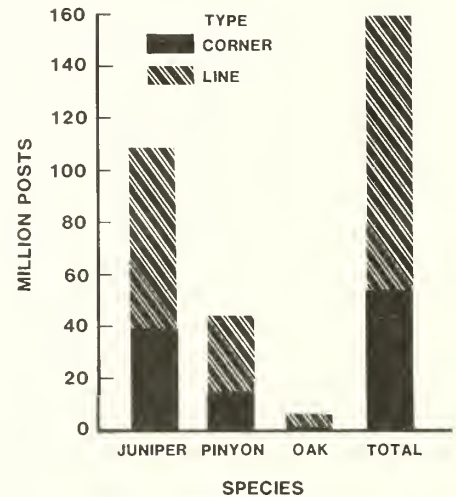


Figure 12—Number of fenceposts on State and private woodland by species and type of post.

Christmas Trees

Pinyon is the only woodland tree species used as Christmas trees. Of the estimated 239.3 million pinyon trees on State and private land in Colorado, about 70 million, or 29 percent, met at least minimum height and form criteria to qualify as potential Christmas trees (appendix table 21).

Although the majority were considered utility grade, over a third, roughly 23.2 million, met the standard grade criteria. Another 3.2 million were the more desirable premium grade (fig. 13).

Nearly half the trees were in the preferred 6- to 10-foot height class. Just under 86 percent of the premium grade trees were in this class.

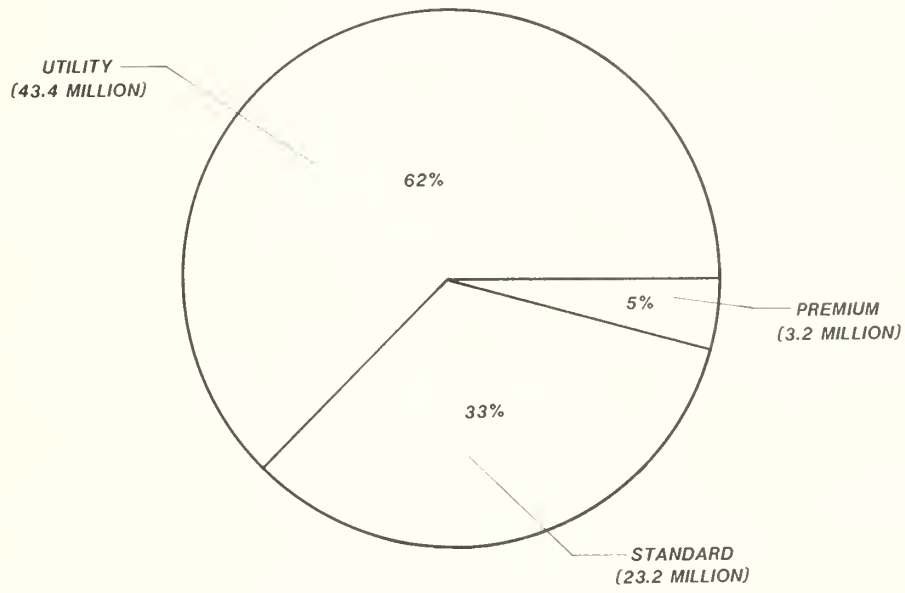


Figure 13—Number of pinyon Christmas trees on State and private woodland by grade.

Other Potential Products

In addition to these widely accepted products already being harvested from woodlands, recent research has been conducted into the feasibility of producing other wood fiber products. Although additional research is needed, the potential to use pinyon and juniper wood to produce particle board, paper, cement board, and naval-stores products has shown promise (Murphy 1987).

ACCESSIBILITY

Accessibility has to do with the relative ease or difficulty with which trees can be reached for harvest. Nearness to roads and steepness of slope are usually thought to be reasonable indicators of the degree of difficulty to be encountered in a commercial harvest operation. The rather arbitrary rule of thumb of "less than 30 percent slope and within a mile of a road" is considered here as an acceptable standard for accessibility.

Using that definition we find much of Colorado's State and private woodlands is easily accessible (fig. 14). Nearly 2.0 million acres or 70 percent of the woodland area is within 1 mile of a road and has slopes of less than 30 percent. These acres contain the major proportion of the live and dead volume, net annual growth, and wood products available from Colorado's woodlands.

Moreover, because degree of slope has some bearing on site quality, these areas likely contain some of the better woodland sites. Thus, slope would be an indicator of areas to feature in management.

The distribution of the accessible area by forest type is virtually the same as the distribution of the total State and private woodland area: pinyon-juniper 59 percent, oak 23 percent, juniper 17 percent, and other woodland types 1 percent (fig. 15).

In addition to the above area, another 114,000 acres of State and private woodland in Colorado have slopes of less than 30 percent but are presently more than 1 mile from a road. The assumption of site quality and management potential apply to these acres as well.

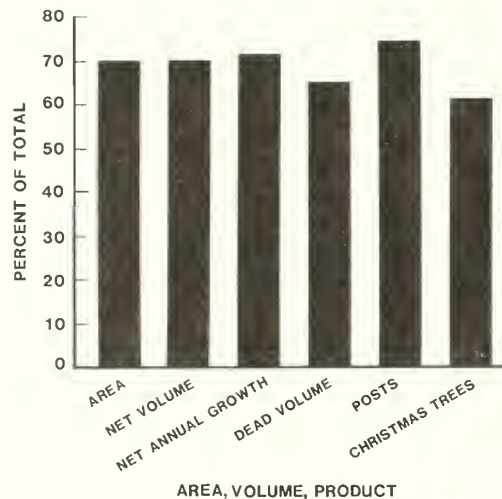


Figure 14—Percentage of State and private woodland on slopes less than 30 percent and within 1 mile of a road by area, volume, and wood product.

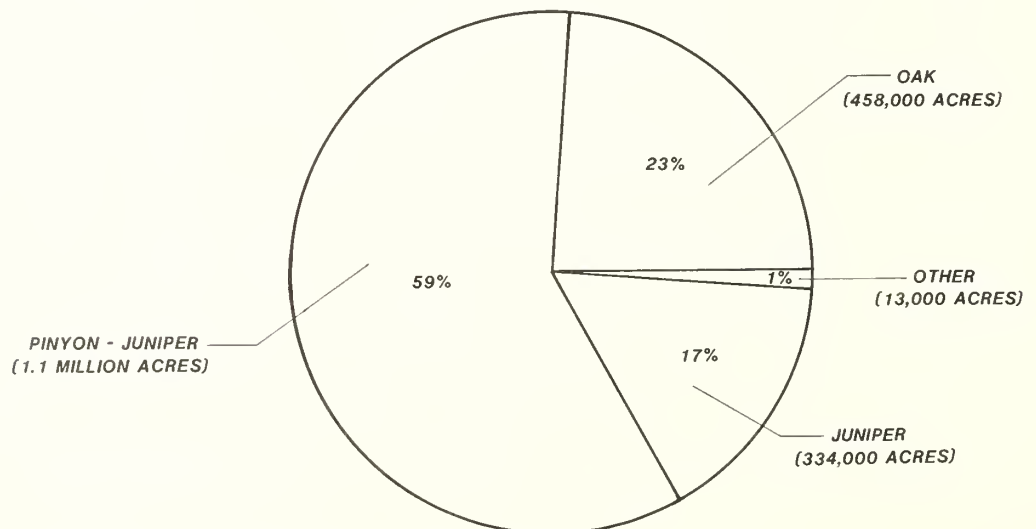


Figure 15—Area of State and private woodland on slopes less than 30 percent and within 1 mile of a road by forest type.

HOW THE INVENTORY WAS CONDUCTED

The inventory was designed to provide reliable statistics primarily at the State and sample area levels.

Prefield

Primary area estimates were based on the classification of 187,765 sample points systematically placed on the latest aerial photographs available. The photopoints, adjusted to meet known land areas by owner class, were used to stratify and compute expansion factors for the field sample data.

Field

Land classification and estimates for woodland characteristics and volume were based on observations and measurements recorded at 3,340 ground sample locations, of which 1,216 were forested. Of the forested locations, 243 were classified as woodland. Sample trees were selected using fixed radius plots of 1/5, 1/10, or 1/20 acre for trees over 3 inches d.r.c., and 1/100 acre for trees less than 3 inches d.r.c.

Compilation

All photo and field data were entered into a computer for editing, computation, and tabulation. Final estimates from these data were based on statistical summaries, a portion of which is included in this bulletin. Volume was computed using equations developed by Edminster and others (1980, 1981), Kemp (1958), Chojnacky (1985), Meyers (1964), and Meyers and others (1972). Defect was computed from field observations.

DATA RELIABILITY

Individual cells within tables should be used with caution. Some are based on small sample sizes, which may result in high sampling errors. The standard error percentages shown in table 1 were calculated at the 67 percent confidence level.

STANDARD FOREST SURVEY TERMINOLOGY

Acceptable trees—Growing-stock trees meeting specified standards of size and quality but not qualifying as desirable trees.

Area condition class—A classification of timberland reflecting the degree to which the site is being utilized by growing-stock trees and other conditions affecting current and prospective timber growth (see Stocking):

Class 10—Areas fully stocked with desirable trees and not overstocked.

Class 20—Areas fully stocked with desirable trees but overstocked with all live trees.

Class 30—Areas medium to fully stocked with desirable trees and with less than 30 percent of the area controlled by other trees, or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees, or both.

Class 40—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees, or conditions that ordinarily prevent occupancy by desirable trees, or both.

Class 50—Areas poorly stocked with desirable trees but fully stocked with growing-stock trees.

Class 60—Areas poorly stocked with desirable trees but with medium to full stocking of growing-stock trees.

Class 70—Areas nonstocked or poorly stocked with desirable trees and poorly stocked with growing-stock trees.

Class 80—Low-risk old-growth stands.

Class 90—High-risk old-growth stands.

Nonstocked—Areas less than 10 percent stocked with growing-stock trees.

Basal area—The cross-sectional area of a tree expressed in square feet. For timber species the calculation is based on diameter at breast height (d.b.h.); for woodland species it is based on diameter at root collar (d.r.c.).

Christmas tree grade—Pinyon species are classified as Christmas trees using the following guidelines:

Premium—Excellent conical form with no gaps in branches and a straight bole.

Standard—Good conical form with small gaps in branches and bole slightly malformed.

Utility—Conical in form with branches missing and bole bent or malformed.

Cull—Not meeting one of the above classifications or over 12 feet in height.

Cord—A pile of stacked wood equivalent to 128 cubic feet of wood and air space having standard dimensions of 4 by 4 by 8 feet.

Cull trees—Live trees that are unmerchantable now or prospectively (see Rough trees and Rotten trees).

Cull volume—Portions of a tree's volume that are not usable for wood products because of rot, form, missing material, or other cubic-foot defect. Form and sound defects include severe sweep and crook, forks, extreme form reduction, large deformities, and dead material.

Deferred forest land—Forest lands within the National Forest System that are under study for possible inclusion in the Wilderness System.

Desirable trees—Growing-stock trees (1) having no serious defect in quality to limit present or prospective use for timber products, (2) of relatively high vigor, and (3) containing no pathogens that may result in death or serious deterioration within the next decade.

Diameter at breast height (d.b.h.)—Diameter of the stem measured at 4.5 feet above the ground.

Diameter at root collar (d.r.c.)—Diameter equivalent at the point nearest the ground line that represents the basal area of the tree stem or stems.

Diameter classes—Tree diameters, either d.b.h. or d.r.c., grouped into 2-inch classes labeled by the midpoint of the class.

Farmer/rancher-owned lands—Lands owned by a person who operates a farm or a ranch and who either does the work or directly supervises the work.

Forest industry lands—Lands owned by companies or individuals operating a primary wood-processing plant.

Forest lands—Lands at least 10 percent stocked by forest trees of any size, including lands that formerly had such tree cover and that will be naturally or artificially regenerated. The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width at least 120 feet wide to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 feet wide.

Forest trees—Woody plants having a well-developed stem or stems, usually more than 12 feet in height at maturity, with a generally well-defined crown.

Forest type—A classification of forest land based upon and named for the tree species presently forming a plurality of live-tree stocking.

Gross annual growth—The average annual increase in the net volume of trees during a specified period.

Growing-stock trees—Live sawtimber trees, poletimber trees, saplings, and seedlings of timber species meeting specified standards of quality and vigor; excludes cull trees.

Growing-stock volume—Net cubic-foot volume in live poletimber-size and sawtimber-size growing-stock trees from a 1-foot stump to a minimum 4-inch top (of central stem) outside bark or to the point where the central stem breaks into limbs.

Growth—See definition for Net annual growth.

Hardwood trees—Dicotyledonous trees, usually broad-leaved and deciduous.

High-risk old-growth stands—Timber stands over 100 years old in which the majority of the trees are not expected to survive more than 10 years.

Indian lands—Indian lands held in trust by the Federal Government.

Industrial wood—All commercial roundwood products except fuelwood.

Land area—The area of dry land and land temporarily or partially covered by water such as marshes, swamps, and river flood plains, streams, sloughs, estuaries, and canals less than 120 feet wide; and lakes, reservoirs, and ponds less than 1 acre in size.

Logging residues—The unused portions of growing-stock trees cut or killed by logging.

Low-risk old-growth stands—Timber stands over 100 years old in which the majority of the trees are expected to survive more than 10 years.

Miscellaneous Federal lands—Lands administered by Federal agencies other than the Forest Service, U.S. Department of Agriculture, or Bureau of Land Management, U.S. Department of the Interior.

Mortality—The net volume of growing-stock trees that have died from natural causes during a specified period.

National Forest lands—Public lands administered by the Forest Service, U.S. Department of Agriculture.

National Resource lands—Public lands administered by the Bureau of Land Management, U.S. Department of the Interior.

Net annual growth—Gross annual growth minus average annual mortality.

Net dead volume—Total net volume of dead trees plus the net volume of dead material in live trees.

Net volume in board feet—The gross board-foot volume in the sawlog portion of growing-stock trees, less deductions for cull volume.

Net volume in cubic feet—Gross cubic-foot volume in the merchantable portion of trees less deductions for cull volume. For timber species, volume is computed for the merchantable stem from a 1-foot stump to a minimum 4-inch top diameter outside bark (d.o.b.), or to the point where the central stem breaks into limbs. For woodland species, volume is computed outside bark (o.b.) for all woody material above d.r.c. that is larger than 1.5 inches d.o.b.

Nonforest lands—Lands that do not currently qualify as forest land.

Nonindustrial private—All private ownerships except forest industry.

Nonstocked areas—Forest land less than 10 percent stocked with live trees.

Old-growth stands—Stands of timber species over 100 years old.

Other private lands—Privately owned lands other than forest industry or farmer-owned.

Other public lands—Public lands administered by agencies other than the Forest Service, U.S. Department of Agriculture.

Other removals—The net volume of growing-stock trees removed from the inventory by cultural operations such as timber-stand improvement, by land clearing, and by changes in land use, such as a shift to wilderness.

Poletimber stands—Stands at least 10 percent stocked with growing-stock trees, in which half or more of the stocking is sawtimber or poletimber trees or both, with poletimber stocking exceeding that of sawtimber (see definition for Stocking).

Poletimber trees—Live trees of timber species at least 5 inches d.b.h. but smaller than sawtimber size.

Posts—Juniper and oak species are evaluated for post potential using the following criteria:
 Line post—A 7-foot minimum length with 5 to 7 inches diameter at the butt, 2.5-inch minimum small end diameter, and reasonably straight and solid.
 Corner post—An 8-foot minimum length with 7 to 9 inches diameter at the butt, 2.5-inch minimum small end diameter, and reasonably straight and solid.

Potential growth—The average net annual cubic-foot growth per acre at culmination of mean annual growth attainable in fully stocked natural stands.

Primary wood-processing plants—Plants using roundwood products such as sawlogs, pulpwood bolts, veneer logs, and so forth.

Productivity class—A classification of forest land that reflects biological potential. For timberlands the index used is the potential net annual growth at culmination of mean annual increment in fully stocked natural stands. For woodland, characteristics that affect the land's ability to produce wood, such as soil depth and aspect, are used. Furthermore, woodland is classified as high site where sustained wood production is likely, or low site where the continuous production of wood is unlikely.

Removals—The net volume of growing-stock trees removed from the inventory by harvesting, cultural operations, land clearings, or changes in land use.

Reserved forest land—Forest land withdrawn from tree utilization through statute or administrative designation.

Residues:

Coarse residues—Plant residues suitable for chipping, such as slabs, edgings, and ends.

Fine residues—Plant residues not suitable for chipping, such as sawdust, shavings, and veneer clippings.

Plant residues—Wood materials from primary manufacturing plants that are not used for any product.

Rotten trees—Live poletimber or sawtimber trees with more than 67 percent of their total volume cull (cubic-foot) and with more than half of the cull volume attributable to rotten or missing material.

Rough trees—Live poletimber or sawtimber trees with more than 67 percent of their total volume cull (cubic-foot) and with less than half of the cull volume attributable to rotten or missing material.

Roundwood—Logs, bolts, or other round sections cut from trees.

Salvable dead trees—Standing or down dead trees that are currently merchantable by regional standards.

Saplings—Live trees of timber species 1 to 4.9 inches d.b.h. or woodland species 1 to 2.9 inches d.r.c.

Sapling and seedling stands—Timberland stands at least 10 percent stocked on which more than half of the stocking is saplings or seedlings or both.

Sawlog portion—That part of the bole of sawtimber trees between a 1-foot stump and the sawlog top.

Sawlog top—The point on the bole of sawtimber trees above which a sawlog cannot be produced. The minimum sawlog top is 7 inches d.o.b. for softwoods and 9 inches d.o.b. for hardwoods.

Sawtimber stands—Stands at least 10 percent stocked with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Sawtimber trees—Live trees of timber species meeting regional size and defect specifications. Softwood trees must be at least 9 inches d.b.h. and hardwood trees 11 inches d.b.h.

Sawtimber volume—Net volume in board feet of the sawlog portion of live sawtimber trees.

Seedlings—Established live trees of timber species less than 1 inch d.b.h. or woodland species less than 1 inch d.r.c.

Softwood trees—Monocotyledonous trees, usually evergreen, having needle or scalelike leaves.

Standard error—An expression of the degree of confidence that can be placed on an estimated total or average obtained by statistical sampling methods. Standard errors do not include technique errors that could occur in photo classification of areas, field measurements, or compilation of data.

Stand-size classes—A classification of forest land based on the predominant size of trees present (see Sawtimber stands, Poletimber stands, and Sapling and seedling stands).

State, county, and municipal lands—Lands administered by States, counties, and local public agencies, or lands leased by these governmental units for more than 50 years.

Stocking—An expression of the extent to which growing space is effectively utilized by present or potential growing-stock trees of timber species.

Timberland—Forest land where timber species make up at least 10 percent stocking.

Timber species—Tree species traditionally used for industrial wood products. In the Rocky Mountain States, these include aspen and cottonwood hardwood species and all softwood species except pinyon and juniper.

Timber stand improvement—Treatments such as thinning, pruning, release cutting, girdling, weeding, or poisoning of unwanted trees aimed at improving growing conditions for the remaining trees.

Upper-stem portion—That part of the main stem or fork of sawtimber trees above the sawlog top to a minimum top diameter of 4 inches outside bark or to the point where the main stem or fork breaks into limbs.

Water—Streams, sloughs, estuaries, and canals more than 120 feet wide, and lakes, reservoirs, and ponds more than 1 acre in size at mean high water level.

Wilderness—An area of undeveloped land currently included in the Wilderness System, managed so as to preserve its natural conditions and retain its primeval character and influence.

Woodland—Forest land where timber species make up less than 10 percent stocking.

Woodland species—Tree species not usually converted into industrial wood products. Common uses are fuelwood, fenceposts, and Christmas trees.

REFERENCES

- Buckman, Robert E.; Wolters, Gale L. 1987. Multi-resource management of pinyon-juniper woodlands. In: Everett, Richard L., compiler. Proceedings—pinyon-juniper conference; 1986 January 13-16; Reno, NV. Gen. Tech. Rep. INT-215. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station: 2-4.
- Chojnacky, David C. 1985. Pinyon-juniper volume equations for the central Rocky Mountain States. Res. Pap. INT-339. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 27 p.
- Edminster, Carleton B.; Mowrer, H. Todd; Hinds, Thomas E. 1981. Volume tables and point-sampling factor for aspen in Colorado. Res. Pap. RM-232. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 16 p.
- Edminster, Carleton B.; Beeson, Robert T.; Metcalf, Gary E. 1980. Volume tables and point-sampling factor for ponderosa pine in the Front Range of Colorado. Res. Pap. RM-218. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 14 p.
- Kemp, Paul D. 1958. Volume tables. Unpublished report on file at: U.S. Department of Agriculture, Forest Service, Intermountain Research Station, Ogden, UT.
- McLain, William H.; Booth, Gordon D. 1985. Colorado's 1982 fuelwood harvest. Resour. Bull. INT-36. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 11 p.
- Meyers, Clifford A. 1964. Volume tables and point-sampling factors for lodgepole pine in Colorado and Wyoming. Res. Pap. RM-6. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 16 p.
- Meyers, Clifford A.; Edminster, Carleton B. 1972. Volume tables and point-sampling factors for Engelmann spruce in Colorado and Wyoming. Res. Pap. RM-95. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 23 p.
- Murphy, Patrick M. 1987. Specialty wood products from pinyon-juniper. In: Everett, Richard L., compiler. Proceedings—pinyon-juniper conference; 1986 January 13-16; Reno, NV. Gen. Tech. Rep. INT-215. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station: 166-167.
- U.S. Department of Agriculture, Forest Service. 1987. Inventory of Colorado, Wyoming, South Dakota and Nebraska National Forest System lands administered by Region 2. Book 1. Regional and State totals by forest type and stand size. Unpublished report on file at: Rocky Mountain Region, Lakewood, CO.

FOREST SURVEY TABLES

Table 1--Area of State and privately owned forest land with percent standard error, Colorado, 1983

Item	Softwoods		Hardwoods		All types	
	Thousand acres	Percent standard error	Thousand acres	Percent standard error	Thousand acres	Percent standard error
Timberland	2,655.2	± 3.1	945.2	± 5.9	3,600.4	± 2.4
Woodland	2,103.4	± 4.2	683.2	±10.7	2,786.6	± 3.8
Reserved forest land ¹						
Timberland	15.3		3.6		18.9	
Woodland	4.5		2.4		6.9	
Total forest land ²	4,778.4		1,634.4		6,412.8	

¹Reserved land areas are estimated from aerial photos without field verification; therefore, standard errors are not calculated.

²On this and all following tables, totals may vary due to rounding.

Table 2--Total land and water area by ownership class, Colorado, 1983

Ownership class	Area
	- - <u>Thousand acres</u> - -
Land:	
Public:	
National Forest	14,430.8
Other Public:	
Bureau of Land Management	8,333.0
National Parks ¹	610.3
Miscellaneous Federal	271.6
State	3,022.9
County and municipal	316.2
Total other public	11,943.7
Total public	26,984.8
Private	39,315.9
Total land area	66,300.7
Census water	317.5
Total land and water ²	66,618.2

¹National Park area is included in this table only. No volume tables are included for National Parks.

²U.S. Bureau of the Census, land and water area of the United States, 1980.

Table 3--Total land area on State and privately owned land by major land class and ownership class, Colorado, 1983

Land class	Ownership class		
	State	Private	Total
----- Thousand acres -----			
Timberland:			
Reserved	18.9	--	18.9
Nonreserved	235.2	3,365.2	3,600.4
Total	254.1	3,365.2	3,619.3
Woodland:			
Reserved	6.9	--	6.9
Nonreserved	161.2	2,625.4	2,786.6
Total	168.1	2,625.4	2,793.5
Total forest land:			
Reserved	25.8	--	25.8
Nonreserved	396.4	5,990.6	6,412.8
Total	422.2	5,990.6	6,412.8
Nonforest land ¹	2,600.7	33,325.3	35,926.0
Total land area	3,022.9	39,315.9	42,338.8

¹Includes all of eastern Colorado, which was administratively determined to be nonforest land.

Table 4--Area of woodland on State and privately owned land by forest type, ownership class, and land class, Colorado, 1983

Forest type	Ownership class and land class						
	State		Private		All owners		
	Reserved	Nonreserved	Reserved	Nonreserved	Reserved	Nonreserved	Total
----- Thousand acres -----							
Pinyon-juniper	4.5	98.3	--	1,567.6	4.5	1,665.9	1,670.4
Juniper	--	31.1	--	406.4	--	437.5	437.5
Oak	2.4	31.4	--	638.5	2.4	669.9	672.3
Other western hardwoods	--	0.4	--	12.9	--	13.3	13.3
Total	6.9	161.2	--	2,625.4	6.9	2,786.6	2,793.5

Table 5--Area of State and privately owned woodland by forest type and ownership class, Colorado, 1983

Forest type	Ownership class		
	State	Private	Total
	- - - - - Thousand acres - - - - -		
Pinyon-juniper	98.3	1,567.6	1,665.9
Juniper	31.1	406.4	437.5
Total woodland softwoods	129.4	1,974.0	2,103.4
Oak	31.4	638.5	669.9
Other western hardwoods	0.4	12.9	13.3
Total woodland hardwoods	31.8	651.4	683.2
All types	161.2	2,625.4	2,786.6

Table 6--Net volume of State and privately owned woodland by species and ownership class, Colorado, 1983

Species	Ownership class		
	State	Private	Total
	- - - - - Thousand cubic feet - - - - -		
Douglas-fir	5	184	189
Ponderosa pine	13	303	316
Aspen	180	4,431	4,611
Woodland softwoods	53,494	917,020	970,514
Woodland hardwoods	7,319	115,496	122,815
All species	61,011	1,037,434	1,098,445

Table 7--Net annual growth of State and privately owned woodland by species and ownership class, Colorado, 1982

Species	Ownership class		
	State	Private	Total
	- - - - - Thousand cubic feet - - - - -		
Douglas-fir	4	122	126
Ponderosa pine	(¹)	4	4
Aspen	5	120	125
Woodland softwoods	545	9,366	9,911
Woodland hardwoods	244	5,078	5,322
All species	798	14,690	15,488

¹Less than 0.5 thousand cubic feet.

Table 8--Annual mortality of State and privately owned woodland by species and ownership class, Colorado, 1982

Species	Ownership class		
	State	Private	Total
----- <u>Thousand cubic feet</u> -----			
Douglas-fir	--	--	--
Ponderosa pine	--	--	--
Aspen	(¹)	8	8
Woodland softwoods	118	1,543	1,661
Woodland hardwoods	41	570	611
All species	159	2,121	2,280

¹Less than 0.5 thousand cubic feet.

Table 9--Area of State and privately owned woodland by ownership class, site class, and forest type, Colorado, 1983

Ownership class	Site class	Forest type				All types
		Pinyon-juniper	Juniper	Oak	Other	
----- <u>Thousand acres</u> -----						
State:	High site	84	23	19	(¹)	126
	Low site	15	8	12	(¹)	35
	All classes	99	31	31	(¹)	161
Private:	High site	1,253	314	433	3	2,003
	Low site	314	93	206	10	623
	All classes	1,567	407	639	13	2,626
All owners:	High site	1,337	337	452	3	2,129
	Low site	329	101	218	10	658
	All classes	1,666	438	670	13	2,787

¹Less than 0.5 thousand acres.

Table 10--Area of State and privately owned woodland by ownership class, volume class, and forest type, Colorado, 1983

Ownership class	Volume class (cu ft/acre)	Forest type				All types
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand acres -----						
State:	0 - 500	58	26	28	(1)	112
	500 - 1,000	26	5	1	--	32
	1,000+	14	1	2	(1)	17
	All classes	98	32	31	(1)	161
Private:	0 - 500	867	325	594	10	1,796
	500 - 1,000	396	69	30	--	495
	1,000+	305	12	15	3	335
	All classes	1,568	406	639	13	2,626
All owners:	0 - 500	925	351	622	10	1,908
	500 - 1,000	422	74	31	--	527
	1,000+	319	13	17	3	352
	All classes	1,666	438	670	13	2,787

¹Less than 0.5 thousand acres.

Table 11--Net volume on State and privately owned woodland by ownership class, site class, and forest type, Colorado, 1983

Ownership class	Site class	Forest type				All types ¹
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand cubic feet -----						
State:	High site	38,024	7,316	3,830	244	49,414
	Low site	6,838	1,518	3,039	3	11,398
	All classes	44,862	8,834	6,869	247	60,812
Private:	High site	635,429	107,097	75,658	4,946	823,130
	Low site	160,801	19,639	28,835	112	209,387
	All classes	796,230	126,736	104,493	5,058	1,032,517
All owners:	High site	673,453	114,413	79,488	5,190	872,544
	Low site	167,639	21,157	31,874	115	220,785
	All classes	841,092	135,570	111,362	5,305	1,093,329

¹Does not include timber species in woodland forest types.

Table 12--Net volume on State and privately owned woodland by ownership class, volume class, and forest type, Colorado, 1983

Ownership class	Volume class (cu ft/acre)	Forest type				All types ¹
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand cubic feet -----						
State:	0 - 500	13,778	4,875	3,407	3	22,063
	500 - 1,000	16,171	2,705	636	--	19,512
	1,000+	14,914	1,254	2,826	244	19,238
	All classes	44,863	8,834	6,869	247	60,813
Private:	0 - 500	208,097	60,892	66,166	112	335,267
	500 - 1,000	246,076	38,757	15,154	--	299,987
	1,000+	342,056	27,087	23,173	4,946	397,262
	All classes	796,229	126,736	104,493	5,058	1,032,516
All owners:	0 - 500	221,875	65,767	69,573	115	357,330
	500 - 1,000	262,247	41,462	15,790	--	319,499
	1,000+	356,970	28,341	25,999	5,190	416,500
	All classes	841,092	135,570	111,362	5,305	1,093,329

¹Does not include timber species in woodland forest types.

Table 13--Net annual growth on State and privately owned woodland by ownership class, site class, and forest type, Colorado, 1982

Ownership class	Site class	Forest type				All types ¹
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand cubic feet -----						
State:	High site	491	122	168	1	782
	Low site	-72	11	66	(²)	5
	All classes	419	133	234	1	787
Private:	High site	7,700	1,542	4,081	22	13,345
	Low site	174	120	800	7	1,101
	All classes	7,874	1,662	4,881	29	14,446
All owners:	High site	8,191	1,664	4,249	23	14,127
	Low site	102	131	866	7	1,106
	All classes	8,293	1,795	5,115	30	15,233

¹Does not include timber species in woodland forest types.

²Less than 0.5 thousand cubic feet.

Table 14--Net annual growth on State and privately owned woodland by ownership class, volume class, and forest type, Colorado, 1982

Ownership class	Volume class (cu ft/acre)	Forest type				All types ¹
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand cubic feet -----						
State:	0 - 500	244	98	191	(²)	533
	500 - 1,000	42	28	45	--	115
	1,000+	133	7	-1	1	140
	All classes	419	133	235	1	788
Private:	0 - 500	3,552	1,116	3,552	7	8,227
	500 - 1,000	1,391	404	1,372	--	3,167
	1,000+	2,931	142	-44	22	3,051
	All classes	7,874	1,662	4,880	29	14,445
All owners:	0 - 500	3,796	1,214	3,743	7	8,760
	500 - 1,000	1,433	432	1,417	--	3,282
	1,000+	3,064	149	-45	23	3,191
	All classes	8,293	1,795	5,115	30	15,233

¹Does not include timber species in woodland forest types.

²Less than 0.5 thousand cubic feet.

Table 15--Net dead volume on State and privately owned woodland by ownership class, site class, and forest type, Colorado, 1983

Ownership class	Site class	Forest type				All types ¹
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand cubic feet -----						
State:	High site	3,644	493	516	24	4,677
	Low site	1,360	94	110	--	1,564
	All classes	5,004	587	626	24	6,241
Private:	High site	72,077	7,910	10,060	495	90,542
	Low site	31,598	6,613	1,207	--	39,418
	All classes	103,675	14,523	11,267	495	129,960
All owners:	High site	75,721	8,403	10,576	519	95,219
	Low site	32,958	6,707	1,317	--	40,982
	All classes	108,679	15,110	11,893	519	136,201

¹Does not include timber species in woodland forest types.

Table 16--Net dead volume on State and privately owned woodland by ownership class, volume class, and forest type, Colorado, 1983

Ownership class	Volume class (cu ft/acre)	Forest type				All types ¹
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand cubic feet -----						
State:	0 - 500	1,101	368	239	--	1,708
	500 - 1,000	2,336	109	104	--	2,549
	1,000+	1,567	110	283	24	1,984
	All classes	5,004	587	626	24	6,241
Private:	0 - 500	17,484	9,995	6,284	--	33,763
	500 - 1,000	35,580	2,150	2,392	--	40,122
	1,000+	50,610	2,379	2,591	495	56,075
	All classes	103,674	14,524	11,267	495	129,960
All owners:	0 - 500	18,585	10,363	6,523	--	35,471
	500 - 1,000	37,916	2,259	2,496	--	42,671
	1,000+	52,177	2,489	2,874	519	58,059
	All classes	108,678	15,111	11,893	519	136,201

¹Does not include timber species in woodland forest types.

Table 17--Number of trees on State and privately owned woodland by ownership class, species, and diameter class, Colorado, 1983

Ownership class and species	Diameter class (inches at root collar)																All classes
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		
----- Thousand trees -----																	
State:																	
Pinyon	4,219	2,340	2,046	1,629	1,001	595	417	99	21	135	12	21	--	9	--	12,544	
Juniper	1,856	1,200	1,250	1,407	864	843	633	555	447	167	171	90	146	79	127	9,835	
Oak	37,711	11,307	1,096	128	94	156	83	--	--	--	--	--	--	--	--	50,575	
Other	858	58	28	16	14	9	--	--	--	--	--	--	--	--	4	987	
All species ¹	44,644	14,905	4,420	3,180	1,973	1,603	1,133	654	468	302	183	111	146	88	131	73,941	
Private:																	
Pinyon	81,556	46,478	37,772	26,750	15,215	8,733	5,731	2,348	563	960	442	104	--	82	--	226,734	
Juniper	31,326	21,068	20,203	20,266	15,471	15,413	10,863	10,959	7,179	4,112	3,255	2,196	1,910	1,119	2,058	167,398	
Oak	702,210	231,737	20,641	2,448	1,051	1,221	635	--	--	--	--	--	--	--	--	959,943	
Other	9,887	1,960	912	482	570	380	--	--	--	--	--	--	--	--	69	14,260	
All species ¹	824,979	301,243	79,528	49,946	32,307	25,747	17,229	13,307	7,742	5,072	3,697	2,300	1,910	1,201	2,127	1,368,335	
All owners:																	
Pinyon	85,775	48,818	39,818	28,379	16,216	9,328	6,148	2,447	584	1,095	454	125	--	91	--	239,278	
Juniper	33,182	22,268	21,453	21,673	16,335	16,256	11,496	11,514	7,626	4,279	3,426	2,286	2,056	1,198	2,185	177,233	
Oak	739,921	243,044	21,737	2,576	1,145	1,377	718	--	--	--	--	--	--	--	--	1,010,518	
Other	10,745	2,018	940	498	584	389	--	--	--	--	--	--	--	--	73	15,247	
All species ¹	869,623	316,148	83,948	53,126	34,280	27,350	18,362	13,961	8,210	5,374	3,880	2,411	2,056	1,289	2,258	1,442,276	

¹Does not include timber species in woodland forest types.

Table 18--Net volume on State and privately owned woodland by ownership class, species, and diameter class, Colorado, 1983

Ownership class and species	Diameter class (inches at root collar)														All classes
	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
----- Thousand cubic feet -----															
State:															
Pinyon	665	2,140	3,741	3,931	3,951	3,949	1,279	266	1,811	254	1,086	--	496	--	23,569
Juniper	231	670	1,687	1,814	2,820	2,701	4,057	2,918	1,443	2,080	1,321	4,223	1,120	2,840	29,925
Oak	3,184	973	276	536	1,260	810	--	--	--	--	--	--	--	--	7,039
Other	9	14	13	--	--	--	--	--	--	--	--	--	--	244	280
All species ¹	4,089	3,797	5,717	6,281	8,031	7,460	5,336	3,184	3,254	2,334	2,407	4,223	1,616	3,084	60,813
Private:															
Pinyon	12,149	37,645	59,346	59,393	56,559	59,282	30,826	9,653	14,101	10,654	5,411	--	4,733	--	359,752
Juniper	4,388	11,621	24,384	33,621	55,774	49,103	83,914	52,576	43,043	45,594	34,200	46,057	18,959	54,034	557,268
Oak	64,756	17,942	5,133	5,532	9,884	6,174	--	--	--	--	--	--	--	--	109,421
Other	321	415	392	--	--	--	--	--	--	--	--	--	--	4,947	6,075
All species ¹	81,614	67,623	89,255	98,546	122,217	114,740	114,559	62,229	57,144	56,248	39,611	46,057	23,692	58,981	1,032,516
All owners:															
Pinyon	12,814	39,785	63,087	63,324	60,510	63,231	32,105	9,919	15,912	10,908	6,497	--	5,229	--	383,321
Juniper	4,619	12,291	26,071	35,435	58,594	51,804	87,971	55,494	44,486	47,674	35,521	50,280	20,079	56,874	587,193
Oak	67,940	18,915	5,409	6,068	11,144	6,984	--	--	--	--	--	--	--	--	116,460
Other	330	429	405	--	--	--	--	--	--	--	--	--	--	5,191	6,355
All species ¹	85,703	71,420	94,972	104,827	130,248	122,019	120,076	65,413	60,398	58,582	42,018	50,280	25,308	62,065	1,093,329

¹ Does not include timber species in woodland forest types.

