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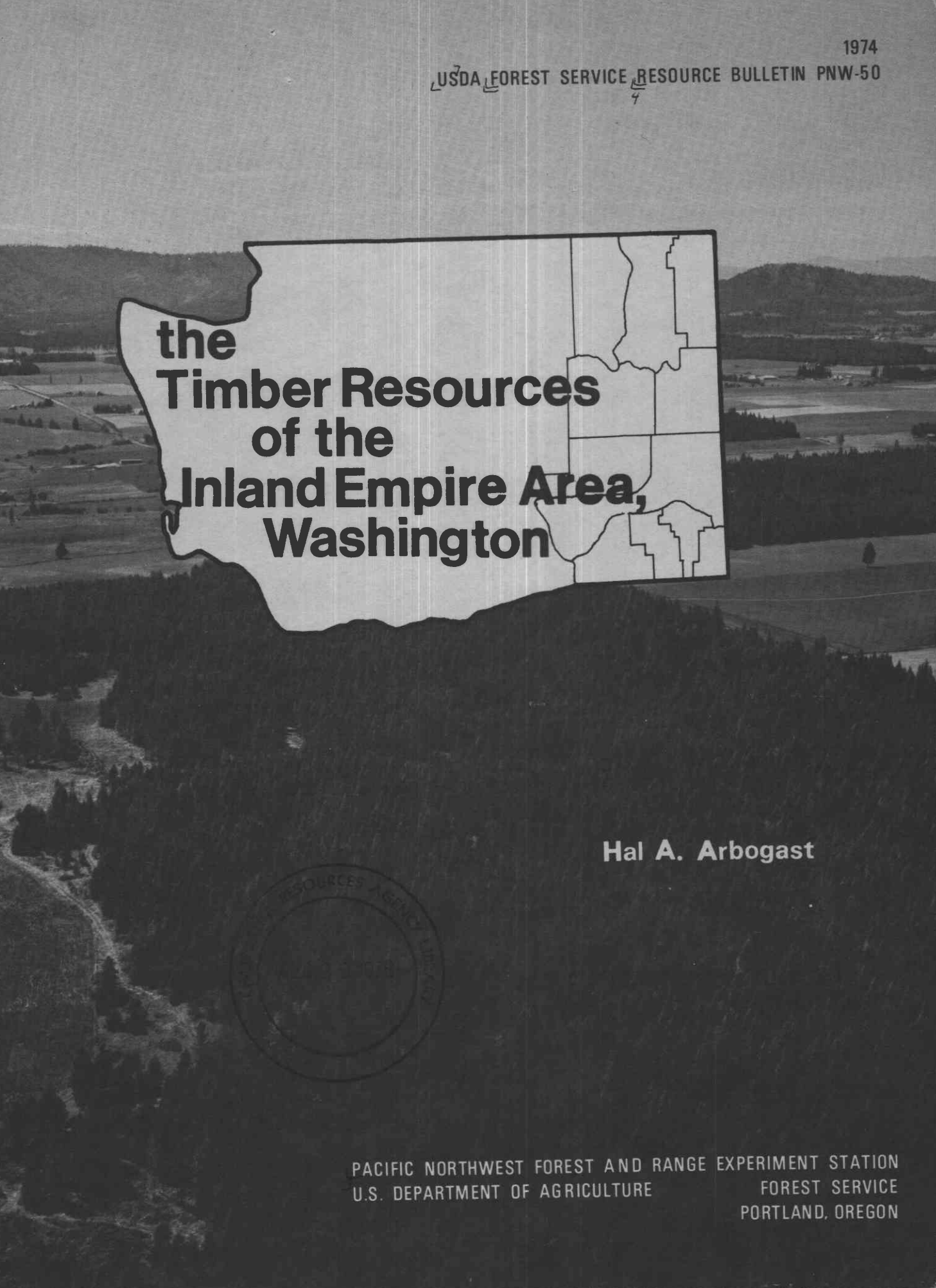

the Timber Resources of the Inland Empire Area, Washington

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PREFACE

This publication summarizes the findings of the latest inventory of the timber resources of the 12 easternmost counties of Washington—Pend Oreille, Spokane, Stevens, Ferry, Lincoln, Whitman, Asotin, Garfield, Columbia, Walla Walla, Adams, and Franklin.

Fieldwork on lands outside the National Forests was done in 1968. Forest inventories of the Colville and Kaniksu National Forests in northeast Washington were done in 1964 and 1969, respectively. The Umatilla National Forest in southeastern Washington was inventoried in 1969.

Three previous inventories have been made for Pend Oreille, Spokane, Stevens, Ferry, Lincoln, and Whitman Counties in northeastern Washington during the periods 1934-35, 1946-48, and 1957-61. Two previous timber inventories have been made in Walla Walla, Columbia, Garfield, and Asotin Counties in southeastern Washington — in 1935 and in 1957. Adams and Franklin Counties are included in the Inland Empire area but are not forested.

This report was prepared by the Forest Survey, a nationwide project of the Forest Service authorized by the McSweeney-McNary Forest Research Act of 1928 and subsequent amendments. The purposes of the Forest Survey are (1) to obtain comprehensive information on timber resources, including the extent and condition of forest lands, the amount and kind of timber growing on these lands, the rate of forest growth and depletion, the amount of timber cut, and probable future trends in timber requirements; and (2) to analyze and make available timber resource information needed to formulate forest policies and programs. Resurveys are made periodically to update basic information.

The Forest Survey is conducted in all the 50 States by the USDA Forest Service Experiment Stations. The Pacific Northwest Forest and Range Experiment Station at Portland, Oregon, is responsible for collecting timber resource information for Alaska, California, Hawaii, Oregon, and Washington.

Forest resource data in this report and the discussion of forest area, volume, growth, and cut relate to the supply of wood available to meet regional and national needs. An analysis is made of the present timber resource, with emphasis on conditions that affect present and future timber production. Following the textual analysis is a more detailed set of tables that give forest area, volume, growth, and mortality statistics. The information in this report is presented for the use of legislators, service organizations, local and regional planners, investors, forest managers, and others interested in the timber situation in eastern Washington.

ABSTRACT

The latest inventory of the timber resources of the Inland Empire area of Washington indicates there are 24 billion board feet of sawtimber on 3.9 million acres of commercial forest land. Public agencies administer about 56 percent of the area and 70 percent of the sawtimber volume, farmer and miscellaneous private ownerships account for 37 percent of the area but only 22 percent of the sawtimber volume, and industry 8 percent of the total commercial forest area and 8 percent of the volume.

Douglas-fir is the most abundant species, accounting for 30 percent of the sawtimber volume. Ponderosa pine accounts for 29 percent of the volume, with larch and true firs also occurring in significant amounts. The forests of the Inland Empire are young, although the 12 percent of old growth is the principal source of timber for the area's forest industries. For the area as a whole, growth exceeds cut, with most of the growth on lands in farmer and miscellaneous private ownership. This imbalance could result in increased timber harvesting, depending on industry's willingness to process smaller timber from these types of owners and the individual owner's management objectives.

Keywords: Forest surveys [regional], statistics [forest].

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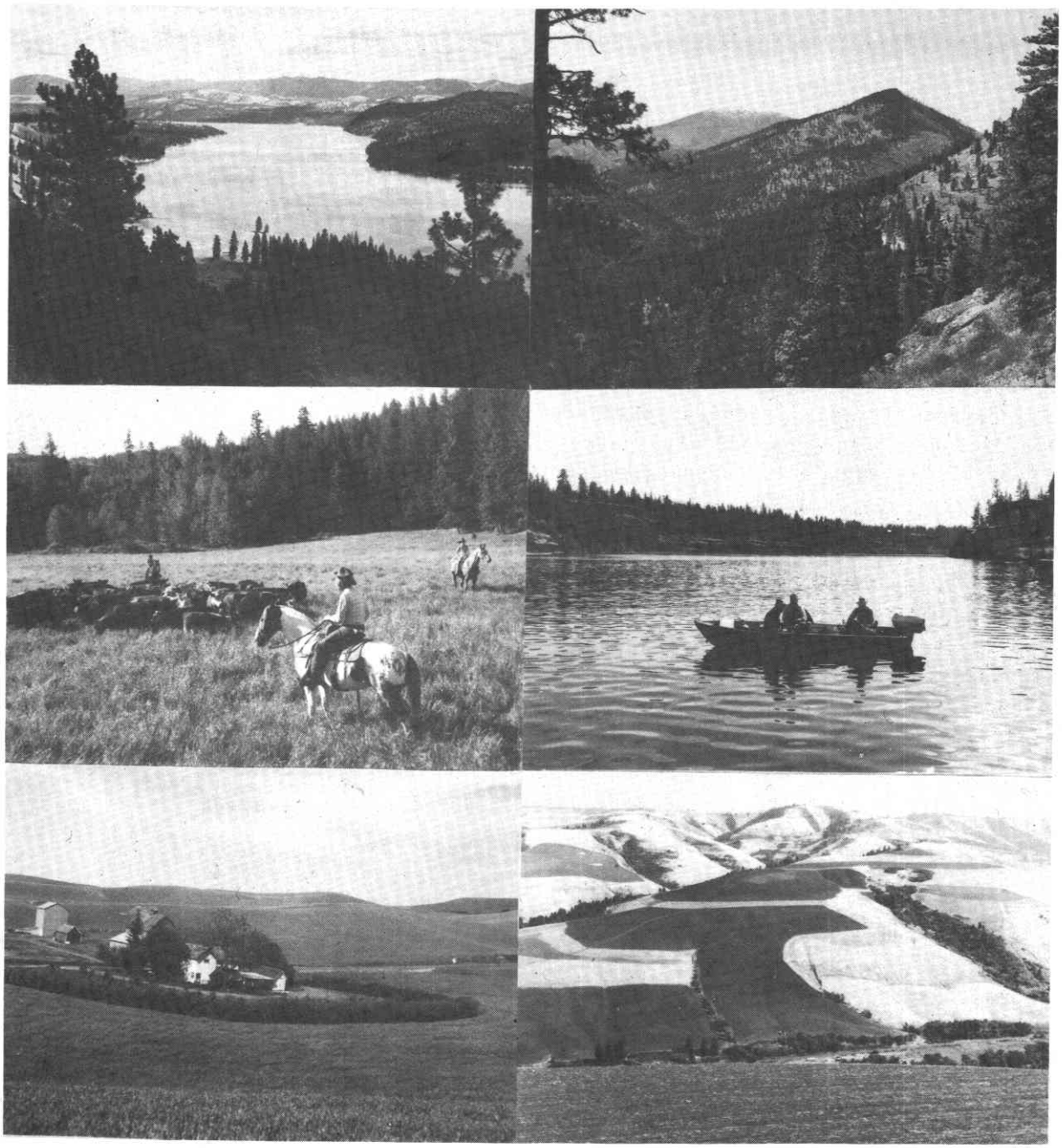

Figure 1. — A land of contrast. Top left — Franklin D. Roosevelt Lake, dividing line between Ferry and Stevens County, Washington. Top right — Looking up Hall Creek with Grizzly Mountain in background, Ferry County, Washington. Middle left — Cattle grazing near Republic in Ferry County, Washington. Middle right — Recreation use on Fish Trap Lake, 15 miles southwest of Cheney, Washington, in Lincoln County. Bottom left — Farm in Palouse wheat country southwest of Palouse, Washington, in Whitman County, Bottom right — View across Mill Creek looking east, 9 miles east of Walla Walla, Washington, in Walla Walla County. Top two photos courtesy of Harold Weaver, retired, BIA. Other photos courtesy of Soil Conservation Service.

FOREST LANDS

The 12.1 million acres that comprise the portion of the Inland Empire in Washington[1] cover a wide diversity of terrain and vegetation (fig. 1). The area reaches north into the rugged and heavily timbered Selkirk, Huckleberry, and Kettle River mountain ranges (fig. 2). Here, the forest lands occur within a wide range of elevation and precipitation—from roughly 1,500 feet with an average annual precipitation of 15 inches up to 7,500 feet where precipitation can average more than 50 inches. The major river drainages of the northern area flow in narrow north-south valleys between the mountain ranges. Most of the central and southern areas are characterized by gently rolling, river-channeled plateaus well-suited for dry farming and including much of the Palouse wheat country. Included in the Inland Empire area are the northernmost reaches of the timbered Blue Mountain range. The forest land in the Blue Mountains reaches 6,500 feet and receives a maximum of 45 inches of precipitation.