Table 19--Net annual growth on State and privately owned woodland by ownership class, species, and diameter class, Colorado, 1982

Ownership class and species	Diameter class (inches at root collar)																All classes
	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+			
----- Thousand cubic feet -----																	
State:																	
Pinyon	43	58	86	64	52	42	13	2	11	-112	4	--	3	--	266		
Juniper	9	23	45	33	38	25	37	20	8	11	5	17	3	6	280		
Oak	209	1	6	8	14	4	--	--	--	--	--	--	--	--	242		
Other	-1	--	(1)	--	--	--	--	--	--	--	--	--	--	1	--		
All species ²	260	82	137	105	104	71	50	22	19	-101	9	17	6	7	788		
Private:																	
Pinyon	739	937	1,284	852	629	643	309	86	91	-1,005	18	--	27	--	4,610		
Juniper	240	349	599	541	619	401	669	342	247	263	131	182	55	116	4,754		
Oak	4,603	166	84	81	109	30	--	--	--	--	--	--	--	--	5,073		
Other	-22	-2	9	--	--	--	--	--	--	--	--	--	--	22	7		
All species ²	5,560	1,450	1,976	1,474	1,357	1,074	978	428	338	-742	149	182	82	138	14,444		
All owners:																	
Pinyon	782	995	1,370	916	681	685	322	88	102	-1,117	22	--	30	--	4,876		
Juniper	249	372	644	574	657	426	706	362	255	274	136	199	58	122	5,034		
Oak	4,812	167	90	89	123	34	--	--	--	--	--	--	--	--	5,315		
Other	-23	-2	9	--	--	--	--	--	--	--	--	--	--	23	7		
All species ²	5,820	1,532	2,113	1,579	1,461	1,145	1,028	450	357	-843	158	199	88	145	15,232		

¹Less than 0.5 thousand acres.

²Does not include timber species in woodland forest types.

Table 20--Net dead volume on State and privately owned woodland by ownership class, species, and diameter class, Colorado, 1983

Ownership class and species	Diameter class (inches at root collar)																All classes
	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+			
----- Thousand cubic feet -----																	
State:																	
Pinyon	6	96	270	458	491	310	184	19	--	576	--	--	295	--	2,705		
Juniper	10	24	120	176	176	183	221	169	105	147	246	21	579	690	2,867		
Oak	317	203	85	25	--	--	--	--	--	--	--	--	--	--	630		
Other	9	7	2	--	--	--	--	--	--	--	--	--	--	24	42		
All species ¹	342	330	477	659	667	493	405	188	105	723	246	21	874	714	6,244		
Private:																	
Pinyon	476	2,401	4,032	11,329	6,012	4,381	7,405	1,378	--	5,515	--	--	2,298	--	45,227		
Juniper	271	752	3,823	4,263	9,779	4,324	8,295	9,908	5,307	6,240	6,778	570	4,301	7,967	72,578		
Oak	6,462	3,590	805	282	--	--	--	--	--	--	--	--	--	--	11,139		
Other	262	200	57	--	--	--	--	--	--	--	--	--	--	495	1,014		
All species ¹	7,471	6,943	8,717	15,874	15,791	8,705	15,700	11,286	5,307	11,755	6,778	570	6,599	8,462	129,958		
All owners:																	
Pinyon	482	2,497	4,302	11,787	6,503	4,691	7,589	1,397	--	6,091	--	--	2,593	--	47,932		
Juniper	281	776	3,943	4,439	9,955	4,507	8,516	10,077	5,412	6,387	7,024	591	4,880	8,657	75,445		
Oak	6,779	3,793	890	307	--	--	--	--	--	--	--	--	--	--	11,769		
Other	271	207	59	--	--	--	--	--	--	--	--	--	--	519	1,056		
All species ¹	7,813	7,273	9,194	16,533	16,458	9,198	16,105	11,474	5,412	12,478	7,024	591	7,473	9,176	136,202		

¹Does not include timber species in woodland forest types.

Table 21--Number of pinyon Christmas trees on State and privately owned woodland by ownership class, height class, and grade class, Colorado, 1983

Ownership class	Height class (feet)	Grade class			All grades
		Premium	Standard	Utility	
----- Thousand trees -----					
State:	0 - 5	0	323	1,317	1,640
	6 - 10	45	727	623	1,395
	11 - 12	6	67	173	246
	All classes	51	1,117	2,113	3,281
Private:	0 - 5	89	5,114	24,856	30,059
	6 - 10	2,689	15,557	12,746	30,992
	11 - 12	351	1,396	3,700	5,447
	All classes	3,129	22,067	41,302	66,498
All owners:	0 - 5	89	5,437	26,173	31,699
	6 - 10	2,734	16,284	13,369	32,387
	11 - 12	357	1,463	3,873	5,693
	All classes	3,180	23,184	43,415	69,779

Table 22--Number of fenceposts on State and privately owned woodland by ownership class, type of post, and species, Colorado, 1983

Ownership class	Type of post	Species			All species
		Pinyon	Juniper	Oak	
----- Thousand fenceposts -----					
State:	Line	2,305	4,699	156	7,160
	Corner	1,252	2,193	14	3,459
	All posts	3,557	6,892	170	10,619
Private:	Line	25,954	66,056	5,336	97,346
	Corner	14,050	36,442	272	50,764
	All posts	40,004	102,498	5,608	148,110
All owners:	Line	28,259	70,755	5,492	104,506
	Corner	15,302	38,635	286	54,223
	All posts	43,561	109,390	5,778	158,729

Table 23--Area of State and privately owned woodland on less than 30 percent slope by ownership class, site class, and forest type, Colorado, 1983

Ownership class	Site class	Forest type				All types
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand acres -----						
State:	High site	64	21	14	(¹)	99
	Low site	4	6	8	(¹)	18
	All classes	68	27	22	(¹)	117
Private:	High site	989	272	315	3	1,579
	Low site	155	53	154	10	372
	All classes	1,144	325	469	13	1,951
All owners:	High site	1,053	293	329	3	1,678
	Low site	159	59	162	10	390
	All classes	1,212	352	491	13	2,068

¹Less than 0.5 thousand acres.

Table 24--Area of State and privately owned woodland on less than 30 percent slope by ownership class, volume class, and forest type, Colorado, 1983

Ownership class	Volume class (cu ft/acre)	Forest type				All types
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand acres -----						
State:	0 - 500	45	24	19	(¹)	88
	500 - 1,000	17	3	1	--	21
	1,000+	6	--	2	(¹)	8
	All classes	68	27	22	(¹)	117
Private:	0 - 500	643	281	429	10	1,363
	500 - 1,000	260	43	25	--	328
	1,000+	242	--	15	3	260
	All classes	1,145	324	469	13	1,951
All owners:	0 - 500	688	305	448	10	1,451
	500 - 1,000	277	46	26	--	349
	1,000+	248	--	17	3	268
	All classes	1,213	351	491	13	2,068

¹Less than 0.5 thousand acres.

Table 25--Net volume on State and privately owned woodland on less than 30 percent slope by ownership class, site class, and forest type, Colorado, 1983

Ownership class	Site class	Forest type				All types ¹
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand cubic feet -----						
State:	High site	28,363	5,672	2,630	244	36,909
	Low site	1,964	316	2,903	2	5,185
	All classes	30,327	5,988	5,533	246	42,094
Private:	High site	506,916	71,444	51,576	4,946	634,882
	Low site	105,491	2,994	27,609	112	136,206
	All classes	612,407	74,438	79,185	5,058	771,088
All owners:	High site	535,279	77,116	54,206	5,190	671,791
	Low site	107,455	3,310	30,512	114	141,391
	All classes	642,734	80,426	84,718	5,304	813,182

¹Does not include timber species in woodland forest types.

Table 26--Net volume on State and privately owned woodland on less than 30 percent slope by ownership class, volume class, and forest type, Colorado, 1983

Ownership class	Volume class (cu ft/acre)	Forest type				All types ¹
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand cubic feet -----						
State:	0 - 500	11,215	4,377	2,380	2	17,974
	500 - 1,000	10,973	1,611	327	--	12,911
	1,000+	8,139	--	2,826	244	11,209
	All classes	30,327	5,988	5,533	246	42,094
Private:	0 - 500	156,334	50,792	43,283	112	250,521
	500 - 1,000	164,539	23,646	12,729	--	200,914
	1,000+	291,534	--	23,173	4,946	319,653
	All classes	612,407	74,438	79,185	5,058	771,088
All owners:	0 - 500	167,549	55,169	45,663	114	268,495
	500 - 1,000	175,512	25,257	13,056	--	213,825
	1,000+	299,673	--	25,999	5,190	330,862
	All classes	642,734	80,426	84,718	5,304	813,182

¹Does not include timber species in woodland forest types.

Table 27--Net annual growth on State and privately owned woodland on less than 30 percent slope by ownership class, site class, and forest type, Colorado, 1982

Ownership class	Site class	Forest type				All types ¹
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand cubic feet -----						
State:	High site	381	111	106	1	599
	Low site	-104	3	48	(²)	-53
	All classes	277	114	154	1	546
Private:	High site	6,084	1,320	2,939	22	10,365
	Low site	-29	25	587	7	590
	All classes	6,055	1,345	3,526	29	10,955
All owners:	High site	6,465	1,431	3,045	23	10,964
	Low site	-133	28	635	7	537
	All classes	6,332	1,459	3,680	30	11,501

¹Does not include timber species in woodland forest types.

²Less than 0.5 thousand acres.

Table 28--Net annual growth on State and privately owned woodland on less than 30 percent slope by ownership class, volume class, and forest type, Colorado, 1982

Ownership class	Volume class (cu ft/acre)	Forest type				All types ¹
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand cubic feet -----						
State:	0 - 500	209	94	123	(²)	426
	500 - 1,000	-21	20	33	--	32
	1,000+	89	--	-2	1	88
	All classes	277	114	154	1	546
Private:	0 - 500	2,895	1,028	2,290	7	6,220
	500 - 1,000	568	316	1,281	--	2,165
	1,000+	2,592	--	-44	22	2,570
	All classes	6,055	1,344	3,527	29	10,955
All owners:	0 - 500	3,104	1,122	2,413	7	6,646
	500 - 1,000	547	336	1,314	--	2,197
	1,000+	2,681	--	-46	23	2,658
	All classes	6,332	1,458	3,681	30	11,501

¹Does not include timber species in woodland forest types.

²Less than 0.5 thousand acres.

Table 29--Net dead volume on State and privately owned woodland on less than 30 percent slope by ownership class, site class, and forest type, Colorado, 1983

Ownership class	Site class	Forest type				All types ¹
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand cubic feet -----						
State:	High site	2,327	381	406	24	3,138
	Low site	625	89	105	0	819
	All classes	2,952	470	511	24	3,957
Private:	High site	56,687	4,791	7,782	495	69,755
	Low site	20,250	791	1,163	0	22,204
	All classes	76,937	5,582	8,945	495	91,959
All owners:	High site	59,014	5,172	8,188	519	72,893
	Low site	20,875	880	1,268	0	23,023
	All classes	79,889	6,052	9,456	519	95,916

¹Does not include timber species in woodland forest types.

Table 30--Net dead volume on State and privately owned woodland on less than 30 percent slope by ownership class, volume class, and forest type, Colorado, 1983

Ownership class	Volume class (cu ft/acre)	Forest type				All types ¹
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand cubic feet -----						
State:	0 - 500	762	366	177	--	1,305
	500 - 1,000	1,657	104	51	--	1,812
	1,000+	533	--	283	24	840
	All classes	2,952	470	511	24	3,957
Private:	0 - 500	13,421	4,117	4,385	--	21,923
	500 - 1,000	22,447	1,466	1,969	--	25,882
	1,000+	41,068	--	2,591	495	44,154
	All classes	76,936	5,583	8,945	495	91,959
All owners:	0 - 500	14,183	4,483	4,562	--	23,228
	500 - 1,000	24,104	1,570	2,020	--	27,694
	1,000+	41,601	--	2,874	519	44,994
	All classes	79,888	6,053	9,456	519	95,916

¹Does not include timber species in woodland forest types.

Table 31--Number of trees on State and privately owned woodland on less than 30 percent slope by ownership class, species, and diameter class, Colorado, 1983

Ownership class and species	Diameter class (inches at root collar)																All classes
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		
----- Thousand trees -----																	
State:																	
Pinyon	2,582	1,597	1,349	1,205	592	316	201	67	7	15	7	--	--	9	--	7,947	
Juniper	1,527	1,043	1,093	1,170	726	596	447	416	251	111	130	42	119	63	50	7,784	
Oak	28,523	7,511	779	128	94	156	83	--	--	--	--	--	--	--	--	37,274	
Other	92	58	28	16	14	9	--	--	--	--	--	--	--	--	3	220	
All species ¹	32,724	10,209	3,249	2,519	1,426	1,077	731	483	258	126	137	421	119	72	53	53,225	
Private:																	
Pinyon	46,868	34,080	28,384	19,470	10,066	5,463	3,896	1,662	386	203	219	--	--	82	--	150,779	
Juniper	27,275	18,114	17,104	16,256	13,033	11,746	8,422	9,013	4,604	3,255	2,336	1,170	1,573	829	998	135,728	
Oak	578,196	161,057	13,709	2,448	1,051	1,221	635	--	--	--	--	--	--	--	--	758,317	
Other	2,095	1,960	912	481	570	380	--	--	--	--	--	--	--	--	69	6,467	
All species ¹	654,434	215,211	60,109	38,655	24,720	18,810	12,953	10,675	4,990	3,458	2,555	1,170	1,573	911	1,067	1,051,291	
All owners:																	
Pinyon	49,450	35,677	29,733	20,675	10,658	5,779	4,097	1,729	393	218	226	--	--	91	--	158,726	
Juniper	28,802	19,157	18,197	17,426	13,759	12,342	8,869	9,429	4,855	3,366	2,466	1,212	1,692	892	1,048	143,512	
Oak	606,719	168,568	14,488	2,576	1,145	1,377	718	--	--	--	--	--	--	--	--	795,591	
Other	2,187	2,018	940	497	584	389	--	--	--	--	--	--	--	--	72	6,687	
All species ¹	687,158	225,420	63,358	41,174	26,146	19,887	13,684	11,158	5,248	3,584	2,692	1,212	1,692	983	1,120	1,104,516	

¹Does not include timber species in woodland forest types.

Table 32--Net volume on State and privately owned woodland on less than 30 percent slope by ownership class, species, and diameter class, Colorado, 1983

Ownership class and species	Diameter class (inches at root collar)												All classes	
	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9		27.0-28.9
----- Thousand cubic feet -----														
State:														
Pinyon	447	1,450	2,797	2,464	2,083	2,057	971	60	400	112	--	--	496	--
Juniper	199	604	1,466	1,567	2,032	1,881	3,208	2,007	1,066	1,793	629	3,960	1,120	1,313
Oak	2,069	681	276	536	1,260	810	--	--	--	--	--	--	--	--
Other	9	14	13	--	--	--	--	--	--	--	--	--	--	244
All species ¹	2,724	2,749	4,552	4,567	5,375	4,748	4,179	2,067	1,466	1,905	629	3,960	1,616	1,557
Private:														
Pinyon	8,894	28,752	43,425	40,656	36,085	42,017	23,484	7,056	4,710	4,892	--	--	4,733	--
Juniper	3,752	10,117	20,465	29,311	43,013	39,345	73,236	38,083	36,302	36,476	19,331	42,789	16,510	28,565
Oak	43,976	12,315	5,133	5,532	9,884	6,174	--	--	--	--	--	--	--	--
Other	321	415	393	--	--	--	--	--	--	--	--	--	--	4,946
All species ¹	56,943	51,599	69,416	75,499	88,982	87,536	96,720	45,139	41,012	41,368	19,331	42,789	21,243	33,511
All owners:														
Pinyon	9,341	30,202	46,222	43,120	38,168	44,074	24,455	7,116	5,110	5,004	--	--	5,229	--
Juniper	3,951	10,721	21,931	30,878	45,045	41,226	76,444	40,090	37,368	38,269	19,960	46,749	17,630	29,878
Oak	46,045	12,996	5,409	6,068	11,144	6,984	--	--	--	--	--	--	--	--
Other	330	429	406	--	--	--	--	--	--	--	--	--	--	5,190
All species ¹	59,667	54,348	73,968	80,066	94,357	92,284	100,899	47,206	42,478	43,273	19,960	46,749	22,859	35,068

¹Does not include timber species in woodland forest types.

Table 33--Net annual growth on State and privately owned woodland on less than 30 percent slope by ownership class, species, and diameter class, Colorado, 1982

Ownership class and species	Diameter class (inches at root collar)														All classes
	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
----- Thousand cubic feet -----															
State:															
Pinyon	28	43	65	45	32	28	10	(1)	3	-114	--	--	3	--	143
Juniper	9	21	41	30	31	20	32	16	6	10	2	16	3	3	240
Oak	135	-5	6	8	14	4	--	--	--	--	--	--	--	--	162
Other	-1	--	1	--	--	--	--	--	--	--	--	--	--	1	1
All species ²	171	59	113	83	77	52	42	16	9	-104	2	16	6	4	546
Private:															
Pinyon	501	744	942	616	517	528	232	67	38	-1,056	--	--	27	--	3,156
Juniper	229	323	534	495	517	336	611	263	218	230	77	167	41	57	4,098
Oak	3,335	55	84	81	109	30	--	--	--	--	--	--	--	--	3,694
Other	-22	-2	9	--	--	--	--	--	--	--	--	--	--	22	7
All species ²	4,043	1,120	1,569	1,192	1,143	894	843	330	256	-826	77	167	68	79	10,955
All owners:															
Pinyon	529	787	1,007	661	549	556	242	67	41	-1,170	--	--	30	--	3,299
Juniper	238	344	575	525	548	356	643	279	224	240	79	183	44	60	4,338
Oak	3,470	50	90	89	123	34	--	--	--	--	--	--	--	--	3,856
Other	-23	-2	10	--	--	--	--	--	--	--	--	--	--	23	8
All species ²	4,214	1,179	1,682	1,275	1,220	946	885	346	265	-930	79	183	74	83	11,501

¹Less than 0.5 thousand acres.

²Does not include timber species in woodland forest types.

Table 34--Net dead volume on State and privately owned woodland on less than 30 percent slope by ownership class, species, and diameter class, Colorado, 1983

Ownership class and species	Diameter class (inches at root collar)														All classes
	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
----- Thousand cubic feet -----															
State:															
Pinyon	4	95	177	295	229	236	119	5	--	576	--	--	295	--	2,031
Juniper	9	24	116	152	140	158	200	139	26	128	62	8	78	133	1,373
Oak	214	187	85	25	--	--	--	--	--	--	--	--	--	--	511
Other	9	7	2	--	--	--	--	--	--	--	--	--	--	24	42
All species ¹	236	313	380	472	369	394	319	144	26	704	62	8	373	157	3,957
Private:															
Pinyon	402	2,327	2,418	7,708	3,462	3,032	1,263	104	--	5,515	--	--	2,298	--	28,529
Juniper	231	735	2,677	3,534	8,406	3,781	6,220	7,886	4,224	5,777	4,223	399	1,438	4,120	53,651
Oak	4,309	3,370	805	282	--	--	--	--	--	--	--	--	--	--	8,766
Other	262	200	56	--	--	--	--	--	--	--	--	--	--	495	1,013
All species ¹	5,204	6,632	5,956	11,524	11,868	6,813	7,483	7,990	4,224	11,292	4,223	399	3,736	4,615	91,959
All owners:															
Pinyon	406	2,422	2,595	8,003	3,691	3,268	1,382	109	--	6,091	--	--	2,593	--	30,560
Juniper	240	759	2,793	3,686	8,546	3,939	6,420	8,025	4,250	5,905	4,285	407	1,516	4,253	55,024
Oak	4,523	3,557	890	307	--	--	--	--	--	--	--	--	--	--	9,277
Other	271	207	58	--	--	--	--	--	--	--	--	--	--	519	1,055
All species ¹	5,440	6,945	6,336	11,996	12,237	7,207	7,802	8,134	4,250	11,996	4,285	407	4,109	4,772	95,916

¹Does not include timber species in woodland forest types.

Table 35--Number of pinyon Christmas trees on State and privately owned woodland on less than 30 percent slope by ownership class, height class, and grade class, Colorado, 1983

Ownership class	Height class (feet)	Grade class			All grades
		Premium	Standard	Utility	
----- Thousand trees -----					
State:	0 - 5	--	220	889	1,109
	6 - 10	18	500	554	1,072
	11 - 12	6	37	155	198
	All classes	24	757	1,598	2,379
Private:	0 - 5	89	3,421	13,875	17,385
	6 - 10	962	8,122	11,202	20,286
	11 - 12	351	692	2,818	3,861
	All classes	1,402	12,235	27,895	41,532
All owners:	0 - 5	89	3,641	14,764	18,494
	6 - 10	980	8,622	11,756	21,358
	11 - 12	357	729	2,973	4,059
	All classes	1,426	12,992	29,493	43,911

Table 36--Number of fenceposts on State and privately owned woodland on less than 30 percent slope by ownership class, type of post, and species, Colorado, 1983

Ownership class	Type of post	Species			
		Pinyon	Juniper	Oak	All species
- - - - - Thousand fenceposts - - - - -					
State:	Line	1,514	3,848	117	5,479
	Corner	786	1,918	14	2,718
	All posts	2,300	5,766	131	8,197
Private:	Line	16,126	52,899	3,833	72,858
	Corner	8,501	31,475	272	40,248
	All posts	24,627	84,374	4,105	113,106
All owners:	Line	17,640	56,747	3,950	78,337
	Corner	9,287	33,393	286	42,966
	All posts	26,927	90,140	4,236	121,303

Table 37--Area of State and privately owned woodland on less than 30 percent slope and within 1 mile of a road by ownership class, site class, and forest type, Colorado, 1983

Ownership class	Site class	Forest type				All types
		Pinyon-juniper	Juniper	Oak	Other	
- - - - - Thousand acres - - - - -						
State:	High site	64	21	12	(¹)	97
	Low site	4	4	8	(¹)	16
	All classes	68	25	20	(¹)	113
Private:	High site	973	272	289	3	1,537
	Low site	108	37	149	10	304
	All classes	1,081	309	438	13	1,841
All owners:	High site	1,037	293	301	3	1,634
	Low site	112	41	157	10	320
	All classes	1,149	334	458	13	1,954

¹Less than 0.5 thousand acres.

Table 38--Area of State and privately owned woodland on less than 30 percent slope and within 1 mile of a road by ownership class, volume class, and forest type, Colorado, 1983

Ownership class	Volume class (cu ft/acre)	Forest type				All types
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand acres -----						
State:	0 - 500	45	22	17	(¹)	84
	500 - 1,000	17	3	1	--	21
	1,000+	6	--	2	(¹)	8
	All classes	68	25	20	(¹)	113
Private:	0 - 500	623	266	398	10	1,297
	500 - 1,000	248	43	25	--	316
	1,000+	210	--	15	3	228
	All classes	1,081	309	438	13	1,841
All owners:	0 - 500	668	288	415	10	1,381
	500 - 1,000	265	46	26	--	337
	1,000+	216	--	17	3	236
	All classes	1,149	334	458	13	1,954

¹Less than 0.5 thousand acres.

Table 39--Net volume on State and privately owned woodland on less than 30 percent slope and within 1 mile of a road by ownership class, site class, and forest type, Colorado, 1983

Ownership class	Site class	Forest type				All types ¹
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand cubic feet -----						
State:	High site	28,363	5,672	2,332	244	36,611
	Low site	1,964	58	2,845	3	4,870
	All classes	30,327	5,730	5,177	247	41,481
Private:	High site	492,586	71,444	48,745	4,946	617,721
	Low site	80,801	546	27,153	112	108,612
	All classes	573,387	71,990	75,898	5,058	726,333
All owners:	High site	520,949	77,116	51,077	5,190	654,332
	Low site	82,765	604	29,998	115	113,482
	All classes	603,714	77,720	81,075	5,305	767,814

¹Does not include timber species in woodland forest types.

Table 40--Net volume on State and privately owned woodland on less than 30 percent slope and within 1 mile of a road by ownership class, volume class, and forest type, Colorado 1983

Ownership class	Volume class (cu ft/acre)	Forest type				All types ¹
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand cubic feet -----						
State:	0 - 500	11,215	4,119	2,023	3	17,360
	500 - 1,000	10,973	1,611	328	--	12,912
	1,000+	8,139	--	2,826	244	11,209
	All classes	30,327	5,730	5,177	247	41,481
Private:	0 - 500	150,347	48,343	39,996	112	238,798
	500 - 1,000	159,173	23,647	12,729	--	195,549
	1,000+	263,867	--	23,173	4,946	291,986
	All classes	573,387	71,990	75,898	5,058	726,333
All owners:	0 - 500	161,562	52,462	42,019	115	256,158
	500 - 1,000	170,146	25,258	13,057	--	208,461
	1,000+	272,006	--	25,999	5,190	303,195
	All classes	603,714	77,720	81,075	5,305	767,814

¹Does not include timber species in woodland forest types.

Table 41--Net annual growth on State and privately owned woodland on less than 30 percent slope and within 1 mile of a road by ownership class, site class, and forest type, Colorado, 1982

Ownership class	Site class	Forest type				All types ¹
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand cubic feet -----						
State:	High site	380	112	92	1	585
	Low site	-103	1	46	(²)	-56
	All classes	277	113	138	1	529
Private:	High site	6,018	1,320	2,721	22	10,081
	Low site	-346	11	571	7	243
	All classes	5,672	1,331	3,292	29	10,324
All owners:	High site	6,398	1,432	2,813	23	10,666
	Low site	-449	12	617	7	187
	All classes	5,949	1,444	3,430	30	10,853

¹Does not include timber species in woodland forest types.

²Less than 0.5 thousand acres.

Table 42--Net annual growth on State and privately owned woodland on less than 30 percent slope and within 1 mile of a road by ownership class, volume class, and forest type, Colorado, 1982

Ownership class	Volume class (cu ft/acre)	Forest type				All types ¹
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand cubic feet -----						
State:	0 - 500	209	92	107	(²)	408
	500 - 1,000	-21	21	33	--	33
	1,000+	89	--	-2	1	88
	All classes	277	113	138	1	529
Private:	0 - 500	2,741	1,014	2,056	7	5,818
	500 - 1,000	529	316	1,281	--	2,126
	1,000+	2,402	--	-44	22	2,380
	All classes	5,672	1,330	3,293	29	10,324
All owners:	0 - 500	2,950	1,106	2,163	7	6,226
	500 - 1,000	508	337	1,314	--	2,159
	1,000+	2,491	--	-46	23	2,468
	All classes	5,949	1,443	3,431	30	10,853

¹Does not include timber species in woodland forest types.

²Less than 0.5 thousand acres.

Table 43--Net dead volume on State and privately owned woodland on less than 30 percent slope and within 1 mile of a road by ownership class, site class, and forest type, Colorado, 1983

Ownership class	Site class	Forest type				All types ¹
		Pinyon-juniper	Juniper	Oak	Other	
----- Thousand cubic feet -----						
State:	High site	2,327	381	404	24	3,136
	Low site	625	62	103	--	790
	All classes	2,952	443	507	24	3,926
Private:	High site	55,058	4,791	7,760	495	68,104
	Low site	14,174	577	1,148	--	15,899
	All classes	69,232	5,368	8,908	495	84,003
All owners:	High site	57,385	5,172	8,164	519	71,240
	Low site	14,799	639	1,251	--	16,689
	All classes	72,184	5,811	9,415	519	87,929

¹Does not include timber species in woodland forest types.

Table 44--Net dead volume on State and privately owned woodland on less than 30 percent slope and within 1 mile of a road by ownership class, volume class, and forest type, Colorado, 1983

Ownership class	Volume class (cu ft/acre)	Forest type					All types ¹
		Pinyon-juniper	Juniper	Oak	Other		
----- Thousand cubic feet -----							
State:	0 - 500	762	339	173	--	--	1,274
	500 - 1,000	1,657	104	51	--	--	1,812
	1,000+	533	--	283	24	--	840
	All classes	2,952	443	507	24	--	3,926
Private:	0 - 500	12,934	3,902	4,348	--	--	21,184
	500 - 1,000	21,713	1,466	1,969	--	--	25,148
	1,000+	34,585	--	2,591	495	--	37,671
	All classes	69,232	5,368	8,908	495	--	84,003
All owners:	0 - 500	13,696	4,241	4,521	--	--	22,458
	500 - 1,000	23,370	1,570	2,020	--	--	26,960
	1,000+	35,118	--	2,874	519	--	38,511
	All classes	72,184	5,811	9,415	519	--	87,929

¹Does not include timber species in woodland forest types.

Table 45--Number of trees on State and privately owned woodland on less than 30 percent slope and within 1 mile of a road by ownership class, species, and diameter class, Colorado, 1983

Ownership class and species	Diameter class (inches at root collar)																		All classes
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+				
----- Thousand trees -----																			
State:																			
Pinyon	2,582	1,597	1,349	1,205	592	316	201	67	7	15	7	0	0	0	9	--	--	7,947	
Juniper	1,527	1,043	1,093	1,159	726	576	447	416	220	111	124	42	119	63	50	--	--	7,716	
Oak	26,355	6,695	707	128	79	156	83	--	--	--	--	--	--	--	--	--	--	34,203	
Other	92	58	28	16	14	9	--	--	--	--	--	--	--	--	3	--	--	220	
All species ¹	30,556	9,393	3,177	2,508	1,411	1,057	731	483	227	126	131	42	119	72	53	--	--	50,086	
Private:																			
Pinyon	45,830	33,198	27,498	18,992	10,066	5,463	3,896	1,503	386	203	219	0	0	0	82	--	--	147,336	
Juniper	22,010	17,116	15,698	16,001	12,043	10,751	7,358	8,853	4,363	2,870	1,997	1,057	1,254	829	998	--	--	123,198	
Oak	561,184	150,782	12,934	2,448	938	1,221	635	--	--	--	--	--	--	--	--	--	--	730,142	
Other	2,095	1,960	912	481	570	380	--	--	--	--	--	--	--	--	69	--	--	6,467	
All species ¹	631,119	203,056	57,042	37,922	23,617	17,815	11,889	10,356	4,749	3,073	2,216	1,057	1,254	911	1,067	--	--	1,007,143	
All owners:																			
Pinyon	48,412	34,795	28,847	20,197	10,658	5,779	4,097	1,570	393	218	226	--	--	91	--	--	--	155,283	
Juniper	23,537	18,159	16,791	17,160	12,769	11,327	7,805	9,269	4,583	2,981	2,121	1,099	1,373	892	1,048	--	--	130,914	
Oak	587,539	157,477	13,641	2,576	1,017	1,377	718	--	--	--	--	--	--	--	--	--	--	764,345	
Other	2,187	2,018	940	497	584	389	--	--	--	--	--	--	--	--	72	--	--	6,687	
All species ¹	661,675	212,449	60,219	40,430	25,028	18,872	12,620	10,839	4,976	3,199	2,347	1,099	1,373	983	1,120	--	--	1,057,229	

¹Does not include timber species in woodland forest types.

Table 46--Net volume on State and privately owned woodland on less than 30 percent slope and within 1 mile of a road by ownership class, species, and diameter class, Colorado, 1983

Ownership class and species	Diameter class (inches at root collar)																All classes
	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+			
----- Thousand cubic feet -----																	
State:																	
Pinyon	447	1,450	2,797	2,464	2,083	2,057	971	60	400	112	--	--	496	--	13,337		
Juniper	199	604	1,460	1,567	1,995	1,881	3,208	1,865	1,066	1,721	629	3,960	1,120	1,313	22,588		
Oak	1,821	640	276	469	1,260	810	--	--	--	--	--	--	--	--	5,276		
Other	9	14	13	--	--	--	--	--	--	--	--	--	--	244	280		
All species ¹	2,476	2,708	4,546	4,500	5,338	4,748	4,179	1,925	1,466	1,833	629	3,960	1,616	1,557	41,481		
Private:																	
Pinyon	8,676	28,127	42,338	40,656	36,085	42,017	20,325	7,056	4,710	4,892	--	--	4,733	--	239,615		
Juniper	3,452	8,907	20,229	26,930	39,478	33,089	72,840	36,979	31,867	27,843	16,129	38,605	16,510	28,565	401,423		
Oak	41,205	11,820	5,133	5,004	9,884	6,174	--	--	--	--	--	--	--	--	79,220		
Other	321	415	393	--	--	--	--	--	--	--	--	--	--	4,946	6,075		
All species ¹	53,654	49,269	68,093	72,590	85,447	81,280	93,165	44,035	36,577	32,735	16,129	38,605	21,243	33,511	726,333		
All owners:																	
Pinyon	9,123	29,577	45,135	43,120	38,168	44,074	21,296	7,116	5,110	5,004	--	--	5,229	--	252,952		
Juniper	3,651	9,511	21,689	28,497	41,473	34,970	76,048	38,844	32,933	29,564	16,758	42,565	17,630	29,878	424,011		
Oak	43,026	12,460	5,409	5,473	11,144	6,984	--	--	--	--	--	--	--	--	84,496		
Other	330	429	406	--	--	--	--	--	--	--	--	--	--	5,190	6,355		
All species ¹	56,130	51,977	72,639	77,090	90,785	86,028	97,344	45,960	38,043	34,568	16,758	42,565	22,859	35,068	767,814		

¹Does not include timber species in woodland forest types.

Table 47--Net annual growth on State and privately owned woodland on less than 30 percent slope and within 1 mile of a road by ownership class, species, and diameter class, Colorado, 1982

Ownership class and species	Diameter class (inches at root collar)																All classes
	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+			
----- Thousand cubic feet -----																	
State:																	
Pinyon	28	44	65	45	32	27	10	(¹)	3	-114	--	--	3	--	143		
Juniper	9	21	41	30	31	20	32	15	6	10	2	--	3	3	239		
Oak	121	-6	6	8	14	4	--	--	--	--	--	--	--	--	147		
Other	-1	--	(¹)	--	--	--	--	--	--	--	--	--	--	--	--		
All species ²	157	59	112	83	77	51	42	15	9	-104	2	16	6	4	529		
Private:																	
Pinyon	487	709	910	616	517	528	205	67	38	-1,056	--	--	27	--	3,048		
Juniper	188	293	527	462	500	310	609	258	195	178	58	154	41	57	3,830		
Oak	3,096	45	84	74	109	30	--	--	--	--	--	--	--	--	3,438		
Other	-22	-2	9	--	--	--	--	--	--	--	--	--	--	23	8		
All species ²	3,749	1,045	1,530	1,152	1,126	868	814	325	233	-878	58	154	68	80	10,324		
All owners:																	
Pinyon	515	753	975	661	549	555	215	67	41	-1,170	--	--	30	--	3,191		
Juniper	197	314	568	492	531	330	641	273	201	188	60	170	44	60	4,069		
Oak	3,217	39	90	82	123	34	--	--	--	--	--	--	--	--	3,585		
Other	-23	-2	9	--	--	--	--	--	--	--	--	--	--	24	8		
All species ²	3,906	1,104	1,642	1,235	1,203	919	856	340	242	-982	60	170	74	84	10,853		

¹Less than 0.5 thousand acres.

²Does not include timber species in woodland forest types.

Table 48--Net dead volume on State and privately owned woodland on less than 30 percent slope and within 1 mile of a road by ownership class, species, and diameter class, Colorado, 1983

Ownership class and species	Diameter class (inches at root collar)																All classes
	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+			
	----- Thousand cubic feet -----																
State:																	
Pinyon	5	95	177	295	229	236	119	5	--	576	--	--	295	--	--	2,032	
Juniper	9	24	116	140	139	158	200	125	26	128	62	8	78	133	--	1,346	
Oak	210	187	85	25	--	--	--	--	--	--	--	--	--	--	--	507	
Other	9	6	2	--	--	--	--	--	--	--	--	--	--	24	--	41	
All species ¹	233	312	380	460	368	394	319	130	26	704	62	8	373	157	--	3,926	
Private:																	
Pinyon	402	1,975	2,252	5,122	3,462	3,032	1,105	104	--	5,515	--	--	2,298	--	--	25,267	
Juniper	231	575	2,580	3,023	7,307	3,611	6,220	6,096	3,815	5,777	4,063	170	1,438	4,120	--	49,026	
Oak	4,245	3,365	805	282	--	--	--	--	--	--	--	--	--	--	--	8,697	
Other	262	200	56	--	--	--	--	--	--	--	--	--	--	495	--	1,013	
All species ¹	5,140	6,115	5,693	8,427	10,769	6,643	7,325	6,200	3,815	11,292	4,063	170	3,736	4,615	--	84,003	
All owners:																	
Pinyon	407	2,070	2,429	5,417	3,691	3,268	1,224	109	--	6,091	--	--	2,593	--	--	27,299	
Juniper	240	599	2,696	3,163	7,446	3,769	6,420	6,221	3,841	5,905	4,125	178	1,516	4,253	--	50,372	
Oak	4,455	3,552	890	307	--	--	--	--	--	--	--	--	--	--	--	9,204	
Other	271	206	58	--	--	--	--	--	--	--	--	--	--	519	--	1,054	
All species ¹	5,373	6,427	6,073	8,887	11,137	7,037	7,644	6,330	3,841	11,996	4,125	178	4,109	4,772	--	87,929	

¹Does not include timber species in woodland forest types.

Table 49--Number of pinyon Christmas trees on State and privately owned woodland on less than 30 percent slope and within 1 mile of a road by ownership class, height class, and grade class, Colorado, 1983

Ownership class	Height class (feet)	Grade class			All grades
		Premium	Standard	Utility	
----- Thousand trees -----					
State:	0 - 5	--	220	889	1,109
	6 - 10	18	500	554	1,072
	11 - 12	6	37	155	198
	All classes	24	757	1,598	2,379
Private:	0 - 5	89	3,421	13,875	17,385
	6 - 10	643	7,962	10,883	19,488
	11 - 12	351	580	2,706	3,637
	All classes	1,083	11,963	27,464	40,510
All owners:	0 - 5	89	3,641	14,764	18,494
	6 - 10	661	8,462	11,437	20,560
	11 - 12	357	617	2,861	3,835
	All classes	1,107	12,720	29,062	42,889

Table 50--Number of fenceposts on State and privately owned woodland on less than 30 percent slope and within 1 mile of a road by ownership class, type of post, and species, Colorado, 1983

Ownership class	Type of post	Species			
		Pinyon	Juniper	Oak	All species
----- <u>Thousand fenceposts</u> -----					
State:	Line	1,514	3,820	117	5,451
	Corner	786	1,918	14	2,718
	All posts	2,300	5,738	131	8,169
Private:	Line	16,126	50,817	3,625	70,568
	Corner	8,501	30,302	272	39,075
	All posts	24,627	81,119	3,897	109,643
All owners:	Line	17,640	54,637	3,742	76,019
	Corner	9,287	32,220	286	41,793
	All posts	26,927	86,857	4,028	117,812

Table 51--Area of State and privately owned woodland by county and ownership class, Colorado, 1983

County	Ownership class		Total
	State	Private	
----- Thousand acres -----			
Alamosa	0.2	3.3	3.5
Archuleta	0.5	126.2	126.7
Boulder	(¹)	1.5	1.5
Chaffee	1.1	18.9	20.0
Clear Creek	(¹)	0.8	0.8
Conejos	3.0	3.0	6.0
Costilla	--	82.2	82.2
Custer	0.5	16.1	16.6
Delta	1.1	54.7	55.8
Dolores	2.4	49.0	51.4
Douglas	0.4	25.5	25.9
Eagle	4.7	28.4	33.1
Elbert	0.1	2.2	2.3
El Paso	0.4	11.2	11.6
Fremont	14.4	112.3	126.7
Garfield	1.8	140.6	142.4
Gilpin	(¹)	1.9	1.9
Grand	2.4	5.1	7.5
Gunnison	0.6	34.5	35.1
Hinsdale	0.1	1.5	1.6
Huerfano	8.0	131.2	139.2
Jackson	1.5	4.7	6.2
Jefferson	(¹)	4.1	4.1
Lake	(¹)	1.0	1.0
La Plata	4.7	204.2	208.9
Larimer	0.9	5.3	6.2
Las Animas	48.3	564.8	613.1
Mesa	0.4	130.1	130.5
Mineral	0.1	0.8	0.9
Moffat	20.5	101.0	121.5
Montezuma	2.5	269.5	272.0
Montrose	2.8	102.9	105.7
Ouray	2.2	56.5	58.7
Park	0.2	3.8	4.0
Pitkin	0.4	18.4	18.8
Pueblo	8.4	66.1	74.5
Rio Blanco	8.0	74.6	82.6
Rio Grande	0.8	7.6	8.4
Routt	9.6	57.3	66.9
Saguache	1.9	23.8	25.7
San Juan	(¹)	0.9	0.9
San Miguel	5.8	72.5	78.3
Summit	(¹)	2.0	2.0
Teller	0.5	3.4	3.9
All counties	161.2	2,625.4	2,786.6

¹Less than 0.05 thousand acres.

Table 52--Net volume of State and privately owned woodland by county and ownership class, Colorado, 1983

County	Ownership class		
	State	Private	Total
	- - - - - <u>Thousand cubic feet</u> - - - - -		
Alamosa	110	1,319	1,429
Archuleta	199	68,927	69,126
Boulder	(¹)	777	777
Chaffee	560	7,115	7,675
Clear Creek	1	114	115
Conejos	1,210	1,061	2,271
Costilla	--	21,549	21,549
Custer	91	4,989	5,080
Delta	495	23,976	24,471
Dolores	574	17,926	18,500
Douglas	66	5,949	6,015
Eagle	2,155	12,631	14,786
Elbert	1	247	248
El Paso	38	3,333	3,371
Fremont	6,518	50,343	56,861
Garfield	805	50,168	50,973
Gilpin	(¹)	350	350
Grand	1,401	2,352	3,753
Gunnison	138	7,286	7,424
Hinsdale	26	316	342
Huerfano	3,461	53,681	57,142
Jackson	922	1,311	2,233
Jefferson	(¹)	772	772
Lake	(¹)	177	177
La Plata	1,678	117,143	118,821
Larimer	450	2,086	2,536
Las Animas	13,366	149,947	163,313
Mesa	193	55,765	55,958
Mineral	11	219	230
Moffat	8,115	32,739	40,854
Montezuma	1,615	157,126	158,741
Montrose	1,772	43,803	45,575
Ouray	1,425	27,126	28,551
Park	48	1,021	1,069
Pitkin	72	3,376	3,448
Pueblo	2,943	23,333	26,276
Rio Blanco	3,239	21,842	25,081
Rio Grande	545	4,243	4,788
Routt	2,859	22,332	25,191
Saguache	1,082	12,211	13,293
San Juan	2	158	160
San Miguel	2,716	24,657	27,373
Summit	(¹)	945	945
Teller	109	692	801
All counties	61,011	1,037,433	1,098,444

¹Less than 0.5 thousand cubic feet.

Table 53--Net annual growth of State and privately owned woodland by county and ownership class, Colorado, 1982

County	Ownership class		
	State	Private	Total
	----- Thousand cubic feet -----		
Alamosa	1	11	12
Archuleta	4	862	866
Boulder	(¹)	6	6
Chaffee	9	99	108
Clear Creek	(¹)	4	4
Conejos	18	14	32
Costilla	--	273	273
Custer	1	79	80
Delta	4	358	362
Dolores	15	308	323
Douglas	2	162	164
Eagle	32	205	237
Elbert	(¹)	10	10
El Paso	2	69	71
Fremont	67	455	522
Garfield	14	965	979
Gilpin	(¹)	12	12
Grand	15	37	52
Gunnison	4	309	313
Hinsdale	1	11	12
Huerfano	52	818	870
Jackson	12	35	47
Jefferson	(¹)	25	25
Lake	(¹)	6	6
La Plata	21	1,162	1,183
Larimer	7	34	41
Las Animas	183	2,125	2,308
Mesa	4	926	930
Mineral	(¹)	8	8
Moffat	58	484	542
Montezuma	14	1,455	1,469
Montrose	14	714	728
Ouray	21	426	447
Park	2	22	24
Pitkin	4	175	179
Pueblo	42	343	385
Rio Blanco	42	470	512
Rio Grande	4	35	39
Routt	90	527	617
Saguache	8	119	127
San Juan	(¹)	9	9
San Miguel	28	494	522
Summit	(¹)	17	17
Teller	3	12	15
All counties	798	14,690	15,488

¹Less than 0.5 thousand cubic feet.

Table 54--Annual mortality of State and privately owned woodland by county and ownership class, Colorado, 1982

County	Ownership class		Total
	State	Private	
	----- <u>Thousand cubic feet</u> -----		
Alamosa	--	(1)	(1)
Archuleta	(1)	207	207
Boulder	--	--	--
Chaffee	(1)	6	6
Clear Creek	--	--	--
Conejos	(1)	(1)	(1)
Costilla	--	41	41
Custer	(1)	3	3
Delta	2	55	57
Dolores	3	68	71
Douglas	--	--	--
Eagle	(1)	3	3
Elbert	--	--	--
El Paso	--	--	--
Fremont	34	332	366
Garfield	1	152	153
Gilpin	--	--	--
Grand	(1)	(1)	(1)
Gunnison	(1)	5	5
Hinsdale	--	(1)	(1)
Huerfano	1	8	9
Jackson	--	(1)	(1)
Jefferson	--	--	--
Lake	--	--	--
La Plata	10	228	238
Larimer	--	--	--
Las Animas	1	15	16
Mesa	--	139	139
Mineral	--	1	1
Moffat	66	218	284
Montezuma	5	246	251
Montrose	6	126	132
Ouray	(1)	42	42
Park	--	--	--
Pitkin	(1)	2	2
Pueblo	1	5	6
Rio Blanco	16	119	135
Rio Grande	--	(1)	(1)
Routt	1	4	5
Saguache	--	1	1
San Juan	--	(1)	(1)
San Miguel	12	95	107
Summit	--	(1)	(1)
Teller	--	--	--
All counties	159	2,121	2,280

¹Less than 0.5 thousand cubic feet.

Conner, Roger C.; Green, Alan W. 1988. Colorado's woodland resources on State and private land. Resour. Bull. INT-50. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 50 p.

Presents highlights of Colorado's State and privately owned woodlands. Summarizes the basic statistics and presents tables of area, volume, growth, and mortality estimates. Also includes estimates of fuelwood harvest and number of fenceposts and Christmas trees available.

KEYWORDS: woodland area, net volume, growth, mortality, pinyon-juniper

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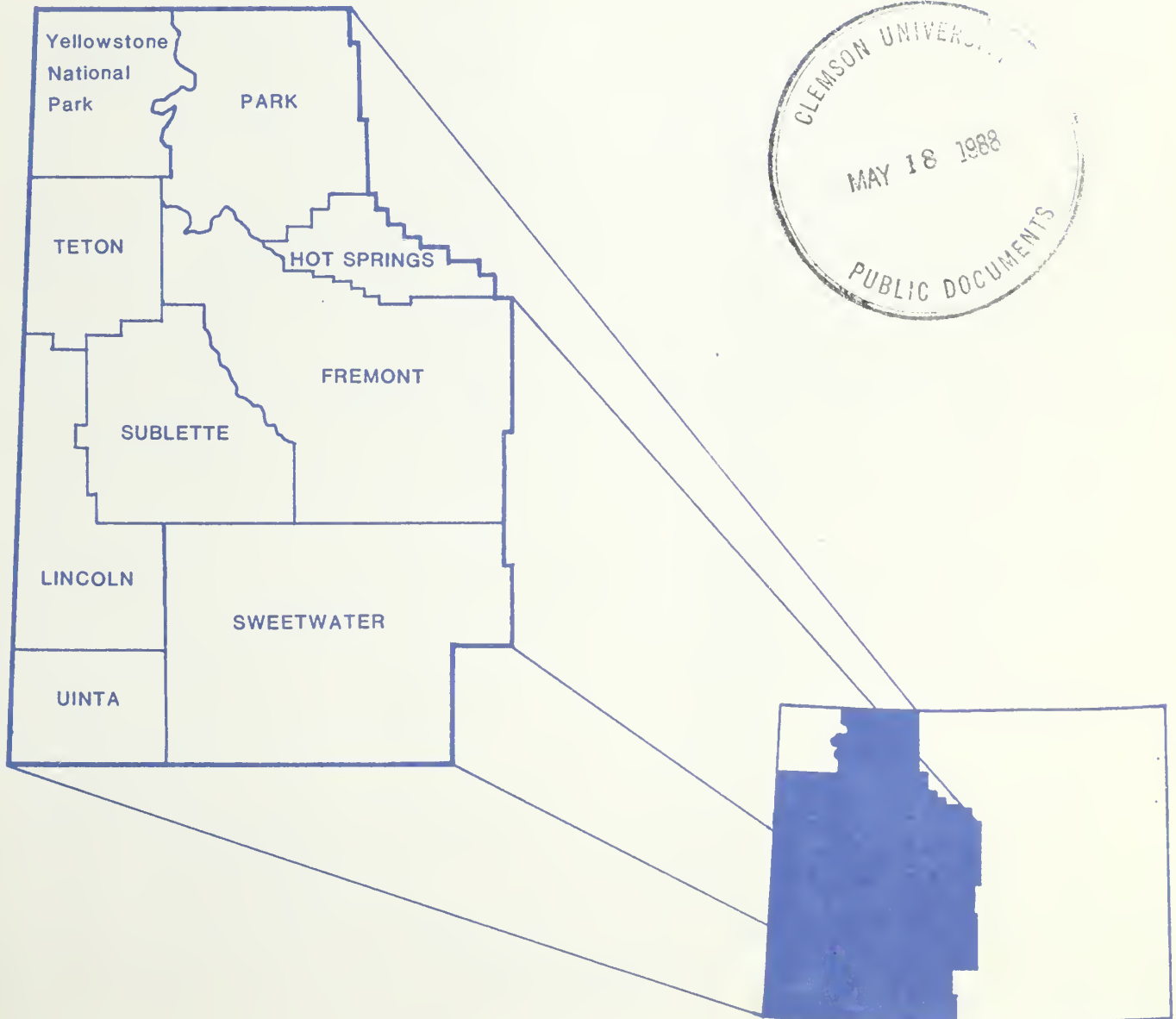
Resource Bulletin
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Timberland and Woodland Resources Outside National Forests in Western Wyoming, 1984

Roger C. Conner
W. Thomas Pawley



PREFACE

Forest Survey is a continuing nationwide undertaking conducted by the Forest Service, U.S. Department of Agriculture, with the primary objective of providing an assessment of the renewable resources on the Nation's forests. This requires periodic State-by-State resource inventories. Originally, Forest Survey was authorized by the McSweeney-McNary Act of 1928. The current authorization is through the Renewable Resources Research Act of 1978.

The Intermountain Research Station with headquarters in Ogden, UT, administers the forest resource inventories for the Rocky Mountain States of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, Wyoming, western South Dakota, western Texas, and Oklahoma's Panhandle. These inventories provide information on the extent and condition of State and privately owned forest lands, volume of timber, and rates of timber growth and mortality. These data, when combined with similar information for Federal lands, provide a basis for forest policies and programs and for the orderly development and use of the resources.

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ACKNOWLEDGMENTS

This report is the result of the combined efforts of numerous people on the Forest Survey staff. In addition to the photo interpretation and field crews, several individuals played key roles in the reduction of basic data into information describing the extent, nature, and condition of the forest resources in Wyoming: Dennis Collins supervised the data collection; Sharon Woudenberg and Shirley Waters compiled the data and made summaries; and Susan Brown transformed the data summaries into tables of information. And we extend a special note of gratitude to the private land owners who allowed the field crews access to the sample locations on their properties.

RESEARCH SUMMARY

Presents highlights of the timberland and woodland resources outside National Forests in western Wyoming. Includes statistical tables of area, volume, growth, and mortality based on Forest Survey data collected in 1983.

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Timberland and Woodland Resources Outside National Forests in Western Wyoming, 1984

Roger C. Conner
W. Thomas Pawley

INTRODUCTION

For the latest inventory of forest land in Wyoming, completed in 1983, the State was divided into three multi-county Sample Areas. Within those sample areas all nonreserved forest lands, including woodland not under the administration of the Forest Service, were inventoried.

Sample Area 1, the subject of this report, is largest in geographic area and encompasses the eight counties that make up the western third of the State (fig. 1). Sample Areas 2 and 3 cover the rest of the State and are the subjects of separate reports.

The data presented here pertain only to those lands not administered by the Forest Service or USDI National Park Service. Data for public lands administered by other agencies such as the USDI Bureau of Land Management (BLM) and the State of Wyoming are included along with those for privately owned lands.

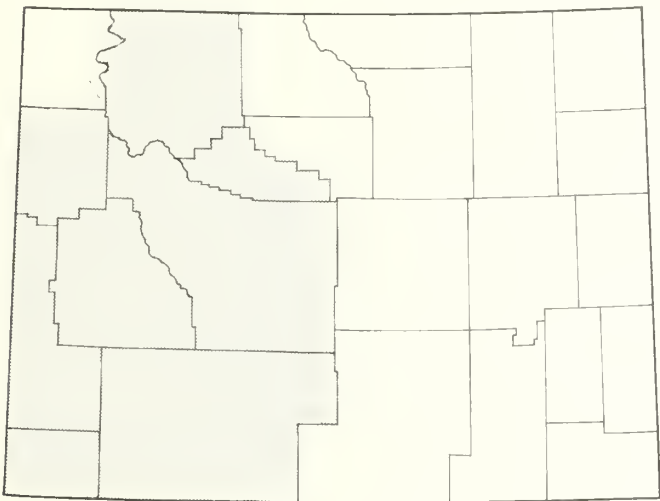


Figure 1—Sample Area 1, western Wyoming.

HIGHLIGHTS

Area, Forest Type, and Stand Size

Land area of western Wyoming is nearly 27.9 million acres. Roughly 73 percent, 20.4 million acres, is publicly owned, and the remaining 27 percent, 7.5 million acres, is privately owned.

Approximately 6.3 million acres of the public land is administered and managed by the Forest Service, and another 2.2 million acres is managed by the National Park Service (table 1).

The remaining 11.8 million acres of "other" public land are largely distributed between the Bureau of Land Management with 10.5 million acres and the State with 1.2 million. Miscellaneous Federal lands account for less than 1 percent of the area, approximately 126,000 acres.

About 1.9 million acres of the private land in the sample area—25 percent—are Indian trust lands. The remaining 5.6 million acres include all other private land owners.

Forests occupy roughly 2.9 million acres of land outside National Forests in western Wyoming (fig. 2), over 1.8 million acres of which are reserved.

Approximately 677,000 acres of the nonreserved forest land are classified as timberland, and the remaining 372,000 acres are woodlands.

About half of the timberland area and over a third of the woodland area are privately owned.

Softwood forest types occupy over 81 percent of the timberland outside National Forests in western Wyoming. The major types are limber pine (46 percent), Douglas-fir (19 percent), lodgepole pine (17 percent), spruce-fir (12 percent), and spruce (5 percent).

The rest of the timberland area is composed of hardwood forest types, specifically aspen (78 percent) and cottonwood (22 percent).

Stocking is adequate on much of the timberland area; 44 percent is at least medium to fully stocked with growing-stock trees, but a third, or 218,000 acres, is poorly stocked or nonstocked.

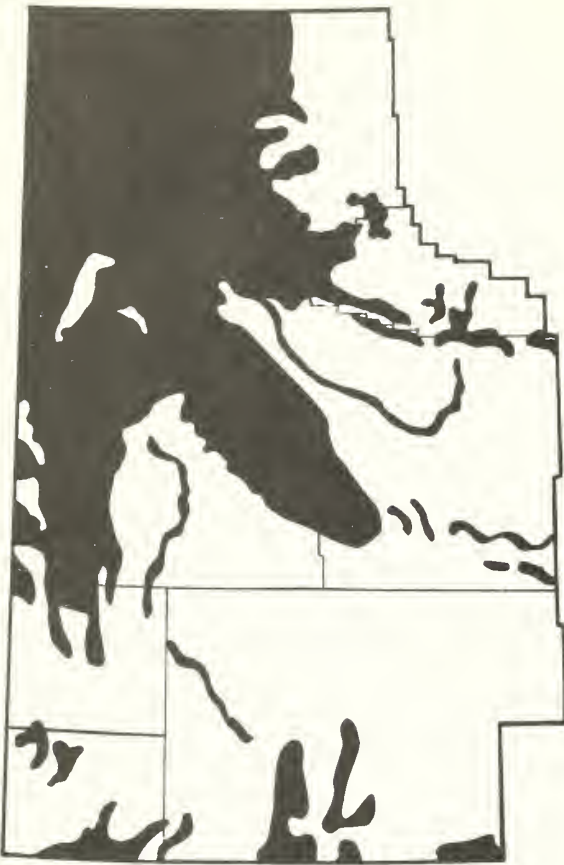


Figure 2—General geographic location of forest land in western Wyoming.

Sawtimber stands occupy about 299,000 acres (44 percent), and poletimber stands account for about 190,000 acres (28 percent) of the timberland area.

Juniper, the dominant woodland forest type, occupies about 94 percent of the woodland area. Pinyon-juniper (P-J) stands account for another 4 percent.

Volume

Net growing-stock volume on timberland amounts to 752.9 million cubic feet, and sawtimber volume totals nearly 2.3 billion board feet (International ¼-inch rule). Just over half of the growing-stock volume is privately owned.

Three-fourths of the softwood growing-stock volume is accounted for by Douglas-fir (*Pseudotsuga menziesii*), lodgepole pine (*Pinus contorta*), and Engelmann spruce (*Picea engelmannii*) species combined.

Limber pine (*Pinus flexilis*), which accounts for nearly half of the area of timberland softwoods, contributes only 12 percent of the net cubic-foot volume.

Aspen accounts for almost 82 percent of the hardwood growing-stock volume, about 111 million cubic feet.

Timberland productivity is generally low; 66 percent of the area is incapable of producing 50 cubic feet of wood per acre per year.

Over half of the timberland area—345,000 acres—supports less than 1,500 board feet per acre (International ¼-inch rule).

Nearly 75 percent of the growing-stock volume and 57 percent of the sawtimber volume is in trees less than 15 inches diameter at breast height (d.b.h.).

Cull and salvable dead volume on timberland totaled 111.9 million cubic feet, and only 5 percent of this is in rotten cull trees.

Net volume on woodland amounts to approximately 120.6 million cubic feet, about a third of which is on private land. Net dead volume totaled nearly 24.5 million cubic feet.

Juniper species (*Juniperus monosperma*, *J. osteosperma*, and *J. scopulorum*) account for nearly all of the woodland net volume.

COMPONENTS OF CHANGE

Growth

Net annual growth of growing stock on timberland was about 13.1 million cubic feet in 1983; sawtimber growth was over 46.6 million board feet (International ¼-inch rule).

Just under half of the net growth on timberland was accounted for by subalpine fir (*Abies lasiocarpa*) and Douglas-fir species combined.

Net annual growth on woodland was over 1.1 million cubic feet in 1983, and nearly 80 percent was accounted for by pinyon and juniper species.

Mortality

Annual mortality on timberland of 5.8 million cubic feet offsets about 31 percent of the gross annual growth.

Lodgepole pine and limber pine combined represent 71 percent of the mortality.

About 53 percent of mortality on timberland was due to disease. Insects caused another 30 percent.

Removals

An estimated 38.5 million board feet (International ¼-inch rule), or 6.6 million cubic feet, of industrial roundwood was harvested from western Wyoming in 1983. Only 9 percent came from private and other public lands. Some 35 million board feet (International ¼-inch rule) was harvested from National Forest lands, and over half of this came from Teton County (McLain 1987b).

The major roundwood product harvested was sawlogs, which accounted for 97 percent of the cubic-foot volume. Roughly 81 percent of the harvest was from lodgepole pine, amounting to nearly 5.4 million cubic feet. The lodgepole pine and sawlog harvest statistics include all land owners in the Sample Area.

Fuelwood harvest in western Wyoming in 1983 amounted to more than 51,000 cords, equal to over 3.7 million cubic feet (McLain 1987a). About a quarter of the harvest came from private and other public lands (includes BLM).

Lodgepole pine was the major contributor to the fuelwood harvested from all lands, accounting for over half the total for the Sample Area.

HOW THE INVENTORY WAS CONDUCTED

The inventory was designed to provide reliable statistics primarily at the State and Sample Area levels.

Prefield

Primary area estimates were based on the classification of 114,005 sample points systematically placed on the latest aerial photographs available. The photo points, adjusted to meet known land areas by owner class, were used to stratify and compute expansion factors for the field sample data.

Field

Land classification and estimates for forest characteristics and volume were based on observations and measurements recorded at 2,581 ground sample locations, of which 180 were forested. Sample trees on timberland plots were selected using 5-point cluster, which included 1/300-acre fixed radius plots for trees less than 5 inches d.b.h., and variable radius plots (40 BAF) for trees 5 inches d.b.h. or larger. Sample trees on woodland plots were selected using a 1/5-, 1/10-, or 1/20-acre fixed plot for trees 3 inches diameter at root collar (d.r.c.) and larger. Trees less than 3 inches d.r.c. were tallied on a 1/100-acre subplot.

Compilation

All photo and field data were entered into a computer for editing, computation, and tabulation. Final estimates from these data were based on statistical summaries, a portion of which is included in this bulletin. Volume and defect were computed using equations developed by Edminster and others (1980, 1981), Kemp (1958), Chojnacky (1985), Meyers (1964), Meyers and Edminster (1972). Defect for woodland species was computed from field observations.

DATA RELIABILITY

Individual cells within tables should be used with caution. Some are based on small sample sizes, which may result in high sampling errors. The standard error percentages shown in tables 2 and 3 were calculated at the 67 percent confidence level.

STANDARD FOREST SURVEY TERMINOLOGY

Acceptable trees—Growing-stock trees meeting specified standards of size and quality, but not qualifying as desirable trees.

Area condition class—A classification of timberland reflecting the degree to which the site is being utilized by growing-stock trees and other conditions affecting current and prospective timber growth (see Stocking):

Class 10—Areas fully stocked with desirable trees and not overstocked.

Class 20—Areas fully stocked with desirable trees, but overstocked with all live trees.

Class 30—Areas medium to fully stocked with desirable trees and with less than 30 percent of the area controlled by other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

Class 40—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees, or conditions that ordinarily prevent occupancy by desirable trees, or both.

Class 50—Areas poorly stocked with desirable trees, but fully stocked with growing-stock trees.

Class 60—Areas poorly stocked with desirable trees, but with medium to full stocking of growing-stock trees.

Class 70—Areas nonstocked or poorly stocked with desirable trees, and poorly stocked with growing-stock trees.

Class 80—Low-risk old-growth stands.

Class 90—High-risk old-growth stands.

Nonstocked—Areas less than 10 percent stocked with growing-stock trees.

Basal area—The cross-sectional area of a tree expressed in square feet. For timber species the calculation is based on diameter at breast height (d.b.h.); for woodland species it is based on diameter at root collar (d.r.c.).

Christmas tree grade—Pinyon species are classified as Christmas trees using the following guidelines:

Premium—Excellent conical form with no gaps in branches and a straight bole.

Standard—Good conical form with small gaps in branches and bole slightly malformed.

Utility—Conical in form with branches missing and bole bent or malformed.

Cull—Not meeting one of the above classifications or over 12 feet in height.

Cord—A pile of stacked wood equivalent to 128 cubic feet of wood and air space having standard dimensions of 4 by 4 by 8 feet.

Cull trees—Live trees that are unmerchantable now or prospectively (see Rough tree and Rotten tree).

Cull volume—Portions of a tree's volume that are not usable for wood products because of rot, missing or dead material, or other cubic-foot defect.

Deferred forest land—Forest lands within the National Forest System that are under study for possible inclusion in the Wilderness System.

Desirable trees—Growing-stock trees (1) having no serious defect in quality to limit present or prospective use for timber products, (2) of relatively high vigor, and (3) containing no pathogens that may result in death or serious deterioration within the next decade.

Diameter at breast height (d.b.h.)—Diameter of the stem measured at 4.5 feet above the ground.

Diameter at root collar (d.r.c.)—Diameter equivalent at the point nearest the ground line that represents the basal area of the tree stem or stems.

Diameter classes—Tree diameters, either d.b.h. or d.r.c., grouped into 2-inch classes labeled by the midpoint of the class.

- Farmer/rancher-owned lands*—Lands owned by a person who operates a farm or a ranch and who either does the work or directly supervises the work.
- Forest industry lands*—Lands owned by companies or individuals operating a primary wood-processing plant.
- Forest land*—Land at least 10 percent stocked by forest trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated. The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width at least 120 feet wide to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 feet wide.
- Forest trees*—Woody plants having a well-developed stem or stems, usually more than 12 feet in height at maturity, with a generally well-defined crown.
- Forest type*—A classification of forest land based upon and named for the tree species presently forming a plurality of live-tree stocking.
- Gross annual growth*—The average annual increase in the net volume of trees during a specified period.
- Growing-stock trees*—Live sawtimber trees, poletimber trees, saplings, and seedlings of timber species meeting specified standards of quality and vigor; excludes cull trees.
- Growing-stock volume*—Net cubic-foot volume in live poletimber-size and sawtimber-size growing-stock trees from a 1-foot stump to a minimum 4-inch top (of central stem) outside bark or to the point where the central stem breaks into limbs.
- Growth*—See definition for Net annual growth.
- Hardwood trees*—Dicotyledonous trees, usually broad-leaved and deciduous.
- High-risk old-growth stands*—Timber stands over 100 years old in which the majority of the trees are not expected to survive more than 10 years.
- Indian lands*—Indian lands held in trust by the Federal Government.
- Industrial wood*—All commercial roundwood products except fuelwood.
- Land area*—The area of dry land and land temporarily or partially covered by water such as marshes, swamps, and river flood plains, streams, sloughs, estuaries, and canals less than 120 feet wide; and lakes, reservoirs, and ponds less than 1 acre in size.
- Logging residues*—The unused portions of growing-stock trees cut or killed by logging.
- Low-risk old-growth stands*—Timber stands over 100 years old in which the majority of the trees are expected to survive more than 10 years.
- Miscellaneous Federal lands*—Lands administered by Federal agencies other than the U.S. Department of Agriculture, Forest Service or U.S. Department of the Interior, Bureau of Land Management.
- Mortality*—The net volume of growing-stock trees that have died from natural causes during a specified period.
- National Forest lands*—Public lands administered by the U.S. Department of Agriculture, Forest Service.
- National Resource lands*—Public lands administered by the U.S. Department of the Interior, Bureau of Land Management.
- Net annual growth*—Gross annual growth minus average annual mortality.
- Net dead volume*—Total net volume of dead trees plus the net volume of dead material in live trees.
- Net volume in board feet*—The gross board-foot volume in the sawlog portion of growing-stock trees, less deductions for cull volume.
- Net volume in cubic feet*—Gross cubic-foot volume in the merchantable portion of trees less deductions for cull volume. For timber species, volume is computed for the merchantable stem from a 1-foot stump to a minimum 4-inch top diameter outside bark (d.o.b.), or to the point where the central stem breaks into limbs. For woodland species, volume is computed outside bark (o.b.) for all woody material above d.r.c. that is larger than 1.5 inches d.o.b.
- Nonforest land*—Land that does not currently qualify as forest land.
- Nonindustrial private*—All private ownerships except forest industry.
- Nonstocked areas*—Forest land less than 10 percent stocked with live trees.
- Old-growth stands*—Stands of timber species over 100 years old.
- Other private land*—Privately owned land other than forest industry or farmer-owned.
- Other public land*—Public land administered by agencies other than the U.S. Department of Agriculture, Forest Service.
- Other removals*—The net volume of growing-stock trees removed from the inventory by cultural operations such as timber-stand improvement, by land clearing, and by changes in land use, such as a shift to wilderness.
- Poletimber stands*—Stands at least 10 percent stocked with growing-stock trees, in which half or more of the stocking is sawtimber or poletimber trees or both, with poletimber stocking exceeding that of sawtimber (see definition for Stocking).
- Poletimber trees*—Live trees of timber species at least 5 inches d.b.h. but smaller than sawtimber size.
- Posts*—Juniper and oak species are evaluated for post potential using the following criteria:
 Line post—A 7-foot minimum length with 5 to 7 inches diameter at the butt, 2.5-inch minimum small end diameter, and reasonably straight and solid.
 Corner post—An 8-foot minimum length with 7 to 9 inches diameter at the butt, 2.5-inch minimum small end diameter, and reasonably straight and solid.
- Potential growth*—The average net annual cubic-foot growth per acre at culmination of mean annual growth attainable in fully stocked natural stands.
- Primary wood-processing plants*—Plants using roundwood products such as sawlogs, pulpwood bolts, veneer logs, and so forth.
- Productivity class*—A classification of forest land that reflects biological potential. For timberland the potential net annual growth at culmination of mean annual increment in fully stocked natural stands is the index used. For woodland, characteristics that affect the land's ability to produce wood, such as soil depth and aspect, are used. Furthermore, woodland is classified as high site where sustained wood production is likely, or low site where the continuous production of wood is unlikely.

Removals—The net volume of growing-stock trees removed from the inventory by harvesting, cultural operations, land clearings, or changes in land use.

Reserved forest land—Forest land withdrawn from tree utilization through statute or administrative designation.

Residues:

Coarse residues—Plant residues suitable for chipping, such as slabs, edgings, and ends.

Fine residues—Plant residues not suitable for chipping, such as sawdust, shavings, and veneer clippings.

Plant residues—Wood materials from primary manufacturing plants that are not used for any product.

Rotten tree—A live poletimber or sawtimber tree with more than 67 percent of its total volume cull (cubic-foot), and with more than half of the cull volume attributable to rotten or missing material.

Rough tree—A live poletimber or sawtimber tree with more than 67 percent of its total volume cull (cubic-foot), and with less than half of the cull volume attributable to rotten or missing material.

Roundwood—Logs, bolts, or other round sections cut from trees.

Salvable dead trees—Standing or down dead trees that are currently merchantable by regional standards.

Saplings—Live trees of timber species 1 to 4.9 inches d.b.h., or woodland species 1 to 2.9 inches d.r.c.

Sapling and seedling stands—Timberland stands at least 10 percent stocked on which more than half of the stocking is saplings or seedlings or both.

Sawlog portion—That part of the bole of sawtimber trees between a 1-foot stump and the sawlog top.

Sawlog top—The point on the bole of sawtimber trees above which a sawlog cannot be produced. The minimum sawlog top is 7 inches d.o.b. for softwoods and 9 inches d.o.b. for hardwoods.

Sawtimber stands—Stands at least 10 percent stocked with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Sawtimber trees—Live trees of timber species meeting regional size and defect specifications. Softwood trees must be at least 9 inches d.b.h. and hardwood trees 11 inches d.b.h.

Sawtimber volume—Net volume in board feet of the sawlog portion of live sawtimber trees.

Seedlings—Established live trees of timber species less than 1 inch d.b.h. or woodland species less than 1 inch d.r.c.

Softwood trees—Monocotyledonous trees, usually evergreen, having needle or scalelike leaves.

Standard error—An expression of the degree of confidence that can be placed on an estimated total or average obtained by statistical sampling methods. Standard errors do not include technique errors that could occur in photo classification of areas, field measurements, or compilation of data.

Stand-size classes—A classification of forest land based on the predominant size of trees present (see Sawtimber stands, Poletimber stands, and Sapling and seedling stands).

State, county, and municipal lands—Lands administered by States, counties, and local public agencies, or lands leased by these governmental units for more than 50 years.

Stocking—An expression of the extent to which growing space is effectively utilized by present or potential growing-stock trees of timber species.

Timberland—Forest land where timber species make up at least 10 percent stocking.

Timber species—Tree species traditionally used for industrial wood products. In the Rocky Mountain States, these include aspen and cottonwood hardwood species and all softwood species except pinyon and juniper.

Timber stand improvement—Treatments such as thinning, pruning, release cutting, girdling, weeding, or poisoning of unwanted trees aimed at improving growing conditions for the remaining trees.

Upper-stem portion—That part of the main stem or fork of sawtimber trees above the sawlog top to a minimum top diameter of 4 inches outside bark or to the point where the main stem or fork breaks into limbs.

Water—Streams, sloughs, estuaries, and canals more than 120 feet wide, and lakes, reservoirs, and ponds more than 1 acre in size at mean high water level.

Wilderness—An area of undeveloped land currently included in the Wilderness System, managed so as to preserve its natural conditions and retain its primeval character and influence.

Woodland—Forest land where timber species make up less than 10 percent stocking.

Woodland species—Tree species not usually converted into industrial wood products. Common uses are fuelwood, fenceposts, and Christmas trees.

REFERENCES

- Chojnacky, David C. 1985. Pinyon-juniper volume equations for the central Rocky Mountain States. Res. Pap. INT-339. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 27 p.
- Edminster, Carleton B.; Mowrer, H. Todd; Hinds, Thomas E. 1981. Volume tables and point-sampling factor for aspen in Colorado. Res. Pap. RM-232. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 16 p.
- Edminster, Carleton B.; Beeson, Robert T.; Metcalf, Gary E. 1980. Volume tables and point-sampling factors for ponderosa pine in the Front Range of Colorado. Res. Pap. RM-218. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 14 p.
- Kemp, Paul D. 1958. Volume tables. Unpublished report on file at: U.S. Department of Agriculture, Forest Service, Intermountain Research Station, Ogden, UT.
- McLain, William H. 1987a. Wyoming and western South Dakota 1983 fuelwood harvest. Resour. Bull. INT-47. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 10 p.

McLain, William H. 1987b. Wyoming and western South Dakota—timber production and mill residues, 1983. Resour. Bull. INT-45. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 32 p.

Meyers, Clifford A. 1964. Volume tables and point-sampling factors for lodgepole pine in Colorado and Wyoming. Res. Pap. RM-6. Fort Collins, CO: U.S.

Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 16 p.

Meyers, Clifford A.; Edminster, Carleton B. 1972. Volume tables and point-sampling factors for Engelmann spruce in Colorado and Wyoming. Res. Pap. RM-95. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 23 p.

FOREST SURVEY TABLES

Table 1--Total land and water area by ownership class in western Wyoming, 1984

Ownership class	Area
	- - - <u>Acres</u> - - -
Land:	
Public:	
National Forest	6,305,975
Other:	
Bureau of Land Management	10,523,622
National Parks ¹	2,226,609
Miscellaneous Federal	126,392
State	1,190,010
Total other public	<u>14,066,633</u>
Total public	<u><u>20,372,608</u></u>
Private:	
Indian	1,886,703
Other private	5,589,188
Total private	<u>7,475,891</u>
Total land area	<u><u>27,848,499</u></u>
Census water	<u>353,670</u>
Total land and water ²	<u>28,202,169</u>

¹Not included with miscellaneous Federal, a component of other public, for purpose of clarity. These lands, and other reserved lands, are included in tables 1, 2, 4, and 5 only.

²U.S. Department of Commerce, Bureau of Census. Area measurement reports, GE-20 No. 1, 22 p., 1970, updated to account for changes in inland water estimates obtained from the USDA, Soil Conservation Service's National Resource Inventory, 1982.

Table 2--Area of forest land outside National Forests with percent standard error in western Wyoming, 1984

Item	Softwoods		Hardwoods		All types	
	Acres	Percent standard error	Acres	Percent standard error	Acres	Percent standard error
Timberland	548,446	±7.4	128,335	±20.7	676,781	±5.8
Woodland	361,450	±15.1	10,073	±71.6	371,523	±14.7
Reserved forest land: ¹						
Timberland	1,829,412		6,060		1,835,472	
Woodland	491		--		491	
Total forest land ²	2,739,799		144,468		2,884,267	

¹Reserved land areas are estimated from aerial photos without field verification; therefore, standard errors are not calculated.

²On this and all following tables, totals may vary due to rounding.

Table 3--Net volume, net annual growth, and annual mortality of growing stock and sawtimber on timberland outside National Forests with percent standard error in western Wyoming

Item	Softwoods		Hardwoods		All species	
	Volume	Percent standard error	Volume	Percent standard error	Volume	Percent standard error
Net volume, 1984:						
Growing stock (M cubic feet)	617,301	±13.5	135,618	±23.1	752,919	±11.6
Sawtimber ¹ (M board feet)	2,116,054	±15.8	180,337	±37.3	2,296,391	±14.9
Sawtimber ² (M board feet)	1,794,136	±15.8	153,617	±37.5	1,947,753	±14.9
Net annual growth, 1983:						
Growing stock (M cubic feet)	10,502	±25.5	2,558	±30.5	13,060	±21.4
Sawtimber ¹ (M board feet)	37,091	±34.2	9,557	±62.3	46,648	±29.9
Sawtimber ² (M board feet)	30,713	±34.7	8,347	±61.8	39,060	±30.1
Annual mortality, 1983:						
Growing stock (M cubic feet)	5,111	±39.0	711	±57.6	5,822	±35.8
Sawtimber ¹ (M board feet)	18,590	±44.4	218	±100.0	18,808	±43.9
Sawtimber ² (M board feet)	15,770	±44.3	168	±100.0	15,938	±43.8

¹International 4-inch rule.