The Inland Empire's forest zone encompasses site conditions suitable for a variety of tree species. Douglas-fir, ponderosa pine, and western larch are the principal species.

[1] *The Inland Empire area of Washington [the 12 easternmost counties of the State] is a part of the entire Inland Empire which also includes portions of Canada, Idaho, and Oregon.*

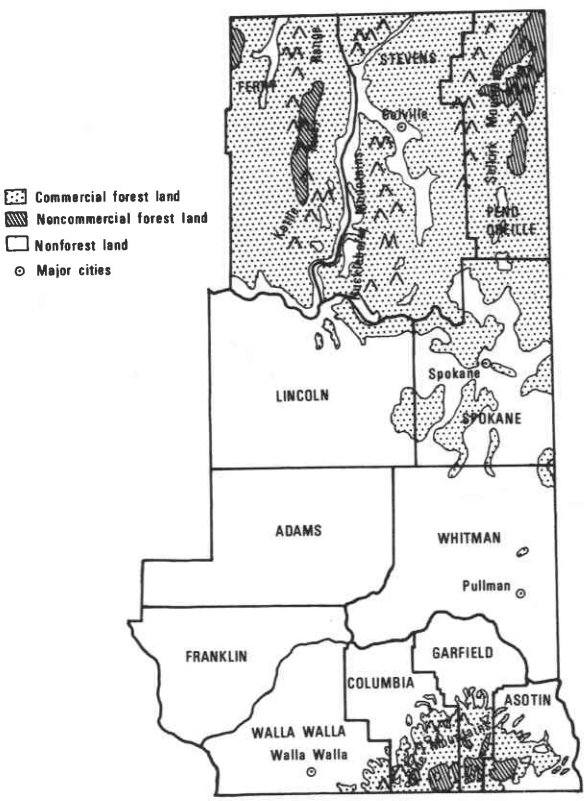

Figure 2.—Commercial, noncommercial, and nonforest lands in eastern Washington, 1968.

Ponderosa pine occurs primarily on the dry sites characteristic of the lower elevations of the forest zone (fig. 3). Douglas-fir and western larch most commonly occur between the ponderosa pine and high-elevational subalpine species. Gradations of association between species occur throughout the forest zone. Other species which occur both in relatively pure stands and in association with other species are grand fir, subalpine fir, Engelmann spruce, lodgepole pine, western white pine, western redcedar, western hemlock, and a small variety of hardwoods.

Figure 3.—Ponderosa pine occurs primarily on the dry sites characteristic of the lower elevations of the forest zone. (Photo courtesy of Harold Weaver, retired, BIA.)

The Inland Empire is sparsely populated; only about 454,000 persons, or 13.5 percent of Washington's population, live on 28.4 percent of the area of the State. About 40 percent of the Inland Empire population is in Spokane, Washington's second largest city. Spokane is the major transportation center and hub of economic activity for the Inland Empire.

The Inland Empire was first settled in 1810, with the establishment of "Spokane House." This settlement, which was a bartering center for fur trade with the Indians, was located at the junction of the Spokane and Little Spokane Rivers—about 10 miles northwest of the present site of Spokane. Later, as the fur trade expanded, the center of trading activity moved to Fort Colville on the Columbia River near Kettle Falls.

The influx of fur traders and other venturesome individuals continued through the early 1800's. Their explorations and the reports of their trips created much public interest in the area. Missionary societies sent workers to the area; and their letters describing their experiences started the "Great Migration," as it was called, in 1843 (Waddell 1943).

Discovery of gold hastened the rate of settlement in the Inland Empire during the 1850's and up through the 1890's. Many immigrants, lured by these discoveries, settled down and occupied new land. During the 1880's and 1890's, establishment of mines became particularly significant (fig. 4) when more

Figure 4.—This tungsten mine (old Germania Mine in Stevens County) was established in 1907 and abandoned in 1955. However, the mining industry is still important to the economy of the Inland Empire. (Photo courtesy of Harold Weaver, retired, BIA.)

attention was given to the search for additional minerals, such as lead, silver, copper, zinc, and tin. The mining industry has continued as an important activity.

Forests of the Inland Empire provided the fuel and building material needed for the early settlers. Lumbering first became important to the economy during the 1870's. With the coming of railroads and depletion of white pine in the Lake States, lumbermen in search of new timber established new mills, drawn primarily by the ponderosa and western white pine in the area. Harvesting and processing of wood from much of the area's 4.2 million acres of forest land are important generators of employment and wages in the Inland Empire, accounting for 18 percent of the total manufacturing base in 1971 (State of Washington, 1971). In five counties, Asotin, Ferry, Lincoln, Pend Oreille, and Stevens, forest industries accounted for more than half of the total manufacturing sector. In 1971 for the region as a whole, the forest products industry paid about $19 million in wages to about 2,400 persons.

Timber production is, of course, only one of the values of the forest lands in the Inland Empire. Recreation, water yields, and grazing have been significant uses for many years (fig. 1). Pressures for greater use of these resources will continue to mount and have an increasing effect on timber production. However, presentation of statistics on these "other" uses is beyond the scope of this report, which is limited largely to describing the timber resource.

Forests cover more than one-third of the Inland Empire

The Inland Empire's 4.2 million acres of forests account for 35 percent of the total land area of 12.1 million acres. Of this forest area, 3.9 million acres or 92.9 percent is classed as commercial[2] forest land.

About 56 percent of the commercial forest area is in public ownership. Private owners account for 44 percent. The following tabulation breaks down the kinds of public and private owners.

	Percent
Public:	
National Forests	57
Bureau of Indian Affairs	28
Other public	15
Private:	
Forest industry	17
Farmer	62
Miscellaneous private	21

[2] *"Commercial forest land area" and other terms used in this report are defined in "Definition of Terms."*

About nine-tenths of the commercial forest land on National Forests occurs on the Colville and Kaniksu National Forests in the three northern counties. The northern portion of the Umatilla National Forest in southeastern Washington accounts for the remaining tenth (fig. 5). The three Indian reservations in the Inland Empire—Colville, Spokane, and Kalispell—represent about two-thirds of the "other public" lands. The remainder is State, county, municipal, and other Federal lands.

Most of the forest land in private ownership is owned by farmers. This area, which represents about 62 percent of the total private commercial forest land, occurs in every forested county, but over three-fourths of it is in Pend Oreille, Spokane, and Stevens Counties. The remaining area in private ownership is owned by individuals or corporations owning sawmills, plywood or veneer mills, or pulp plants, and by a number of miscellaneous owners including both individuals and corporations. Most of the industrially owned forest land, as well as the land in miscellaneous private ownership, occurs in Stevens County, with lesser but still significant acreages in Ferry, Pend Oreille, and Spokane Counties. In total, the farmer and miscellaneous private owners hold 83 percent of the

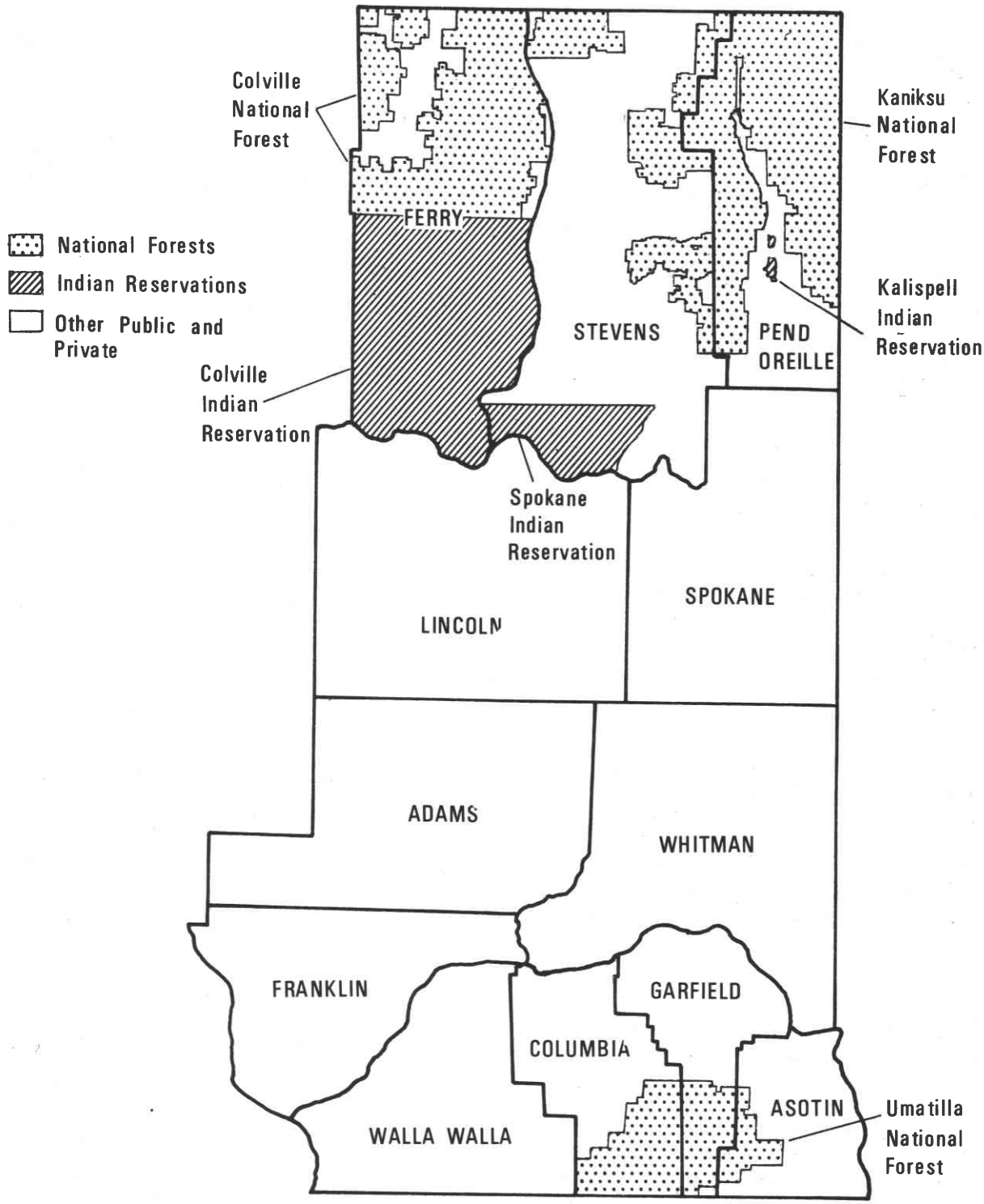

Figure 5.—Ownership map of Washington's Inland Empire.

commercial forest area in private ownership in the Inland Empire, a much greater share than in any other area of comparable size in the State. Consequently, these lands will be a dominant factor in the future supply of timber and other goods and services from private forest lands in this area.

A small area of forested land, 302,000 acres or approximately 2.5 percent of the total land area within the Inland Empire, is classified as noncommercial forest land. Of these lands, 255,000 acres are classified as noncommercial because they are unproductive due to adverse climate and soil conditions. About 80 percent of these unproductive lands consists of thin, rocky soils. The remaining 20 percent is limited in productivity by such factors as lack of precipitation and erosive soils on steep slopes.

The remaining 47,000 acres of noncommercial forest land are physically productive but are reserved from timber production; included are forests in Coulee Dam recreation area, Mount Spokane Park, and a few other State and county parks. Of this area, 4,000 acres on National Forests are classed as deferred, pending study and decisions concerning their classification as productive-reserved or as commercial forest land.

About 58 percent of the noncommercial forest land is in National Forests. "Other public" owners account for 32 percent, leaving only 10 percent on private lands.

Only about 12 percent of commercial forest land is in old-growth sawtimber

The forests of the Inland Empire are mostly young. They consist mainly of young-growth sawtimber, poletimber, saplings, and seedlings. Only 12 percent of the area is in old-growth sawtimber.

	Thousand acres	Percent
Old-growth sawtimber	461	12
Young-growth sawtimber	1,539	39
Poletimber, saplings, and seedlings	1,729	44
Nonstocked	209	5
Total	3,938	100

Although old-growth sawtimber comprises only 12 percent of the commercial forest area (fig. 6), it is of particular significance as a source of wood for present markets. In 1970, the principal old-growth species—ponderosa pine, Douglas-fir, and western larch—made up about three-fourths of the log consumption in the Inland Empire (Bergvall and Holtcamp 1970).