²Scribner rule.

Table 4--Total land area outside National Forests by major land class and ownership class in western Wyoming, 1984

Land class	Ownership class		
	Other public	Private	Total
	- - - - - Acres - - - - -		
Timberland:			
Reserved	1,747,962	87,510	1,835,472
Nonreserved	332,742	344,039	676,781
Total	<u>2,080,704</u>	<u>431,549</u>	<u>2,512,253</u>
Woodland:			
Reserved	234	257	491
Nonreserved	237,405	134,118	371,523
Total	<u>237,639</u>	<u>134,375</u>	<u>372,014</u>
Total forest land:			
Reserved	1,748,196	87,767	1,835,963
Nonreserved	570,147	478,157	1,048,304
Total	<u>2,318,343</u>	<u>565,924</u>	<u>2,884,267</u>
Nonforest land	<u>11,748,286</u>	<u>6,909,971</u>	<u>18,658,257</u>
Total land area	<u>14,066,629</u>	<u>7,475,895</u>	<u>21,542,524</u>

Table 5--Area of forest land outside National Forests by forest type, ownership class, and land class in western Wyoming, 1984

Forest type	Ownership class and land class						Total
	Other public		Private		All owners		
	Reserved	Nonreserved	Reserved	Nonreserved	Reserved	Nonreserved	
	----- Acres -----						
Douglas-fir	--	45,374	--	59,375	--	104,749	104,749
Lodgepole pine	1,464,179	52,936	11,325	41,926	1,475,504	94,862	1,570,366
Limber pine	--	136,122	--	117,395	--	253,517	253,517
Spruce	50,906	7,562	26,253	22,400	77,159	29,962	107,121
Spruce-fir	227,589	60,499	49,160	4,858	276,749	65,357	342,106
Aspen	4,262	30,249	772	69,650	5,034	99,899	104,933
Cottonwood	1,026	--	--	28,435	1,026	28,435	29,461
Total timberland	1,747,962	332,742	87,510	344,039	1,835,472	676,781	2,512,253
Pinyon-juniper	--	13,071	257	--	257	13,071	13,328
Juniper	234	218,407	--	129,973	234	348,380	348,614
Other hardwoods	--	5,927	--	4,145	--	10,072	10,072
Total woodland	234	237,405	257	134,118	491	371,523	372,014
Total all types	1,748,196	570,147	87,767	478,157	1,835,963	1,048,304	2,884,267

Table 6--Cubic feet of net volume in trees on forest land outside
National Forests by species and ownership class in western
Wyoming, 1984

Species	Ownership class		
	Other public	Private	Total
	- - - - <u>Thousand cubic feet</u> - - - -		
Douglas-fir	120,889	76,930	197,819
Lodgepole pine	88,735	85,462	174,197
Limber pine	35,041	40,217	75,258
Subalpine fir	66,225	15,212	81,437
Engelmann spruce	13,495	76,884	90,379
Aspen	46,344	64,686	111,030
Cottonwood	459	24,588	25,047
Total timberland species	<u>371,188</u>	<u>383,979</u>	<u>755,167</u>
Woodland softwoods	70,723	49,748	120,471
Woodland hardwoods	541	10,703	11,244
Total woodland species	<u>71,264</u>	<u>60,451</u>	<u>131,715</u>
Total all species	<u>442,452</u>	<u>444,430</u>	<u>886,882</u>

Table 7--Cubic feet of net annual growth in trees on forest land outside National Forests by species and ownership class in western Wyoming, 1983

Species	Ownership class		Total
	Other public	Private	
	- - - - Thousand cubic feet - - - -		
Douglas-fir	1,936	1,083	3,019
Lodgepole pine	1,565	205	1,770
Limber pine	1,734	-687	1,047
Subalpine fir	2,426	791	3,217
Engelmann spruce	414	1,139	1,553
Aspen	904	1,120	2,024
Cottonwood	9	534	543
Total timberland species	8,988	4,185	13,173
Woodland softwoods	627	304	931
Woodland hardwoods	14	175	189
Total woodland species	641	479	1,120
Total all species	9,629	4,664	14,293

Table 8--Cubic feet of annual mortality in trees on forest land outside National Forests by species and ownership class in western Wyoming, 1983

Species	Ownership class		
	Other public	Private	Total
	- - - - <u>Thousand cubic feet</u> - - - -		
Douglas-fir	--	--	--
Lodgepole pine	829	1,448	2,277
Limber pine	135	1,734	1,869
Subalpine fir	965	--	965
Engelmann spruce	--	--	--
Aspen	183	477	660
Cottonwood	--	51	51
Total timberland species	2,112	3,710	5,822
Woodland softwoods	--	--	--
Woodland hardwoods	--	--	--
Total woodland species	--	--	--
Total all species	2,112	3,710	5,822

Table 9--Area of timberland outside National Forests by forest type, stand-size class, and productivity class in western Wyoming, 1984

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
- - - - - Acres - - - - -					
Douglas-fir:					
Sawtimber	--	17,913	60,786	10,350	89,049
Poletimber	--	--	10,124	2,788	12,912
Sapling and seedling	--	--	2,788	--	2,788
Nonstocked	--	--	--	--	--
Total	--	17,913	73,698	13,138	104,749
Lodgepole pine:					
Sawtimber	--	22,245	42,286	--	64,531
Poletimber	--	--	22,770	--	22,770
Sapling and seedling	--	--	7,562	--	7,562
Nonstocked	--	--	--	--	--
Total	--	22,245	72,618	--	94,863
Limber pine:					
Sawtimber	--	4,548	34,640	26,864	66,052
Poletimber	--	16,740	42,131	4,147	63,018
Sapling and seedling	--	7,562	6,390	27,091	41,043
Nonstocked	--	--	31,865	51,538	83,403
Total	--	28,850	115,026	109,640	253,516
Spruce-fir:					
Sawtimber	7,562	12,420	7,562	--	27,544
Poletimber	--	15,125	--	--	15,125
Sapling and seedling	--	22,687	--	--	22,687
Nonstocked	--	--	--	--	--
Total	7,562	50,232	7,562	--	65,356
Spruce:					
Sawtimber	7,562	11,966	2,788	--	22,316
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	2,788	--	2,788
Nonstocked	--	4,858	--	--	4,858
Total	7,562	16,824	5,576	--	29,962

(con.)

Table 9 (con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
- - - - - Acres - - - - -					
Aspen:					
Sawtimber	7,762	--	--	--	7,762
Poletimber	--	46,199	25,757	--	71,956
Sapling and seedling	7,562	7,762	4,858	--	20,182
Nonstocked	--	--	--	--	--
Total	15,324	53,961	30,615	--	99,900
Cottonwood:					
Sawtimber	5,872	--	12,841	2,788	21,501
Poletimber	--	4,146	--	--	4,146
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	2,788	2,788
Total	5,872	4,146	12,841	5,576	28,435
All types:					
Sawtimber	28,758	69,092	160,903	40,002	298,755
Poletimber	--	82,210	100,782	6,935	189,927
Sapling and seedling	7,562	38,011	24,386	27,091	97,050
Nonstocked	--	4,858	31,865	54,326	91,049
Total	36,320	194,171	317,936	128,354	676,781

Table 10--Area of other publicly owned timberland by forest type, stand-size class, and productivity class in western Wyoming, 1984

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
----- Acres -----					
Douglas-fir:					
Sawtimber	--	15,125	22,687	7,562	45,374
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	15,125	22,687	7,562	45,374
Lodgepole pine:					
Sawtimber	--	15,125	15,125	--	30,250
Poletimber	--	--	15,125	--	15,125
Sapling and seedling	--	--	7,562	--	7,562
Nonstocked	--	--	--	--	--
Total	--	15,125	37,812	--	52,937
Limber pine:					
Sawtimber	--	--	15,125	7,562	22,687
Poletimber	--	7,562	22,687	--	30,249
Sapling and seedling	--	7,562	--	15,125	22,687
Nonstocked	--	--	22,687	37,812	60,499
Total	--	15,124	60,499	60,499	136,122
Spruce-fir:					
Sawtimber	7,562	7,562	7,562	--	22,686
Poletimber	--	15,125	--	--	15,125
Sapling and seedling	--	22,687	--	--	22,687
Nonstocked	--	--	--	--	--
Total	7,562	45,374	7,562	--	60,498
Spruce:					
Sawtimber	7,562	--	--	--	7,562
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	7,562	--	--	--	7,562

(con.)

Table 10 (con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
----- Acres -----					
Aspen:					
Sawtimber	--	--	--	--	--
Poletimber	--	15,125	7,562	--	22,687
Sapling and seedling	7,562	--	--	--	7,562
Nonstocked	--	--	--	--	--
Total	7,562	15,125	7,562	--	30,249
Cottonwood:					
Sawtimber	--	--	--	--	--
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	--	--	--
All types:					
Sawtimber	15,124	37,812	60,499	15,124	128,559
Poletimber	--	37,812	45,374	--	83,186
Sapling and seedling	7,562	30,249	7,562	15,125	60,498
Nonstocked	--	--	22,687	37,812	60,499
Total	22,686	105,873	136,122	68,061	332,742

Table 11--Area of privately owned timberland by forest type, stand-size class, and productivity class in western Wyoming, 1984

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
- - - - - Acres - - - - -					
Douglas-fir:					
Sawtimber	--	2,788	38,099	2,788	43,675
Poletimber	--	--	10,124	2,788	12,912
Sapling and seedling	--	--	2,788	--	2,788
Nonstocked	--	--	--	--	--
Total	--	2,788	51,011	5,576	59,375
Lodgepole pine:					
Sawtimber	--	7,120	27,161	--	34,281
Poletimber	--	--	7,645	--	7,645
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	7,120	34,806	--	41,926
Limber pine:					
Sawtimber	--	4,548	19,515	19,302	43,365
Poletimber	--	9,178	19,444	4,147	32,769
Sapling and seedling	--	--	6,390	11,966	18,356
Nonstocked	--	--	9,178	13,726	22,904
Total	--	13,726	54,527	49,141	117,394
Spruce-fir:					
Sawtimber	--	4,858	--	--	4,858
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	4,858	--	--	4,858
Spruce:					
Sawtimber	--	11,966	2,788	--	14,754
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	2,788	--	2,788
Nonstocked	--	4,858	--	--	4,858
Total	--	16,824	5,576	--	22,400

(con.)

Table 11 (con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	- - - - - <u>Acres</u> - - - - -				
Aspen:					
Sawtimber	7,762	--	--	--	7,762
Poletimber	--	31,074	18,195	--	49,269
Sapling and seedling	--	7,762	4,858	--	12,620
Nonstocked	--	--	--	--	--
Total	7,762	38,836	23,053	--	69,651
Cottonwood:					
Sawtimber	5,872	--	12,841	2,788	21,501
Poletimber	--	4,146	--	--	4,146
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	2,788	2,788
Total	5,872	4,146	12,841	5,576	28,435
All types:					
Sawtimber	13,634	31,280	100,404	24,878	170,196
Poletimber	--	44,398	55,408	6,935	106,741
Sapling and seedling	--	7,762	16,824	11,966	36,552
Nonstocked	--	4,858	9,178	16,514	30,550
Total	13,634	88,298	181,814	60,293	344,039

Table 12--Area of timberland outside National Forests by stand volume and ownership class in western Wyoming, 1984

Stand volume per acre ¹	Ownership class			Total
	Other public	Private		
			Acres	
Less than 1,500 board feet	173,933	171,121		345,054
1,500 to 4,999 board feet	83,186	103,759		186,945
5,000 to 9,999 board feet	52,936	34,497		87,433
10,000 board feet or more	22,687	34,662		57,349
All classes	332,742	344,039		676,781

¹International 4-inch rule.

Table 13--Area of timberland outside National Forests by forest type and area condition class in western Wyoming, 1984

Forest type	Area condition class											Nonstocked	All classes		
	10	20	30	40	50	60	70	80	90						
															Acres
Douglas-fir	--	--	--	2,788	7,562	15,699	8,363	--	--	70,335	--	--	--	--	104,747
Lodgepole pine	--	--	--	--	25,558	19,982	17,470	--	--	31,852	--	--	--	--	94,862
Lumber pine	--	--	--	7,562	8,364	47,163	83,175	--	--	23,850	83,403	--	--	--	253,517
Spruce-fir	--	--	--	15,125	15,125	15,125	--	--	--	19,982	--	--	--	--	65,357
Spruce	--	--	--	--	--	7,562	2,788	2,788	11,966	--	--	--	--	--	29,962
Aspen	--	--	--	--	30,449	61,805	7,646	--	--	--	--	--	--	--	99,900
Cottonwood	--	--	--	--	--	14,165	7,336	--	--	4,147	--	--	--	--	28,436
All types	--	--	--	25,475	87,058	181,501	126,778	2,788	162,132	91,049	--	--	--	--	676,781

Table 14--Number of growing-stock trees on timberland outside National Forests by species and diameter class in western Wyoming, 1984

Species	Diameter class (inches at breast height)																All classes
	1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 22.9	23.0- 24.9	25.0- 26.9	27.0- 28.9	29.0+		
	----- Thousand trees -----																
Douglas-fir	8,214	5,241	7,382	4,726	3,467	1,200	1,445	423	323	233	138	140	82	61	36	33,111	
Lodgepole pine	5,185	3,861	7,642	4,956	3,386	1,736	750	466	76	87	9	39	6	9	--	28,208	
Limber pine	16,845	11,385	9,107	4,689	2,123	1,092	474	262	78	47	13	--	12	--	41	46,168	
Subalpine fir	13,414	15,722	6,169	3,751	1,715	832	600	220	37	27	--	--	--	--	--	42,487	
Engelmann spruce	2,951	2,114	910	1,435	896	564	618	409	208	118	73	32	55	--	4	10,387	
Total softwoods	46,609	38,323	31,210	19,557	11,587	5,424	3,887	1,780	722	512	233	211	155	70	81	160,361	
Aspen	11,811	12,539	12,881	8,508	2,812	911	52	127	44	--	--	--	--	--	--	49,685	
Cottonwood	--	1,108	702	459	597	326	296	76	40	74	46	22	--	--	21	3,767	
Total hardwoods	11,811	13,647	13,583	8,967	3,409	1,237	348	203	84	74	46	22	--	--	21	53,452	
All species	58,420	51,970	44,793	28,524	14,996	6,661	4,235	1,983	806	586	279	233	155	70	102	213,813	

Table 15--Number of cull and salvable dead trees on timberland outside National Forests by ownership class, and softwoods and hardwoods in western Wyoming, 1984

Ownership class and species group	Cull trees			Salvable dead trees	Total
	Rough	Rotten	Total		
- - - - - Thousand trees - - - - -					
Other public:					
Softwoods	502	787	1,289	6,543	7,832
Hardwoods	--	956	956	3,025	3,981
Total	502	1,743	2,245	9,568	11,813
Private:					
Softwoods	805	105	910	6,755	7,665
Hardwoods	183	288	471	5,070	5,541
Total	988	393	1,381	11,825	13,206
Total:					
Softwoods	1,307	892	2,199	13,298	15,497
Hardwoods	183	1,244	1,427	8,095	9,522
Total	1,490	2,136	3,626	21,393	25,019

Table 16--Net volume of growing stock on timberland outside National Forests by ownership class, forest type, and stand-size class in western Wyoming, 1984

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	
----- Thousand cubic feet -----						
Other public:						
	Douglas-fir	99,084	--	--	--	99,084
	Lodgepole pine	53,945	23,751	--	--	77,696
	Limber pine	9,001	24,690	2,061	2,903	38,655
	Spruce-fir	72,989	13,459	13,801	--	100,249
	Spruce	13,181	--	--	--	13,181
	Aspen	--	37,345	3,134	--	40,479
	Cottonwood	--	--	--	--	--
	All types	248,200	99,245	18,996	2,903	369,344
Private:						
	Douglas-fir	78,219	15,220	273	--	93,712
	Lodgepole pine	62,331	13,716	--	--	76,047
	Limber pine	26,627	15,699	760	1,488	44,574
	Spruce-fir	25,452	--	--	--	25,452
	Spruce	48,168	--	--	1,940	50,108
	Aspen	9,669	48,121	6,801	--	64,591
	Cottonwood	27,044	1,879	--	168	29,091
	All types	277,510	94,635	7,834	3,596	383,575
Total:						
	Douglas-fir	177,303	15,220	273	--	192,796
	Lodgepole pine	116,276	37,467	--	--	153,743
	Limber pine	35,628	40,389	2,821	4,391	83,229
	Spruce-fir	98,441	13,459	13,801	--	125,701
	Spruce	61,349	--	--	1,940	63,289
	Aspen	9,669	85,466	9,935	--	105,070
	Cottonwood	27,044	1,879	--	168	29,091
	All types	525,710	193,880	26,830	6,499	752,919

Table 17--Net volume of sawtimber (International ¼-inch rule) on timberland outside National Forests by ownership class, forest type, and stand-size class in western Wyoming, 1984

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	
- - - Thousand board feet, International ¼-inch rule - - -						
Other public:	Douglas-fir	393,801	--	--	--	393,801
	Lodgepole pine	176,012	13,686	--	--	189,698
	Limber pine	30,425	34,413	--	3,523	68,361
	Spruce-fir	275,899	25,981	31,087	--	332,967
	Spruce	64,320	--	--	--	64,320
	Aspen	--	41,625	8,640	--	50,265
	Cottonwood	--	--	--	--	--
	All types	940,457	115,705	39,727	3,523	1,099,412
Private:	Douglas-fir	269,912	31,785	1,356	--	303,053
	Lodgepole pine	233,899	22,345	--	--	256,244
	Limber pine	98,536	25,440	1,855	2,523	128,354
	Spruce-fir	87,038	--	--	--	87,038
	Spruce	222,175	--	--	5,477	227,652
	Aspen	22,954	37,002	20,473	--	80,429
	Cottonwood	113,433	--	--	776	114,209
	All types	1,047,947	116,572	23,684	8,776	1,196,979
Total:	Douglas-fir	663,713	31,785	1,356	--	696,854
	Lodgepole pine	409,911	36,031	--	--	445,942
	Limber pine	128,961	59,853	1,855	6,046	196,715
	Spruce-fir	362,937	25,981	31,087	--	420,005
	Spruce	286,495	--	--	5,477	291,972
	Aspen	22,954	78,627	29,113	--	130,694
	Cottonwood	113,433	--	--	776	114,209
	All types	1,988,404	232,277	63,411	12,299	2,296,391

Table 18--Net volume of sawtimber (Scribner rule) on timberland outside National Forests by ownership class, forest type, and stand-size class in western Wyoming, 1984

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	
- - - - - <u>Thousand board feet, Scribner rule</u> - - - - -						
Other public:	Douglas-fir	334,872	--	--	--	334,872
	Lodgepole pine	151,098	12,000	--	--	163,098
	Limber pine	25,687	28,476	--	3,081	57,244
	Spruce-fir	235,453	22,078	26,134	--	283,665
	Spruce	53,426	--	--	--	53,426
	Aspen	--	35,763	7,040	--	42,803
	Cottonwood	--	--	--	--	--
	All types	800,536	98,317	33,174	3,081	935,108
Private:	Douglas-fir	230,358	26,447	1,119	--	257,924
	Lodgepole pine	198,426	19,035	--	--	217,461
	Limber pine	82,800	20,478	1,308	1,936	106,522
	Spruce-fir	74,284	--	--	--	74,284
	Spruce	185,678	--	--	4,715	190,393
	Aspen	20,079	31,675	17,162	--	68,916
	Cottonwood	96,657	--	--	488	97,145
	All types	888,282	97,635	19,589	7,139	1,012,645
Total:	Douglas-fir	565,230	26,447	1,119	--	592,796
	Lodgepole pine	349,524	31,035	--	--	380,559
	Limber pine	108,487	48,954	1,308	5,017	163,766
	Spruce-fir	309,737	22,078	26,134	--	357,949
	Spruce	239,104	--	--	4,715	243,819
	Aspen	20,079	67,438	24,202	--	111,719
	Cottonwood	96,657	--	--	488	97,145
	All types	1,688,818	195,952	52,763	10,220	1,947,753

Table 19--Net volume of growing stock on timberland outside National Forests by species and ownership class in western Wyoming, 1984

Species	Ownership class		
	Other public	Private	Total
- - - - - Thousand cubic feet - - - - -			
Douglas-fir	120,444	76,931	197,375
Lodgepole pine	88,735	85,462	174,197
Limber pine	34,101	39,812	73,913
Subalpine fir	66,225	15,212	81,437
Engelmann spruce	13,495	76,884	90,379
Total softwoods	323,000	294,301	617,301
Aspen	46,344	64,686	111,030
Cottonwood	--	24,588	24,588
Total hardwood	46,344	89,274	135,618
All species	369,344	383,575	752,919

Table 20--Net volume of sawtimber (International ¼-inch rule) on timberland outside National Forests by species and ownership class in western Wyoming, 1984

Species	Ownership class		
	Other public	Private	Total
- Thousand board feet, International ¼-inch rule -			
Douglas-fir	505,619	278,216	783,835
Lodgepole pine	236,796	299,065	535,861
Limber pine	75,148	107,106	182,254
Subalpine fir	185,531	31,995	217,526
Engelmann spruce	59,000	337,578	396,578
Total softwoods	1,062,094	1,053,960	2,116,054
Aspen	37,318	49,228	86,546
Cottonwood	--	93,791	93,791
Total hardwoods	37,318	143,019	180,337
All species	1,099,412	1,196,979	2,296,391

Table 21--Net volume of sawtimber (Scribner rule) on timberland outside National Forests by species and ownership class in western Wyoming, 1984

Species	Ownership class		
	Other public	Private	Total
- - - <u>Thousand board feet, Scribner rule</u> - - -			
Douglas-fir	431,215	236,143	667,358
Lodgepole pine	202,942	254,327	457,269
Limber pine	62,085	88,744	150,829
Subalpine fir	157,759	27,102	184,861
Engelmann spruce	49,163	284,656	333,819
Total softwoods	903,164	890,972	1,794,136
Aspen	31,944	42,115	74,059
Cottonwood	--	79,558	79,558
Total hardwoods	31,944	121,673	153,617
All species	935,108	1,012,645	1,947,753

Table 22--Net volume of growing stock on timberland outside National Forests by species and diameter class in western Wyoming, 1984

Species	Diameter class (inches at breast height)														All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		
	----- Thousand cubic feet -----														
Douglas-fir	13,783	22,013	32,252	17,648	34,296	13,357	13,885	12,628	7,611	10,811	8,708	5,378	5,005	197,375	
Lodgepole pine	18,330	32,788	40,991	33,698	19,586	15,039	3,339	5,118	562	3,153	574	1,019	--	174,197	
Limber pine	12,034	15,609	13,156	11,112	7,351	5,281	1,927	1,508	483	--	691	--	4,761	73,913	
Subalpine fir	11,869	18,690	16,609	11,745	13,895	5,596	1,641	1,392	--	--	--	--	--	81,437	
Engelmann spruce	1,663	6,895	9,061	9,518	17,465	14,802	9,972	7,470	5,181	2,719	5,074	--	559	90,379	
Total softwoods	57,679	95,995	112,069	83,721	92,593	54,075	30,764	28,116	13,837	16,683	15,047	6,397	10,325	617,301	
Aspen	23,749	40,842	28,184	13,239	946	2,878	1,192	--	--	--	--	--	--	111,030	
Cottonwood	353	1,113	3,721	3,927	5,528	1,347	690	2,811	1,839	984	--	--	2,275	24,588	
Total hardwoods	24,102	41,955	31,905	17,166	6,474	4,225	1,882	2,811	1,839	984	--	--	2,275	135,618	
All species	81,781	137,950	143,974	100,887	99,067	58,300	32,646	30,927	15,676	17,667	15,047	6,397	12,600	752,919	

Table 23--Net volume of sawtimber (International 4-inch rule) on timberland outside National Forests by species and diameter class in western Wyoming, 1984

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	- - - - - Thousand board feet, International 4-inch rule - - - - -											
Douglas-fir	109,252	79,665	171,411	69,124	73,784	68,126	41,096	60,828	50,607	30,655	29,287	783,835
Lodgepole pine	140,580	150,454	96,153	76,218	17,216	26,659	2,943	16,914	3,121	5,603	--	535,861
Lumber pine	41,134	38,558	30,376	23,486	8,913	7,437	2,435	--	3,678	--	26,237	182,254
Subalpine fir	57,622	51,385	66,680	26,689	8,197	6,953	--	--	--	--	--	217,526
Engelmann spruce	31,468	43,626	86,256	73,968	50,100	38,366	27,111	14,669	27,779	--	3,235	396,578
Total softwoods	380,056	363,688	450,876	269,485	158,210	147,541	73,585	92,411	85,185	36,258	58,759	2,116,054
Aspen	XXXXX	61,993	4,539	14,158	5,857	--	--	--	--	--	--	86,547
Cottonwood	XXXXX	19,907	27,739	6,607	3,257	13,028	8,400	4,383	--	--	10,469	93,790
Total hardwoods	XXXXX	81,900	32,278	20,765	9,114	13,028	8,400	4,383	--	--	10,469	180,337
All species	380,056	445,588	483,154	290,250	167,324	160,569	81,985	96,794	85,185	36,258	69,228	2,296,391

Table 24--Net volume of sawtimber (Scribner rule) on timberland outside National Forests by species and diameter class in western Wyoming, 1984

Species	Diameter class (inches at breast height)											All classes
	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 22.9	23.0- 24.9	25.0- 26.9	27.0- 28.9	29.0+	
	----- Thousand board feet, Scribner rule -----											
Douglas-fir	95,837	68,240	142,089	56,493	60,322	57,356	34,858	53,885	45,040	27,172	26,066	667,358
Lodgepole pine	121,530	127,677	80,894	63,771	14,667	23,324	2,589	15,054	2,777	4,986	--	457,269
Lumber pine	29,615	33,039	25,950	19,884	7,504	6,237	2,032	--	3,221	--	23,347	150,829
Subalpine fir	51,079	44,380	55,236	21,969	6,612	5,584	--	--	--	--	--	184,860
Engelmann spruce	27,672	37,041	70,798	60,107	40,678	33,130	23,737	13,055	24,723	--	2,879	333,820
Total softwoods	325,733	310,377	374,967	222,224	129,783	125,631	63,216	81,994	75,761	32,158	52,292	1,794,136
Aspen	XXXX	53,294	3,882	11,939	4,944	--	--	--	--	--	--	74,059
Cottonwood	XXXX	15,854	23,345	5,556	2,750	11,454	7,399	3,882	--	--	9,318	79,558
Total hardwoods	XXXX	69,148	27,227	17,495	7,694	11,454	7,399	3,882	--	--	9,318	153,617
All species	325,733	379,525	402,194	239,719	137,477	137,085	70,615	85,876	75,761	32,158	61,610	1,947,753

Table 25--Net volume of timber on timberland outside National Forests by class of timber, and softwoods and hardwoods in western Wyoming, 1984

Class of timber	Softwoods	Hardwoods	Total
	- - - - - Thousand cubic feet - - - - -		
Sawtimber trees:			
Sawlog portion	414,172	28,534	442,706
Upper-stem portion	49,455	9,121	58,576
Total	463,627	37,655	501,282
Poletimber trees	153,674	97,963	251,637
All growing-stock trees	617,301	135,618	752,919
Rough cull trees	2,459	809	3,268
Rotten cull trees	2,242	2,946	5,188
Salvable dead trees	83,491	19,923	103,414
All timber	705,493	159,296	864,789

Table 26--Net volume of growing stock on timberland outside National Forests by forest type and species in western Wyoming, 1984

Forest type	Species							Total hardwoods	All species	
	Douglas-fir	Lodgepole pine	Limber pine	Subalpine fir	Engelmann spruce	Total softwoods	Aspen			Cottonwood
----- Thousand cubic feet -----										
Douglas-fir	154,586	5,844	11,779	2,599	13,251	188,059	4,738	--	4,738	192,797
Lodgepole pine	--	139,426	3,291	5,168	1,051	148,936	4,806	--	4,806	153,742
Limber pine	11,510	5,161	54,162	5,284	5,956	82,073	1,156	--	1,156	83,229
Spruce-fir	25,220	11,374	3,228	60,764	10,470	111,056	14,645	--	14,645	125,701
Spruce	2,331	3,506	1,034	1,548	54,870	63,289	--	--	--	63,289
Aspen	3,728	8,886	419	6,074	279	19,386	85,685	--	85,685	105,071
Cottonwood	--	--	--	--	4,502	4,502	--	24,588	24,588	29,090
All types	197,375	174,197	73,913	81,437	90,379	617,301	111,030	24,588	135,618	752,919

Table 27--Net volume of sawtimber (International 1/4-inch rule) on timberland outside National Forests by forest type and species in western Wyoming, 1984

Forest type	Species							Total hardwoods	All species	
	Douglas-fir	Lodgepole pine	Limber pine	Subalpine fir	Engelmann spruce	Total softwoods	Aspen			Cottonwood
----- Thousand board feet, International 1/4-inch rule -----										
Douglas-fir	597,970	15,754	34,368	10,223	38,539	696,854	--	--	--	696,854
Lodgepole pine	--	411,965	14,134	14,176	5,667	445,942	--	--	--	445,942
Limber pine	38,369	6,573	119,005	8,367	24,401	196,715	--	--	--	196,715
Spruce-fir	120,248	52,310	7,850	168,643	53,242	402,293	17,712	--	17,712	420,005
Spruce	10,551	15,181	5,163	7,585	253,491	291,971	--	--	--	291,971
Aspen	16,697	34,078	1,734	8,532	819	61,860	68,835	--	68,835	130,695
Cottonwood	--	--	--	--	20,419	20,419	--	93,790	93,790	114,209
All types	783,835	535,861	182,254	217,526	396,578	2,116,054	86,547	93,790	180,337	2,296,391

Table 28--Net volume of sawtimber (Scribner rule) on timberland outside National Forests by forest type and species in western Wyoming, 1984

Forest type	Species										Total hardwoods	All species
	Douglas-fir	Lodgepole pine	Limber pine	Subalpine fir	Engelmann spruce	Total softwoods	Aspen	Cottonwood	Total hardwoods	All species		
	Thousand board feet, Scribner rule											
Douglas-fir	508,357	13,447	29,162	8,467	33,363	592,796	--	--	--	--	592,796	
Lodgepole pine	--	351,739	11,856	12,116	4,848	380,559	--	--	--	--	380,559	
Limber pine	32,820	5,432	97,607	7,419	20,488	163,766	--	--	--	--	163,766	
Spruce-fir	103,622	44,581	6,246	143,122	45,248	342,819	15,129	--	--	15,129	357,948	
Spruce	8,638	12,907	4,479	6,239	211,557	243,820	--	--	--	--	243,820	
Aspen	13,920	29,163	1,479	7,498	729	52,789	58,930	--	--	58,930	111,719	
Cottonwood	--	--	--	--	17,587	17,587	--	79,558	--	79,558	79,558	97,145
All types	667,357	457,269	150,829	184,861	333,820	1,794,136	74,059	79,558	153,617	1,947,753		

Table 29--Net annual growth of growing stock on timberland outside National Forests by species and ownership class in western Wyoming, 1983

Species	Ownership class		Total
	Other public	Private	
	- - - - - Thousand cubic feet - - - - -		
Douglas-fir	1,915	1,083	2,998
Lodgepole pine	1,565	205	1,770
Limber pine	1,672	-708 ⁽¹⁾	964
Subalpine fir	2,426	791	3,217
Engelmann spruce	414	1,139	1,553
Total softwoods	7,992	2,510	10,502
Aspen	904	1,120	2,024
Cottonwood	--	534	534
Total hardwoods	904	1,654	2,558
All species	8,896	4,164	13,060

¹Net annual growth is negative when annual mortality exceeds gross annual growth.

Table 30--Net annual growth of sawtimber (International ¼-inch rule) on timberland outside National Forests by species and ownership class in western Wyoming, 1983

Species	Ownership class		
	Other public	Private	Total
- Thousand board feet, International ¼-inch rule -			
Douglas-fir	10,900	3,593	14,493
Lodgepole pine	11,570	1,383	12,953
Limber pine	4,067	-5,100 ⁽¹⁾	-1,033
Subalpine fir	2,901	1,044	3,945
Engelmann spruce	2,042	4,691	6,733
Total softwoods	31,480	5,611	37,091
Aspen	3,375	5,411	8,786
Cottonwood	--	771	771
Total hardwoods	3,375	6,182	9,557
All species	34,855	11,793	46,648

¹Net annual growth is negative when annual mortality exceeds gross annual growth.

Table 31--Net annual growth of sawtimber (Scribner rule) on timberland outside National Forests by species and ownership class in western Wyoming, 1983

Species	Ownership class			Total
	Other public	Private		
	- - Thousand board feet, Scribner rule - - -			
Douglas-fir	9,406	3,036		12,442
Lodgepole pine	9,474	1,426		10,900
Limber pine	3,012	-4,394 ⁽¹⁾		-1,382
Subalpine fir	2,307	823		3,130
Engelmann spruce	1,690	3,933		5,623
Total softwoods	25,889	4,824		30,713
Aspen	2,945	4,659		7,604
Cottonwood	--	743		743
Total hardwoods	2,945	5,402		8,347
All species	28,834	10,226		39,060

¹Net annual growth is negative when annual mortality exceeds gross annual growth.

Table 32--Net annual growth of growing stock on timberland outside National Forests by species and diameter class in western Wyoming, 1983

Species	Diameter class (inches at breast height)																All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+				
	----- Thousand cubic feet -----																
Douglas-fir	768	507	636	307	312	160	109	55	30	50	24	24	16	2,998			
Lodgepole pine	1,139	517	471	72	-315	-244(1)	18	97	2	10	2	1	--	1,770			
Limber pine	1,327	636	56	-492	-397	67	-173	8	1	-84	2	--	13	964			
Subalpine fir	1,794	778	348	86	63	113	6	29	--	--	--	--	--	3,217			
Engelmann spruce	71	196	185	207	246	272	116	111	44	50	52	--	3	1,553			
Total softwoods	5,099	2,634	1,696	180	-91	368	76	300	77	26	80	25	32	10,502			
Aspen	607	1,091	148	151	7	15	5	--	--	--	--	--	--	2,024			
Cottonwood	255	33	79	72	10	14	6	33	12	9	--	--	11	534			
Total hardwoods	862	1,124	227	223	17	29	11	33	12	9	--	--	11	2,558			
All species	5,961	3,758	1,923	403	-74	397	87	333	89	35	80	25	43	13,060			

¹Net annual growth is negative when annual mortality exceeds gross annual growth.

Table 33--Net annual growth of sawtimber (International 4-inch rule) on timberland outside National Forests by species and diameter class in western Wyoming, 1983

Species	Diameter class (inches at breast height)													All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+			
	-- -- -- -- -- Thousand board feet, International 4-inch rule -- -- -- -- --													
Douglas-fir	8,164	1,779	1,789	911	626	338	175	316	148	148	99		14,493	
Lodgepole pine	13,453	1,214	-1,254	-1,174 ⁽¹⁾	95	534	10	59	13	4	--		12,954	
Limber pine	3,192	-1,656	-1,845	398	-837	51	5	-429	12	--	76		-1,033	
Subalpine fir	1,884	770	513	590	32	156	--	--	--	--	--		3,945	
Engelmann spruce	649	1,151	1,315	1,424	612	654	268	313	327	--	19		6,732	
Total softwoods	27,342	3,258	518	2,149	528	1,733	458	259	500	152	194		37,091	
Aspen	XXXXX	8,645	39	78	24	--	--	--	--	--	--		8,786	
Cottonwood	XXXXX	373	37	60	27	136	49	37	--	--	52		771	
Total hardwoods	XXXXX	9,018	76	138	51	136	49	37	--	--	52		9,557	
All species	27,342	12,276	594	2,287	579	1,869	507	296	500	152	246		46,648	

¹Net annual growth is negative when annual mortality exceeds gross annual growth.

Table 34--Net annual growth of sawtimber (Scribner rule) on timberland outside National Forests by species and diameter class in western Wyoming, 1983

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	----- Thousand board feet, Scribner rule -----											
Douglas-fir	7,272	1,405	1,409	717	507	324	160	297	132	131	88	12,442
Lodgepole pine	11,283	965	-1,069	-947 ⁽¹⁾	89	503	10	52	11	4	--	10,901
Lumber pine	2,155	-1,368	-1,562	330	-703	42	5	-360	11	--	68	-1,382
Subalpine fir	1,641	539	339	462	26	123	--	--	--	--	--	3,130
Engelmann spruce	579	903	1,033	1,119	503	643	255	279	291	--	17	5,622
Total softwoods	22,930	2,444	150	1,681	422	1,635	430	268	445	135	173	30,713
Aspen	XXXX	7,483	32	68	21	--	--	--	--	--	--	7,604
Cottonwood	XXXX	344	69	56	25	124	45	34	--	--	46	743
Total hardwoods	XXXX	7,827	101	124	46	124	45	34	--	--	46	8,347
All species	22,930	10,271	251	1,805	468	1,759	475	302	445	135	219	39,060

¹Net annual growth is negative when annual mortality exceeds gross annual growth.