With most (93 percent) of the old-growth forest area in public ownership, the industries are heavily dependent on these ownerships for the type and size of material they are currently utilizing. The 286,000 acres of old growth on National Forests is two-thirds of the total old growth in public ownership.

The large area of young and intermediate age stands in the "farmer and miscellaneous private" category—1.3 million acres or nearly two-fifths of all such stands—undoubtedly will be far more important to the timber industry than they are today.

	Young-growth sawtimber	Poletimber and saplings-seedlings	Total	Percent
		Thousand acres		
National Forest	304	632	936	29
Other public	520	237	757	23
Forest industry	141	140	281	9
Farmer-miscellaneous private	574	720	1,294	39
Total	1,539	1,729	3,268	100

Despite the oncoming young-growth stands in farmer and miscellaneous private forest land, the National Forests contain the greatest potential for sustaining high levels of timber production over time. Forty-three percent of the National Forests are in site classes potentially capable of yielding more than 120 cubic feet per acre per year compared with 5 to 7 percent in other ownerships. Between 70 and 80 percent of the total commercial forest land in other public, forest industry, and farmer and miscellaneous private holdings have yield potentials of less than 84 cubic feet per acre per year, reflecting drier sites and more adverse growing conditions characteristic of lower elevations.

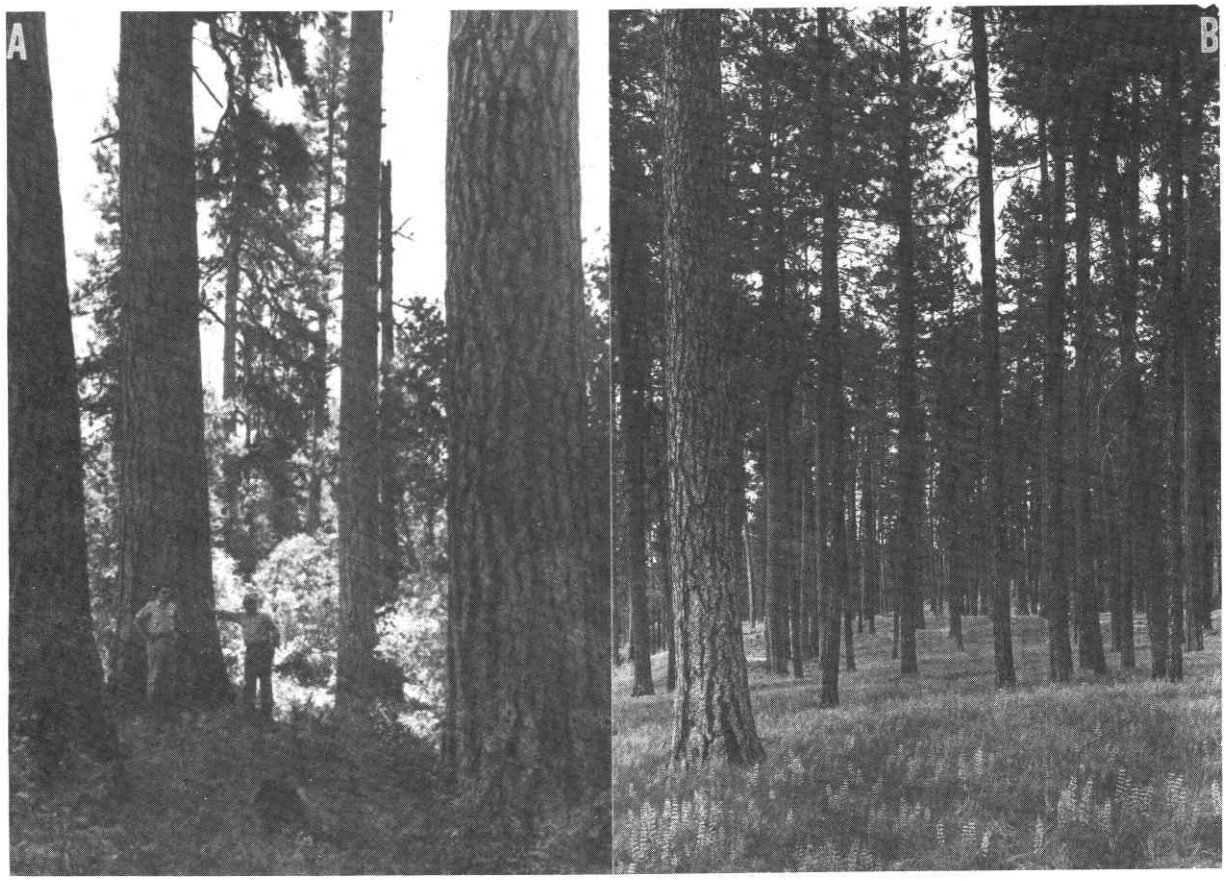

Figure 6. — Old-growth sawtimber stands occupy 461,000 acres in the Inland Empire area. A, a virgin stand of ponderosa pine, Douglas-fir, and western larch. Not all old growth is in large trees — some, like the 200-year-old, even-aged stand of ponderosa pine, B, is in relatively small trees. (Photos courtesy of Harold Weaver, retired, BIA.)

Five percent of the commercial area is nonstocked

About 209,000 acres or 5 percent of the commercial timberlands in the Inland Empire of Washington have either no trees or too few to qualify as stocked. Of these lands, 69 percent are in farmer and miscellaneous private holdings and comprise 10 percent of this ownership.

About 80 percent of the nonstocked area occurs in the ponderosa pine type of three northeastern Washington counties—Ferry, Spokane, and Stevens. The ponderosa pine type occurs primarily on the dry sites characteristic of the lower elevations of the forest zone. A recent study (MacLean and Bolsinger 1973) in eastern Oregon and California indicates that many of these nonstocked and poorly stocked areas do not have the capability of supporting more trees. It is probable that some of the areas classified as nonstocked in the Inland Empire do not have the potential for supporting commercial stands of timber and in the future will be considered noncommercial.

Douglas-fir and ponderosa pine are the most extensive forest types

The Inland Empire is characterized by a diversity of commercially important timber types. Douglas-fir and ponderosa pine types, which are so widespread in the Western States, are the leading types in the Inland Empire of Washington; and western larch type ranks third in terms of area (fig. 7).

Other widely distributed western types that occur here are lodgepole pine, grand fir, western redcedar, Engelmann spruce, and subalpine fir. Two other types of more limited distribution but commercially significant within the Inland Empire are western hemlock and western white pine. A small amount of hardwoods also occurs as a type.

Sawtimber volume represents about 8 percent of State total

Although the 3.9 million acres of commercial forest land in the Inland Empire of Washington comprises 21 percent of the State's total commercial forest land area, the 23.9 billion board feet[3] in sawtimber trees represents only 7 percent of the total sawtimber volume. Volume in growing stock trees in the Inland Empire of Washington amounts to 6.5 million cubic feet. Softwoods greatly predominate; less than 2 percent of the commercial forest area, as well as sawtimber and growing stock volumes, falls in the hardwood category. There is little volume—only 3 percent—in salvable dead and cull trees.

The commercial forest area of the Inland Empire averages 6,059 board feet per acre. This is considerably less than the volume found in those parts of the State with better site conditions. In western Washington, where amount of precipitation, length of growing season, and other factors of growth are more favorable, the average volume per acre is 26,370 board feet; in central Washington it is 11,650.

[3]*All board-foot volumes in this report, except where noted, are International 1/4-inch rule.*

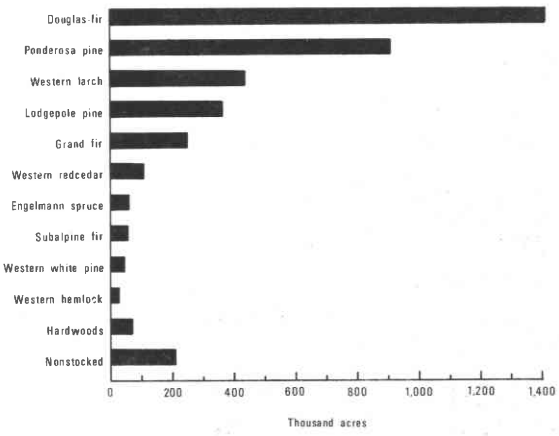

Figure 7.—Acreage of forest types in eastern Washington.

Sawtimber volume is concentrated on public lands

Although public lands represent about 56 percent of the commercial forest area, they contain 70 percent of the board-foot volume. The distribution of area and sawtimber volume as well as average volume per acre among major ownership classes are shown in table 1.

Nearly three-fourths of sawtimber volume is of three species — Douglas-fir, ponderosa pine, and western larch. For these three species combined, public lands account for about two-thirds of the sawtimber volume. Douglas-fir and western larch occur more commonly at intermediate to higher elevations where public lands predominate. Western larch is particularly prevalent in public ownership. Although 57 percent of the ponderosa pine type area is privately owned, it has been so greatly cut that public lands also have the larger part of the ponderosa pine volume.

	Douglas-fir	Ponderosa pine	Western larch
	Million board feet		
Public	4,790	3,923	3,064
Private	2,283	2,884	765
Total	7,073	6,807	3,829

There are a number of other species which individually account for small percentages of the total sawtimber volume but collectively comprise about one-fourth of the total. These other softwood species in order of amount of sawtimber volume are grand fir, lodgepole pine, subalpine fir, western white pine, Engelmann spruce, western redcedar, and western hemlock. As shown by the following breakdown of volume of these relatively minor species, public ownership greatly predominates:

Minor Species	
	Million board feet
Public	4,680
Private	1,163
Total	5,843

These minor species will very likely become more important as the old-growth volume of the leading species diminishes.

Table 1. — Area, Sawtimber volume, and volume per acre of commercial forest, by ownership class, Inland Empire area, Washington, 1968
(International 1/4-inch rule)

Ownership class	Area		Sawtimber volume		Volume per acre
	Thousand acres	*Percent*	*Million board feet*	*Percent*	*Board feet*
National Forest	1,240	31.5	9,678	40.5	7,805
Other public	947	24.0	7,008	29.4	7,400
Forest industry	302	7.7	1,928	8.1	6,384
Farmer and miscellaneous private	1,449	36.8	5,246	22.0	3,620
Total	3,938	100.0	23,860	100.0	6,059

GROWTH, CUT, AND MORTALITY

Net annual sawtimber growth is 567 million board feet

Net growth of sawtimber on commercial forest land in Washington's Inland Empire is estimated at 567 million board feet for 1968 — about 2.1 percent of inventory volume for that year. Net growth per acre averaged 144 board feet for all ownerships, with growth on public lands 121 board feet per acre and private lands 174 board feet. Table 2 shows inventory, growth, and mortality for the four ownership groups.

The low net annual growth rates on National Forest land reflect both the lower growth and high mortality that accompany old-growth sawtimber stands as well as the large area in pole and seedling-sapling stands on which board-foot increment is not yet accruing. Taken together, these lands with low board-foot growth account for about three-quarters of the commercial forest area on National Forests; only one-quarter is in relatively fast growing young sawtimber.

Net annual growth per acre is highest on private lands. On both industrial-owned lands and farmer and miscellaneous private holdings, mortality is far less than on public lands and 40 to 50 percent of their commercial forest land area is in young-growth sawtimber stands.

Net growth is higher on other public lands than on National Forest Lands, despite a high mortality, perhaps reflecting the fact that almost 55 percent of these lands are in young-growth sawtimer stands.

Table 2. — Annual per-acre volume, growth, and mortality, by ownership class, Inland Empire area, Washington, 1968
(International 1/4-inch rule)

Ownership class	Inventory volume per acre	Gross growth per acre	Net annual growth per acre	Annual mortality per acre	Annual mortality as % of gross growth
	Board feet				*Percent*
National Forest	7,805	192	117	75	53
Other public	7,400	214	125	89	42
Forest industry	6,384	221	199	22	10
Farmer and miscellaneous private	3,620	183	168	15	8
Average, all ownerships	6,059	196	144	52	29

Net annual growth exceeds cut

Growth in Washington's Inland Empire exceeds cut. Annual net growth in 1968 was 567 million board feet; annual cut of live trees for the period 1968-71 averaged about 415 million board feet.

Comparisons of growth and cut are meaningful only when management objectives, development toward meeting these objectives, and social and economic factors are considered. The following tabulation shows growth, average annual cut from 1968 to 1971, and net effect on inventory by ownership class.

The two public ownerships are in the process of converting a largely old-growth forest to a managed young-growth forest. The long-term goal is a regulated forest with a relatively even distribution of stand age classes to provide continuous timber production. Though cut is slightly more than growth at the present time, growth will increase in the future as the more slowly growing old-growth stands are harvested and replaced with rapidly growing young-growth stands.

Cut and growth on industrial ownerships are about in balance; if present trends continue, the inventory should remain relatively constant over time. Most of the land in industrial ownership is adequately stocked, and little slow-growing old growth remains in this ownership. Thus, the present level of cut should be generally sustainable over an extended period of time.

Substantially more timber is growing annually on the farmer and miscellaneous private lands than is being harvested—244 million board feet versus 79 million. Several factors contribute to this. Farmer and miscellaneous private ownerships have lower volumes per acre and smaller trees and thus higher conversion costs (fig. 8). Only 30 percent of the area in farmer and miscellaneous private ownership has stands of timber of more than 5,000 board feet per acre, compared with 51 percent for industry lands and 76 percent for public lands.

Figure 8.—The small average size of sawtimber on this old farmstead in Ferry County may partially account for limited cutting on these lands. (Photo courtesy of Harold Weaver, retired, BIA.)

Ownership	Inventory volume	Live cut	Net annual growth	Annual change in inventory
	Thousand board feet, International ¼-inch rule			*Percent*
National Forest	9,678,000	152,085	144,500	—0.08
Other public	7,008,000	129,362	118,200	—.16
Forest industry	1,928,000	55,096	60,200	+.26
Farmer and misc. private	5,246,000	78,622	244,000	+3.15
All ownerships	23,860,000	415,165	566,900	+.64

A second and possibly more important factor was the rise in timber availability from public lands during the 1960's (fig. 9) because of increased annual cuts. The relatively larger trees and volumes per acre on public lands became more attractive to industry buyers than the smaller trees and low volumes per acre on farmer and miscellaneous private lands.

The farmer and miscellaneous private owners represent a diverse group with various objectives ranging from timber production to esthetic and recreational benefits. To the extent that timber growing is the objective of a significant portion of these owners, the excess of growth over cut should result in increased harvesting on these lands as the stands increase in volume and sizes of trees more attractive to industry. This owner group can be expected to soon dominate the private timber supply picture in Washington's Inland Empire.

Mortality greatest on public lands

Approximately 53 million cubic feet of timber, which includes about 205 million board feet of sawtimber, was estimated to have died annually over the period 1959-68. Over 85 percent of total sawtimber mortality and the heaviest rates occurred on the public ownerships (tables 2 and 31). On private lands with their limited old-growth inventory, mortality was only 8 to 10 percent of gross growth as contrasted with the 42 to 53 percent on public lands.

Data which identify the cause of mortality show that weather and insects are the major causes of mortality. This is based on 31 million cubic feet (112 million board feet) on lands other than National Forests.[4] Weather damage was mostly in the form of wind and snow

[4] Cause-of-mortality data are not available for the Colville and Kaniksu National Forests.

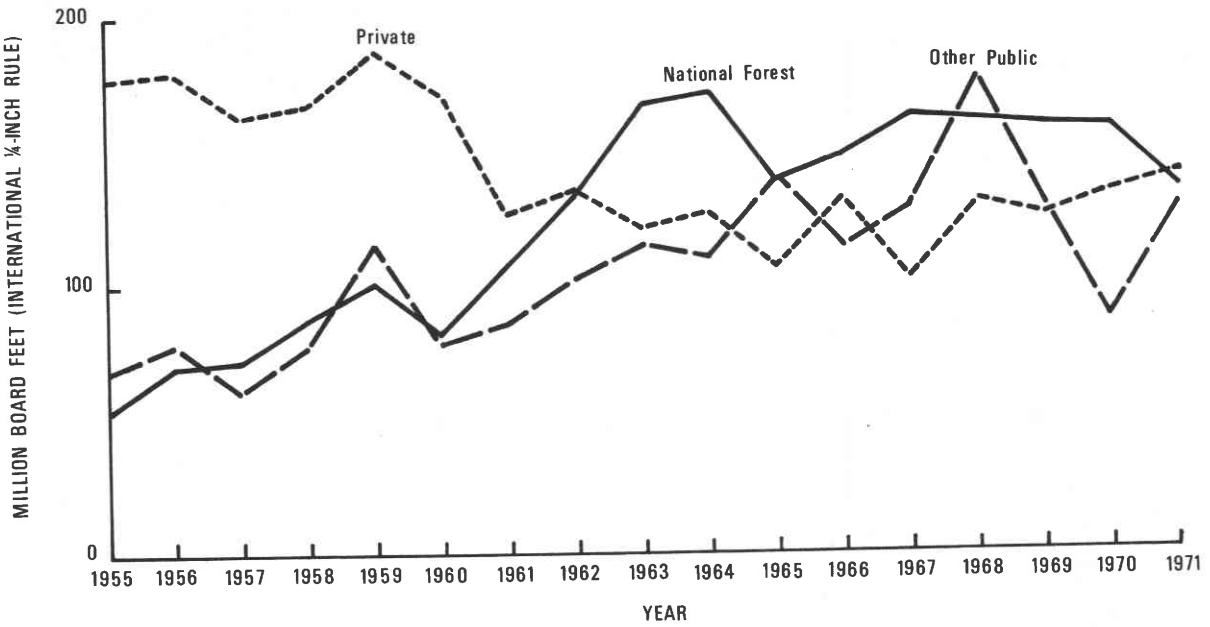

Figure 9.—Live and dead timber cut by ownership class, Inland Empire area, Washington, 1955-71 (International ¼-inch rule).

breakage, and the most common insect was the western larch casebearer and various bark beetles (USDA Forest Service 1958-68). Wind and insects accounted for slightly more than half the damage. Other damaging agents include fire, disease, animals, suppression, logging, and unknown causes.

Because mortality normally occurs in isolated trees or small stands, salvage of this material is limited. The salvable dead material that was removed by logging over the last decade averaged about 4.5 million board feet annually. This amounts to slightly over 2 percent of the estimated annual mortality.

TIMBER INDUSTRY

The forest resource of the Inland Empire provides raw material for a very substantial timber industry (fig. 10). The timber industry is a leading source of employment and the principal manufacturing industry in this part of the State.

Timber harvesting has been increasing recently. Between 1955 and 1970, the harvest of logs increased from 301 million board feet to 381 million—a rise of 27 percent (fig. 9). The log harvest is consumed mainly by mills within the Washington Inland Empire area, although some logs go to mills elsewhere in Washington, as well as to neighboring States.

A 1970 survey of Washington mills included many detailed statistics on primary wood processing plants in the Inland Empire. All statistics in this section are from this survey (Bergvall and Holtcamp 1971).

In 1970, the Inland Empire had 42 mills—8 percent of the 509 mills reported for the State. These mills were distributed by county and industry as shown in table 3.

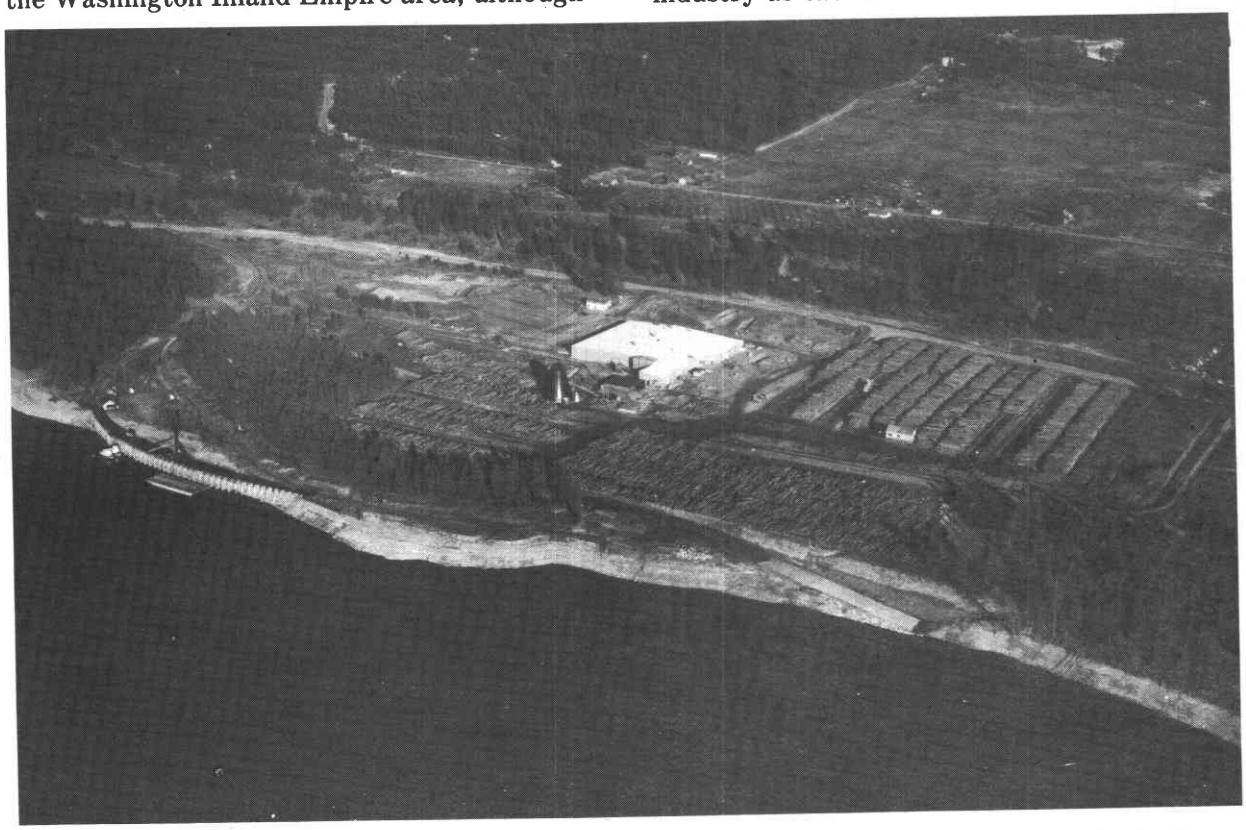

Figure 10. — One of the three plywood mills in Washington's Inland Empire that make for a diversified timber industry. This mill is located in Stevens County near Kettle Falls, Washington. (Photo courtesy of Boise Cascade Corp., Boise, Idaho.)

Table 3. — Number of mills in the timber industry, by industry and county, Inland Empire area, Washington, 1970

County	Industry					
	Total	Lumber	Veneer and plywood	Pulp	Shake and shingle	Pole, post, and piling
Asotin	1	1	0	0	0	0
Ferry	6	6	0	0	0	0
Pend Oreille	4	3	0	0	0	1
Spokane	8	4	1	2	0	1
Stevens	19	14	2	0	1	2
Walla Walla	4	2	0	2	0	0
Total	42	30	3	4	1	4

The lumber industry with 30 sawmills was the principal component of the timber industry. These mills had a combined capacity of about 1 million board feet per 8-hour shift, equivalent to 9 percent of total capacity of sawmills in the State. The 257 million board feet of log receipts by sawmills in 1970 amounted to a little more than three-quarters of the log receipts by all timber industry mills in Washington's Inland Empire. Fifty-six percent of logs received by sawmills were reported as harvested from public lands.

The 42 mills of all types received 334 million board feet of logs in 1970. Eighty-nine percent of this volume came from log harvests within the Inland Empire, 3 percent from elsewhere in Washington, and 8 percent from out-of-State.