Table 35--Annual mortality of growing stock on timberland outside National Forests by species and ownership class in western Wyoming, 1983

Species	Ownership class		
	Other public	Private	Total
	- - - - - Thousand cubic feet - - - - -		
Douglas-fir	--	--	--
Lodgepole pine	829	1,448	2,277
Limber pine	135	1,735	1,870
Subalpine fir	965	--	965
Engelmann spruce	--	--	--
Total softwoods	1,929	3,183	5,112
Aspen	183	477	660
Cottonwood	--	50	50
Total hardwoods	183	527	710
All species	2,112	3,710	5,822

Table 36--Annual mortality of sawtimber (International 4-inch rule) on timberland outside National Forests by species and ownership class in western Wyoming, 1983

Species	Ownership class		
	Other public	Private	Total
	- Thousand board feet, International 4-inch rule -		
Douglas-fir	--	--	--
Lodgepole pine	2,588	5,785	8,373
Limber pine	402	7,381	7,783
Subalpine fir	2,434	--	2,434
Engelmann spruce	--	--	--
Total softwoods	5,424	13,166	18,590
Aspen	--	--	--
Cottonwood	--	218	218
Total hardwoods	--	218	218
All species	5,424	13,384	18,808

Table 37--Annual mortality of sawtimber (Scribner rule) on timberland outside National Forests by species and ownership class in western Wyoming, 1983

Species	Ownership class		
	Other public	Private	Total
- - - Thousand board feet, Scribner rule - - -			
Douglas-fir	--	--	--
Lodgepole pine	2,180	4,910	7,090
Limber pine	347	6,224	6,571
Subalpine fir	2,109	--	2,109
Engelmann spruce	--	--	--
Total softwoods	4,636	11,134	15,770
Aspen	--	--	--
Cottonwood	--	168	168
Total hardwoods	--	168	168
All species	4,636	11,302	15,938

Table 38--Annual mortality of growing stock on timberland outside National Forests by species and diameter class in western Wyoming, 1983

Species	Diameter class (inches at breast height)													All classes	
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		
	----- Thousand cubic feet -----														
Douglas-fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole pine	--	439	490	492	481	375	--	--	--	--	--	--	--	--	2,277
Limber pine	--	--	346	749	497	--	193	--	--	84	--	--	--	--	1,869
Subalpine fir	162	188	181	205	229	--	--	--	--	--	--	--	--	--	965
Engelmann spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total softwoods	162	627	1,017	1,446	1,207	375	193	--	--	84	--	--	--	--	5,111
Aspen	388	--	272	--	--	--	--	--	--	--	--	--	--	--	660
Cottonwood	6	--	--	--	45	--	--	--	--	--	--	--	--	--	51
Total hardwoods	394	--	272	--	45	--	--	--	--	--	--	--	--	--	711
All species	556	627	1,289	1,446	1,252	375	193	--	--	84	--	--	--	--	5,822

Table 39--Annual mortality of sawtimber (International 1/4-inch rule) on timberland outside National Forests by species and diameter class in western Wyoming, 1983

Species	Diameter class (inches at breast height)												All classes	
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+			
	- - - - - Thousand board feet, International 1/4-inch rule - - - - -													
Douglas-fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole pine	2,027	2,177	2,267	1,902	--	--	--	--	--	--	--	--	--	8,373
Limber pine	1,038	2,927	2,436	--	952	--	--	430	--	--	--	--	--	7,783
Subalpine fir	530	855	1,049	--	--	--	--	--	--	--	--	--	--	2,434
Engelmann spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total softwoods	3,595	5,959	5,752	1,902	952	--	--	430	--	--	--	--	--	18,590
Aspen	XXXX	--	--	--	--	--	--	--	--	--	--	--	--	--
Cottonwood	XXXX	--	218	--	--	--	--	--	--	--	--	--	--	218
Total hardwoods	XXXX	--	218	--	--	--	--	--	--	--	--	--	--	218
All species	3,595	5,959	5,970	1,902	952	--	--	430	--	--	--	--	--	18,808

Table 40--Annual mortality of sawtimber (Scribner rule) on timberland outside National Forests by species and diameter class in western Wyoming, 1983

Species	Diameter class (inches at breast height)											All classes	
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		
	----- Thousand board feet, Scribner rule -----												
Douglas-fir	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole pine	1,731	1,848	1,914	1,596	--	--	--	--	--	--	--	--	7,089
Limber pine	854	2,506	2,051	--	800	--	--	361	--	--	--	--	6,572
Subalpine fir	472	752	885	--	--	--	--	--	--	--	--	--	2,109
Engelmann spruce	--	--	--	--	--	--	--	--	--	--	--	--	--
Total softwood	3,057	5,106	4,850	1,596	800	--	--	361	--	--	--	--	15,770
Aspen	XXXXX	--	--	--	--	--	--	--	--	--	--	--	--
Cottonwood	XXXXX	--	168	--	--	--	--	--	--	--	--	--	168
Total hardwoods	XXXXX	--	168	--	--	--	--	--	--	--	--	--	168
All species	3,057	5,106	5,018	1,596	800	--	--	361	--	--	--	--	15,938

Table 41--Annual mortality of growing stock on timberland outside National Forests by species and cause of death in western Wyoming, 1983

Species	Cause of death							Total
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	
					Thousand cubic feet			
Lodgepole pine	1,318	829	--	--	--	--	--	130
Limber pine	--	1,785	--	--	84	--	--	--
Subalpine fir	433	351	--	--	--	--	--	181
Total softwoods	1,751	2,965	--	--	84	--	--	311
Aspen	--	138	--	--	--	--	--	522
Cottonwood	--	--	--	45	--	--	--	6
Total hardwoods	--	138	--	45	--	--	--	528
All species	1,751	3,103	--	45	84	--	--	839
								5,822

¹Because many destructive agents often attack trees in concert or in succession, it is often difficult to identify the actual causal agent. When the primary cause of death cannot be precisely determined, it is listed as unknown.

Table 42--Annual mortality of sawtimber (International ¼-inch rule) on timberland outside National Forests by species and cause of death in western Wyoming, 1983

Species	Cause of death								Total
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	
----- Thousand board feet, International ¼-inch rule -----									
Lodgepole pine	5,102	2,588	--	--	--	--	--	683	8,373
Limber pine	--	7,353	--	--	430	--	--	--	7,783
Subalpine fir	1,904	--	--	--	--	--	--	530	2,434
Total softwoods	7,006	9,941	--	--	430	--	--	1,213	18,590
Aspen	--	--	--	--	--	--	--	--	--
Cottonwood	--	--	--	218	--	--	--	--	218
Total hardwoods	--	--	--	218	--	--	--	--	218
All species	7,006	9,941	--	218	430	--	--	1,213	18,808

Table 43--Annual mortality of sawtimber (Scribner rule) on timberland outside National Forests by species and cause of death in western Wyoming, 1983

Species	Cause of death								Total
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	
----- Thousand board feet, Scribner rule -----									
Lodgepole pine	4,337	2,179	--	--	--	--	--	573	7,089
Limber pine	--	6,211	--	--	361	--	--	--	6,572
Subalpine fir	1,637	--	--	--	--	--	--	472	2,109
Total softwoods	5,974	8,390	--	--	361	--	--	1,045	15,770
Aspen	--	--	--	--	--	--	--	--	--
Cottonwood	--	--	--	168	--	--	--	--	168
Total hardwoods	--	--	--	168	--	--	--	--	168
All species	5,974	8,390	--	168	361	--	--	1,045	15,938

Table 44--Area of woodland outside National Forests by forest type and ownership class in western Wyoming, 1984

Forest type	Ownership class		Total
	Other public	Private	
	----- Acres -----		
Pinyon-juniper	13,071	--	13,071
Juniper	218,407	129,973	348,380
Total woodland softwoods	231,478	129,973	361,451
Riparian ¹	--	4,145	4,145
Mountain brush	5,927	--	5,927
Other western hardwoods	--	--	--
Total woodland hardwoods	5,927	4,145	10,072
All types	237,405	134,118	371,523

¹Mountain brush and riparian hardwood forest types are shown separately on this table only. These types are included in the "other" forest type category on the remaining woodland tables.

Table 45--Area of woodland outside National Forests by ownership class forest type, and productivity class in western Wyoming, 1984

Ownership class	Forest type	Productivity class		All classes
		High	Low	
		----- Acres -----		
Other public:	Pinyon-juniper	13,071	--	13,071
	Juniper	131,774	86,633	218,407
	Other	5,927	--	5,927
	Total	150,772	86,633	237,405
Private:	Pinyon-juniper	--	--	--
	Juniper	102,912	27,061	129,973
	Other	--	4,145	4,145
	Total	102,912	31,206	134,118
Total:	Pinyon-juniper	13,071	--	13,071
	Juniper	234,686	113,694	348,380
	Other	5,927	4,145	10,072
	Total	253,684	117,839	371,523

Table 46--Area of woodland outside National Forests by ownership class, forest type, and volume class in western Wyoming, 1984

Ownership class	Forest type	Volume class				All classes
		0 - 499 cu ft/acre	500-999 cu ft/acre	1,000+ cu ft/acre	Acres	
Other public:	Pinyon-juniper	13,071	--	--	--	13,071
	Juniper	167,338	51,069	--	--	218,407
	Other	5,927	--	--	--	5,927
	Total	186,336	51,069	--	--	237,405
Private:	Pinyon-juniper	--	--	--	--	--
	Juniper	88,880	36,948	4,145	--	129,973
	Other	4,145	--	--	--	4,145
	Total	93,025	36,948	4,145	--	134,118
Total:	Pinyon-juniper	13,071	--	--	--	13,071
	Juniper	256,218	88,017	4,145	--	348,380
	Other	10,072	--	--	--	10,072
	Total	279,361	88,017	4,145	--	371,523

Table 47--Number of trees on woodland outside National Forests by ownership class, species, and diameter class in western Wyoming, 1984

Ownership class and species	Two-inch diameter at root collar class																All classes
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		
	----- Thousand trees -----																
Other public:																	
Pinyon	--	--	131	261	261	--	--	--	--	--	--	--	--	--	--	--	653
Juniper	16,718	4,627	3,709	3,704	2,440	2,322	1,229	2,655	1,585	1,021	885	730	510	131	713	42,979	
Mtn. mahogany	1,185	474	--	119	119	--	--	--	--	--	--	--	--	--	--	--	2,016
Other	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	17,903	5,101	3,840	4,084	2,820	2,441	1,229	2,655	1,585	1,021	885	730	510	131	713	45,648	
Private:																	
Pinyon	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Juniper	3,153	1,424	2,234	1,714	2,117	797	858	682	957	944	341	233	303	--	591	16,348	
Mtn. mahogany	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other	--	3,233	995	83	83	--	--	--	--	--	--	--	--	--	--	--	4,394
Total	3,153	4,657	3,229	1,797	2,200	797	858	682	957	944	341	233	303	--	591	20,742	
Total:																	
Pinyon	--	--	131	261	261	--	--	--	--	--	--	--	--	--	--	--	653
Juniper	19,871	6,051	5,943	5,418	4,557	3,119	2,087	3,337	2,542	1,965	1,226	963	813	131	1,304	59,327	
Mtn. mahogany	1,185	474	--	119	119	--	--	--	--	--	--	--	--	--	--	--	2,016
Other	--	3,233	995	83	83	--	--	--	--	--	--	--	--	--	--	--	4,394
Total	21,056	9,758	7,069	5,881	5,020	3,238	2,087	3,337	2,542	1,965	1,226	963	813	131	1,304	66,390	

Table 48--Net volume on woodland outside National Forests by species and ownership class in western Wyoming, 1984

Species	Ownership class		Total
	Other public	Private	
Douglas-fir	445	--	445
Limber pine	940	405	1,345
Cottonwood	459	--	459
Woodland softwoods	68,250	47,897	116,147
Woodland hardwoods	541	1,712	2,253
All species	70,635	50,014	120,649

Table 49--Net volume of woodland species on woodland outside National Forests by ownership class, species, and diameter class in western Wyoming, 1984

Ownership class and species	Two-inch diameter at root collar class														All classes	
	Thousand cubic feet															
	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		
Other public:																
Pinyon	--	137	604	717	--	--	--	--	--	--	--	--	--	--	--	1,458
Juniper	592	1,441	2,863	4,008	4,347	3,810	9,891	6,111	6,772	5,139	7,250	5,058	380	9,130	66,792	
Mtn. mahogany	93	--	73	139	236	--	--	--	--	--	--	--	--	--	541	
Other	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Total	685	1,578	3,540	4,864	4,583	3,810	9,891	6,111	6,772	5,139	7,250	5,058	380	9,130	68,791	
Private:																
Pinyon	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Juniper	206	1,159	1,668	3,050	1,985	2,371	2,808	5,603	6,923	2,778	2,278	4,949	--	12,119	47,897	
Mtn. mahogany	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other	793	696	73	149	--	--	--	--	--	--	--	--	--	--	1,711	
Total	999	1,855	1,741	3,199	1,985	2,371	2,808	5,603	6,923	2,778	2,278	4,949	--	12,119	49,608	
Total:																
Pinyon	--	137	604	717	--	--	--	--	--	--	--	--	--	--	--	1,458
Juniper	798	2,600	4,531	7,058	6,332	6,181	12,699	11,714	13,695	7,917	9,528	10,007	380	21,249	114,689	
Mtn. mahogany	93	--	73	139	236	--	--	--	--	--	--	--	--	--	541	
Other	793	696	73	149	--	--	--	--	--	--	--	--	--	--	1,711	
Total	1,684	3,433	5,281	8,063	6,568	6,181	12,699	11,714	13,695	7,917	9,528	10,007	380	21,249	118,399	

Table 50--Net volume of woodland species on woodland outside National Forests by ownership class, forest type, and productivity class in western Wyoming, 1984

Ownership class	Forest type	Productivity class		All classes
		High	Low	
- - - - <u>Thousand cubic feet</u> - - - -				
Other public:	Pinyon-juniper	3,974	--	3,974
	Juniper	38,105	26,170	64,275
	Other	541	--	541
	Total	42,620	26,170	68,790
Private:	Pinyon-juniper	--	--	--
	Juniper	43,475	4,423	47,898
	Other	--	1,711	1,711
	Total	43,475	6,134	49,609
Total:	Pinyon-juniper	3,974	--	3,974
	Juniper	81,580	30,593	112,173
	Other	541	1,711	2,252
	Total	86,095	32,304	118,399

Table 51--Net volume of woodland species on woodland outside National Forests by ownership class, forest type, and volume class in western Wyoming, 1984

Ownership class	Forest type	Volume class			All classes
		0 - 499 cu ft/acre	500-999 cu ft/acre	1,000+ cu ft/acre	
- - - - - <u>Thousand cubic feet</u> - - - - -					
Other public:	Pinyon-juniper	3,974	--	--	3,974
	Juniper	32,297	31,978	--	64,275
	Other	541	--	--	541
	Total	36,812	31,978	--	68,790
Private:	Pinyon-juniper	--	--	--	--
	Juniper	18,465	23,864	5,568	47,897
	Other	1,712	--	--	1,712
	Total	20,177	23,864	5,568	49,609
Total:	Pinyon-juniper	3,974	--	--	3,974
	Juniper	50,762	55,842	5,568	112,172
	Other	2,253	--	--	2,252
	Total	56,989	55,842	5,568	118,399

Table 52--Net dead volume of woodland species on woodland outside National Forests by ownership class, species, and diameter class in western Wyoming, 1984

Ownership class and species	Two-inch diameter at root collar class													All classes	
	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9		29.0+
----- Thousand cubic feet -----															
Other public:															
Pinyon	--	--	48	78	--	--	--	--	--	--	--	--	--	--	126
Juniper	3	47	146	508	327	952	1,240	1,381	753	1,046	1,280	1,075	2,288	5,787	16,833
Mtn. mahogany	17	21	--	21	--	--	--	--	--	--	--	--	--	--	59
Other	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	20	68	194	607	327	952	1,240	1,381	753	1,046	1,280	1,075	2,288	5,787	17,018
Private:															
Pinyon	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Juniper	1	62	7	249	492	667	138	421	653	373	244	1,215	--	2,673	7,195
Mtn. mahogany	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other	196	35	18	--	--	--	--	--	--	--	--	--	--	--	249
Total	197	97	25	249	492	667	138	421	653	373	244	1,215	--	2,673	7,444
Total:															
Pinyon	--	--	48	78	--	--	--	--	--	--	--	--	--	--	126
Juniper	4	109	153	757	819	1,619	1,378	1,802	1,406	1,419	1,524	2,290	2,288	8,460	24,028
Mtn. mahogany	17	21	--	21	--	--	--	--	--	--	--	--	--	--	59
Other	196	35	18	--	--	--	--	--	--	--	--	--	--	--	249
Total	217	165	219	856	819	1,619	1,378	1,802	1,406	1,419	1,524	2,290	2,288	8,460	24,462

Table 53--Net dead volume of woodland species on woodland outside National Forests by ownership class, forest type, and productivity class in western Wyoming, 1984

Ownership class	Forest type	Productivity class		All classes
		High	Low	
- - - Thousand cubic feet - - -				
Other public:	Pinyon-juniper	1,093	--	1,093
	Juniper	7,125	8,741	15,866
	Other	59	--	59
	Total	8,277	8,741	17,018
Private:	Pinyon-juniper	--	--	--
	Juniper	6,684	511	7,195
	Other	--	249	249
	Total	6,684	760	7,444
Total:	Pinyon-juniper	1,093	--	1,093
	Juniper	13,809	9,252	23,061
	Other	59	249	308
	Total	14,961	9,501	24,462

Table 54--Net dead volume of woodland species on woodland outside National Forests by ownership class, forest type, and volume class in western Wyoming, 1984

Ownership class	Forest type	Volume class			
		0 - 499 cu ft/acre	500-999 cu ft/acre	1,000+ cu ft/acre	All classes
- - - - - Thousand cubic feet - - - - -					
Other public:	Pinyon-juniper	1,094	--	--	1,094
	Juniper	4,928	10,937	--	15,865
	Other	59	--	--	59
	Total	6,081	10,937	--	17,018
Private:	Pinyon-juniper	--	--	--	--
	Juniper	4,203	2,563	429	7,195
	Other	249	--	--	249
	Total	4,452	2,563	429	7,444
Total:	Pinyon-juniper	1,094	--	--	1,094
	Juniper	9,131	13,500	429	23,060
	Other	308	--	--	308
	Total	10,533	13,500	429	24,462

Table 55--Net annual growth on woodland outside National Forests by species and ownership class in western Wyoming, 1983

Species	Ownership class		Total
	Other public	Private	
	- - - - - <u>Thousand cubic feet</u> - - - - -		
Douglas-fir	21	--	21
Limber pine	62	20	82
Cottonwood	9	--	9
Woodland softwoods	613	292	905
Woodland hardwoods	14	92	106
All species	719	404	1,123

Table 56--Net annual growth of woodland species on woodland outside National Forests by ownership class, species, and diameter class in western Wyoming, 1983

Ownership class and species	Two-inch diameter at root collar class														All classes
	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
----- Thousand cubic feet -----															
Other public:															
Pinyon	--	7	16	19	--	--	--	--	--	--	--	--	--	--	42
Juniper	43	42	62	54	51	38	73	48	48	23	42	23	1	23	571
Mtn. mahogany	5	--	2	3	4	--	--	--	--	--	--	--	--	--	14
Other	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	48	49	80	76	55	38	73	48	48	23	42	23	1	23	627
Private:															
Pinyon	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Juniper	21	21	26	34	21	17	20	32	36	13	7	19	--	25	292
Mtn. mahogany	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other	66	22	1	3	--	--	--	--	--	--	--	--	--	--	92
Total	87	43	27	37	21	17	20	32	36	13	7	19	--	25	384
Total:															
Pinyon	--	7	16	19	--	--	--	--	--	--	--	--	--	--	42
Juniper	64	63	88	88	72	55	93	80	84	36	49	42	1	48	863
Mtn. mahogany	5	--	2	3	4	--	--	--	--	--	--	--	--	--	14
Other	66	22	1	3	--	--	--	--	--	--	--	--	--	--	92
Total	135	92	107	113	76	55	93	80	84	36	49	42	1	48	1,011

Table 57--Net annual growth of woodland species on woodland outside National Forests by ownership class, forest type, and productivity class in western Wyoming, 1983

Ownership class	Forest type	Productivity class		All classes
		High	Low	
- - - Thousand cubic feet - - -				
Other public:	Pinyon-Juniper	64	--	64
	Juniper	363	186	549
	Other	14	--	14
	Total	441	186	627
Private:	Pinyon-Juniper	--	--	--
	Juniper	258	34	292
	Other	--	91	91
	Total	258	125	383
Total:	Pinyon-Juniper	64	--	64
	Juniper	621	220	841
	Other	14	91	105
	Total	699	311	1,010

Table 58--Net annual growth of woodland species on woodland outside National Forests by ownership class, forest type, and volume class in western Wyoming, 1983

Ownership class	Forest type	Volume class			All classes
		0 - 499 cu ft/acre	500-999 cu ft/acre	1,000+ cu ft/acre	
- - - - - Thousand cubic feet - - - - -					
Other public:	Pinyon-juniper	64	--	--	64
	Juniper	291	258	--	549
	Other	14	--	--	14
	Total	369	258	--	627
Private:	Pinyon-juniper	--	--	--	--
	Juniper	134	142	16	292
	Other	91	--	--	91
	Total	225	142	16	383
Total:	Pinyon-juniper	64	--	--	64
	Juniper	425	400	16	841
	Other	105	--	--	105
	Total	594	400	16	1,010

Table 59--Number of fenceposts on woodland outside National Forests by ownership class, species, and type of post in western Wyoming, 1984

Ownership class	Species	Type of post		Total
		Line	Corner	
- - - - <u>Thousand fenceposts</u> - - -				
Other public:	Juniper	3,749	1,520	5,269
Private:	Juniper	3,156	1,308	4,464
Total	Juniper	6,905	2,828	9,733

Conner, Roger C.; Pawley, W. Thomas. 1988. Timberland and woodland resources outside National Forests in western Wyoming, 1984. Resour. Bull. INT-51. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 61 p.

Highlights the timberland and woodland resources outside National Forests in western Wyoming. Presents statistical tables of area, volume, growth, and mortality as of 1984.

KEYWORDS: softwoods, hardwoods, growing-stock, sawtimber volumes, net annual growth, harvest

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Logging Utilization— Colorado, Wyoming, and Western South Dakota

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RESEARCH SUMMARY

Reports results of studies made on timber harvesting operations in Colorado, Wyoming, and western South Dakota to estimate logging residue (the component of slash consisting of growing-stock and sawtimber volume), non-inventory product volume (the component of timber products consisting of material other than growing-stock and sawtimber volume), and removals (the growing-stock and sawtimber volume removed from inventory in logging residue and timber products) associated with harvesting. Results show: factors that can be applied to product volumes to estimate removals, noninventory product volume, logging residue from product trees, and logging residue from nonproduct trees; the number and volume of trees by diameter at breast height class removed from growing-stock inventories per thousand cubic feet of product volume; the volume of residue in pieces 6 feet and longer to a 4-inch top as a proportion of product volume; and board-foot/cubic-foot conversion factors. This report also covers survey methods and data reliability.

Logging Utilization—Colorado, Wyoming, and Western South Dakota

William H. McLain

INTRODUCTION

The Forest Survey Unit of the Intermountain Research Station inventoried the non-National Forest lands in Colorado in 1982 and Wyoming and western South Dakota (that part of South Dakota west of the 103d meridian, including the Black Hills) in 1983 to estimate and describe the volume, growth, and mortality of the forests' trees. Timber product output, fuelwood harvest, and logging utilization studies were conducted concurrently with those inventories. The first two studies, timber product output and fuelwood harvest, provided estimates of log volumes harvested and delivered to primary wood processors (such as sawmills and houselog plants) and residences burning wood. The logging utilization studies provided the factors to convert these harvest estimates to estimates of removals associated with harvesting. These removals estimates, when compared to inventory volumes and growth, are used to estimate residual inventories and rates of inventory change associated with harvesting. The factors themselves provide a means to analyze the components of removals and, when compared to those developed in previous years, to ascertain changes in logging utilization practices.

This bulletin reports the results of logging utilization studies conducted in Colorado, Wyoming, and western South Dakota, their use, and the study methods. The report presents factors to apply to harvest estimates to obtain estimates of removals (the growing-stock and sawtimber volume removed from inventory), logging residue (the growing-stock and sawtimber volume of slash), diameter class distributions of the harvests, and the volume of residue in pieces 6 feet and longer.

The bulletin illustrates the factor formulas and the application of the factors and presents the derived estimates of logging residue, noninventory product volume, and removals for the three States.

Cubic-foot/board-foot conversions for both International 1/4-inch and Scribner rules are also included.

STUDY METHODS

Separate studies were conducted for each of the three States using the sampling and measurement techniques designed by A. K. Wilson of the Forest Survey Project at the Intermountain Station in 1959-60.

Sample Size and Distribution

Measurements were obtained on active sawlog and multiproduct logging operations, located on timberland,

visited in the summers of 1983 (Colorado) and 1984 (Wyoming and South Dakota). These operations, composing the basic sample units, were distributed throughout the States and were selected within four strata defined by land ownership and operator size class. Two ownership classes were used—National Forest and other. Operator size class corresponded to the production class of the wood processing plant receiving the logs harvested. Two size classes were used—small (less than 10 MM board feet per year) and large (10 MM board feet and more per year).

Sample size was calculated to achieve a standard error of the logging residue ratio (total net cubic foot volume of logging residues divided by the total net volume of timber products) of not more than ± 20 percent for each State.

The samples for each State were distributed throughout the strata in proportion to the estimated harvest volume occurring in each stratum. For instance, in Wyoming it was estimated that measurements from 17 logging operations would provide sufficient sample data to achieve a standard error of the ratio of 18 percent. Further, it was estimated that "large" mills (those with capacities of at least 10 MM board feet per year) received about 45 percent of the timber production and that 85 percent of the harvest occurred on National Forests. The 17 samples were distributed as close to these estimates as possible. Measurements were collected on eight logging operations (table 1) sending logs to "large" mills and 15 logging operations on National Forest lands.

Data Collection

The study design prescribed four basic measurements to be obtained from each sample unit to meet the primary objectives of computing removals and logging residue factors.

On each sample unit 10 to 30 felled and bucked product trees (trees felled for timber products) and a varying number of associated nonproduct trees (trees not selected for harvest; see Terminology) were measured to obtain the following:

1. Product volume
2. Noninventory volume in products
3. Volume of logging residue from product trees
4. Volume of logging residue from nonproduct trees

All measured trees were categorized as poletimber, sawtimber, (salvable) dead, cull, or nontimber (from other sources). Both gross (includes defect) and net volumes in cubic feet and board feet (International 1/4-inch rule and Scribner rule) were obtained by scaling. These

Table 1—Number of logging operations within each stratum measured to obtain logging residue data by State, year, and owner group

Colorado, 1983			
Stratum	Owner group		
	National Forest	Other	Total
---- Number of operations measured ----			
Mill size:			
Small	8	3	11
Large	12	2	14
Total	20	5	25

Wyoming, 1984			
Stratum	Owner group		
	National Forest	Other	Total
---- Number of operations measured ----			
Mill size:			
Small	8	1	9
Large	7	1	8
Total	15	2	17

South Dakota, 1984			
Stratum	Owner group		
	National Forest	Other	Total
---- Number of operations measured ----			
Mill size:			
Small	4	1	5
Large	8	1	9
Total	12	2	14

measurements were related to obtain factors (proportions) to apply to reported product volumes received by primary wood processors. Thus, all factors were calculated as proportions of live product volume or live and dead product volume (little product volume from dead trees was encountered on the logging operations measured and no product volume from cull or nontimber species was encountered).

Factor Formulas

$$\text{Logging residue factor} = \frac{\text{product tree residue volume}}{\text{live product volume}}$$

$$+ \frac{\text{nonproduct tree residue volume}}{\text{live + dead product volume}}$$

$$\text{Product tree residue factor} = \frac{\text{product tree residue volume}}{\text{live product volume}}$$

$$\text{Nonproduct tree residue factor} = \frac{\text{nonproduct tree residue volume}}{\text{live + dead product volume}}$$

$$\text{Noninventory product volume factor} = \frac{\text{noninventory product volume}}{\text{live product volume}}$$

$$\text{Inventory product volume factor} = \frac{\text{inventory product volume}}{\text{live product volume}}$$

or

$$\text{Inventory product volume factor} = 1 - \text{noninventory product volume factor}$$

$$\frac{\text{live product volume} - \text{noninventory product volume}}{\text{product tree residue volume}}$$

$$\text{Removals factor} = \frac{\text{live product volume}}{\text{live product volume}}$$

$$+ \frac{\text{nonproduct tree residue volume}}{\text{live + dead product volume}}$$

STUDY RESULTS

The factors presented in table 2 were used to derive the growing-stock and sawtimber removals estimates presented in tables 3 through 5.

Sawlog and Other Industrial Estimates

Primary wood processors provided annual estimates of the total sawlog and other industrial timber product volumes received at their plants (McLain 1985, 1987) and estimates of the proportion of that volume cut from dead trees. The volume from dead trees, exhibited in the "Salvable dead" column of tables 3-5, was subtracted from the timber product volume. The appropriate factors in table 2 were applied to the remainder ("Live" column, tables 3-5) to obtain the estimates of product volume from growing stock and sawtimber, the product volume from noninventory material in product trees, and the growing-stock and sawtimber volumes left as logging residue (product tree residue; and nonproduct tree residue resulting from the harvest of live product trees).

Additionally, the nonproduct tree residue factors were applied to the salvable dead product volumes to obtain the growing-stock and sawtimber volumes of nonproduct trees destroyed and killed while logging the salvable dead trees.

Table 2—Logging residue, noninventory product volume, and removals factors in cubic and board feet for Colorado, Wyoming, and western South Dakota

Type of factor	Colorado			Wyoming			South Dakota		
	Cubic	B.f.S. ¹	B.f.I. ²	Cubic	B.f.S. ¹	B.f.I. ²	Cubic	B.f.S. ¹	B.f.I. ²
Logging residue	0.072	0.022	0.021	0.064	0.016	0.015	0.077	0.015	0.014
Product tree residue	.065	.021	.020	.060	.016	.015	.075	.015	.014
Nonproduct tree residue	.007	.001	.001	.003	0	0	.002	0	0
Noninventory product volume	.005	.036	.038	0	.021	.022	0	.011	.010
Inventory product volume	.995	.964	.962	1	.979	.978	1	.989	.990
Growing-stock (cubic) or sawtimber removals (bd ft)	1.067	.987	.983	1.064	.994	.993	1.077	1.004	1.004

¹Board feet, Scribner rule.

²Board feet, International 1/4-inch rule.

Table 3—Timber production and timber removals for Colorado by source of material and product, 1983

Products and additional removals	Product volume				Noninventory product volume	Growing-stock removals
	Total ¹	Live	Salvable dead	Other ² sources		
----- <i>M cubic feet</i> -----						
Sawlogs	20,279	18,700	1,579	—	94	18,606
Other industrial	990	944	46	—	5	939
Total ¹	21,269	19,644	1,625	—	99	19,545
Fuelwood	40,375	3,990	29,869	6,516	20	3,970
Logging residue	—	—	—	—	—	1,425
Total ¹	61,644	23,634	31,494	6,516	119	24,940
----- <i>M board feet (Scribner)</i> -----						
Sawlogs	100,515	92,689	7,826	—	3,337	89,352
Other industrial	2,933	2,783	150	—	99	2,684
Total ¹	103,448	95,472	7,976	—	3,436	92,036
Fuelwood	164,776	19,407	145,283	86	698	18,708
Logging residue	—	—	—	—	—	2,108
Total ¹	268,224	114,879	153,259	86	4,134	112,852
----- <i>M board feet (International 1/4-inch)</i> -----						
Sawlogs	120,084	110,771	9,313	—	4,209	106,562
Other industrial	3,495	3,317	178	—	127	3,190
Total ¹	123,579	114,088	9,491	—	4,336	109,752
Fuelwood	196,824	23,182	173,539	103	881	22,301
Logging residue	—	—	—	—	—	2,405
Total ¹	320,403	137,270	183,030	103	5,217	134,458

¹Data may not add to totals due to rounding or truncating.

²Other sources board-foot volume contains only timber species from nonforest lands. Nontimber species have no board-foot volume.

Table 4—Timber production and timber removals for Wyoming by source of material and product, 1984

Products and additional removals	Product volume				Noninventory product volume	Growing-stock removals
	Total ¹	Live	Salvable dead	Other ² sources		
----- <i>M cubic feet</i> -----						
Sawlogs	29,496	27,934	1,562	—	—	27,934
Other industrial	522	430	92	—	—	430
Total ¹	30,019	28,364	1,655	—	—	28,363
Fuelwood	10,374	1,137	8,472	766	—	1,137
Logging residue	—	—	—	—	—	1,820
Total ¹	40,393	29,501	10,127	766	—	31,321
Sawtimber removals						
----- <i>M board feet (Scribner)</i> -----						
Sawlogs	146,022	138,287	7,735	—	2,904	135,383
Other industrial	1,076	645	430	—	14	631
Total ¹	147,098	138,932	8,165	—	2,918	136,014
Fuelwood	47,267	5,583	41,640	44	117	5,466
Logging residue	—	—	—	—	—	2,223
Total ¹	194,364	144,515	49,805	44	3,035	143,703
----- <i>M board feet (International 1/4-inch)</i> -----						
Sawlogs	174,496	165,253	9,243	—	3,636	161,617
Other industrial	1,285	771	514	—	17	754
Total ¹	175,781	166,024	9,757	—	3,653	162,371
Fuelwood	56,466	6,675	49,739	52	147	6,528
Logging residue	—	—	—	—	—	2,490
Total ¹	232,247	172,699	59,496	52	3,800	171,389

¹Data may not add to totals due to rounding or truncating.

²Other sources board-foot volume contains only timber species from nonforest lands. Nontimber species have no board-foot volume.

Fuelwood Estimates

Because the logging utilization data were not collected from fuelwood harvesting operations, some adjustments were made to estimate removals from growing stock and sawtimber associated with fuelwood harvesting. Non-inventory product volume factors were applied to fuelwood live product estimates, but logging residue factors were not. An assumption was that all the growing-stock volume in trees cut for fuelwood and in trees killed by such logging went into fuelwood (hence, no logging residue), and the fuelwood volume probably contained noninventory volume (magnitude unknown; so, for lack of anything else, we used noninventory volume factors developed from data collected on sawlog and other roundwood harvesting operations).

Use of Factors

The following illustrates the applications of the factors (table 2) to obtain a detailed analysis of noninventory product volume and the components of growing-stock removals for Colorado (M cubic feet; table 3).

Estimate of growing-stock removals:

From products:

Live product volume x inventory
product volume factor +
Live fuelwood volume x inventory
product volume factor

= Total growing-stock
removals from
products (TGSRP)

Table 5—Timber production and timber removals for western South Dakota by source of material and product, 1983

Products and additional removals	Product volume			Other ² sources	Noninventory product volume	Growing-stock removals
	Total ¹	Live	Salvable dead			
----- M cubic feet -----						
Sawlogs	22,160	21,931	229	—	—	21,931
Other industrial	951	951	—	—	—	951
Total ¹	23,111	22,883	229	—	—	22,883
Fuelwood	3,363	379	2,626	358	—	379
Logging residue	—	—	—	—	—	1,767
Total ¹	26,474	23,262	2,855	358	—	25,029
Sawtimber removals						
----- M board feet (Scribner) -----						
Sawlogs	115,417	114,226	1,191	—	1,256	112,970
Other industrial	547	547	—	—	6	541
Total ¹	115,964	114,773	1,191	—	1,262	113,511
Fuelwood	15,287	1,929	13,358	—	21	1,908
Logging residue	—	—	—	—	—	1,722
Total ¹	131,251	116,702	14,549	—	1,283	117,141
----- M board feet (International 1/4-inch) -----						
Sawlogs	135,961	134,558	1,403	—	1,346	133,213
Other industrial	644	644	—	—	6	638
Total ¹	136,606	135,203	1,403	—	1,352	133,851
Fuelwood	18,012	2,272	15,740	—	23	2,249
Logging residue	—	—	—	—	—	1,893
Total ¹	154,618	137,475	17,143	—	1,375	137,993

¹Data may not add to totals due to rounding or truncating.

²Other sources board-foot volume contains only timber species from nonforest lands. Nontimber species have no board-foot volume.

From logging residue:

$$\begin{aligned}
 &\text{Live product volume} \times \text{logging residue factor} + \\
 &\text{Dead product volume} \times \text{non-product tree residue factor} = \text{Total growing-stock removals from logging residues (TGSRLR)}
 \end{aligned}$$

Total removals from growing-stock = TGSRP + TGSRLR

or:

From products:

$$\begin{aligned}
 19,644 \times 0.995 &= 19,545 \\
 3,990 \times 0.995 &= 3,970 \\
 \text{Total TGSRP} &= \underline{23,515}
 \end{aligned}$$

From logging residue:

$$\begin{aligned}
 19,644 \times 0.072 &= 1,414 \\
 1,625 \times 0.007 &= 11 \\
 \text{Total TGSRLR} &= \underline{1,425} \\
 \text{Total removals from growing stock} &= \underline{24,940}
 \end{aligned}$$

Estimate of noninventory product volume harvested:

$$\begin{aligned}
 &\text{Live product volume} \times \text{noninventory product volume factor} + \\
 &\text{Live fuelwood volume} \times \text{noninventory product volume factor} = \\
 &\text{Noninventory product volume harvested} \\
 19,644 \times 0.005 &= 98 \\
 3,990 \times 0.005 &= 20 \\
 \text{Noninventory product volume harvested} &= 118
 \end{aligned}$$

Alternative

To estimate total removals only, the following procedure could be used:

From products and logging residue (live sawlog and other)

Live product volume x removals factor +

From logging residue (dead sawlog and other)

Dead product volume x nonproduct tree residue factor +

From products (live fuelwood)

Live fuelwood volume x inventory

product volume factor = Growing-stock removals

or:

From products and logging residue

19,644 x 1.067 = 20,960

From logging residue

1,625 x 0.007 = 11

From products

3,990 x 0.995 = 3,970

Growing stock removals =

24,941

(does not equal
table 3 due
to rounding)

Product Volume From Other Sources

Estimates of product volume cut from nonforest land and nontimber species, labeled "Other sources" in tables 3-5, were obtained in the same manner as the salvable dead estimates. They came directly from the wood processors and fuelwood harvesters, not by application of factors to reported product volumes. Tables 3-5 show that fuelwood was the only product derived in any measurable volume from other sources.