Table 4. — Area by land class and county, Inland Empire area, Washington, January 1, 1969
(In thousand acres)

Land class	All counties	Adams	Asotin	Columbia	Ferry	Franklin	Garfield	Lincoln	Pend Oreille	Spokane	Stevens	Walla Walla	Whitman
Forest													
Commercial	3,938	—	54	125	1,113	—	63	77	778	407	1,298	13	10
Productive-reserved[1]	47	—	—	1	4	—	—	2	7	28	5	—	—
Unproductive	255	—	10	46	114	—	25	1	20	2	35	2	—
Total forest	4,240	—	64	172	1,231	—	88	80	805	437	1,338	15	10
Nonforest[2]	7,882	1,213	341	379	178	806	368	1,395	92	688	250	796	1,376
Total area[3]	12,122	1,213	405	551	1,409	806	456	1,475	897	1,125	1,588	811	1,386

[1] *Includes 4,000 acres of deferred land on National Forests set aside for study as to land use allocation.*

[2] *Includes swampland and industrial and urban areas, other nonforest land, and 1,210 acres, classed as water by Forest Survey standards but defined by the Bureau of the Census as land.*

[3] *Source: U.S. Bureau of the Census, Land and Water Area of the United States, 1960, revised 1965.*

Table 5. — Area of commercial forest land by ownership class and county, Inland Empire area, Washington, January 1, 1969
(In thousand acres)

Ownership class	All counties	Asotin	Columbia	Ferry	Garfield	Lincoln	Pend Oreille	Spokane	Stevens	Walla Walla	Whitman
National Forest	1,240	24	71	409	50	—	460	—	226	—	—
Other public:[1]											
Bureau of Land Management	26	([2])	—	10	—	—	1	—	15	—	—
Bureau of Indian Affairs	611	—	—	487	—	—	3	—	121	—	—
Miscellaneous Federal	73	—	—	—	—	—	—	10	63	—	—
State	233	2	5	31	2	7	34	10	140	1	1
County and municipal	4	—	—	1	—	—	3	—	—	([2])	—
Total other public	947	2	5	529	2	7	41	20	339	1	1
Private:											
Forest industry	302	—	4	46	1	—	41	24	186	—	—
Farmer-owned	1,075	21	45	92	10	64	144	314	370	6	9
Miscellaneous private—corporate	198	7	—	11	—	—	86	16	72	6	—
Miscellaneous private—noncorporate	176	—	—	26	—	6	6	33	105	—	—
Total private	1,751	28	49	175	11	70	277	387	733	12	9
All classes	3,938	54	125	1,113	63	77	778	407	1,298	13	10

[1] *Estimates of commercial forest land in specific ownerships are derived by sampling methods. Consequently, they may not agree with the official estimates of the individual agencies.*

[2] *Less than 500 acres.*

Table 6. — Area of commercial forest land by stand-size and ownership classes, Inland Empire area, Washington, January 1, 1969
(In thousand acres)

Stand-size class	All ownerships	National Forest	Other public	Forest industry	Farmer and miscellaneous private
Sawtimber stands:					
Old growth[1]	461	286	143	21	11
Young growth[2]	1,539	304	520	141	574
Total	2,000	590	663	162	585
Poletimber stands	929	255	128	72	474
Sapling and seedling stands	800	377	109	68	246
Nonstocked areas	209	18	47	—	144
All classes	3,938	1,240	947	302	1,449

[1]*Stands 140 years and older.*

[2]*Stands less than 140 years old.*

Table 7. — Area of commercial forest land by stand volume and ownership class, Inland Empire area, Washington, January 1, 1969
(In thousand acres)

Stand volume[1]	All ownerships	National Forest	Other public	Forest industry	Farmer and miscellaneous private
Less than 1,500	659	47	111	35	466
1,500-4,999	1,026	129	232	113	552
5,000-9,999	1,121	298	351	112	360
10,000-19,999	1,067	713	247	38	69
20,000-29,999	51	44	1	4	2
30,000 or more	14	9	5	—	—
All classes	3,938	1,240	947	302	1,449

[1] *Net volume, board feet per acre, International ¼-inch rule.*

Table 8. — Area of commercial forest land by cubic-foot site and ownership classes, Inland Empire area, Washington, January 1, 1969
(In thousand acres)

Site class[1] (cubic feet)	All ownerships	National Forest	Other public	Forest industry	Farmer and miscellaneous private
225 or more	—	—	—	—	—
165-224	189	141	10	([2])	38
120-164	509	386	38	16	69
85-119	894	396	159	66	273
50-84	2,023	227	651	205	940
20-49	323	90	89	15	129
All classes	3,938	1,240	947	302	1,449

[1] *A classification in terms of capacity for cubic-foot annual growth per acre at culmination of mean annual growth in full-stocked stands.*

[2] *Less than 500 acres.*

Table 9. — Area of commercial forest land by forest type and ownership class, Inland Empire area, Washington, January 1, 1969
(In thousand acres)

Forest type	All ownerships	National Forest	Other public	Forest industry	Farmer and miscellaneous private
Douglas-fir	1,405	388	383	131	503
Grand fir	247	142	39	([1])	66
Subalpine fir	57	44	—	7	6
Western larch	435	274	51	28	82
Ponderosa pine	909	80	314	69	446
Lodgepole pine	364	145	82	6	131
Western white pine	45	39	—	—	6
Engelmann spruce	62	56	—	—	6
Western redcedar	109	22	10	61	16
Western hemlock	26	26	—	—	—
Hardwoods[2]	70	6	21	—	43
Nonstocked	209	18	47	—	144
All types	3,938	1,240	947	302	1,449

[1] *Less than 500 acres.*

[2] *Includes primarily red alder, white alder, paper birch, quaking aspen, and black cottonwood.*

Table 10. — Area of noncommercial forest land by ground land use and ownership class, Inland Empire area, Washington, January 1, 1969
(In thousand acres)

Forest type	All ownerships	National Forest	Other public	Forest industry	Farmer and miscellaneous private
Productive:[1]					
Douglas-fir	2	2	([2])	—	—
Spruce-fir	10	—	10	—	—
Western larch	([2])	—	([2])	—	—
Ponderosa pine	28	—	28	—	—
Lodgepole pine	1	—	1	—	—
Western white pine	2	—	2	—	—
Unclassified[3]	4	4	—	—	—
Total productive	47	6	41	—	—
Unproductive:					
Low site[4]	35	7	21	—	7
Noncommercial rocky[5]	203	145	34	1	23
Other[6]	17	17	—	—	—
Total unproductive	255	169	55	1	30
Total	302	175	96	1	30

[1] *Includes land capable of growing 20 cubic feet or more per acre per year but set aside in a reserved category, such as county and State parks.*

[2] *Less than 500 acres.*

[3] *Deferred lands on National Forests set aside for study as to land use allocation.*

[4] *Areas stocked with commercial tree species but incapable of growing 20 cubic feet per acre per year because of soil and climatic factors.*

[5] *Includes areas that are capable of growing 20 cubic feet or more per year in merchantable trees but are too steep and rocky for timber management.*

[6] *Includes unstable areas that cannot be logged without seriously affecting the watershed and small isolated patches of commercial forest on steep mountainsides.*

Table 11. — Volume of growing stock and sawtimber on commercial forest land, by ownership class and by softwoods and hardwoods, Inland Empire area, Washington, January 1, 1969

Ownership class	Volume per acre	Total volume		
		All species	Softwoods	Hardwoods
	Cubic feet	.....	*Million cubic feet*	.....
Growing stock:				
National Forest	1,919	2,380	2,357	23
Other public	1,781	1,687	1,637	50
Forest industry	1,834	554	539	15
Farmer and miscellaneous private	1,317	1,908	1,877	31
All ownerships	1,658	6,529	6,410	119
	Board feet	.....	*Million board feet*	.....
Sawtimber (International ¼-inch rule):				
National Forest	7,805	9,678	9,637	41
Other public	7,400	7,008	6,820	188
Forest industry	6,384	1,928	1,892	36
Farmer and miscellaneous private	3,620	5,246	5,203	43
All ownerships	6,059	23,860	23,552	308
Sawtimber (Scribner rule):				
National Forest	6,675	8,277	8,241	36
Other public	6,312	5,977	5,792	185
Forest industry	5,374	1,623	1,588	35
Farmer and miscellaneous private	2,930	4,245	4,204	41
All ownerships	5,110	20,122	19,825	297

Table 12. — Volume of growing stock and sawtimber on commercial forest land, by county and ownership class, Inland Empire area, Washington, January 1, 1969

County	All ownerships	National Forest	Other public	Forest industry	Farmer and miscellaneous private
			Million cubic feet		
Growing stock:					
Asotin	121	75	7	—	39
Columbia	389	296	8	11	74
Ferry	1,710	630	885	74	121
Garfield	179	156	1	2	20
Lincoln	80	—	7	—	73
Pend Oreille	1,465	855	85	112	413
Spokane	540	—	31	51	458
Stevens	2,022	368	660	304	690
Walla Walla	11	—	2	—	9
Whitman	12	—	1	—	11
Total	6,529	2,380	1,687	554	1,908
			Million board feet		
Sawtimber (International ¼-inch rule):					
Asotin	465	301	35	—	129
Columbia	1,855	1,455	26	56	318
Ferry	7,390	2,607	4,164	317	302
Garfield	808	750	5	4	49
Lincoln	257	—	29	—	228
Pend Oreille	4,741	3,187	259	427	868
Spokane	1,689	—	100	187	1,402
Stevens	6,550	1,378	2,372	937	1,863
Walla Walla	42	—	10	—	32
Whitman	63	—	8	—	55
Total	23,860	9,678	7,008	1,928	5,246
Sawtimber (Scribner rule):					
Asotin	384	251	31	—	102
Columbia	1,554	1,222	19	48	265
Ferry	6,387	2,260	3,608	275	244
Garfield	676	628	4	3	41
Lincoln	214	—	25	—	189
Pend Oreille	3,976	2,725	209	354	688
Spokane	1,389	—	83	160	1,146
Stevens	5,454	1,191	1,983	783	1,497
Walla Walla	35	—	8	—	27
Whitman	53	—	7	—	46
Total	20,122	8,277	5,977	1,623	4,245

Table 13. — Number of growing-stock trees on commercial forest land, by diameter and ownership classes, Inland Empire area, Washington, January 1, 1969
(Thousands of trees)

Diameter class (inches at breast height)	All ownerships	National Forest	Other public	Forest industry	Farmer and miscellaneous private
5.0-6.9	198,955	67,612	35,821	17,513	78,009
7.0-8.9	118,757	41,279	22,044	8,737	46,697
9.0-10.9	67,403	21,825	13,568	6,482	25,528
11.0-12.9	39,379	12,863	8,585	3,724	14,207
13.0-14.9	24,297	7,552	6,555	1,915	8,275
15.0-16.9	13,937	5,242	3,705	900	4,090
17.0-18.9	9,759	3,443	3,051	768	2,497
19.0-20.9	5,643	2,068	1,677	579	1,319
21.0-28.9	9,096	3,440	3,537	760	1,359
29.0-38.9	1,501	746	530	144	81
39.0 and larger	146	110	8	24	4
All classes	488,873	166,180	99,081	41,546	182,066

Table 14. — Number of growing-stock trees on commercial forest land, by species and diameter class, Inland Empire area, Washington, January 1, 1969
(In thousand trees)

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	21.0-28.9	29.0-38.9	39.0 and larger
Softwoods:												
Douglas-fir	149,502	57,860	33,368	24,106	13,132	8,239	4,498	3,070	1,918	2,924	337	50
Grand fir	31,815	11,207	8,307	4,899	2,889	1,582	1,053	687	435	633	119	4
Subalpine fir	26,985	11,978	6,388	4,032	1,793	1,100	694	469	202	302	26	1
Western larch	71,467	29,782	17,338	8,361	6,362	3,683	2,262	1,491	637	1,288	243	20
Ponderosa pine	81,466	27,212	18,520	10,560	7,396	5,918	3,530	2,856	1,818	3,021	599	36
Lodgepole pine	77,722	40,944	22,361	8,529	3,453	1,529	604	190	97	15	—	—
Western white pine	7,317	1,592	1,667	1,624	1,130	511	345	175	99	143	30	1
Engelmann spruce	9,628	4,507	1,794	914	870	542	354	272	126	205	40	4
Western redcedar	14,571	5,465	3,851	2,059	1,292	744	384	297	150	220	81	28
Western hemlock	6,100	2,114	1,733	995	412	287	173	146	66	147	25	2
Total	476,573	192,661	115,327	66,079	38,729	24,135	13,897	9,653	5,548	8,898	1,500	146
Hardwoods[1]	12,300	6,294	3,430	1,324	650	162	40	106	95	198	1	—
All species	488,873	198,955	118,757	67,403	39,379	24,297	13,937	9,759	5,643	9,096	1,501	146

[1] *Includes primarily red alder, white alder, paper birch, quaking aspen, and black cottonwood.*

Table 15. — Volume of timber on commercial forest land, by class of timber and by softwoods and hardwoods, Inland Empire area, Washington, January 1, 1969
(In million cubic feet)

Class of timber	All species	Softwoods	Hardwoods
Growing stock			
Sawtimber trees:			
Saw-log portion	4,301	4,245	56
Upper-stem portion	133	131	2
Total	4,434	4,376	58
Poletimber trees	2,095	2,034	61
All growing stock	6,529	6,410	119
Nongrowing stock			
Sound cull trees	45	43	2
Rotten cull trees	40	40	([1])
Salvable dead sawtimber trees	109	109	—
Total, all timber	6,723	6,602	121