Discussion of Factors

In all three States, the growing-stock (cubic) removals factor exceeds 1 (table 2). This means that residue exceeded noninventory product volume. In most instances, the top logs were bucked short of (below) a 4-inch top diameter outside bark (d.o.b.), often at 7 or 6 inches, or even, less frequently, at 5 inches d.o.b. The wood in the upper stems between the 7-, 6-, or 5-inch top d.o.b. and the

4-inch top d.o.b. is left in the woods as residue. This residue is a removal from inventory, not reflected in product volume.

The sawtimber removals factor is less than 1 in Colorado and Wyoming and only slightly exceeds 1 (1.004) in South Dakota. This is due to the harvest of trees of less than sawtimber size. The resulting board-foot product volume from these trees is not board-foot volume removed from the sawtimber inventory; in other words, it is not sawtimber removals by Forest Survey standards. It is, however, cubic-foot growing-stock removals.

Table 6 exhibits removals factors for the three States from data collected in 1969 (Setzer 1973) compared to that collected in 1983-84. Colorado's current factors are 0.03 and 0.05 less than those of 1969, indicating more noninventory product volume or less residue now than then, or perhaps both. Wyoming's cubic volume factor is about the same as 1969's, while its sawtimber removals factor increased by 0.064. South Dakota's removals factors increased 0.039 (cubic) and 0.02 (board-foot) over 1969's. These increases might reflect a diminished harvest of trees less than sawtimber size (no pulpwood) or decreased utilization of the upper stems, or both.

LOGGING RESIDUE VOLUME IN PIECES 6 FEET AND LONGER

Table 7 contains the cubic volume of product tree residue in sound pieces ≥ 6 feet in length to a 4-inch top, the factors used to derive the volume estimates, and the proportion of product trees that produced residues ≥ 6 feet in length to a 4-inch top. The factors were derived from the logging utilization data by dividing the product tree residue volume in pieces ≥ 6 feet in length to a 4-inch top by the product volume from live trees. The factors are merely the residue volume expressed as a proportion of product volume. Multiplying the factors by the product volume from live timber trees reported by wood processors produces an estimate of residue volume in sound pieces ≥ 6 feet. Additional residue volume in pieces 6 feet and longer is often available from nonproduct trees damaged or killed by felling or skidding.

The proportion of trees measured that produced residue in pieces 6 feet and longer may be indicative of the degree of utilization; the lower the proportion, the higher the utilization.

Table 6—Removal factors by Forest Survey standards to estimate total net removals from inventory due to logging in Colorado, Wyoming, and western South Dakota, 1983-84 compared to factors computed in 1969

Factor	Colorado			Wyoming			Western South Dakota		
	1969	1983	Diff.	1969	1984	Diff.	1969	1984	Diff.
Growing-stock removals (cubic)	1.100	1.067	(-.033)	1.070	1.064	(-.006)	1.038	1.077	(.039)
Sawtimber removals (bd ft)	1.035	.983	(-.052)	.929	.993	(.064)	.984	1.004	(.020)

Table 7—Volume of, proportion of harvest volume (factor) in, and proportion of product trees containing logging residues to a 4-inch top in pieces 6 feet and longer, Colorado (1983), Wyoming (1984), and South Dakota (1984)

State	Residue volume in pieces 6 feet and longer (MCF)	Factor ¹ for residue volume in pieces 6 feet and longer	Proportion of product trees producing residue volume in pieces 6 feet and longer
Colorado	923	0.047	0.420
Wyoming	1,418	.050	.728
South Dakota	1,419	.062	.927

¹Apply to product volume.

Comparing the proportions from table 7 for 1983 and 1984 to those of 1969 (Setzer 1973), it appears as if the utilization practices in Colorado and South Dakota flipped. The degree of utilization of the product trees is now higher in Colorado than in South Dakota:

	1969	1983-84
Colorado	0.90	0.42
Wyoming	.68	.73
South Dakota	.47	.93

DIAMETER CLASS DISTRIBUTION OF TREES HARVESTED OR DAMAGED

Information on the number of growing-stock trees harvested or destroyed (and, therefore, removed from the inventory) in each diameter class and their associated volumes is useful for computing diameter class cutting rates, which in turn are useful for projecting residual inventory, growth, and yield. Logging utilization data provide an estimate of the distribution of trees removed in relation to the volume of logs harvested. Tables 8-10 present the total number and volume of growing-stock trees (product and nonproduct trees) removed per thousand cubic feet of product volume (excluding fuelwood) from live trees. These diameter distributions, which are statewide averages, may be applied to reported harvest volumes to determine removals by diameter class or be compared to previous years to determine change.

In Colorado, for instance, there appears to be a bulge in the harvest of 8- to 16-inch trees now compared to the 1969 harvest (table 8).

Table 8—Diameter at breast height (d.b.h.) class distribution of the number and volume of growing-stock trees removed from inventory through harvesting per MCF of net product volume, Colorado, 1983—the number of trees removed in 1969 provided for comparison. The 1969 volume by d.b.h. class is unavailable

D.b.h. class	Number of growing-stock trees		Volume of growing-stock trees in cubic feet, 1983
	1969	1983	
2	8.70	2.82	—
4	8.12	3.24	—
6	2.68	1.52	4.75
8	2.75	5.23	47.24
10	2.94	7.58	104.40
12	2.37	7.44	149.58
14	3.32	6.47	181.46
16	2.05	4.06	157.56
18	2.24	2.27	110.25
20	1.53	.90	57.85
22	.77	.48	33.74
24	.77	.83	75.61
26	.70	.83	84.02
28	.45	.41	48.21
30+	.90	.14	12.81
All classes	40.29	44.22	1,067.49

Table 9—Diameter at breast height (d.b.h.) class distribution of the number and volume of growing-stock trees removed from inventory through harvesting per million cubic feet of net product volume, Wyoming, 1984—the number of trees removed in 1969 provided for comparison. The 1969 volume by d.b.h. class is unavailable

D.b.h. class	Number of growing-stock trees		Net volume of growing-stock trees in cubic feet, 1984
	1969	1984	
2	15.32	3.67	—
4	10.97	2.94	—
6	3.65	.94	2.62
8	3.48	4.51	40.94
10	4.70	9.34	133.54
12	7.14	9.03	196.32
14	11.49	5.46	162.20
16	2.61	3.36	143.20
18	2.26	2.20	122.20
20	.87	1.78	143.62
22	.17	.63	61.10
24	.52	.52	59.11
26	.17	—	—
28	.52	—	—
30+	.52	—	—
All classes	64.40	44.41	1,064.88

Table 10—Diameter at breast height (d.b.h.) class distribution of the number and volume of growing-stock trees removed from inventory through harvesting per million cubic feet of net product volume, western South Dakota, 1984—the number of trees removed in 1969 provided for comparison. The 1969 volume by d.b.h. class is unavailable

D.b.h. class	Number of growing-stock trees		Net volume of growing-stock trees in cubic feet, 1984
	1969	1984	
2	33.29	0.34	—
4	18.59	2.57	—
6	4.39	.67	1.79
8	6.93	2.68	21.35
10	5.41	7.04	88.86
12	6.25	10.17	198.50
14	7.27	6.37	175.48
16	4.73	6.04	222.64
18	3.21	2.91	142.51
20	1.69	1.12	81.70
22	.68	.78	71.53
24	—	.56	61.58
26	—	.11	13.75
28	—	—	—
30+	.17	—	—
All classes	92.61	41.35	1,079.69

Table 11—Product volume conversion factors for Colorado, Wyoming, and western South Dakota

	Colorado	Wyoming	South Dakota	
1 cubic foot equals	4.8625	4.9146	5.0868	board feet (Scribner)
1 cubic foot equals	5.8096	5.8714	5.9944	board feet (International 1/4-inch)
1 board foot equals (Scribner)	1.1948	1.1947	1.1784	board feet (International 1/4-inch)

PRODUCT VOLUME CONVERSIONS

The conversion factors in table 11 were estimated from logging utilization data derived from measurements obtained on the sawlog and multiproduct harvesting operations composing the sample for each State. They are thus State-wide averages, reflecting average conversion for the harvest of the product mix encountered on the samples measured. Caution is recommended in applying these factors to State subdivisions or to harvests of a narrow range of products of small size, such as posts or fuelwood, or sawlogs of exceptionally large diameters (see tables 8-10).

RELIABILITY OF ESTIMATES

The computation of the standard error of the various residues and utilization percentages employs the formula

for the standard error of a ratio (Wilson 1965), which may be stated:

$$S_r = \sqrt{\frac{\bar{r}^2}{n} \left[\frac{\sum(y_i - \bar{y})^2}{(n-1)y^2} + \frac{\sum(x_i - \bar{x})^2}{(n-1)x^2} - \frac{2\sum(x_i - \bar{x})(y_i - \bar{y})}{(n-1)\bar{y}\bar{x}} \right]}$$

where

y = logging residues measured on an operation (net volume)

x = timber products measured on an operation (net volume)

\bar{r} = $\frac{\sum y}{\sum x}$ = logging residues ratio

Table 12—Achieved standard errors of the logging residue volumes/product volume ratios and the standard errors as percentages of the ratios

	Colorado		Wyoming		South Dakota	
	Sr	SE(%)	Sr	SE(%)	Sr	SE(%)
Cubic foot	0.0086	11.91	0.0080	12.57	0.0113	14.67
Board foot, Scribner	.0044	19.16	.0033	19.68	.0032	21.09
Board foot, International 1/4-inch	.0041	18.81	.0033	20.74	.0030	21.62

n = total number of operations sampled

$$\bar{y} = \frac{\Sigma y}{n}$$

$$\bar{x} = \frac{\Sigma x}{n}$$

$$S_y^2 = \text{variance for } y = \frac{\Sigma(y_i - \bar{y})^2}{n - 1}$$

$$S_x^2 = \text{variance for } x = \frac{\Sigma(x_i - \bar{x})^2}{n - 1}$$

$$\text{Cov.}(yx) = \text{covariance of } y \text{ and } x = \frac{\Sigma(y - \bar{y})(x - \bar{x})}{n - 1}$$

$$S_{\bar{r}}^2 = \text{variance for } \bar{r} = \frac{\bar{r}^2}{n} \left[\frac{S_y^2}{\bar{y}} + \frac{S_x^2}{\bar{x}} - \frac{2 \text{Cov.}(yx)}{\bar{y}\bar{x}} \right]$$

$$S_r = \sqrt{S_{\bar{r}}^2} = \text{standard error of the ratio } (\bar{r})$$

$$\text{SE}(\%) = \frac{S_r}{\bar{r}} \times 100 = \text{standard error of the ratio as a percentage of the ratio.}$$

Table 12 gives the achieved standard errors of the logging residue volumes/product volumes ratios and the standard errors as percentages of the ratios.

TERMINOLOGY

Cubic-foot/board-foot conversions—The cubic-foot volume in product logs compared to the board-foot volume in the same logs.

Dead product volume—Same as salvable dead volume. The cubic volume in dead poletimber-size and sawtimber-size trees of timber species from a 1-foot stump to a minimum 4-inch top d.o.b. The board-foot volume in dead sawtimber-size trees of timber species between a 1-foot-high stump and a 7-inch d.o.b. top (softwoods) or 9-inch d.o.b. top (hardwoods).

Forest lands—Lands at least 10 percent stocked by forest trees of any size, including lands that formerly had such tree cover and that will be naturally or artificially regenerated. The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelter-

belt strips of timber must have a crown width at least 120 feet wide to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 feet wide.

Forest trees—Woody plants having a well-developed stem or stems, usually more than 12 feet in height at maturity, with a generally well-defined crown.

Growing-stock product volume—The growing-stock volume in timber products such as sawlogs, posts, poles, pulpwood, fuelwood, and house logs.

Growing-stock removals (in this publication)—The growing-stock volume removed from inventory by harvesting. Consists of logging residue and the growing-stock volume of products.

Growing-stock trees (in this publication)—Live sawtimber trees and poletimber trees meeting specified standards of quality and vigor; excludes cull trees.

Growing-stock volume—Net cubic-foot volume in live poletimber-size and sawtimber-size growing-stock trees from a 1-foot stump to a minimum 4-inch top (of central stem) outside bark or to the point where the central stem breaks into limbs.

Industrial wood products—All timber products except fuelwood.

Inventory product volume—The growing-stock or sawtimber volume in timber products.

Live product volume—Product volume minus salvable dead and other sources.

Logging residue—The unused growing-stock or sawtimber volume of trees cut or killed by logging and left in the woods.

Noninventory product volume—The cubic volume of timber products that came from the upper stems (beyond the 4-inch top d.o.b.) or below the 1-foot-high stumps of growing-stock product trees; the board-foot volume in timber products that came from poletimber trees and below the 1-foot-high stump of sawtimber trees; the product volume of cull trees.

Non-National Forest lands—Lands not administered by the Forest Service, U.S. Department of Agriculture.

Nonproduct tree residue—The growing-stock or sawtimber volume of nonproduct trees cut, killed, or damaged while felling or skidding product trees. This volume is left in the woods. It is a component of slash.

Nonproduct trees—Those trees cut, killed, knocked down, or destroyed due to felling and skidding the product trees.

Other sources—Product volume from nontimber species (such as juniper and, in the West, oak) and trees harvested on nonforest land (such as urban streets, orchards, and windbreaks).

Poletimber trees—Live trees of timber species at least 5 inches diameter at breast height (d.b.h.) but smaller than sawtimber size.

Product tree residue—The unused growing-stock or sawtimber volume of product trees that is left in the woods.

Product trees—Those trees selected for harvest.

Product volume—The cubic-foot or board-foot volume in timber products such as sawlogs, posts, poles, pulpwood, fuelwood, and house logs. Product volume comprises volume from salvable dead trees, other sources, and the noninventory and growing-stock (or sawtimber) volume from growing-stock trees.

Removals—The growing-stock and sawtimber volume removed from the inventory by harvesting. Consists of logging residue and the growing-stock and sawtimber volume of products.

Residual inventory (in this publication)—The growing-stock and sawtimber volume remaining after the inventory is reduced through removals due to harvest.

Salvable dead trees—Standing or down dead trees of timber species that are merchantable by regional standards.

Salvable dead volume—The cubic volume in dead poletimber-size and sawtimber-size trees of timber species from a 1-foot stump to a minimum 4-inch top d.o.b. The board-foot volume in dead sawtimber-size trees of timber species between a 1-foot-high stump and a 7-inch d.o.b. top (softwoods) or 9-inch d.o.b. top (hardwoods).

Sawlog portion—That part of the bole of sawtimber trees between a 1-foot stump and the sawlog top.

Sawlog top—The portion on the bole of sawtimber trees above which a sawlog cannot be produced. The minimum sawlog top is 7 inches d.o.b. for softwoods and 9 inches d.o.b. for hardwoods.

Sawtimber product volume—The sawtimber volume in timber products.

Sawtimber removals (in this publication)—The sawtimber volume removed from inventory by harvesting. Consists of logging residue and the sawtimber volume of products.

Sawtimber trees—Live trees of timber species meeting regional size and defect specifications. Softwood trees must be at least 9 inches d.b.h. and hardwood trees 11 inches d.b.h.

Sawtimber volume—Net volume in board feet of the sawlog portion of live sawtimber trees.

Slash—The wood volume cut or killed as a result of logging and left in the woods (not hauled out as timber products). Slash consists of logging residue (growing-stock and sawtimber volume) and noninventory volume (such as tree tops, limbs, cull trees, dead trees, and nontimber trees).

Timberland—Forest land where timber species make up at least 10 percent stocking.

Timber products—Roundwood products such as sawlogs, posts, poles, pulpwood, fuelwood, veneer logs, and house logs.

Timber removals—Same as “Removals.”

Timber species—Trees traditionally used for industrial wood products. In the Rocky Mountains, these include aspen and cottonwood hardwood species and all softwood species except pinyon and juniper.

Total removals (associated with harvesting)—Comprises the growing-stock (or sawtimber) volume contained in products, the product tree logging residue, and the nonproduct tree logging residue.

REFERENCES

- McLain, William H. 1985. Colorado's industrial roundwood production and mill residues, 1982. Resour. Bull. INT-35. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 13 p.
- McLain, William H. 1987. Wyoming and western South Dakota timber production and mill residues, 1983. Resour. Bull. INT-45. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 32 p.
- Setzer, Theodore S. 1973. Logging residues on harvesting operations, western South Dakota, Wyoming, Utah, and Colorado. Res. Pap. INT-135. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 13 p.
- Wilson, A. K. 1965. Work plan for logging residues studies in the Rocky Mountain States. On file at: U.S. Department of Agriculture, Forest Service, Intermountain Research Station, Forest Survey Research Work Unit, Ogden, UT. 40 p.

McLain, William H. 1988. Logging utilization—Colorado, Wyoming, and western South Dakota. Resour. Bull. INT-52. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 10 p.

Reports results of studies made of timber harvesting operations in Colorado, Wyoming, and western South Dakota to derive factors used to estimate logging residue, growing stock and sawtimber removals, diameter class distribution of harvests, and board-foot/cubic-foot conversions.

KEYWORDS: timber removals, growing-stock removals, sawtimber removals, cubic/board-foot conversions, logging residue

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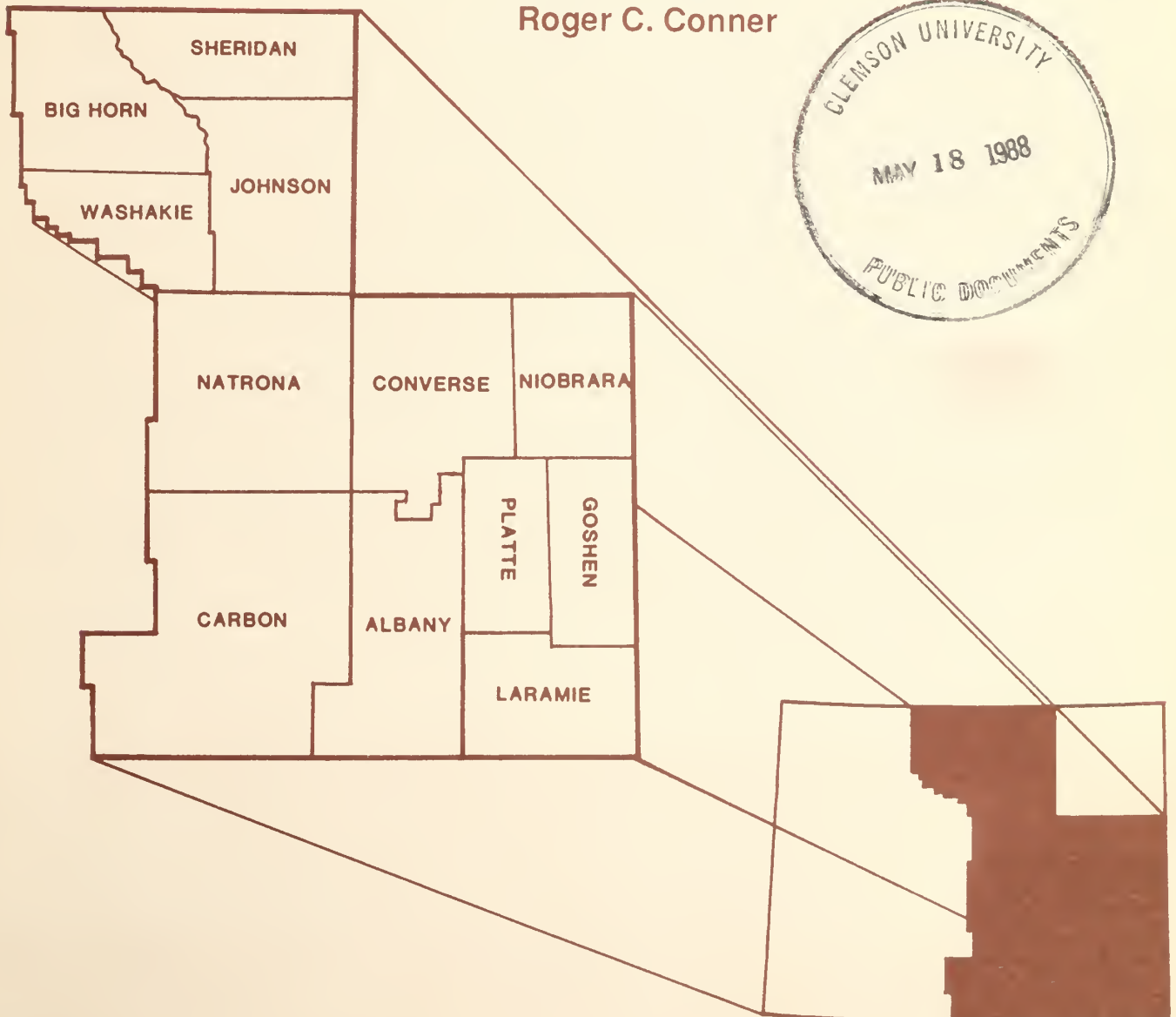
Intermountain
Research Station

Resource Bulletin
INT-53



Timberland and Woodland Resources Outside National Forests in Central and Southeastern Wyoming, 1984

Alan W. Green
Roger C. Conner



PREFACE

Forest Survey is a continuing nationwide undertaking conducted by the Forest Service, U.S. Department of Agriculture, with the primary objective of providing an assessment of the renewable resources on the Nation's forests.

This requires periodic State-by-State resource inventories. Originally, Forest Survey was authorized by the McSweeney-McNary Act of 1928. The current authorization is through the Renewable Resources Research Act of 1978.

The Intermountain Research Station, with headquarters in Ogden, UT, administers the forest resource inventories for the Rocky Mountain States of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, Wyoming, western South Dakota, western Texas, and Oklahoma's Panhandle. These inventories provide information on the extent and condition of State and privately owned forest lands, volume of timber, and rates of timber growth and mortality. These data, when combined with similar information for Federal lands, provide a basis for forest policies and programs and for the orderly development and use of the resources.

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This report is the result of the combined efforts of numerous people on the Forest Survey staff. In addition to the photo interpretation and field crews, several individuals played key roles in the reduction of basic data into information describing the extent, nature, and condition of the forest resources in Wyoming: Dennis Collins supervised the data collection; Sharon Woudenberg and Shirley Waters compiled the data and made summaries; and Susan Brown transformed the data summaries into tables of information. And we extend a special note of gratitude to the private land owners who allowed the field crews access to the sample locations on their properties.

RESEARCH SUMMARY

Highlights the results of forest inventory of the 12 counties in central and southeastern Wyoming. Presents area, volume, growth, and mortality statistics for both timberland and woodlands outside the National Forests as of 1984.

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Intermountain Research Station
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Timberland and Woodland Resources Outside National Forests in Central and Southeastern Wyoming, 1984

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INTRODUCTION

For the latest inventory of the forest land in Wyoming, completed in 1983, the State was divided into three multicounty Sample Areas. Within those Sample Areas all nonreserved forest lands, including woodland, not under the administration of the Forest Service, were inventoried.

Sample Area 2, the subject area of this report, is second largest in geographic area and comprises 12 counties in the central and southeastern portions of the State (fig. 1). Sample Areas 1 and 3 cover the rest of the State and are subjects of separate reports.

Data in this report pertain only to the lands outside the National Forests. Data for public lands administered by agencies such as the USDI Bureau of Land Management (BLM) and the State of Wyoming are included along with those for privately owned lands.

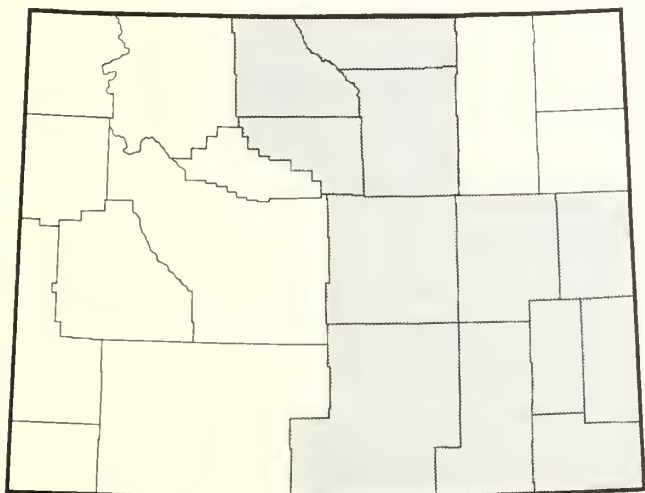


Figure 1—Sample Area 2, central-southeastern Wyoming.

HIGHLIGHTS

Area, Forest Type, and Stand Size

Land area outside the National Forests is approximately 25.4 million acres, of which some 1.3 million are forest. Much of the forest land is found in the higher elevations, primarily in the Bighorn, Laramie, and Medicine Bow Mountains (fig. 2). (See table 1 for total land and water area by ownership class.)

Roughly 79 percent of the forest land is timberland and is predominantly privately owned. The 281,000 acres of woodlands are largely on public land.

Three major forest types, ponderosa, lodgepole, and limber pine, make up about three-fourths of the timberland. The ponderosa pine forest type alone accounts for nearly half the timberland.



Figure 2—General geographic location of forest land.

Woodlands are predominantly Rocky Mountain juniper (*Juniperus scopulorum*), but about 10 percent are hardwoods, primarily in riparian zones along streams.

Productivity of the timberland is relatively low. Only about 20 percent can produce more than 50 cubic feet of usable wood per acre per year, and 11 percent cannot produce 20 cubic feet per acre.

Roughly 39 percent of the higher site timberland (capable of producing in excess of 50 cubic feet) is occupied by hardwoods. Spruce-fir and lodgepole pine are the major softwood forest types on better sites.

Sawtimber-size stands are the rule, making up 50 percent or more of the timberlands. About 194,000 acres of the timberland (nearly a fifth of the total) are nonstocked.

Privately owned timberland has a higher proportion in sawtimber stands than other publicly owned land.

Volume

Ponderosa pine (*Pinus ponderosa*) and lodgepole pine (*P. contorta*) account for about 65 percent of the softwood and 57 percent of the growing-stock volume.

Aspen (*Populus tremuloides*) has 9 percent of the total and 76 percent of hardwood growing-stock volume.

Volumes per acre in sawtimber stands tend to be low; 80 percent of the timberland has less than 5,000 board feet (International 1/4-inch rule) per acre, and half the area has less than 1,500 board feet per acre.

The total net volume in timberland trees is slightly more than 1 billion cubic feet, 996 million in growing-stock trees. There are about 58.5 million cubic feet in salvable dead trees.

Some 868 million cubic feet (87 percent of the growing-stock volume) is in softwood species. Softwood sawtimber volume is about 2.8 billion board feet (International 1/4-inch rule).

Ponderosa and lodgepole pine make up 57 percent of the growing-stock volume.

Coniferous trees on timberland tend to be small; 83 percent of the softwood growing-stock trees are less than 9 inches diameter at breast height (d.b.h.).

The average d.b.h. of trees with measurable volume (5 inches d.b.h. and larger) is about 9 inches. The average diameter of sawtimber size trees (9 inches d.b.h. and larger) is about 13 inches.

Because of the small tree sizes, two-thirds of the sawtimber volume is in trees less than 17 inches d.b.h.

Net volume on woodlands is roughly 116.6 million cubic feet including some 3.5 million cubic feet in ponderosa and limber pine growing in woodlands.

Woodland volume is split about evenly between juniper and hardwoods.

COMPONENTS OF CHANGE

Growth

In 1983 the net annual growth of growing stock was about 20.5 million cubic feet; sawtimber growth was over 75 million board feet (International 1/4-inch rule). Most of it was in softwood species and over half of it on private land.

Around 89 percent of the growing-stock growth was on trees less than 15 inches d.b.h.

Sawtimber growth was concentrated in trees less than 17 inches d.b.h. (88 percent), and over 70 percent was on trees less than 13 inches d.b.h.

Mortality

In 1983 approximately 4.1 million cubic feet of growing stock died, 58 percent of it in softwood species. Nearly all the hardwood mortality was in aspen (1.4 million cubic feet).

Ponderosa pine and Douglas-fir (*Pseudotsuga menziesii*) accounted for virtually all of the softwood sawtimber mortality of 6.9 million board feet (International 1/4-inch rule).

The major identifiable causes of mortality were animal, weather, fire, and disease.

Removals

In 1983 nearly 10 million cubic feet of growing stock and approximately 58 million board feet (International 1/4-inch rule) of sawtimber were removed from timberlands, including the National Forests (McLain 1987). That was about a third of the removals in the State.

Nearly 70 percent came from public lands in Albany and Carbon Counties. Less than 6 percent of the total came from private land.

About 8 million board feet (International 1/4-inch rule) (14 percent of the total) came from lands outside the National Forests, and of that nearly 39 percent came from private land.

Roughly 70 percent of the total removals were lodgepole pine.

HOW THE INVENTORY WAS CONDUCTED

The inventory was designed to provide reliable statistics primarily at the State and Sample Area levels.

Prefield

Primary area estimates were based on the classification of 113,079 sample points systematically placed on the latest aerial photographs available. The photo points, adjusted to meet known land areas by owner class, were used to stratify and compute expansion factors for the field sample data.

Field

Land classification and estimates for forest characteristics and volume were based on observations and measurements recorded at 4,090 ground sample locations, of which 192 were forested. Sample trees on timberland plots were selected using five-point cluster, which included 1/300-acre field radius plots for trees less than 5 inches d.b.h. and variable radius plots (40 BAF) for trees 5 inches or larger.

Sample trees on woodland plots were selected using a $\frac{1}{5}$ -, $\frac{1}{10}$ -, or $\frac{1}{20}$ -acre fixed plot for trees 3 inches diameter at root collar (d.r.c.) and larger. Trees less than 3 inches d.r.c. were tallied on a $\frac{1}{100}$ -acre subplot.

Compilation

All photo and field data were entered into a computer for editing, computation, and tabulation. Final estimates from these data were based on statistical summaries, a portion of which is included in this bulletin. Volume and defect were computed using equations developed by Edminster and others (1980, 1981), Kemp (1958), Chojnacky (1985), Meyers (1964), Meyers and Edminster (1972). Defect for woodland species was computed from field observations.

DATA RELIABILITY

Individual cells within tables should be used with caution. Some are based on small sample sizes, which may result in high sampling errors. The standard error percentages shown in tables 2 and 3 were calculated at the 67 percent confidence level.

STANDARD FOREST SURVEY TERMINOLOGY

Acceptable trees—Growing-stock trees meeting specified standards of size and quality, but not qualifying as desirable trees.

Area condition class—A classification of timberland reflecting the degree to which the site is being utilized by growing-stock trees and other conditions affecting current and prospective timber growth (see Stocking):

Class 10—Areas fully stocked with desirable trees and not overstocked.

Class 20—Areas fully stocked with desirable trees, but overstocked with all live trees.

Class 30—Areas medium to fully stocked with desirable trees and with less than 30 percent of the area controlled by other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

Class 40—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees, or conditions that ordinarily prevent occupancy by desirable trees, or both.

Class 50—Areas poorly stocked with desirable trees, but fully stocked with growing-stock trees.

Class 60—Areas poorly stocked with desirable trees, but with medium to full stocking of growing-stock trees.

Class 70—Areas nonstocked or poorly stocked with desirable trees, and poorly stocked with growing-stock trees.

Class 80—Low-risk old-growth stands.

Class 90—High-risk old-growth stands.

Nonstocked—Areas less than 10 percent stocked with growing-stock trees.

Basal area—The cross-sectional area of a tree expressed in square feet. For timber species the calculation is based on diameter at breast height (d.b.h.); for woodland species it is based on diameter at root collar (d.r.c.).

Christmas tree grade—Pinyon species are classified as Christmas trees using the following guidelines:

Premium—Excellent conical form with no gaps in branches and a straight bole.

Standard—Good conical form with small gaps in branches and bole slightly malformed.

Utility—Conical in form with branches missing and bole bent or malformed.

Cull—Not meeting one of the above classifications or over 12 feet in height.

Cord—A pile of stacked wood equivalent to 128 cubic feet of wood and air space having standard dimensions of 4 by 4 by 8 feet.

Cull trees—Live trees that are unmerchantable now or prospectively (see Rough tree and Rotten tree).

Cull volume—Portions of a tree's volume that are not usable for wood products because of rot, missing or dead material, or other cubic-foot defect.

Deferred forest land—Forest lands within the National Forest System that are under study for possible inclusion in the Wilderness System.

Desirable trees—Growing-stock trees (1) having no serious defect in quality to limit present or prospective use for timber products, (2) of relatively high vigor, and (3) containing no pathogens that may result in death or serious deterioration within the next decade.

Diameter at breast height (d.b.h.)—Diameter of the stem measured at 4.5 feet above the ground.

Diameter at root collar (d.r.c.)—Diameter equivalent at the point nearest the ground line that represents the basal area of the tree stem or stems.

Diameter classes—Tree diameters, either d.b.h. or d.r.c., grouped into 2-inch classes labeled by the midpoint of the class.

Farmer/rancher-owned lands—Lands owned by a person who operates a farm or a ranch and who either does the work or directly supervises the work.

Forest industry lands—Lands owned by companies or individuals operating a primary wood-processing plant.

Forest land—Land at least 10 percent stocked by forest trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated. The minimum area for classification of forest land is 1 acre. Roadside, streamside, and

- shelterbelt strips of timber must have a crown width at least 120 feet wide to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 feet wide.
- Forest trees*—Woody plants having a well-developed stem or stems, usually more than 12 feet in height at maturity, with a generally well-defined crown.
- Forest type*—A classification of forest land based upon and named for the tree species presently forming a plurality of live-tree stocking.
- Gross annual growth*—The average annual increase in the net volume of trees during a specified period.
- Growing-stock trees*—Live sawtimber trees, poletimber trees, saplings, and seedlings of timber species meeting specified standards of quality and vigor; excludes cull trees.
- Growing-stock volume*—Net cubic-foot volume in live poletimber-size and sawtimber-size growing-stock trees from a 1-foot stump to a minimum 4-inch top (of central stem) outside bark or to the point where the central stem breaks into limbs.
- Growth*—See definition for Net annual growth.
- Hardwood trees*—Dicotyledonous trees, usually broad-leaved and deciduous.
- High-risk old-growth stands*—Timber stands over 100 years old in which the majority of the trees are not expected to survive more than 10 years.
- Indian lands*—Indian lands held in trust by the Federal Government.
- Industrial wood*—All commercial roundwood products except fuelwood.
- Land area*—The area of dry land and land temporarily or partially covered by water such as marshes, swamps, and river flood plains, streams, sloughs, estuaries, and canals less than 120 feet wide; and lakes, reservoirs, and ponds less than 1 acre in size.
- Logging residues*—The unused portions of growing-stock trees cut or killed by logging.
- Low-risk old-growth stands*—Timber stands over 100 years old in which the majority of the trees are expected to survive more than 10 years.
- Miscellaneous Federal lands*—Lands administered by Federal agencies other than the U.S. Department of Agriculture, Forest Service or U.S. Department of the Interior, Bureau of Land Management.
- Mortality*—The net volume of growing-stock trees that have died from natural causes during a specified period.
- National Forest lands*—Public lands administered by the U.S. Department of Agriculture, Forest Service.
- National Resource lands*—Public lands administered by the U.S. Department of the Interior, Bureau of Land Management.
- Net annual growth*—Gross annual growth minus average annual mortality.
- Net dead volume*—Total net volume of dead trees plus the net volume of dead material in live trees.
- Net volume in board feet*—The gross board-foot volume in the sawlog portion of growing-stock trees, less deductions for cull volume.
- Net volume in cubic feet*—Gross cubic-foot volume in the merchantable portion of trees less deductions for cull volume. For timber species, volume is computed for the merchantable stem from a 1-foot stump to a minimum 4-inch top diameter outside bark (d.o.b.), or to the point where the central stem breaks into limbs. For woodland species, volume is computed outside bark (o.b.) for all woody material above d.r.c. that is larger than 1.5 inches d.o.b.
- Nonforest land*—Land that does not currently qualify as forest land.
- Nonindustrial private*—All private ownerships except forest industry.
- Nonstocked areas*—Forest land less than 10 percent stocked with live trees.
- Old-growth stands*—Stands of timber species over 100 years old.
- Other private land*—Privately owned land other than forest industry or farmer-owned.
- Other public land*—Public land administered by agencies other than the U.S. Department of Agriculture, Forest Service.
- Other removals*—The net volume of growing-stock trees removed from the inventory by cultural operations such as timber-stand improvement, by land clearing, and by changes in land use, such as a shift to wilderness.
- Poletimber stands*—Stands at least 10 percent stocked with growing-stock trees, in which half or more of the stocking is sawtimber or poletimber trees or both, with poletimber stocking exceeding that of sawtimber (see definition for Stocking).
- Poletimber trees*—Live trees of timber species at least 5 inches d.b.h. but smaller than sawtimber size.
- Posts*—Juniper and oak species are evaluated for post potential using the following criteria:

Line post—A 7-foot minimum length with 5 to 7 inches diameter at the butt, 2.5-inch minimum small end diameter, and reasonably straight and solid.

Corner post—An 8-foot minimum length with 7 to 9 inches diameter at the butt, 2.5-inch minimum small end diameter, and reasonably straight and solid.

Potential growth—The average net annual cubic-foot growth per acre at culmination of mean annual growth attainable in fully stocked natural stands.

Primary wood-processing plants—Plants using roundwood products such as sawlogs, pulpwood bolts, veneer logs, and so forth.

Productivity class—A classification of forest land that reflects biological potential. For timberland the potential net annual growth at culmination of mean annual increment in fully stocked natural stands is the index used. For woodland, characteristics that affect the land's ability to produce wood, such as soil depth and aspect, are used. Furthermore, woodland is classified as high site where sustained wood production is likely, or low site where the continuous production of wood is unlikely.

Removals—The net volume of growing-stock trees removed from the inventory by harvesting, cultural operations, land clearings, or changes in land use.

Reserved forest land—Forest land withdrawn from tree utilization through statute or administrative designation.

Residues:

Coarse residues—Plant residues suitable for chipping, such as slabs, edgings, and ends.

Fine residues—Plant residues not suitable for chipping, such as sawdust, shavings, and veneer clippings.

Plant residues—Wood materials from primary manufacturing plants that are not used for any product.

Rotten tree—A live poletimber or sawtimber tree with more than 67 percent of its total volume cull (cubic-foot), and with more than half of the cull volume attributable to rotten or missing material.

Rough tree—A live poletimber or sawtimber tree with more than 67 percent of its total volume cull (cubic-foot), and with less than half of the cull volume attributable to rotten or missing material.

Roundwood—Logs, bolts, or other round sections cut from trees.

Salvable dead trees—Standing or down dead trees that are currently merchantable by regional standards.

Saplings—Live trees of timber species 1 to 4.9 inches d.b.h., or woodland species 1 to 2.9 inches d.r.c.

Sapling and seedling stands—Timberland stands at least 10 percent stocked on which more than half of the stocking is saplings or seedlings or both.

Sawlog portion—That part of the bole of sawtimber trees between a 1-foot stump and the sawlog top.

Sawlog top—The point on the bole of sawtimber trees above which a sawlog cannot be produced. The minimum sawlog top is 7 inches d.o.b. for softwoods and 9 inches d.o.b. for hardwoods.

Sawtimber stands—Stands at least 10 percent stocked with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Sawtimber trees—Live trees of timber species meeting regional size and defect specifications. Softwood trees must be at least 9 inches d.b.h. and hardwood trees 11 inches d.b.h.

Sawtimber volume—Net volume in board feet of the sawlog portion of live sawtimber trees.

Seedlings—Established live trees of timber species less than 1 inch d.b.h. or woodland species less than 1 inch d.r.c.

Softwood trees—Monocotyledonous trees, usually evergreen, having needle or scalelike leaves.

Standard error—An expression of the degree of confidence that can be placed on an estimated total or average obtained by statistical sampling methods. Standard errors do not include technique errors that could occur in photo classification of areas, field measurements, or compilation of data.

Stand-size classes—A classification of forest land based on the predominant size of trees present (see Sawtimber stands, Poletimber stands, and Sapling and seedling stands).

State, county, and municipal lands—Lands administered by States, counties, and local public agencies, or lands leased by these governmental units for more than 50 years.

Stocking—An expression of the extent to which growing space is effectively utilized by present or potential growing-stock trees of timber species.

Timberland—Forest land where timber species make up at least 10 percent stocking.

Timber species—Tree species traditionally used for industrial wood products. In the Rocky Mountain States, these include aspen and cottonwood hardwood species and all softwood species except pinyon and juniper.

Timber stand improvement—Treatments such as thinning, pruning, release cutting, girdling, weeding, or poisoning of unwanted trees aimed at improving growing conditions for the remaining trees.

Upper-stem portion—That part of the main stem or fork of sawtimber trees above the sawlog top to a minimum top diameter of 4 inches outside bark or to the point where the main stem or fork breaks into limbs.

Water—Streams, sloughs, estuaries, and canals more than 120 feet wide, and lakes, reservoirs, and ponds more than 1 acre in size at mean high water level.

Wilderness—An area of undeveloped land currently included in the Wilderness System, managed so as to preserve its natural conditions and retain its primeval character and influence.

Woodland—Forest land where timber species make up less than 10 percent stocking.

Woodland species—Tree species not usually converted into industrial wood products. Common uses are fuelwood, fenceposts, and Christmas trees.

REFERENCES

- Chojnacky, David C. 1985. Pinyon-juniper volume equations for the central Rocky Mountain States. Res. Pap. INT-339. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 27 p.
- Edminster, Carleton B.; Mowrer, H. Todd; Hinds, Thomas E. 1981. Volume tables and point-sampling factor for aspen in Colorado. Res. Pap. RM-232. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 16 p.
- Edminster, Carleton B.; Beeson, Robert T.; Metcalf, Gary E. 1980. Volume tables and point-sampling factors for ponderosa pine in the Front Range of Colorado. Res. Pap. RM-218. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 14 p.
- Kemp, Paul D. 1958. Volume tables. Unpublished report on file at: U.S. Department of Agriculture, Forest Service, Intermountain Research Station, Ogden, UT.
- McLain, William H. 1987. Wyoming and western South Dakota—timber production and mill residues, 1983. Resour. Bull. INT-45. Ogden, UT: U.S. Department of Agriculture, Forest Survey, Intermountain Research Station. 32 p.
- Meyers, Clifford A. 1964. Volume tables and point-sampling factors for lodgepole pine in Colorado and Wyoming. Res. Pap. RM-6. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 16 p.
- Meyers, Clifford A.; Edminster, Carleton B. 1972. Volume tables and point-sampling factors for Engelmann spruce in Colorado and Wyoming. Res. Pap. RM-95. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 23 p.

FOREST SURVEY TABLES

Table 1--Total land and water area by ownership class in central-southeastern Wyoming, 1984

Ownership class	Area
	- - <u>Acres</u> - -
Land:	
Public:	
National Forest	2,387,826
Other public:	
Bureau of Land Management	6,851,719
National Parks ¹	23,163
Miscellaneous Federal	55,634
State	2,543,546
County and municipal	<u>2,717</u>
Total other public	<u>9,476,779</u>
Total public	<u><u>11,864,605</u></u>
Private	<u>15,925,687</u>
Total land area	<u><u>27,790,292</u></u>
Census water	<u>161,120</u>
Total land and water ²	<u>27,951,412</u>

¹Not included with miscellaneous Federal, a component of other public, for purpose of clarity. These lands, and other reserved lands, are included in tables 1, 2, 4, and 5 only.

²U.S. Department of Commerce, Bureau of Census. Area measurement reports, GE-20 No. 1, 22p., 1970, updated to account for changes in inland water estimates obtained from the USDA, Soil Conservation Service National Resource Inventory, 1982.

Table 2--Area of forest land outside National Forests with percent standard error in central-southeastern Wyoming, 1984

Item	Softwoods		Hardwoods		All types	
	Acres	Percent standard error	Acres	Percent standard error	Acres	Percent standard error
Timberland	900,176	±5.2	153,825	±20.8	1,054,001	±4.0
Woodland	253,375	±16.6	27,689	±57.9	281,064	±15.8
Reserved forest land: ¹						
Timberland	2,238		--		2,238	
Woodland	3,200		--		3,200	
Total forest land ²	1,158,989		181,514		1,340,503	

¹Reserved land areas are estimated from aerial photos without field verification; therefore, standard errors are not calculated.

²On this and all following tables, totals may vary due to rounding.

Table 3--Net volume, net annual growth, and annual mortality of growing stock and sawtimber on timberland outside National Forests with percent standard error in central-southeastern Wyoming

Item	Softwoods		Hardwoods		All species	
	Volume	Percent standard error	Volume	Percent standard error	Volume	Percent standard error
Net volume, 1984:						
Growing stock (M cubic feet)	867,820	±11.9	128,180	±28.3	996,000	±10.8
Sawtimber ¹ (M board feet)	2,783,304	±14.4	239,204	±35.4	3,022,508	±13.4
Sawtimber ² (M board feet)	2,371,262	±14.6	206,091	±35.8	2,577,353	±13.5
Net annual growth, 1983:						
Growing stock (M cubic feet)	18,500	±13.4	1,962	±55.6	20,462	±13.3
Sawtimber ¹ (M board feet)	72,045	±17.9	2,998	±90.0	75,043	±17.5
Sawtimber ² (M board feet)	62,197	±17.7	2,656	±89.2	64,853	±17.3
Annual mortality, 1983:						
Growing stock (M cubic feet)	2,381	±37.1	1,729	±53.3	4,110	±30.6
Sawtimber ¹ (M board feet)	6,914	±55.9	2,518	±73.0	9,432	±45.2
Sawtimber ² (M board feet)	5,894	±56.1	2,166	±73.0	8,060	±45.2

¹International ¼-inch rule.

²Scribner rule.

Table 4--Total land area outside National Forests by major land class and ownership class in central-southeastern Wyoming, 1984

Land class	Ownership class		
	Other public	Private	Total
	----- Acres -----		
Timberland:			
Reserved	2,238	--	2,238
Nonreserved	361,427	692,574	1,054,001
Total	363,665	692,574	1,056,239
Woodland:			
Reserved	3,200	--	3,200
Nonreserved	190,807	90,257	281,064
Total	194,007	90,257	284,264
Total forest land:			
Reserved	5,438	--	5,438
Nonreserved	552,234	782,831	1,335,065
Total	557,672	782,831	1,340,503
Nonforest land	8,919,946	15,142,017	24,061,963
Total land area	9,477,618	15,924,848	25,402,466

Table 5--Area of forest land outside National Forests by forest type, ownership class, and land class in central-southeastern Wyoming, 1984

Forest type	Ownership class and land class						Total
	Other public		Private		All owners		
	Reserved	Nonreserved	Reserved	Nonreserved	Reserved	Nonreserved	
	----- Acres -----						
Douglas-fir	--	21,111	--	16,015	--	37,126	37,126
Ponderosa pine	--	143,008	--	362,398	--	505,406	505,406
Lodgepole pine	--	56,713	--	79,928	--	136,641	136,641
Limber pine	--	84,074	--	69,749	--	153,823	153,823
Spruce-fir	--	26,086	--	27,454	--	53,540	53,540
Spruce	--	6,959	--	6,681	--	13,640	13,640
Aspen	--	23,476	--	69,161	--	92,637	92,637
Cottonwood	2,238	--	--	61,188	2,238	61,188	63,426
Total timberland	2,238	361,427	--	692,574	2,238	1,054,001	1,056,239
Juniper	3,200	183,175	--	70,200	3,200	253,375	256,575
Mountain brush	--	7,632	--	--	--	7,632	7,632
Riparian	--	--	--	20,057	--	20,057	20,057
Total woodland	3,200	190,807	--	90,257	3,200	281,064	284,264
Total all types	5,438	552,234	--	782,831	5,438	1,335,065	1,340,503

Table 6--Cubic feet of net volume in trees on forest land outside National Forests by species and ownership class in central-southeastern Wyoming, 1984

Species	Ownership class		
	Other public	Private	Total
- - - - Thousand cubic feet - - - -			
Douglas-fir	41,637	48,180	89,817
Ponderosa pine	95,994	232,085	328,079
Lodgepole pine	101,527	138,505	240,032
Limber pine	33,006	49,970	82,976
Subalpine fir	39,667	34,705	74,372
Engelmann spruce	42,557	13,503	56,060
Aspen	32,322	69,128	101,450
Cottonwood	--	26,731	26,731
Total timberland species	386,710	612,807	999,517
Woodland softwoods	45,115	26,927	72,042
Woodland hardwoods	897	61,757	62,654
Total woodland species	46,012	88,684	134,696
Total all species	432,722	701,491	1,134,213

Table 7--Cubic feet of net annual growth in trees on forest land outside National Forests by species and ownership class in central-southeastern Wyoming, 1983

Species	Ownership class		
	Other public	Private	Total
- - - - Thousand cubic feet - - - -			
Douglas-fir	1,541	-41	1,500
Ponderosa pine	1,334	3,950	5,284
Lodgepole pine	1,851	4,374	6,225
Limber pine	1,114	585	1,699
Subalpine fir	1,379	993	2,372
Engelmann spruce	1,067	386	1,453
Aspen	357	1,247	1,604
Cottonwood	--	358	358
Total timberland species	8,643	11,852	20,495
Woodland softwoods	509	241	750
Woodland hardwoods	12	1,099	1,111
Total woodland species	521	1,340	1,861
Total all species	9,164	13,192	22,356

Table 8--Cubic feet of annual mortality in trees on forest land outside National Forests by species and ownership class in central-southeastern Wyoming, 1983

Species	Ownership class		
	Other public	Private	Total
	- - - - - Thousand cubic feet - - - - -		
Douglas-fir	--	564	564
Ponderosa pine	689	254	943
Lodgepole pine	--	149	149
Limber pine	493	156	649
Subalpine fir	--	76	76
Engelmann spruce	--	--	--
Aspen	528	848	1,376
Cottonwood	--	353	353
Total timberland species	1,710	2,400	4,110
Woodland softwoods	--	86	86
Woodland hardwoods	--	--	--
Total woodland species	--	86	86
Total all species	1,710	2,486	4,196

Table 9--Area of timberland outside National Forests by forest type, stand-size class, and productivity class in central-southeastern Wyoming, 1984

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
----- Acres -----					
Douglas-fir:					
Sawtimber	--	--	22,974	--	22,974
Poletimber	--	--	7,193	--	7,193
Sapling and seedling	--	6,959	--	--	6,959
Nonstocked	--	--	--	--	--
Total	--	6,959	30,167	--	37,126
Ponderosa pine:					
Sawtimber	--	--	285,002	31,377	316,379
Poletimber	--	--	38,982	12,492	51,474
Sapling and seedling	--	--	25,599	--	25,599
Nonstocked	--	--	94,925	17,029	111,954
Total	--	--	444,508	60,898	505,406
Lodgepole pine:					
Sawtimber	--	20,320	14,132	--	34,452
Poletimber	--	6,440	73,068	--	79,508
Sapling and seedling	--	8,121	6,439	--	14,560
Nonstocked	--	--	8,121	--	8,121
Total	--	34,881	101,760	--	136,641
Limber pine:					
Sawtimber	--	18,113	26,964	11,999	57,076
Poletimber	--	--	41,167	13,120	54,287
Sapling and seedling	--	--	6,680	--	6,680
Nonstocked	--	--	3,630	32,150	35,780
Total	--	18,113	78,441	57,269	153,823
Spruce-fir:					
Sawtimber	19,647	21,488	--	--	41,135
Poletimber	--	6,681	--	--	6,681
Sapling and seedling	--	5,724	--	--	5,724
Nonstocked	--	--	--	--	--
Total	19,647	33,893	--	--	53,540

(con.)

Table 9 (con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	----- Acres -----				
Spruce:					
Sawtimber	--	13,640	--	--	13,640
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	13,640	--	--	13,640
Aspen:					
Sawtimber	--	14,688	--	--	14,688
Poletimber	--	19,244	32,464	--	51,708
Sapling and seedling	--	6,440	19,801	--	26,241
Nonstocked	--	--	--	--	--
Total	--	40,372	52,265	--	92,637
Cottonwood:					
Sawtimber	9,021	4,363	10,087	--	23,471
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	20,043	8,452	9,222	--	37,717
Total	29,064	12,815	19,309	--	61,188
Total:					
Sawtimber	28,668	92,612	359,159	43,376	523,815
Poletimber	--	32,365	192,874	25,612	250,851
Sapling and seedling	--	27,244	58,519	--	85,763
Nonstocked	20,043	8,452	115,898	49,179	193,572
Total	48,711	160,673	726,450	118,167	1,054,001

Table 10--Area of other publicly owned timberland by forest type,
stand-size class, and productivity class in central-southeastern
Wyoming, 1984

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
----- Acres -----					
Douglas-fir:					
Sawtimber	--	--	6,959	--	6,959
Poletimber	--	--	7,193	--	7,193
Sapling and seedling	--	6,959	--	--	6,959
Nonstocked	--	--	--	--	--
Total	--	6,959	14,152	--	21,111
Ponderosa pine:					
Sawtimber	--	--	62,448	13,283	75,731
Poletimber	--	--	16,080	6,768	22,848
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	44,429	--	44,429
Total	--	--	122,957	20,051	143,008
Lodgepole pine:					
Sawtimber	--	6,959	--	--	6,959
Poletimber	--	6,440	36,875	--	43,315
Sapling and seedling	--	--	6,439	--	6,439
Nonstocked	--	--	--	--	--
Total	--	13,399	43,314	--	56,713
Limber pine:					
Sawtimber	--	6,439	10,588	3,630	20,657
Poletimber	--	--	33,045	6,440	39,485
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	3,630	20,302	23,932
Total	--	6,439	47,263	30,372	84,074
Spruce-fir:					
Sawtimber	19,647	6,439	--	--	26,086
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	19,647	6,439	--	--	26,086

(con.)

Table 10 (con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	----- Acres -----				
Spruce:					
Sawtimber	--	6,959	--	--	6,959
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	6,959	--	--	6,959
Aspen:					
Sawtimber	--	--	--	--	--
Poletimber	--	6,439	4,157	--	10,596
Sapling and seedling	--	6,440	6,440	--	12,880
Nonstocked	--	--	--	--	--
Total	--	12,879	10,597	--	23,476
Cottonwood:					
Sawtimber	--	--	--	--	--
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	--	--	--
Total:					
Sawtimber	19,647	26,796	79,995	16,913	143,351
Poletimber	--	12,879	97,350	13,208	123,437
Sapling and seedling	--	13,399	12,879	--	26,278
Nonstocked	--	--	48,059	20,302	68,361
Total	19,647	53,074	238,283	50,423	361,427

Table 11--Area of privately owned timberland by forest type, stand-size class, and productivity class in central-southeastern Wyoming, 1984

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
- - - - - Acres - - - - -					
Douglas-fir:					
Sawtimber	--	--	16,015	--	16,015
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	16,015	--	16,015
Ponderosa pine:					
Sawtimber	--	--	222,554	18,094	240,648
Poletimber	--	--	22,902	5,724	28,626
Sapling and seedling	--	--	25,599	--	25,599
Nonstocked	--	--	50,496	17,029	67,525
Total	--	--	321,551	40,847	362,398
Lodgepole pine:					
Sawtimber	--	13,361	14,132	--	27,493
Poletimber	--	--	36,193	--	36,193
Sapling and seedling	--	8,121	--	--	8,121
Nonstocked	--	--	8,121	--	8,121
Total	--	21,482	58,446	--	79,928
Limber pine:					
Sawtimber	--	11,674	16,376	8,369	36,419
Poletimber	--	--	8,122	6,680	14,802
Sapling and seedling	--	--	6,680	--	6,680
Nonstocked	--	--	--	11,848	11,848
Total	--	11,674	31,178	26,897	69,749
Spruce-fir:					
Sawtimber	--	15,049	--	--	15,049
Poletimber	--	6,681	--	--	6,681
Sapling and seedling	--	5,724	--	--	5,724
Nonstocked	--	--	--	--	--
Total	--	27,454	--	--	27,454

(con.)

Table 11 (con.)

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
- - - - - Acres - - - - -					
Spruce:					
Sawtimber	--	6,681	--	--	6,681
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	6,681	--	--	6,681
Aspen:					
Sawtimber	--	14,688	--	--	14,688
Poletimber	--	12,805	28,307	--	41,112
Sapling and seedling	--	--	13,361	--	13,361
Nonstocked	--	--	--	--	--
Total	--	27,493	41,668	--	69,161
Cottonwood:					
Sawtimber	9,021	4,363	10,087	--	23,471
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	20,043	8,452	9,222	--	37,717
Total	29,064	12,815	19,309	--	61,188
Total:					
Sawtimber	9,021	65,816	279,164	26,463	380,464
Poletimber	--	19,486	95,524	12,404	127,414
Sapling and seedling	--	13,845	45,640	--	59,485
Nonstocked	20,043	8,452	67,839	28,877	125,211
Total	29,064	107,599	488,167	67,744	692,574

Table 12--Area of timberland outside National Forests by stand volume and ownership class in central-southeastern Wyoming, 1984

Stand volume per acre ¹	Ownership class			Total
	Other public	Private	Acres	
Less than 1,500 board feet	181,594	351,236		532,830
1,500 to 4,999 board feet	90,566	216,621		307,187
5,000 to 9,999 board feet	75,869	106,363		182,232
10,000 board feet or more	13,398	18,354		31,752
All classes	361,427	692,574		1,054,001

¹International 4-inch rule.

Table 13--Area of timberland outside National Forests by forest type and area condition class in central-southeastern Wyoming, 1984

Forest type	Area condition class											All classes
	10	20	30	40	50	60	70	80	90	Nonstocked		
	----- Acres -----											
Douglas-fir	--	--	--	--	22,160	14,967	--	--	--	--	--	37,127
Ponderosa pine	--	--	8,369	--	45,410	77,634	140,173	--	121,867	111,954	--	505,407
Lodgepole pine	--	--	--	19,237	47,904	33,811	12,879	--	14,688	8,121	--	136,640
Limber pine	--	--	--	--	12,879	35,045	54,816	--	15,303	35,780	--	153,823
Spruce-fir	--	--	--	5,724	26,327	--	--	--	21,489	--	--	53,540
Spruce	--	--	6,680	--	6,959	--	--	--	--	--	--	13,639
Aspen	--	--	--	--	19,485	66,471	6,681	--	--	--	--	92,637
Cottonwood	--	--	--	--	--	9,021	--	--	14,450	37,717	--	61,188
All types	--	--	15,049	24,961	181,124	236,949	214,549	--	187,797	193,572	--	1,054,001

Table 14--Number of growing-stock trees on timberland outside National Forests by species and diameter class in central-southeastern Wyoming, 1984

Species	Diameter class (inches at breast height)																	All classes
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+			
	----- Thousand trees -----																	
Douglas-fir	5,629	3,325	3,035	3,060	1,403	705	228	220	164	69	226	28	54	22	--	18,168		
Ponderosa pine	12,069	8,182	13,097	9,762	5,781	4,040	3,190	1,474	898	603	302	190	40	82	37	59,747		
Lodgepole pine	10,767	20,882	14,245	9,837	4,054	1,893	447	230	123	27	21	--	--	--	--	62,526		
Limber pine	8,263	4,934	8,107	4,130	1,659	833	489	305	124	--	--	--	24	--	--	28,868		
Subalpine fir	14,855	3,840	3,514	2,188	1,949	311	641	123	32	--	111	--	--	--	--	27,564		
Engelmann spruce	4,845	--	232	1,356	673	336	358	83	153	73	--	33	14	12	10	8,178		
Total softwoods	56,428	41,163	42,230	30,333	15,519	8,118	5,353	2,435	1,494	772	660	251	132	116	47	205,051		
Aspen	6,017	6,581	8,743	5,184	2,937	690	515	119	32	26	--	--	--	--	--	30,844		
Cottonwood	--	--	--	244	136	--	225	36	40	76	38	34	78	43	70	1,020		
Total hardwoods	6,017	6,581	8,743	5,428	3,073	690	740	155	72	102	38	34	78	43	70	31,864		
All species	62,445	47,744	50,973	35,761	18,592	8,808	6,093	2,590	1,566	874	698	285	210	159	117	236,915		

Table 15--Number of cull and salvable dead trees on timberland outside National Forests by ownership class, and softwoods and hardwoods in central-southeastern Wyoming, 1984

Ownership class and species group	Cull trees			Salvable dead trees	Total
	Rough	Rotten	Total		
- - - - - <u>Thousand trees</u> - - - - -					
Other public:					
Softwoods	747	731	1,478	6,750	8,228
Hardwoods	--	--	--	1,092	1,092
Total	747	731	1,478	7,842	9,320
Private:					
Softwoods	344	43	387	4,705	5,092
Hardwoods	418	883	1,301	4,431	5,732
Total	762	926	1,688	9,136	10,824
Total:					
Softwoods	1,091	774	1,865	11,455	13,320
Hardwoods	418	883	1,301	5,523	6,824
Total	1,509	1,657	3,166	16,978	20,144

Table 16--Net volume of growing stock on timberland outside National Forests by ownership class, forest type, and stand-size class in central-southeastern Wyoming, 1984

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/seedling	Nonstocked	
----- Thousand cubic feet -----						
Other public:	Douglas-fir	13,568	17,098	1,442	--	32,108
	Ponderosa pine	83,386	15,561	--	2,623	101,570
	Lodgepole pine	11,010	80,848	260	--	92,118
	Limber pine	18,313	18,825	--	529	37,667
	Spruce-fir	67,403	--	--	--	67,403
	Spruce	29,801	--	--	--	29,801
	Aspen	--	23,873	--	--	23,873
	Cottonwood	--	--	--	--	--
	All types	223,481	156,205	1,702	3,152	384,540
Private:	Douglas-fir	18,471	--	--	--	18,471
	Ponderosa pine	200,483	11,806	7,749	5,825	225,863
	Lodgepole pine	57,756	71,739	3,626	697	133,818
	Limber pine	74,603	2,558	--	--	77,161
	Spruce-fir	31,285	27,182	4,608	--	63,075
	Spruce	3,967	--	--	--	3,967
	Aspen	25,264	36,534	576	--	62,374
	Cottonwood	19,352	--	--	7,379	26,731
	All types	431,181	149,819	16,559	13,901	611,460
Total:	Douglas-fir	32,039	17,098	1,442	--	50,579
	Ponderosa pine	283,869	27,367	7,749	8,448	327,433
	Lodgepole pine	68,766	152,587	3,886	697	225,936
	Limber pine	92,916	21,383	--	529	114,828
	Spruce-fir	98,688	27,182	4,608	--	130,478
	Spruce	33,768	--	--	--	33,768
	Aspen	25,264	60,407	576	--	86,247
	Cottonwood	19,352	--	--	7,379	26,731
	All types	654,662	306,024	18,261	17,053	996,000

Table 17--Net volume of sawtimber (International 1/4-inch rule) on timberland outside National Forests by ownership class, forest type, and stand-size class in central-southeastern Wyoming, 1984

Ownership class	Forest type	Stand-size class				
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	All classes
- - - Thousand board feet, International 1/4-inch rule - - -						
Other public:	Douglas-fir	42,089	29,483	6,291	--	77,863
	Ponderosa pine	301,152	23,759	--	11,437	336,348
	Lodgepole pine	36,446	133,568	--	--	170,014
	Limber pine	53,967	22,570	--	1,569	78,106
	Spruce-fir	260,614	--	--	--	260,614
	Spruce	97,279	--	--	--	97,279
	Aspen	--	38,221	--	--	38,221
	Cottonwood	--	--	--	--	--
	All types	791,547	247,601	6,291	13,006	1,058,445
Private:	Douglas-fir	62,993	--	--	--	62,993
	Ponderosa pine	802,444	20,142	13,146	24,689	860,421
	Lodgepole pine	193,746	86,700	7,476	2,135	290,057
	Limber pine	348,080	3,359	--	--	351,439
	Spruce-fir	106,463	44,711	4,351	--	155,525
	Spruce	19,073	--	--	--	19,073
	Aspen	66,256	45,258	--	--	111,514
	Cottonwood	88,532	--	--	24,509	113,041
	All types	1,687,587	200,170	24,973	51,333	1,964,063
Total:	Douglas-fir	105,082	29,483	6,291	--	140,856
	Ponderosa pine	1,103,596	43,901	13,146	36,126	1,196,769
	Lodgepole pine	230,192	220,268	7,476	2,135	460,071
	Limber pine	402,047	25,929	--	1,569	429,545
	Spruce-fir	367,077	44,711	4,351	--	416,139
	Spruce	116,352	--	--	--	116,352
	Aspen	66,256	83,479	--	--	149,735
	Cottonwood	88,532	--	--	24,509	113,041
	All types	2,479,134	447,771	31,264	64,339	3,022,508

Table 18--Net volume of sawtimber (Scribner rule) on timberland outside National Forests by ownership class, forest type, and stand-size class in central-southeastern Wyoming, 1984

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/seedling	Nonstocked	
		- - - - - Thousand board feet, Scribner rule - - - - -				
Other public:	Douglas-fir	35,674	25,507	4,900	--	66,081
	Ponderosa pine	256,710	19,096	--	9,270	285,076
	Lodgepole pine	31,186	114,989	--	--	146,175
	Limber pine	45,577	19,663	--	1,380	66,620
	Spruce-fir	222,736	--	--	--	222,736
	Spruce	81,567	--	--	--	81,567
	Aspen	--	32,490	--	--	32,490
	Cottonwood	--	--	--	--	--
	All types	673,450	211,745	4,900	10,650	900,745
Private:	Douglas-fir	52,660	--	--	--	52,660
	Ponderosa pine	684,931	15,509	10,877	20,740	732,057
	Lodgepole pine	164,888	74,533	6,401	1,899	247,721
	Limber pine	300,079	2,862	--	--	302,941
	Spruce-fir	89,446	38,585	3,720	--	131,751
	Spruce	15,620	--	--	--	15,620
	Aspen	56,304	38,723	--	--	95,027
	Cottonwood	77,538	--	--	21,293	98,831
	All types	1,441,466	170,212	20,998	43,932	1,676,608
Total:	Douglas-fir	88,334	25,507	4,900	--	118,741
	Ponderosa pine	941,641	34,605	10,877	30,010	1,017,133
	Lodgepole pine	196,074	189,522	6,401	1,899	393,896
	Limber pine	345,656	22,525	--	1,380	369,561
	Spruce-fir	312,182	38,585	3,720	--	354,487
	Spruce	97,187	--	--	--	97,187
	Aspen	56,304	71,213	--	--	127,517
	Cottonwood	77,538	--	--	21,293	98,831
	All types	2,114,916	381,957	25,898	54,582	2,577,353

Table 19--Net volume of growing stock on timberland outside National Forests by species and ownership class in central-southeastern Wyoming, 1984

Species	Ownership class		
	Other public	Private	Total
- - - - <u>Thousand cubic feet</u> - - - -			
Douglas-fir	41,637	48,180	89,817
Ponderosa pine	95,994	230,739	326,733
Lodgepole pine	101,527	138,505	240,032
Limber pine	30,836	49,970	80,806
Subalpine fir	39,667	34,705	74,372
Engelmann spruce	42,557	13,503	56,060
Total softwoods	352,218	515,602	867,820
Aspen	32,322	69,127	101,449
Cottonwood	--	26,731	26,731
Total hardwoods	32,322	95,858	128,180
All species	384,540	611,460	996,000

Table 20--Net volume of sawtimber (International ¼-inch rule) on timberland outside National Forests by species and ownership class in central-southeastern Wyoming, 1984

Species	Ownership class		
	Other public	Private	Total
- <u>Thousand board feet, International ¼-inch rule</u> -			
Douglas-fir	102,331	232,989	335,320
Ponderosa pine	341,264	888,304	1,229,568
Lodgepole pine	218,434	318,124	536,558
Limber pine	44,316	181,663	225,979
Subalpine fir	138,151	100,737	238,888
Engelmann spruce	162,852	54,139	216,991
Total softwoods	1,007,348	1,775,956	2,783,304
Aspen	51,097	75,066	126,163
Cottonwood	--	113,041	113,041
Total hardwoods	51,097	188,107	239,204
All species	1,058,445	1,964,063	3,022,508

Table 21--Net volume of sawtimber (Scribner rule) on timberland outside National Forests by species and ownership class in central-southeastern Wyoming, 1984

Species	Ownership class		
	Other public	Private	Total
- - Thousand board feet, Scribner rule - -			
Douglas-fir	87,533	201,411	288,944
Ponderosa pine	289,372	756,096	1,045,468
Lodgepole pine	186,567	271,694	458,261
Limber pine	37,203	154,204	191,407
Subalpine fir	117,742	85,594	203,336
Engelmann spruce	138,893	44,954	183,847
Total softwoods	857,310	1,513,953	2,371,263
Aspen	43,435	63,825	107,260
Cottonwood	--	98,830	98,830
Total hardwoods	43,435	162,655	206,090
All species	900,745	1,676,608	2,577,353

Table 22--Net volume of growing stock on timberland outside National Forests by species and diameter class in central-southeastern Wyoming, 1984

Species	Diameter class (inches at breast height)																All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	Thousand cubic feet			
Douglas-fir	6,118	14,739	11,916	9,761	4,018	6,636	8,477	3,952	14,299	2,396	4,909	2,596	--	--	89,817	89,817	
Ponderosa pine	20,851	37,595	44,011	43,440	51,677	32,891	28,853	23,706	15,581	13,069	2,646	7,782	4,630	4,630	326,732	326,732	
Lodgepole pine	43,337	70,735	56,260	36,305	13,808	10,429	6,472	1,191	1,496	--	--	--	--	--	240,033	240,033	
Limber pine	10,690	17,020	14,867	8,805	10,644	11,033	4,917	--	--	--	2,830	--	--	--	80,806	80,806	
Subalpine fir	7,701	12,548	19,790	4,624	16,925	3,686	1,538	--	7,560	--	--	--	--	--	74,372	74,372	
Engelmann spruce	1,099	9,077	7,465	6,369	10,271	2,515	6,700	4,134	--	3,218	1,933	1,754	1,525	1,525	56,060	56,060	
Total softwoods	89,796	161,714	154,309	109,304	107,343	67,190	56,957	32,983	38,936	18,683	12,318	12,132	6,155	6,155	867,820	867,820	
Aspen	15,953	28,632	30,975	10,807	10,614	2,757	876	835	--	--	--	--	--	--	101,449	101,449	
Cottonwood	--	876	1,230	--	2,508	380	1,266	1,554	1,055	1,650	5,450	3,338	7,424	7,424	26,731	26,731	
Total hardwoods	15,953	29,508	32,205	10,807	13,122	3,137	2,142	2,389	1,055	1,650	5,450	3,338	7,424	7,424	128,180	128,180	
All species	105,749	191,222	186,514	120,111	120,465	70,327	59,099	35,372	39,991	20,333	17,768	15,470	13,579	13,579	996,000	996,000	

Table 23--Net volume of sawtimber (International 1/4-inch rule) on timberland outside National Forests by species and diameter class in central-southeastern Wyoming, 1984

Species	Diameter class (inches at breast height)													All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+			
	Thousand board feet, International 1/4-inch rule													
Douglas-fir	35,989	43,187	18,932	34,121	45,607	21,463	79,079	13,649	28,155	15,138	--	--	335,320	
Ponderosa pine	143,563	175,855	239,220	162,672	149,437	124,515	82,832	70,243	14,117	42,016	25,098	--	1,229,568	
Lodgepole pine	201,333	161,459	70,723	55,160	33,886	6,088	7,909	--	--	--	--	--	536,558	
Limber pine	48,253	30,620	49,516	56,922	25,137	--	--	--	15,531	--	--	--	225,979	
Subalpine fir	70,178	20,572	82,935	17,914	7,734	--	39,555	--	--	--	--	--	238,888	
Engelmann spruce	21,854	29,952	50,758	12,373	33,448	21,148	--	17,577	10,936	10,068	8,877	--	216,991	
Total softwoods	521,170	461,645	512,084	339,162	295,249	173,214	209,375	101,469	68,739	67,222	33,975	--	2,783,304	
Aspen	XXXXX	51,514	52,483	13,707	4,348	4,111	--	--	--	--	--	--	126,163	
Cottonwood	XXXXX	--	12,249	1,824	6,045	7,139	4,732	7,375	24,503	15,094	34,080	--	113,041	
Total hardwoods	XXXXX	51,514	64,732	15,531	10,393	11,250	4,732	7,375	24,503	15,094	34,080	--	239,204	
All species	521,170	513,159	576,816	354,693	305,642	184,464	214,107	108,844	93,242	82,316	68,055	--	3,022,508	

Table 24--Net volume of sawtimber (Scribner rule) on timberland outside National Forests by species and diameter class in central-southeastern Wyoming, 1984

Species	Diameter class (inches at breast height)											All classes
	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 22.9	23.0- 24.9	25.0- 26.9	27.0- 28.9	29.0+	
	----- Thousand board feet, Scribner rule -----											
Douglas-fir	31,921	37,457	16,021	27,938	38,403	18,139	68,387	12,147	25,058	13,473	--	288,944
Ponderosa pine	111,614	142,536	203,222	140,581	130,690	109,396	73,105	62,201	12,499	37,307	22,317	1,045,468
Lodgepole pine	173,625	137,061	59,135	46,926	29,307	5,185	7,022	--	--	--	--	458,261
Limber pine	40,020	26,710	41,867	47,744	21,244	--	--	--	13,822	--	--	191,407
Subalpine fir	61,890	17,649	68,244	14,639	6,228	--	34,686	--	--	--	--	203,336
Engelmann spruce	19,450	25,183	41,634	10,117	27,009	18,217	--	15,644	9,733	8,960	7,900	183,847
Total softwoods	438,520	386,596	430,123	287,945	252,881	150,937	183,200	89,992	61,112	59,740	30,217	2,371,263
Aspen	XXXXX	44,218	44,390	11,492	3,671	3,489	--	--	--	--	--	107,260
Cottonwood	XXXXX	--	9,758	1,446	5,273	6,115	4,123	6,543	21,807	13,434	30,331	98,830
Total hardwoods	XXXXX	44,218	54,148	12,938	8,944	9,604	4,123	6,543	21,807	13,434	30,331	206,090
All species	438,520	430,814	484,271	300,883	261,825	160,541	187,323	96,535	82,919	73,174	60,548	2,577,353

Table 25--Net volume of timber on timberland outside National Forests by class of timber, and softwoods and hardwoods in central-southeastern Wyoming, 1984

Class of timber	Softwoods	Hardwoods	Total
	- - - - - Thousand cubic feet - - - - -		
Sawtimber trees:			
Sawlog portion	544,221	38,526	582,747
Upper-stem portion	72,089	11,989	84,078
Total	616,310	50,515	666,825
Poletimber trees	251,509	77,666	329,175
All growing-stock trees	867,819	128,181	996,000
Rough cull trees	2,729	647	3,376
Rotten cull trees	1,412	2,329	3,741
Salvable dead trees	48,133	10,415	58,548
All timber	920,093	141,572	1,061,665

Table 26--Net volume of growing stock on timberland outside National Forests by forest type and species in central-southeastern Wyoming, 1984

Forest type	Species										
	Douglas-fir	Ponderosa pine	Lodgepole pine	Limber pine	Subalpine fir	Engelmann spruce	Total softwoods	Aspen	Cottonwood	Total hardwoods	All species
	Thousand cubic feet										
Douglas-fir	46,681	--	--	3,897	--	--	50,578	--	--	--	50,578
Ponderosa pine	10,202	313,075	--	3,031	--	--	326,308	1,126	--	1,126	327,434
Lodgepole pine	1,273	2,248	210,312	3,116	7,856	--	224,805	1,131	--	1,131	225,936
Limber pine	31,661	7,474	6,538	66,501	931	1,299	114,404	424	--	424	114,828
Spruce-fir	--	1,899	15,014	4,261	63,531	23,185	107,890	22,588	--	22,588	130,478
Spruce	--	--	3,223	--	--	30,545	33,768	--	--	--	33,768
Aspen	--	2,036	4,946	--	2,054	1,031	10,067	76,180	--	76,180	86,247
Cottonwood	--	--	--	--	--	--	--	26,731	26,731	26,731	26,731
All types	89,817	326,732	240,033	80,806	74,372	56,060	867,820	101,449	26,731	128,180	996,000

Table 27--Net volume of sawtimber (International 4-inch rule) on timberland outside National Forests by forest type and species in central-southeastern Wyoming, 1984

Forest type	Species										
	Douglas-fir	Ponderosa pine	Lodgepole pine	Limber pine	Subalpine fir	Engelmann spruce	Total softwoods	Aspen	Cottonwood	Total hardwoods	All species
	Thousand board feet, International 4-inch rule										
Douglas-fir	131,493	--	--	9,363	--	--	140,856	--	--	--	140,856
Ponderosa pine	31,474	1,163,259	--	2,036	--	--	1,196,769	--	--	--	1,196,769
Lodgepole pine	3,498	10,211	423,586	6,339	16,438	--	460,072	--	--	--	460,072
Limber pine	168,855	37,872	18,623	196,758	3,635	3,802	429,545	--	--	--	429,545
Spruce-fir	--	9,403	54,972	11,483	214,011	107,510	397,379	18,760	--	18,760	416,139
Spruce	--	--	15,648	--	--	100,704	116,352	--	--	--	116,352
Aspen	--	8,823	23,729	--	4,803	4,976	42,331	107,403	--	107,403	149,734
Cottonwood	--	--	--	--	--	--	--	113,041	113,041	113,041	113,041
All types	335,320	1,229,568	536,558	225,979	238,887	216,992	2,783,304	126,163	113,041	239,204	3,022,508

Table 28--Net volume of sawtimber (Scribner rule) on timberland outside National Forests by forest type and species in central-southeastern Wyoming, 1984

Forest type	Species										Total hardwoods	All species
	Douglas-fir	Ponderosa pine	Lodgepole pine	Limber pine	Subalpine fir	Engelmann spruce	Total softwoods	Aspen	Cottonwood	Total hardwoods		
	Thousand board feet, Scribner rule											
Douglas-fir	111,517	--	--	7,224	--	--	118,741	--	--	--	--	118,741
Ponderosa pine	27,234	988,087	--	1,812	--	--	1,017,133	--	--	--	--	1,017,133
Lodgepole pine	2,876	8,631	362,675	5,444	14,270	--	393,896	--	--	--	--	393,896
Limber pine	147,317	32,922	15,547	167,155	3,236	3,384	369,561	--	--	--	--	369,561
Spruce-fir	--	8,142	46,632	9,772	181,555	92,388	338,489	15,998	--	--	15,998	354,487
Spruce	--	--	13,198	--	--	83,989	97,187	--	--	--	--	97,187
Aspen	--	7,686	20,208	--	4,275	4,086	36,255	91,262	--	--	91,262	127,517
Cottonwood	--	--	--	--	--	--	--	--	98,831	--	98,831	98,831
All types	288,944	1,045,468	458,260	191,407	203,336	183,847	2,371,262	107,260	98,831	206,091	2,577,353	

Table 29--Net annual growth of growing stock on timberland outside National Forests by species and ownership class in central-southeastern Wyoming, 1983

Species	Ownership class		
	Other public	Private	Total
	- - - - - <u>Thousand cubic feet</u> - - - - -		
Douglas-fir	1,541	-41 ⁽¹⁾	1,500
Ponderosa pine	1,334	3,937	5,271
Lodgepole pine	1,851	4,374	6,225
Limber pine	1,095	585	1,680
Subalpine fir	1,379	993	2,372
Engelmann spruce	1,066	386	1,452
Total softwoods	8,266	10,234	18,500
Aspen	357	1,247	1,604
Cottonwood	--	358	358
Total hardwoods	357	1,605	1,962
All species	8,623	11,839	20,462

¹Net annual growth is negative when annual mortality exceeds gross annual growth.