[1] *Less than 500,000 cubic feet.*

Table 16. — Volume of growing stock and sawtimber on commercial forest land, by stand-size class and by softwoods and hardwoods, Inland Empire area, Washington, January 1, 1969

Stand-size class	Volume per acre	Total volume		
		All species	Softwoods	Hardwoods
	Cubic Feet	..... *Million cubic feet*		
Growing stock:				
Sawtimber stands	2,202	4,403	4,337	66
Poletimber stands	1,733	1,610	1,568	42
Sapling and seedling stands	584	467	456	11
Nonstocked areas	234	49	49	—
All classes	1,658	6,529	6,410	119
	Board feet	..... *Million board feet*		
Sawtimber (International ¼-inch rule):				
Sawtimber stands	9,750	19,499	19,254	245
Poletimber stands	2,888	2,683	2,641	42
Sapling and seedling stands	1,826	1,461	1,440	21
Nonstocked areas	1,038	217	217	—
All classes	6,059	23,860	23,552	308
Sawtimber (Scribner rule):				
Sawtimber stands	8,254	16,508	16,265	243
Poletimber stands	2,357	2,190	2,156	34
Sapling and seedling stands	1,545	1,236	1,216	20
Nonstocked areas	900	188	188	—
All classes	5,110	20,122	19,825	297

Table 17. — Volume of growing stock on commercial forest land, by species and county, Inland Empire area, Washington, January 1, 1969
(In million cubic feet)

Species	All counties	Asotin	Columbia	Ferry	Garfield	Lincoln	Pend Oreille	Spokane	Stevens	Walla Walla	Whitman
Softwoods:											
Douglas-fir	1,995	19	116	613	33	19	355	132	703	3	2
Grand fir	507	22	115	56	66	—	96	51	97	4	—
Subalpine fir	269	3	32	68	4	—	121	3	38	—	—
Western larch	990	20	29	314	12	—	241	26	348	—	—
Ponderosa pine	1,466	40	58	438	39	61	92	253	471	4	10
Lodgepole pine	627	8	14	124	12	—	236	57	176	—	—
Western white pine	146	—	—	39	—	—	81	1	25	—	—
Engelmann spruce	141	9	23	30	13	—	48	—	18	—	—
Western redcedar	175	—	—	12	—	—	98	7	58	—	—
Western hemlock	94	—	—	5	—	—	75	4	10	—	—
Total	6,410	121	387	1,699	179	80	1,443	534	1,944	11	12
Hardwoods[1]	119	—	2	11	—	—	22	6	78	—	—
All species	6,529	121	389	1,710	179	80	1,465	540	2,022	11	12

[1] *Includes primarily red alder, white alder, paper birch, quaking aspen, and black cottonwood.*

Table 18. — Volume of sawtimber on commercial forest land, by species and county, Inland Empire area, Washington, January 1, 1969 (International 1/4-inch rule)

(In million board feet)

Species	All Counties	Asotin	Columbia	Ferry	Garfield	Lincoln	Pend Oreille	Spokane	Stevens	Walla Walla	Whitman
Softwoods:											
Douglas-fir	7,073	65	557	2,487	141	54	1,205	401	2,141	13	9
Grand fir	1,888	98	523	209	280	—	297	192	280	9	—
Subalpine fir	827	11	105	241	9	—	327	7	127	—	—
Western larch	3,829	51	138	1,448	50	—	911	81	1,149	1	—
Ponderosa pine	6,807	199	381	2,420	247	203	414	921	1,949	19	54
Lodgepole pine	885	1	34	171	20	—	311	53	295	—	—
Western white pine	658	—	—	201	—	—	340	3	114	—	—
Engelmann spruce	638	40	110	142	61	—	214	—	71	—	—
Western redcedar	574	—	—	44	—	—	362	19	149	—	—
Western hemlock	373	—	—	20	—	—	311	12	30	—	—
Total	23,552	465	1,848	7,383	808	257	4,692	1,689	6,305	42	63
Hardwoods[1]	308	—	7	7	—	—	49	—	245	—	—
All species	23,860	465	1,855	7,390	808	257	4,741	1,689	6,550	42	63

[1] *Includes primarily paper birch, quaking aspen, and black cottonwood.*

Table 19. — Volume of growing stock on commercial forest land, by species and ownership class, Inland Empire area, Washington, January 1, 1969
(In million cubic feet)

Species	All ownerships	National Forest	Other public	Forest industry	Farmer and miscellaneous private
Softwoods:					
Douglas-fir	1,995	562	618	176	639
Grand Fir	507	276	57	54	120
Subalpine fir	269	232	4	9	24
Western larch	990	435	267	83	205
Ponderosa pine	1,466	191	533	119	623
Lodgepole pine	627	261	119	41	206
Western white pine	146	130	3	7	6
Engelmann spruce	141	129	4	6	2
Western redcedar	175	61	30	39	45
Western hemlock	94	80	2	5	7
Total	6,410	2,357	1,637	539	1,877
Hardwoods[1]	119	23	50	15	31
All species	6,529	2,380	1,687	554	1,908

[1] *Includes primarily red alder, white alder, paper birch, quaking aspen, and black cottonwood.*

Table 20. — Volume of sawtimber on commercial forest land, by species and ownership class, Inland Empire area, Washington, January 1, 1969 (International ¼-inch rule)
(In million board feet)

Species	All ownerships	National Forest	Other public	Forest industry	Farmer and miscellaneous private
Softwoods:					
Douglas-fir	7,073	2,316	2,474	574	1,709
Grand fir	1,888	1,192	180	164	352
Subalpine fir	827	785	—	27	15
Western larch	3,829	1,972	1,092	292	473
Ponderosa pine	6,807	1,151	2,772	588	2,296
Lodgepole pine	885	404	180	115	186
Western white pine	658	613	5	21	19
Engelmann spruce	638	599	19	20	—
Western redcedar	574	262	90	85	137
Western hemlock	373	343	8	6	16
Total	23,552	9,637	6,820	1,892	5,203
Hardwoods[1]	308	41	188	36	43
All species	23,860	9,678	7,008	1,928	5,246

[1] *Includes primarily paper birch, quaking aspen, and black cottonwood.*

Table 21. — Volume of sawtimber on commercial forest land, by species and ownership class, Inland Empire area, Washington, January 1, 1969 [Scribner rule]
(In million board feet)

Species	All ownerships	National Forest	Other public	Forest industry	Farmer and miscellaneous private
Softwoods:					
Douglas-fir	5,908	1,979	2,104	482	1,343
Grand fir	1,580	996	153	138	293
Subalpine fir	697	664	—	20	13
Western larch	3,165	1,671	893	241	360
Ponderosa pine	5,826	1,001	2,404	512	1,909
Lodgepole pine	745	360	145	93	147
Western white pine	574	538	4	16	16
Engelmann spruce	546	515	15	16	—
Western redcedar	460	218	68	65	109
Western hemlock	324	299	6	5	14
Total	19,825	8,241	5,792	1,588	4,204
Hardwoods[1]	297	36	185	35	41
All species	20,122	8,277	5,977	1,623	4,245

[1] *Includes primarily paper birch, quaking aspen, and black cottonwood.*

Table 22. — Volume of growing stock on commercial forest land, by species and diameter class, Inland Empire area, Washington, January 1, 1969
(In million cubic feet)

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	21.0-28.9	29.0-38.9	39.0 and larger
Softwoods:												
Douglas-fir	1,995	191	232	289	249	229	168	154	123	288	59	13
Grand fir	507	41	60	66	63	51	47	42	33	73	29	2
Subalpine fir	269	32	46	47	33	28	23	20	11	25	4	—
Western larch	990	89	128	111	133	111	95	82	47	142	47	5
Ponderosa pine	1,466	79	107	115	129	152	130	142	121	336	143	12
Lodgepole pine	627	159	185	117	76	47	26	10	6	1	—	—
Western white pine	146	5	11	19	24	19	18	12	9	20	8	1
Engelmann spruce	141	7	14	12	19	19	16	17	9	21	6	1
Western redcedar	175	17	25	20	22	18	14	13	9	19	12	6
Western hemlock	94	6	13	11	8	9	7	9	5	20	5	1
Total	6,410	626	821	807	756	683	544	501	373	945	313	41
Hardwoods[1]	119	21	24	18	14	5	2	6	7	22	—	—
All species	6,529	647	845	825	770	688	546	507	380	967	313	41

[1] *Includes primarily red alder, white alder, paper birch, quaking aspen, and black cottonwood.*

Table 23. — Volume of sawtimber on commercial forest land, by species and diameter class, Inland Empire area, Washington, January 1, 1969 (International ¼-inch rule)
(In million board feet)

Species	Diameter class (inches at breast height)								
	All classes	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0-38.9	39.0 and larger
Softwoods:									
Douglas-fir	7,073	1,170	1,157	921	880	743	1,760	368	74
Grand fir	1,888	312	275	270	242	192	422	166	9
Subalpine fir	827	181	148	136	120	66	153	23	—
Western larch	3,829	672	598	548	480	289	909	304	29
Ponderosa pine	6,807	594	760	704	797	716	2,137	1,012	87
Lodgepole pine	885	389	249	146	58	37	6	—	—
Western white pine	658	131	104	106	74	56	131	47	9
Engelmann spruce	638	100	102	95	96	60	135	44	6
Western redcedar	574	90	84	69	72	49	106	75	29
Western hemlock	373	41	44	41	50	34	125	37	1
Total	23,552	3,680	3,521	3,036	2,869	2,242	5,884	2,076	244
Hardwoods[1]	308	63	25	9	36	43	131	1	—
All species	23,860	3,743	3,546	3,045	2,905	2,285	6,015	2,077	244

[1] *Includes primarily paper birch, quaking aspen, and black cottonwood.*

Table 24. — Area of commercial forest land and volume of growing stock and sawtimber,[1] by stand age and ownership classes, Inland Empire area, Washington, January 1, 1969

Stand age class (years)	All ownerships[2]			Other public			Forest industry			Farmer and miscellaneous private		
	Area	Growing stock	Saw-timber	Area	Growing stock	Saw-timber	Area	Growing stock	Saw-timber	Area	Growing stock	Saw-timber
	Thousand acres	*Million cubic feet*	*Million board feet*	*Thousand acres*	*Million cubic feet*	*Million board feet*	*Thousand acres*	*Million cubic feet*	*Million board feet*	*Thousand acres*	*Million cubic feet*	*Million board feet*
Nonstocked	191	33	155	47	12	68	—	—	—	144	21	87
0-9	149	63	190	34	19	47	27	12	50	88	32	93
10-19	43	25	96	5	2	5	—	—	—	38	23	91
20-29	70	60	94	26	25	73	6	9	7	38	26	14
30-39	215	250	442	41	54	115	47	61	146	127	135	181
40-49	199	340	727	26	34	37	9	22	60	164	284	630
50-59	155	261	647	25	38	121	—	—	—	130	223	526
60-69	255	488	1,396	66	199	566	11	28	71	178	261	759
70-79	154	338	1,008	64	154	567	4	18	73	86	166	368
80-89	49	92	324	9	14	44	9	16	35	31	62	245
90-99	45	110	436	16	36	147	—	—	—	29	74	289
100-119	26	74	275	5	17	73	16	49	168	5	8	34
120-139	37	36	192	37	36	192	—	—	—	—	—	—
140-159	32	63	329	30	60	317	2	3	12	—	—	—
160-179	14	20	102	14	20	102	—	—	—	—	—	—
180-199	7	4	26	—	—	—	7	4	26	—	—	—
200 and over	6	5	28	—	—	—	—	—	—	6	5	28
Uneven-aged under rotation age	933	1,622	6,340	402	733	3,309	152	307	1,164	379	582	1,867
Uneven-aged over rotation age	118	265	1,375	100	234	1,225	12	25	116	6	6	34
All classes	2,698	4,149	14,182	947	1,687	7,008	302	554	1,928	1,449	1,908	5,246

[1] *International ¼-inch rule.*

[2] *Although stand age data are available for the Umatilla National Forest, they are not available for the Colville and Kaniksu National Forests. Consequently, none are shown in this table. The total acres and volumes of the National Forests are as follows:*

National Forest	*Thousand acres*	*Million cubic feet*	*Million board feet*
Colville	837	1,302	5,047
Kaniksu	257	551	2,124
Umatilla	147	527	2,507

Table 25. — Net annual growth of growing stock on commercial forest land, by species and ownership class, Inland Empire area, Washington, 1968[1]

(In thousand cubic feet)

Species	All ownerships	National Forest	Other public	Forest industry	Farmer and miscellaneous private
Softwoods:					
Douglas-fir	55,000	8,700	10,600	8,800	26,900
Grand fir	8,400	4,300	−1,300[2]	2,000	3,400
Subalpine fir	5,600	3,800	600	100	1,100
Western larch	15,900	6,200	2,700	1,000	6,000
Ponderosa pine	29,700	1,300	8,900	2,100	17,400
Lodgepole pine	20,200	7,700	3,900	1,300	7,300
Western white pine	−1,300[2]	−1,000[2]	100	200	−600[2]
Engelmann spruce	2,300	2,000	—	200	100
Western redcedar	7,000	1,100	1,400	2,800	1,700
Western hemlock	2,300	1,500	100	400	300
Total	145,100	35,600	27,000	18,900	63,600
Hardwoods[3]	2,700	800	500	500	900
All species	147,800	36,400	27,500	19,400	64,500

[1] *See "Inventory Procedures" for an explanation of the actual periods over which growth was measured.*

[2] *Negative growth results from annual mortality exceeding gross annual growth.*

[3] *Includes primarily red alder, white alder, paper birch, quaking aspen, and black cottonwood.*

Table 26. — Net annual growth of sawtimber on commercial forest land, by species and ownership class, Inland Empire area, Washington, 1968[1] *(International ¼-inch rule)*
(In thousand board feet)

Species	All ownerships	National Forest	Other public	Forest industry	Farmer and miscellaneous private
Softwoods:					
Douglas-fir	190,000	46,200	24,400	20,500	98,900
Grand fir	40,600	20,900	-7,500[2]	1,600	25,600
Subalpine fir	17,300	12,500	—	4,100	700
Western larch	84,700	33,900	28,700	3,800	18,300
Ponderosa pine	156,200	12,000	46,300	13,800	84,100
Lodgepole pine	40,900	8,900	16,600	7,400	8,000
Western white pine	-6,700[2]	-7,400[2]	2,000	600	-1,900[2]
Engelmann spruce	8,900	8,000	300	600	—
Western redcedar	21,500	3,700	3,800	5,500	8,500
Western hemlock	7,300	5,000	300	1,300	700
Total	560,700	143,700	114,900	59,200	242,900
Hardwoods[3]	6,200	800	3,300	1,000	1,100
All species	566,900	144,500	118,200	60,200	244,000

[1] *See "Inventory Procedures" for an explanation of growth estimates and the actual periods over which growth was measured.*

[2] *Negative growth results from annual mortality exceeding gross annual growth.*

[3] *Includes primarily paper birch, quaking aspen, and black cottonwood.*

Table 27. — Net annual growth of sawtimber on commercial forest land, by species and ownership class, Inland Empire area, Washington, 1968[1] *(Scribner rule)*
(In thousand board feet)

Species	All ownerships	National Forest	Other public	Forest industry	Farmer and miscellaneous private
Softwoods:					
Douglas-fir	152,200	38,000	19,600	16,800	77,800
Grand fir	32,900	16,500	−6,200[2]	1,500	21,100
Subalpine fir	14,500	10,800	—	3,000	700
Western larch	65,400	27,900	20,700	3,400	13,400
Ponderosa pine	136,000	9,900	42,100	12,000	72,000
Lodgepole pine	33,300	8,000	12,700	5,900	6,700
Western white pine	−5,600[2]	−6,300[2]	1,400	600	−1,300[2]
Engelmann spruce	8,100	7,200	300	600	—
Western redcedar	17,200	3,000	3,400	4,300	6,500
Western hemlock	6,300	4,400	300	1,000	600
Total	460,300	119,400	94,300	49,100	197,500
Hardwoods[3]	6,100	700	3,300	1,000	1,100
All species	466,400	120,100	97,600	50,100	198,600

[1] *See "Inventory Procedures" for an explanation of growth estimates and the actual periods over which growth was measured.*

[2] *Negative growth results from annual mortality exceeding gross annual growth.*

[3] *Includes paper birch, quaking aspen, and black cottonwood.*

Table 28. — Net annual growth of growing stock on commercial forest land, by species and county, Inland Empire area, Washington, 1968[1]

(In thousand cubic feet)

Species	All counties	Asotin	Columbia	Ferry	Garfield	Lincoln	Pend Oreille	Spokane	Stevens	Walla Walla	Whitman
Softwoods:											
Douglas-fir	55,000	400	2,300	10,900	700	1,000	9,700	4,500	25,400	—	100
Grand fir	8,400	400	1,700	−800[2]	1,000	—	2,000	1,500	2,600	—	—
Subalpine fir	5,600	([3])	400	1,500	200	—	2,900	—	600	—	—
Western larch	15,900	([3])	100	4,300	([3])	—	4,100	700	6,700	—	—
Ponderosa pine	29,700	300	200	4,900	—	1,800	2,000	7,300	12,800	100	300
Lodgepole pine	20,200	100	([3])	5,400	([3])	—	6,600	1,300	6,800	—	—
Western white pine	−1,300[2]	—	—	−900[2]	—	—	—	—	−400[2]	—	—
Engelmann spruce	2,300	100	400	500	200	—	1,000	—	100	—	—
Western redcedar	7,000	—	—	400	—	—	2,600	1,100	2,900	—	—
Western hemlock	2,300	—	—	100	—	—	1,900	100	200	—	—
Total	145,100	1,300	5,100	26,300	2,100	2,800	32,800	16,500	57,700	100	400
Hardwoods[4]	2,700	—	—	600	—	—	700	−200[2]	1,700	−100[2]	—
All species	147,800	1,300	5,100	26,900	2,100	2,800	33,500	16,300	59,400	—	400

[1] *See "Inventory Procedures" for an explanation of growth estimates and the actual periods over which growth was measured.*

[2] *Negative growth results from annual mortality exceeding gross annual growth.*

[3] *Less than 50,000 cubic feet.*

[4] *Includes red alder, white alder, paper birch, quaking apsen, and black cottonwood.*

Table 29. — Net annual growth of sawtimber on commercial forest land, by species and county, Inland Empire area, Washington, 1968[1] (International 1/4-inch rule)
(In thousand board feet)

Species	All counties	Asotin	Columbia	Ferry	Garfield	Lincoln	Pend Oreille	Spokane	Stevens	Walla Walla	Whitman
Softwoods:											
Douglas-fir	190,000	2,800	19,000	42,500	5,500	2,000	43,000	14,300	59,300	300	1,300
Grand fir	40,600	1,600	8,600	−6,700[2]	6,200	—	6,000	9,600	15,300	—	—
Subalpine fir	17,300	100	500	4,200	([3])	—	10,100	100	2,300	—	—
Western larch	84,700	1,100	4,900	19,200	−100[2]	—	22,600	3,000	34,000	—	—
Ponderosa pine	156,200	2,700	2,800	29,000	1,200	7,300	11,500	31,600	67,900	700	1,500
Lodgepole pine	40,900	([3])	900	5,900	100	—	8,200	−400[2]	26,200	—	—
Western white pine	−6,700[2]	—	—	−5,400[2]	—	—	−1,000[2]	100	−400[2]	—	—
Engelmann spruce	8,900	200	1,300	2,700	300	—	3,400	—	1,000	—	—
Western redcedar	21,500	—	—	1,500	—	—	8,800	3,900	7,300	—	—
Western hemlock	7,300	—	—	400	—	—	5,900	500	500	—	—
Total	560,700	8,500	38,000	93,300	13,200	9,300	118,500	62,700	213,400	1,000	2,800
Hardwoods[4]	6,200	—	200	100	—	—	1,000	—	4,900	—	—
All species	566,900	8,500	38,200	93,400	13,200	9,300	119,500	62,700	218,300	1,000	2,800

[1] *See "Inventory Procedures" for an explanation of growth estimates and the actual periods over which growth was measured.*

[2] *Negative growth results from annual mortality exceeding gross annual growth.*

[3] *Less than 50,000 board feet.*

[4] *Includes primarily paper birch, quaking aspen, and black cottonwood.*

Table 30. — Average annual mortality of growing stock on commercial forest land, by species and owership class, Inland Empire area, Washington, 1968[1]

(In thousand cubic feet)

Species	All ownerships	National Forest	Other public	Forest industry	Farmer and miscellaneous private
Softwoods:					
Douglas-fir	15,400	4,100	8,600	500	2,200
Grand fir	7,700	2,200	3,500	600	1,400
Subalpine fir	2,000	1,900	—	100	2,100
Western larch	7,300	3,600	1,900	400	1,400
Ponderosa pine	6,100	1,300	2,200	200	2,400
Lodgepole pine	6,100	2,100	1,800	100	2,100
Western white pine	5,900	5,200	—	—	700
Engelmann spruce	1,100	1,000	100	—	—
Western redcedar	300	300	—	—	—
Western hemlock	400	400	—	—	—
Total	52,300	22,100	18,100	1,900	10,200
Hardwoods[2]	800	200	500	—	100
All species	53,100	22,300	18,600	1,900	10,300

[1] *See "Inventory Procedures" for details on the mortality estimates and periods over which mortality was estimated.*

[2] *Includes primarily paper birch, quaking aspen, and black cottonwood.*

Table 31. — Average annual mortality of sawtimber on commercial forest land, by species and ownership class, Inland Empire area, Washington, 1968[1] (International ¼-inch rule)
(*In thousand board feet*)

Species	All ownerships	National Forest	Other public	Forest industry	Farmer and miscellaneous private
Softwoods:					
Douglas-fir	67,000	16,300	45,500	2,400	2,800
Grand fir	35,200	11,200	17,100	3,400	3,500
Subalpine fir	6,300	6,300	—	—	—
Western larch	27,500	15,900	8,000	—	3,600
Ponderosa pine	25,700	7,900	10,100	800	6,900
Lodgepole pine	8,300	2,900	3,000	—	2,400
Western white pine	26,700	24,400	—	—	2,300
Engelmann spruce	5,100	4,800	300	—	—
Western redcedar	1,400	1,400	—	—	—
Western hemlock	1,800	1,800	—	—	—
Total	205,000	92,900	84,000	6,600	21,500
Hardwoods[2]	300	300	—	—	—
All species	205,300	93,200	84,000	6,600	21,500

[1] *See "Inventory Procedures" for details on the mortality estimates and periods over which mortality was estimated.*

[2] *Includes primarily paper birch, quaking aspen, and black cottonwood.*

Table 32. — Average annual mortality of sawtimber on commercial forest land, by species and ownership class, Inland Empire area, Washington, 1968[1] *(Scribner rule)*
(In thousand board feet)

Species	All ownerships	National Forest	Other public	Forest industry	Farmer and miscellaneous private
Softwoods:					
Douglas-fir	58,200	14,100	40,100	1,800	2,200
Grand fir	29,900	9,900	14,200	2,900	2,900
Subalpine fir	5,300	5,300	—	—	—
Western larch	22,200	13,600	5,800	—	2,800
Ponderosa pine	21,300	7,000	8,000	600	5,700
Lodgepole pine	6,800	2,600	2,300	—	1,900
Western white pine	22,200	20,600	—	—	1,600
Engelmann spruce	4,300	4,100	200	—	—
Western redcedar	1,200	1,200	—	—	—
Western hemlock	1,600	1,600	—	—	—
Total	173,000	80,000	70,600	5,300	17,100
Hardwoods[2]	200	200	—	—	—
All species	173,200	80,200	70,600	5,300	17,100

[1] *See "Inventory Procedures" for details on the mortality estimates and periods over which mortality was estimated.*

[2] *Includes primarily paper birch, quaking aspen, and black cottonwood.*

Table 33. — Average annual mortality of growing stock on commercial forest land, by species and county, Inland Empire area, Washington, 1968[1]
(In thousand cubic feet)