Table 30--Net annual growth of sawtimber (International ¼-inch rule) on timberland outside National Forests by species and ownership class in central-southeastern Wyoming, 1983

Species	Ownership class		
	Other public	Private	Total
- Thousand board feet, International ¼-inch rule -			
Douglas-fir	9,047	-934 ⁽¹⁾	8,113
Ponderosa pine	5,676	18,323	23,999
Lodgepole pine	7,706	10,578	18,284
Limber pine	2,290	1,820	4,110
Subalpine fir	9,911	2,315	12,226
Engelmann spruce	3,656	1,657	5,313
Total softwoods	38,286	33,759	72,045
Aspen	181	-22	159
Cottonwood	--	2,839	2,839
Total hardwoods	181	2,817	2,998
All species	38,467	36,576	75,043

¹Net annual growth is negative when annual mortality exceeds gross annual growth.

Table 32--Net annual growth of growing stock on timberland outside National Forests by species and diameter class in central-southeastern Wyoming, 1983

Species	Diameter class (inches at breast height)														All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		
	----- Thousand cubic feet -----														
Douglas-fir	692	336	299	342	73	82	55	-522 ⁽¹⁾	97	9	23	14	--	1,500	
Ponderosa pine	1,137	827	1,147	690	366	469	148	243	83	90	17	29	24	5,270	
Lodgepole pine	2,817	1,559	993	567	141	63	64	16	5	--	--	--	--	6,225	
Limber pine	1,075	191	253	-14	91	37	43	--	--	--	4	--	--	1,680	
Subalpine fir	471	558	716	117	361	45	27	--	77	--	--	--	--	2,372	
Engelmann spruce	64	298	260	130	250	40	197	91	--	65	21	18	19	1,453	
Total softwoods	6,256	3,769	3,668	1,832	1,282	736	534	-172	262	164	65	61	43	18,500	
Aspen	615	655	397	-303	193	30	7	10	--	--	--	--	--	1,604	
Cottonwood	--	-61	-197	--	26	4	35	53	9	63	165	66	195	358	
Total hardwoods	615	594	200	-303	219	34	42	63	9	63	165	66	195	1,962	
All species	6,871	4,363	3,868	1,529	1,501	770	576	-109	271	227	230	127	238	20,462	

¹Net annual growth is negative when annual mortality exceeds gross annual growth.

Table 33--Net annual growth of sawtimber (International 1/4-inch rule) on timberland outside National Forests by species and diameter class in central-southeastern Wyoming, 1983

Species	Diameter class (inches at breast height)												All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		
	----- Thousand board feet, International 1/4-inch rule -----												
Douglas-fir	6,828	1,988	423	469	316	-2,805(1)	612	54	141	87	--	--	8,113
Ponderosa pine	11,084	4,104	2,484	2,698	942	1,354	459	496	92	157	129	--	23,999
Lodgepole pine	13,231	3,438	844	328	331	86	27	--	--	--	--	--	18,285
Limber pine	3,041	124	486	194	237	--	--	--	28	--	--	--	4,110
Subalpine fir	8,787	654	1,930	235	139	--	481	--	--	--	--	--	12,226
Engelmann spruce	742	722	1,335	212	1,019	514	--	405	131	112	121	--	5,313
Total softwoods	43,713	11,030	7,502	4,136	2,984	-851	1,579	955	392	356	250	--	72,046
Aspen	XXXXX	-1,140	1,052	167	34	46	--	--	--	--	--	--	159
Cottonwood	XXXXX	--	123	16	146	217	37	276	768	315	940	--	2,838
Total hardwoods	XXXXX	-1,140	1,175	183	180	263	37	276	768	315	940	--	2,997
All species	43,713	9,890	8,677	4,319	3,164	-588	1,616	1,231	1,160	671	1,190	--	75,043

1 Net annual growth is negative when annual mortality exceeds gross annual growth.

Table 34--Net annual growth of sawtimber (Scribner rule) on timberland outside National Forests by species and diameter class in central-southeastern Wyoming, 1983

Species	Diameter class (inches at breast height)														All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	Thousand board feet, Scribner rule			
Douglas-fir	6,127	1,584	332	369	289	-2,390 ⁽¹⁾	570	48	126	78	--	--	7,133		
Ponderosa pine	8,888	3,857	2,287	2,416	866	1,212	411	444	82	140	115	--	20,718		
Lodgepole pine	11,633	2,851	726	313	315	81	25	--	--	--	--	--	15,944		
Limber pine	2,489	154	402	177	207	--	--	--	25	--	--	--	3,454		
Subalpine fir	7,741	541	1,514	184	109	--	467	--	--	--	--	--	10,556		
Engelmann spruce	661	567	1,049	166	801	464	--	360	117	99	108	--	4,392		
Total softwoods	37,539	9,554	6,310	3,625	2,587	-633	1,473	852	350	317	223	--	62,197		
Aspen	XXXXX	-1,004	899	145	29	40	--	--	--	--	--	--	109		
Cottonwood	XXXXX	--	116	16	135	201	34	246	683	280	836	--	2,547		
Total hardwoods	XXXXX	-1,004	1,015	161	164	241	34	246	683	280	836	--	2,656		
All species	37,539	8,550	7,325	3,786	2,751	-392	1,507	1,098	1,033	597	1,059	--	64,853		

¹Net annual growth is negative when annual mortality exceeds gross annual growth.

Table 35--Annual mortality of growing stock on timberland outside National Forests by species and ownership class in central-southeastern Wyoming, 1983

Species	Ownership class		
	Other public	Private	Total
	- - - - - <u>Thousand cubic feet</u> - - - - -		
Douglas-fir	--	564	564
Ponderosa pine	689	254	943
Lodgepole pine	--	149	149
Limber pine	493	156	649
Subalpine fir	--	76	76
Engelmann spruce	--	--	--
Total softwoods	1,182	1,199	2,381
Aspen	528	848	1,376
Cottonwood	--	353	353
Total hardwoods	528	1,201	1,729
All species	1,710	2,400	4,110

Table 36--Annual mortality of sawtimber (International 1/4-inch rule) on timberland outside National Forests by species and ownership class in central-southeastern Wyoming, 1983

Species	Ownership class		
	Other public	Private	Total
- Thousand board feet, International 1/4-inch rule -			
Douglas-fir	--	3,059	3,059
Ponderosa pine	2,011	1,033	3,044
Lodgepole pine	--	--	--
Limber pine	812	--	812
Subalpine fir	--	--	--
Engelmann spruce	--	--	--
Total softwoods	2,823	4,092	6,915
Aspen	925	1,592	2,517
Cottonwood	--	--	--
Total hardwoods	925	1,592	2,517
All species	3,748	5,684	9,432

Table 37--Annual mortality of sawtimber (Scribner rule) on timberland outside National Forests by species and ownership class in central-southeastern Wyoming, 1983

Species	Ownership class		
	Other public	Private	Total
- - - - Thousand board feet, Scribner rule - - - -			
Douglas-fir	--	2,608	2,608
Ponderosa pine	1,742	847	2,589
Lodgepole pine	--	--	--
Limber pine	696	--	696
Subalpine fir	--	--	--
Engelmann spruce	--	--	--
Total softwoods	2,438	3,455	5,893
Aspen	796	1,371	2,167
Cottonwood	--	--	--
Total hardwoods	796	1,371	2,167
All species	3,234	4,826	8,060

Table 38--Annual mortality of growing stock on timberland outside National Forests by species and diameter class in central-southeastern Wyoming, 1983

Species	Diameter class (inches at breast height)														All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		
	----- Thousand cubic feet -----														
Douglas-fir	--	--	--	--	--	--	--	565	--	--	--	--	--	--	565
Ponderosa pine	149	287	--	104	360	--	191	--	--	--	--	--	--	--	942
Lodgepole pine	82	364	--	203	--	--	--	--	--	--	--	--	--	--	149
Limber pine	76	--	--	--	--	--	--	--	--	--	--	--	--	--	649
Subalpine fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--	76
Engelmann spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total softwoods	307	651	--	307	360	--	191	565	--	--	--	--	--	--	2,381
Aspen	186	340	306	544	--	--	--	--	--	--	--	--	--	--	1,376
Cottonwood	--	78	275	--	--	--	--	--	--	--	--	--	--	--	353
Total hardwoods	186	418	581	544	--	--	--	--	--	--	--	--	--	--	1,729
All species	493	1,069	581	851	360	--	191	565	--	--	--	--	--	--	4,110

Table 39--Annual mortality of sawtimber (International 1/4-inch rule) on timberland outside National Forests by species and diameter class in central-southeastern Wyoming, 1983

Species	Diameter class (inches at breast height)											All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+	
	----- Thousand board feet, International 1/4-inch rule -----											
Douglas-fir	--	--	--	--	--	3,059	--	--	--	--	--	3,059
Ponderosa pine	--	324	1,743	--	977	--	--	--	--	--	--	3,044
Lodgepole pine	--	--	--	--	--	--	--	--	--	--	--	--
Limber pine	--	812	--	--	--	--	--	--	--	--	--	812
Subalpine fir	--	--	--	--	--	--	--	--	--	--	--	--
Engelmann spruce	--	--	--	--	--	--	--	--	--	--	--	--
Total softwoods	--	1,136	1,743	--	977	3,059	--	--	--	--	--	6,915
Aspen	XXXX	2,517	--	--	--	--	--	--	--	--	--	2,517
Cottonwood	XXXX	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	XXXX	2,517	--	--	--	--	--	--	--	--	--	2,517
All species	--	3,653	1,743	--	977	3,059	--	--	--	--	--	9,432

Table 40--Annual mortality of sawtimber (Scribner rule) on timberland outside National Forests by species and diameter class in central-southeastern Wyoming, 1983

Species	Diameter class (inches at breast height)											All classes
	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 22.9	23.0- 24.9	25.0- 26.9	27.0- 28.9	29.0+	
	----- Thousand board feet, Scribner rule -----											
Douglas-fir	--	--	--	--	--	2,608	--	--	--	--	--	2,608
Ponderosa pine	--	241	1,498	--	851	--	--	--	--	--	--	2,590
Lodgepole pine	--	--	--	--	--	--	--	--	--	--	--	--
Limber pine	--	696	--	--	--	--	--	--	--	--	--	696
Subalpine fir	--	--	--	--	--	--	--	--	--	--	--	--
Engelmann spruce	--	--	--	--	--	--	--	--	--	--	--	--
Total softwoods	--	937	1,498	--	851	2,608	--	--	--	--	--	5,894
Aspen	XXXXX	2,166	--	--	--	--	--	--	--	--	--	2,166
Cottonwood	XXXXX	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	XXXXX	2,166	--	--	--	--	--	--	--	--	--	2,166
All species	--	3,103	1,498	--	851	2,608	--	--	--	--	--	8,060

Table 41--Annual mortality of growing stock on timberland outside National Forests by species and cause of death in central-southeastern Wyoming, 1983

Species	Cause of death								Total
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown ¹	
	--	--	--	--	Thousand cubic feet	--	--	--	--
Douglas-fir	--	--	--	--	565	--	--	--	565
Ponderosa pine	315	--	627	--	--	--	--	--	942
Lodgepole pine	--	--	149	--	--	--	--	--	149
Limber pine	290	--	--	--	203	--	--	156	649
Subalpine fir	--	--	--	--	--	--	--	76	76
Total softwoods	605	--	776	--	768	--	--	232	2,381
Aspen	--	740	--	528	108	--	--	--	1,376
Cottonwood	--	--	--	353	--	--	--	--	353
Total hardwoods	--	740	--	881	108	--	--	--	1,729
All species	605	740	776	881	876	--	--	232	4,110

¹Because many destructive agents often attack trees in concert or in succession, it is often difficult to identify the actual causal agent. When the primary cause of death cannot be precisely determined, it is listed as unknown.

Table 42--Annual mortality of sawtimber (International 4-inch rule) on timberland outside National Forests by species and cause of death in central-southeastern Wyoming, 1983

Species	Cause of death								Total
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	
----- Thousand board feet, International 4-inch rule -----									
Douglas-fir	--	--	--	--	3,059	--	--	--	3,059
Ponderosa pine	560	--	2,483	--	--	--	--	--	3,043
Lodgepole pine	--	--	--	--	--	--	--	--	--
Limber pine	--	--	--	--	812	--	--	--	812
Subalpine fir	--	--	--	--	--	--	--	--	--
Total softwoods	560	--	2,483	--	3,871	--	--	--	6,914
Aspen	--	1,592	--	926	--	--	--	--	2,518
Cottonwood	--	--	--	--	--	--	--	--	--
Total hardwoods	--	1,592	--	926	--	--	--	--	2,518
All species	560	1,592	2,483	926	3,871	--	--	--	9,432

Table 43--Annual mortality of sawtimber (Scribner rule) on timberland outside National Forests by species and cause of death in central-southeastern Wyoming, 1983

Species	Cause of death								Total
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	
----- Thousand board feet, Scribner rule -----									
Douglas-fir	--	--	--	--	2,608	--	--	--	2,608
Ponderosa pine	484	--	2,106	--	--	--	--	--	2,590
Lodgepole pine	--	--	--	--	--	--	--	--	--
Limber pine	--	--	--	--	696	--	--	--	696
Subalpine fir	--	--	--	--	--	--	--	--	--
Total softwoods	484	--	2,106	--	3,304	--	--	--	5,894
Aspen	--	1,371	--	795	--	--	--	--	2,166
Cottonwood	--	--	--	--	--	--	--	--	--
Total hardwoods	--	1,371	--	795	--	--	--	--	2,166
All species	484	1,371	2,106	795	3,304	--	--	--	8,060

Table 44--Area of woodland outside National Forests by forest type and ownership class in central-southeastern Wyoming, 1984

Forest type	Ownership class		
	Other public	Private	Total
	- - - - - Acres - - - - -		
Juniper	183,175	70,200	253,375
Total woodland softwoods	183,175	70,200	253,375
Mountain brush ¹	7,632	--	7,632
Riparian	--	20,057	20,057
Total woodland hardwoods	7,632	20,057	27,689
All types	190,807	90,257	281,064

¹Mountain brush and riparian hardwood forest types are shown separately on this table only. These types are included in the "other" forest type category on the remaining woodland tables.

Table 45--Area of woodland outside National Forests by ownership class, forest type, and productivity class in central-southeastern Wyoming, 1984

Ownership class	Forest type	Productivity class		
		High	Low	All classes
		- - - - - Acres - - - - -		
Other public:	Juniper	106,852	76,323	183,175
	Other	--	7,632	7,632
	Total	106,852	83,955	190,807
Private:	Juniper	30,086	40,114	70,200
	Other	20,057	--	20,057
	Total	50,143	40,114	90,257
Total:	Juniper	136,938	116,437	253,375
	Other	20,057	7,632	27,689
	Total	156,995	124,069	281,064

Table 46--Area of woodland outside National Forests by ownership class, forest type, and volume class in central-southeastern Wyoming, 1984

Ownership class	Forest type	Volume class				All classes
		0 - 499 cu ft/acre	500-999 cu ft/acre	1,000+ cu ft/acre	Acres	
Other public:	Juniper	152,646	30,529	--	--	183,175
	Other	7,632	--	--	--	7,632
	Total	160,278	30,529	--	--	190,807
Private:	Juniper	60,171	10,029	--	--	70,200
	Other	--	--	20,057	--	20,057
	Total	60,171	10,029	20,057	--	90,257
Total:	Juniper	212,817	40,558	--	--	253,375
	Other	7,632	--	20,057	--	27,689
	Total	220,449	40,558	20,057	--	281,064

Table 47--Number of trees on woodland outside National Forests by ownership class, species, and diameter class in central-southeastern Wyoming, 1984

Ownership class and species	Two-inch diameter at root collar class																All classes
	Thousand trees																
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		

Other public:	-----																-----
Juniper	8,396	5,075	4,656	3,549	2,938	2,748	1,870	1,183	1,412	458	305	572	191	76	38	33,467	
Mtn. mahogany	9,159	649	534	229	76	--	--	--	--	--	--	--	--	--	--	10,723	
Other	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Total	17,555	5,724	5,190	3,778	3,014	2,748	1,946	1,183	1,412	458	305	572	191	76	38	44,190	

Private:	-----																-----
Juniper	8,023	3,009	2,256	1,655	1,203	501	602	301	401	351	--	201	100	--	--	18,603	
Mtn. mahogany	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Other	1,003	--	401	1,203	602	1,404	602	--	--	201	201	--	--	--	201	5,818	
Total	9,026	3,009	2,657	2,858	1,805	1,905	1,204	301	401	552	201	201	100	--	201	24,421	

Total:	-----																-----
Juniper	16,419	8,084	6,912	5,204	4,141	3,249	2,472	1,484	1,813	809	305	773	291	76	38	52,070	
Mtn. mahogany	9,159	649	534	229	76	--	76	--	--	--	--	--	--	--	--	10,723	
Other	1,003	--	401	1,203	602	1,404	602	--	--	201	201	--	--	--	201	5,818	
Total	26,581	8,733	7,847	6,636	4,819	4,653	3,150	1,484	1,813	1,010	506	773	291	76	239	68,611	

Table 49--Net volume of woodland species on woodland outside National Forests by ownership class, species, and diameter class in central-southeastern Wyoming, 1984

Ownership class and species	Two-inch diameter at root collar class														All classes																																																																																																																																																																																																																																	
	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+																																																																																																																																																																																																																																		
	Thousand cubic feet																																																																																																																																																																																																																																															
Other public:																	Juniper	908	2,022	2,600	3,615	4,628	4,612	4,312	4,004	2,787	2,181	5,302	1,256	191	100	38,518	Mtn. mahogany	73	130	162	16	--	155	--	--	--	--	--	--	--	--	536	Other	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Total	981	2,152	2,762	3,631	4,628	4,767	4,312	4,004	2,787	2,181	5,302	1,256	191	100	39,054	Private:																Juniper	839	1,375	2,010	2,118	1,185	2,486	917	2,783	2,198	--	3,398	1,025	--	--	20,334	Mtn. mahogany	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	839	1,629	5,810	5,057	15,274	8,884	917	2,783	7,143	6,182	3,398	1,025	--	15,159	74,100	Total:																Juniper	1,747	3,397	4,610	5,733	5,813	7,098	5,229	6,787	4,985	2,181	8,700	2,281	191	100	58,852	Mtn. mahogany	73	130	162	16	--	155	--	--	--	--	--	--	--	--	536	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	1,820	3,781	8,572	8,688	19,902	13,651	5,229	6,787	9,930	8,363	8,700	2,281	191	15,259	113,154
Juniper	908	2,022	2,600	3,615	4,628	4,612	4,312	4,004	2,787	2,181	5,302	1,256	191	100	38,518	Mtn. mahogany	73	130	162	16	--	155	--	--	--	--	--	--	--	--	536	Other	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Total	981	2,152	2,762	3,631	4,628	4,767	4,312	4,004	2,787	2,181	5,302	1,256	191	100	39,054	Private:																Juniper	839	1,375	2,010	2,118	1,185	2,486	917	2,783	2,198	--	3,398	1,025	--	--	20,334	Mtn. mahogany	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	839	1,629	5,810	5,057	15,274	8,884	917	2,783	7,143	6,182	3,398	1,025	--	15,159	74,100	Total:																Juniper	1,747	3,397	4,610	5,733	5,813	7,098	5,229	6,787	4,985	2,181	8,700	2,281	191	100	58,852	Mtn. mahogany	73	130	162	16	--	155	--	--	--	--	--	--	--	--	536	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	1,820	3,781	8,572	8,688	19,902	13,651	5,229	6,787	9,930	8,363	8,700	2,281	191	15,259	113,154																	
Mtn. mahogany	73	130	162	16	--	155	--	--	--	--	--	--	--	--	536	Other	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Total	981	2,152	2,762	3,631	4,628	4,767	4,312	4,004	2,787	2,181	5,302	1,256	191	100	39,054	Private:																Juniper	839	1,375	2,010	2,118	1,185	2,486	917	2,783	2,198	--	3,398	1,025	--	--	20,334	Mtn. mahogany	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	839	1,629	5,810	5,057	15,274	8,884	917	2,783	7,143	6,182	3,398	1,025	--	15,159	74,100	Total:																Juniper	1,747	3,397	4,610	5,733	5,813	7,098	5,229	6,787	4,985	2,181	8,700	2,281	191	100	58,852	Mtn. mahogany	73	130	162	16	--	155	--	--	--	--	--	--	--	--	536	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	1,820	3,781	8,572	8,688	19,902	13,651	5,229	6,787	9,930	8,363	8,700	2,281	191	15,259	113,154																																	
Other	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Total	981	2,152	2,762	3,631	4,628	4,767	4,312	4,004	2,787	2,181	5,302	1,256	191	100	39,054	Private:																Juniper	839	1,375	2,010	2,118	1,185	2,486	917	2,783	2,198	--	3,398	1,025	--	--	20,334	Mtn. mahogany	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	839	1,629	5,810	5,057	15,274	8,884	917	2,783	7,143	6,182	3,398	1,025	--	15,159	74,100	Total:																Juniper	1,747	3,397	4,610	5,733	5,813	7,098	5,229	6,787	4,985	2,181	8,700	2,281	191	100	58,852	Mtn. mahogany	73	130	162	16	--	155	--	--	--	--	--	--	--	--	536	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	1,820	3,781	8,572	8,688	19,902	13,651	5,229	6,787	9,930	8,363	8,700	2,281	191	15,259	113,154																																																	
Total	981	2,152	2,762	3,631	4,628	4,767	4,312	4,004	2,787	2,181	5,302	1,256	191	100	39,054	Private:																Juniper	839	1,375	2,010	2,118	1,185	2,486	917	2,783	2,198	--	3,398	1,025	--	--	20,334	Mtn. mahogany	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	839	1,629	5,810	5,057	15,274	8,884	917	2,783	7,143	6,182	3,398	1,025	--	15,159	74,100	Total:																Juniper	1,747	3,397	4,610	5,733	5,813	7,098	5,229	6,787	4,985	2,181	8,700	2,281	191	100	58,852	Mtn. mahogany	73	130	162	16	--	155	--	--	--	--	--	--	--	--	536	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	1,820	3,781	8,572	8,688	19,902	13,651	5,229	6,787	9,930	8,363	8,700	2,281	191	15,259	113,154																																																																	
Private:																Juniper	839	1,375	2,010	2,118	1,185	2,486	917	2,783	2,198	--	3,398	1,025	--	--	20,334	Mtn. mahogany	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	839	1,629	5,810	5,057	15,274	8,884	917	2,783	7,143	6,182	3,398	1,025	--	15,159	74,100	Total:																Juniper	1,747	3,397	4,610	5,733	5,813	7,098	5,229	6,787	4,985	2,181	8,700	2,281	191	100	58,852	Mtn. mahogany	73	130	162	16	--	155	--	--	--	--	--	--	--	--	536	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	1,820	3,781	8,572	8,688	19,902	13,651	5,229	6,787	9,930	8,363	8,700	2,281	191	15,259	113,154																																																																																	
Juniper	839	1,375	2,010	2,118	1,185	2,486	917	2,783	2,198	--	3,398	1,025	--	--	20,334	Mtn. mahogany	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	839	1,629	5,810	5,057	15,274	8,884	917	2,783	7,143	6,182	3,398	1,025	--	15,159	74,100	Total:																Juniper	1,747	3,397	4,610	5,733	5,813	7,098	5,229	6,787	4,985	2,181	8,700	2,281	191	100	58,852	Mtn. mahogany	73	130	162	16	--	155	--	--	--	--	--	--	--	--	536	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	1,820	3,781	8,572	8,688	19,902	13,651	5,229	6,787	9,930	8,363	8,700	2,281	191	15,259	113,154																																																																																																	
Mtn. mahogany	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	839	1,629	5,810	5,057	15,274	8,884	917	2,783	7,143	6,182	3,398	1,025	--	15,159	74,100	Total:																Juniper	1,747	3,397	4,610	5,733	5,813	7,098	5,229	6,787	4,985	2,181	8,700	2,281	191	100	58,852	Mtn. mahogany	73	130	162	16	--	155	--	--	--	--	--	--	--	--	536	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	1,820	3,781	8,572	8,688	19,902	13,651	5,229	6,787	9,930	8,363	8,700	2,281	191	15,259	113,154																																																																																																																	
Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	839	1,629	5,810	5,057	15,274	8,884	917	2,783	7,143	6,182	3,398	1,025	--	15,159	74,100	Total:																Juniper	1,747	3,397	4,610	5,733	5,813	7,098	5,229	6,787	4,985	2,181	8,700	2,281	191	100	58,852	Mtn. mahogany	73	130	162	16	--	155	--	--	--	--	--	--	--	--	536	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	1,820	3,781	8,572	8,688	19,902	13,651	5,229	6,787	9,930	8,363	8,700	2,281	191	15,259	113,154																																																																																																																																	
Total	839	1,629	5,810	5,057	15,274	8,884	917	2,783	7,143	6,182	3,398	1,025	--	15,159	74,100	Total:																Juniper	1,747	3,397	4,610	5,733	5,813	7,098	5,229	6,787	4,985	2,181	8,700	2,281	191	100	58,852	Mtn. mahogany	73	130	162	16	--	155	--	--	--	--	--	--	--	--	536	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	1,820	3,781	8,572	8,688	19,902	13,651	5,229	6,787	9,930	8,363	8,700	2,281	191	15,259	113,154																																																																																																																																																	
Total:																Juniper	1,747	3,397	4,610	5,733	5,813	7,098	5,229	6,787	4,985	2,181	8,700	2,281	191	100	58,852	Mtn. mahogany	73	130	162	16	--	155	--	--	--	--	--	--	--	--	536	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	1,820	3,781	8,572	8,688	19,902	13,651	5,229	6,787	9,930	8,363	8,700	2,281	191	15,259	113,154																																																																																																																																																																	
Juniper	1,747	3,397	4,610	5,733	5,813	7,098	5,229	6,787	4,985	2,181	8,700	2,281	191	100	58,852	Mtn. mahogany	73	130	162	16	--	155	--	--	--	--	--	--	--	--	536	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	1,820	3,781	8,572	8,688	19,902	13,651	5,229	6,787	9,930	8,363	8,700	2,281	191	15,259	113,154																																																																																																																																																																																	
Mtn. mahogany	73	130	162	16	--	155	--	--	--	--	--	--	--	--	536	Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	1,820	3,781	8,572	8,688	19,902	13,651	5,229	6,787	9,930	8,363	8,700	2,281	191	15,259	113,154																																																																																																																																																																																																	
Other	--	254	3,800	2,939	14,089	6,398	--	--	4,945	6,182	--	--	--	15,159	53,766	Total	1,820	3,781	8,572	8,688	19,902	13,651	5,229	6,787	9,930	8,363	8,700	2,281	191	15,259	113,154																																																																																																																																																																																																																	
Total	1,820	3,781	8,572	8,688	19,902	13,651	5,229	6,787	9,930	8,363	8,700	2,281	191	15,259	113,154																																																																																																																																																																																																																																	

Table 50--Net volume of woodland species on woodland outside National Forests by ownership class, forest type, and productivity class in central-southeastern Wyoming, 1984

Ownership class	Forest type	Productivity class		
		High	Low	All classes
- - - - Thousand cubic feet - - - -				
Other public:	Juniper	28,976	9,523	38,499
	Other	--	555	555
	Total	28,976	10,078	39,054
Private:	Juniper	11,217	9,117	20,334
	Other	53,766	--	53,766
	Total	64,983	9,117	74,100
Total:	Juniper	40,193	18,640	58,833
	Other	53,766	555	54,321
	Total	93,959	19,195	113,154

Table 51--Net volume of woodland species on woodland outside National Forests by ownership class, forest type, and volume class in central-southeastern Wyoming, 1984

Ownership class	Forest type	Volume class			
		0 - 499 cu ft/acre	500-999 cu ft/acre	1,000+ cu ft/acre	All classes
		- - - - - Thousand cubic feet - - - - -			
Other public:	Juniper	23,025	15,474	--	38,499
	Other	555	--	--	555
	Total	23,580	15,474	--	39,054
Private:	Juniper	12,955	7,379	--	20,334
	Other	--	--	53,766	53,766
	Total	12,955	7,379	53,766	74,100
Total:	Juniper	35,980	22,853	--	58,833
	Other	555	--	53,766	54,321
	Total	36,535	22,853	53,766	113,154

Table 52--Net dead volume of woodland species on woodland outside National Forests by ownership class, species, and diameter class in central-southeastern Wyoming, 1984

Ownership class and species	Two-inch diameter at root collar class													All classes		
	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9			
	Thousand cubic feet															
Other public:																
Juniper	13	35	136	413	389	396	1,252	920	440	234	875	95	114	1,312	6,624	
Mtn. mahogany	3	7	--	3	--	--	--	--	--	--	--	--	--	--	13	
Other	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Total	16	42	136	416	389	396	1,252	920	440	234	875	95	114	1,312	6,637	
Private:																
Juniper	6	60	17	43	444	47	468	78	145	--	--	--	--	--	1,308	
Mtn. mahogany	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Other	--	191	627	1,071	--	110	1,556	--	247	7,270	--	--	--	758	11,830	
Total	6	251	644	1,114	444	157	2,024	78	392	7,270	--	--	--	758	13,138	
Total:																
Juniper	19	95	153	456	833	443	1,720	998	585	234	875	95	114	1,312	7,932	
Mtn. mahogany	3	7	--	3	--	--	--	--	--	--	--	--	--	--	13	
Other	--	191	627	1,071	--	110	1,556	--	247	7,270	--	--	--	758	11,830	
Total	22	293	780	1,530	833	553	3,276	998	832	7,504	875	95	114	2,070	19,775	

Table 53--Net dead volume of woodland species on woodland outside National Forests by ownership class, forest type, and productivity class in central-southeastern Wyoming, 1984

Ownership class	Forest type	Productivity class		
		High	Low	All classes
- - - - Thousand cubic feet - - - -				
Other public:	Juniper	4,724	1,736	6,460
	Other	--	177	177
	Total	4,724	1,913	6,637
Private:	Juniper	728	580	1,308
	Other	11,830	--	11,830
	Total	12,558	580	13,138
Total:	Juniper	5,452	2,316	7,768
	Other	11,830	177	12,007
	Total	17,282	2,493	19,775

Table 54--Net dead volume of woodland species on woodland outside National Forests by ownership class, forest type, and volume class in central-southeastern Wyoming, 1984

Ownership class	Forest type	Volume class			
		0 - 499 cu ft/acre	500-999 cu ft/acre	1,000+ cu ft/acre	All classes
		- - - - - Thousand cubic feet - - - - -			
Other public:	Juniper	4,334	2,126	--	6,460
	Other	177	--	--	177
	Total	4,511	2,126	--	6,637
Private:	Juniper	1,218	90	--	1,308
	Other	--	--	11,830	11,830
	Total	1,218	90	11,830	13,138
Total:	Juniper	5,552	2,216	--	7,768
	Other	177	--	11,830	12,007
	Total	5,729	2,216	11,830	19,775

Table 55--Net annual growth on woodland outside National Forests by species and ownership class in central-southeastern Wyoming, 1983

Species	Ownership class		
	Other public	Private	Total
	- - - - - <u>Thousand cubic feet</u> - - - - -		
Ponderosa pine	--	13	13
Limber pine	19	--	19
Woodland softwoods	445	178	623
Woodland hardwoods	6	1,008	1,014
All species	470	1,199	1,669

Table 56--Net annual growth of woodland species on woodland outside National Forests by ownership class, species, and diameter class in central-southeastern Wyoming, 1983

Ownership class and species	Two-inch diameter at root collar class													All classes	
	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9		29.0+
	----- Thousand cubic feet -----														
Other public:															
Juniper	56	59	40	46	53	58	41	23	26	12	25	5	1	(1)	445
Mtn. mahogany	1	2	2	(1)	--	1	--	--	--	--	--	--	--	--	6
Other	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	57	61	42	46	53	59	41	23	26	12	25	5	1	--	451
Private:															
Juniper	46	24	60	27	-60	22	8	17	10	--	19	5	--	--	178
Mtn. mahogany	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other	--	20	192	174	312	156	--	--	37	41	--	--	--	76	1,008
Total	46	44	252	201	252	178	8	17	47	41	19	5	--	76	1,186
Total:															
Juniper	102	83	100	73	-7	80	49	40	36	12	44	10	1	--	623
Mtn. mahogany	1	2	2	--	--	1	--	--	--	--	--	--	--	--	6
Other	--	20	192	174	312	156	--	--	37	41	--	--	--	76	1,008
Total	103	105	294	247	305	237	49	40	73	53	44	10	1	76	1,637

¹Less than 0.5 thousand cubic feet.

Table 57--Net annual growth of woodland species on woodland outside National Forests by ownership class, forest type, and productivity class in central-southeastern Wyoming, 1983

Ownership class	Forest type	Productivity class		
		High	Low	All classes
- - - - <u>Thousand cubic feet</u> - - - -				
Other public:	Juniper	338	109	447
	Other	--	4	4
	Total	338	113	451
Private:	Juniper	17	161	178
	Other	1,008	--	1,008
	Total	1,025	161	1,186
Total:	Juniper	355	270	625
	Other	1,008	4	1,012
	Total	1,363	274	1,637

Table 58--Net annual growth of woodland species on woodland outside National Forests by ownership class, forest type, and volume class in central-southeastern Wyoming, 1983

Ownership class	Forest type	Volume class			
		0 - 499 cu ft/acre	500-999 cu ft/acre	1,000+ cu ft/acre	All classes
- - - - - <u>Thousand cubic feet</u> - - - - -					
Other public:	Juniper	295	152	--	447
	Other	4	--	--	4
	Total	299	152	--	451
Private:	Juniper	127	51	--	178
	Other	--	--	1,008	1,008
	Total	127	51	1,008	1,186
Total:	Juniper	422	203	--	625
	Other	4	--	1,008	1,012
	Total	426	203	1,008	1,637

Table 59--Number of fenceposts on woodland outside National Forests by ownership class, species, and type of post in central-southeastern Wyoming, 1984

Ownership class	Species	Type of post		
		Line	Corner	Total
- - - - <u>Thousand fenceposts</u> - - - -				
Other public:	Juniper	6,405	3,056	9,461
Private:	Juniper	6,668	2,781	9,449
Total	Juniper	13,073	5,837	18,910

Green, Alan W.; Conner, Roger C. 1988. Timberland and woodland resources outside National Forests in central and southeastern Wyoming, 1984. Resour. Bull. INT-53. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 58 p.

Highlights the results of forest inventory of the 12 counties in central and southeastern Wyoming. Presents area, volume, growth, and mortality statistics for both timberland and woodlands outside the National Forests as of 1984.

KEYWORDS: softwoods, hardwoods, growing-stock and sawtimber volumes, net annual growth, harvest

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