Species	All counties	Asotin	Columbia	Ferry	Garfield	Lincoln	Pend Oreille	Spokane	Stevens	Walla Walla	Whitman
Softwoods:											
Douglas-fir	15,400	100	500	6,000	200	—	2,000	100	6,400	100	—
Grand fir	7,700	200	1,000	2,400	700	—	1,700	300	1,200	200	—
Subalpine fir	2,000	([2])	400	600	100	—	500	100	300	—	—
Western larch	7,300	500	300	3,100	100	—	1,200	200	1,900	—	—
Ponderosa pine	6,100	500	400	3,300	400	400	300	400	400	—	—
Lodgepole pine	6,100	100	100	1,400	100	—	2,200	900	1,300	—	—
Western white pine	5,900	—	—	1,500	—	—	3,400	—	1,000	—	—
Engelmann spruce	1,100	100	200	200	100	—	200	—	300	—	—
Western redcedar	300	—	—	—	—	—	300	—	—	—	—
Western hemlock	400	—	—	—	—	—	400	—	—	—	—
Total	52,300	1,500	2,900	18,500	1,700	400	12,200	2,000	12,800	300	—
Hardwoods[3]	800	—	—	100	—	—	100	400	100	100	—
All species	53,100	1,500	2,900	18,600	1,700	400	12,300	2,400	12,900	400	—

[1] *See "Inventory Procedures" for details on the mortality estimates and periods over which mortality was estimated.*

[2] *Less than 50,000 cubic feet.*

[3] *Includes primarily paper birch, quaking aspen, and black cottonwood.*

Table 34. — Average annual mortality of sawtimber on commercial forest land, by species and county, Inland Empire area, Washington, 1968[1] *(International ¼-inch rule)*
(In thousand board feet)

Species	All counties	Asotin	Columbia	Ferry	Garfield	Lincoln	Pend Oreille	Spokane	Stevens	Walla Walla	Whitman
Softwoods:											
Douglas-fir	67,000	300	2,300	29,300	700	—	4,700	—	29,500	200	—
Grand fir	35,200	1,000	6,200	11,200	2,600	—	8,000	500	5,400	300	—
Subalpine fir	6,300	100	1,200	2,000	100	—	1,800	—	1,100	—	—
Western larch	27,500	200	1,300	15,600	500	—	4,100	—	5,800	—	—
Ponderosa pine	25,700	1,700	2,200	16,800	1,400	—	1,300	800	1,500	—	—
Lodgepole pine	8,300	([2])	200	4,100	100	—	1,000	2,400	500	—	—
Western white pine	26,700	—	—	8,000	—	—	14,400	—	4,300	—	—
Engelmann spruce	5,100	400	1,100	1,000	600	—	1,200	—	800	—	—
Western redcedar	1,400	—	—	200	—	—	1,100	—	100	—	—
Western hemlock	1,800	—	—	100	—	—	1,500	—	200	—	—
Total	205,000	3,700	14,500	88,300	6,000	—	39,100	3,700	49,200	500	—
Hardwoods[3]	300	—	—	100	—	—	200	([2])	—	—	—
All species	205,300	3,700	14,500	88,400	6,000	—	39,300	3,700	49,200	500	—

[1] *See "Inventory Procedures" for details on the mortality estimates and periods over which mortality was estimated.*

[2] *Less than 50,000 board feet.*

[3] *Includes primarily paper birch, quaking aspen, and black cottonwood.*

Table 35. — Average annual mortality[1] of growing stock and sawtimber on commercial forest land, by causes of death and by softwoods and hardwoods, Inland Empire area, Washington, 1968

Cause of Death	Growing stock			Sawtimber (International ¼-inch rule)			Sawtimber (Scribner rule)		
	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods
	Thousand cubic feet			*Thousand board feet*					
Fire	2,700	2,700	—	12,500	12,500	—	10,000	10,000	—
Insects	7,600	7,600	—	29,700	29,700	—	25,700	25,700	—
Disease	2,900	2,900	—	12,400	12,400	—	9,800	9,800	
Weather	8,400	7,900	500	26,900	26,900	—	21,700	21,700	—
Other[2]	2,000	1,900	100	1,500	1,500	—	1,200	1,200	—
Unknown	7,200	7,200	—	29,100	29,100	—	24,600	24,600	—
All causes	30,800	30,200	600	112,100	112,100	—	93,000	93,000	—

[1] *Data not available for National Forests.*

[2] *Mostly logging-killed, with some trees killed by animals and suppression.*

Table 36. — Net volume of salvable dead sawtimber[1] on commercial forest land, by volume-per-acre class, Inland Empire area, Washington, January 1, 1969

Volume-per-acre class	All counties
	Thousand cubic feet
Cubic feet:	
1-199	25,200
200-499	11,700
500-999	4,900
1,000-1,999	7,000
2,000 or more	—
All classes	48,800
	Thousand board feet, International ¼-inch rule
Board feet:	
1-499	44,500
500-999	75,100
1,000-2,499	70,900
2,500-4,999	—
5,000-9,999	72,600
10,000 or more	—
All classes	263,100
	Thousand board feet, Scribner rule
Board feet:	
1-499	49,500
500-999	62,200
1,000-2,499	45,400
2,500-4,999	—
5,000-9,999	65,200
10,000 or more	—
All classes	222,300

[1] *Data not available for National Forests.*

Table 37. — Net volume of salvable dead sawtimber[1] on commercial forest land by species, Inland Empire area, Washington, January 1, 1969

Species	Cubic Feet	Int. ¼-inch rule	Scribner rule
	Thousand cubic feet	*Thousand board feet*	
Douglas-fir	16,900	86,700	70,900
Grand fir	800	3,700	3,100
Subalpine fir	—	—	—
Western larch	24,600	137,900	118,700
Ponderosa pine	5,100	28,700	24,900
Lodgepole pine	500	2,600	2,000
Engelmann spruce	200	1,200	900
Western redcedar	700	2,300	1,800
All species	48,800	263,100	222,300

[1] *Data not available for National Forests.*

Table 38. — Timber harvest by ownership class, Inland Empire Area, Washington, 1950-71 (International ¼-inch rule)
(In thousand board feet)

Year	All ownerships			Private[1]			State			National Forest			Other public		
	Total	Live	Dead[2]	Total	Live	Dead[2]	Total	Live	Dead[2]	Total	Live	Dead[2]	Total	Live	Dead[2]
1950	159,506	([3])	([3])	—	—	—	61,272	([3])	([3])	44,875	([3])	([3])	53,359	([3])	([3])
1951	227,811	([3])	([3])	—	—	—	130,387	([3])	([3])	45,354	([3])	([3])	52,070	([3])	([3])
1952	241,891	241,321	570	—	—	—	126,388	126,214	174	55,210	54,814	396	60,293	60,293	—
1953	242,620	([3])	([3])	—	—	—	141,058	141,058	—	39,037	([3])	([3])	62,525	62,525	—
1954	270,472	270,442	30	—	—	—	159,940	159,940	—	55,973	55,973	—	54,559	54,529	30
1955	300,550	298,036	2,514	177,291	177,291	—	6,134	6,134	—	53,389	50,875	2,514	63,736	63,736	—
1956	329,931	328,380	1,551	180,703	180,692	11	544	544	—	69,967	68,427	1,540	78,717	78,717	—
1957	298,302	298,172	130	164,275	164,275	—	2,679	2,679	—	73,359	73,234	125	57,989	57,984	5
1958	336,342	334,395	1,947	169,118	169,116	2	962	962	—	88,446	86,520	1,926	77,816	77,797	19
1959	403,174	397,764	5,410	187,513	187,268	245	2,451	2,451	—	100,397	95,232	5,165	112,813	112,813	—
1960	329,524	327,324	2,200	169,868	168,809	1,059	3,523	3,431	92	81,346	80,297	1,049	74,787	74,787	—
1961	320,197	310,850	9,347	126,024	117,336	8,688	2,109	2,006	103	107,696	107,140	556	84,368	84,368	—
1962	374,623	369,609	5,014	136,755	135,651	1,104	8,371	8,371	—	134,245	130,458	3,787	95,252	95,129	123
1963	402,748	400,148	2,600	119,863	119,146	717	9,429	9,339	90	167,696	165,903	1,793	105,760	105,760	—
1964	412,178	410,776	1,402	127,632	127,632	—	8,707	8,707	—	171,913	170,511	1,402	103,926	103,926	—
1965	385,238	384,385	853	105,998	105,977	21	20,214	20,214	—	138,126	137,294	832	120,900	120,900	—
1966	398,154	398,128	26	134,249	134,223	26	12,172	12,172	—	149,550	149,550	—	102,183	102,183	—
1967	397,539	383,001	14,538	103,215	103,215	—	22,574	22,574	—	164,889	150,522	14,367	106,861	106,690	171
1968	468,189	464,344	3,845	131,000	131,000	—	35,683	35,683	—	161,202	159,967	1,235	140,304	137,694	2,610
1969	413,399	410,216	3,183	125,542	125,542	—	27,205	27,081	124	159,025	155,966	3,059	101,627	101,627	—
1970	381,494	378,975	2,519	135,354	135,133	221	5,176	5,129	47	159,286	157,035	2,251	81,678	81,678	—
1971	406,473	404,453	2,020	143,101	141,526	1,575	19,583	19,532	51	135,767	135,373	394	108,022	108,022	—

[1] *Data for private ownership are combined with State ownership for 1950-54.*

[2] *Includes snags and down material existing before logging. Salvage of this material does not constitute drain on the volume of the forest inventory of live trees.*

[3] *Data not available.*

ACCURACY OF CURRENT INVENTORY DATA

Forest land area and timber volume

The estimates of forest land area and timber volume in the Washington Inland Empire area were derived by sampling and consequently have sampling errors. Sampling errors have been computed for the estimates of commercial forest land area, noncommercial forest land area, net cubic-foot volume of growing stock, and net board-foot volume (International ¼-inch rule) of sawtimber. These sampling errors are presented in table 39 as a percent of the estimated total at the 68-percent and 95-percent probability levels. They may be interpreted as meaning that the odds are two out of three for the 68-percent probability, or 19 out of 20 for 95-percent probability, that the ranges shown include the true value (i.e., the results of a 100-percent inventory). For example, we can expect, with 95-percent confidence, that the estimate of total commercial forest land area — 3,938,000 acres ±2.7 percent (106,326 acres) — includes the true value.

In addition to measurable sampling errors, there may be other nonsampling errors due to mistakes in judgment, measurement, and compilation. The magnitude of errors from these sources cannot be determined. However, such errors are kept to a minimum through training, supervision, field checking, and complete editing and machine verification in compiling the data.

The sampling error of any breakdown of these totals will be substantially greater than for the total. The smaller the breakdown, the larger the sampling error. An approximation of the increasing sampling error can be obtained from table 40, which shows the sampling error associated with smaller estimates.

Table 39. — Sampling errors of estimates of forest area and timber volume, Inland Empire area, Washington, January 1, 1969

Item	Estimated total	Sampling error in percent	
		68-percent probability	95-percent probability
Commercial forest land	3,938,000 acres[1]	±1.4	±2.7
Noncommercial forest land	255,000 acres[1]	±7.4	±9.4
Volume:			
Growing stock	6,529 million cubic feet	±1.8	±3.5
Sawtimber (International ¼-inch rule)	23,860 million board feet	±2.2	±4.3

[1] *Of the estimated 3,938,000 acres of commercial forest and of the estimated 255,000 acres of noncommercial forest land, 1,095,000 acres of commercial forest land and 92,000 acres of noncommercial forest land were classified by type-mapping procedures and have no associated sampling error.*

Table 40. — Approximate sampling error by size of estimate, Inland Empire area, Washington, January 1, 1969

Commercial forest land		Growing stock		Sawtimber	
Area	Sampling error[1]	Volume	Sampling error[1]	Volume	Sampling error[1]
Thousand acres	*Percent*	*Million cubic feet*	*Percent*	*Million board feet*[2]	*Percent*
2,843	1.4	6,529	1.8		
1,393	2.0	5,288	2.0	23,860	2.2
619	3.0	2,350	3.0	12,831	3.0
348	4.0	1,322	4.0	7,218	4.0
223	5.0	846	5.0	4,619	5.0
56	10.0	211	10.0	1,154	10.0
24	15.0	94	15.0	513	15.0
14	20.0	53	20.0	289	20.0
9	25.0	34	25.0	184	25.0
6	30.0	23	30.0	128	30.0
4	35.0	17	35.0	94	35.0
3	40.0	13	40.0	72	40.0
		8	50.0	46	50.0
		2	100.0	11	100.0

[1] *By random sampling; 68-percent probability.*

[2] *International 1/4-inch rule.*

INVENTORY PROCEDURES

The summary tables in this report include data from the inventories of the Colville, Kaniksu, and Umatilla National Forests, conducted by the Division of Timber Management, Region 1 for the Colville and Kaniksu and Region 6 for the Umatilla, U.S. Forest Service; and data from the inventory of lands outside the National Forests, conducted by the Forest Survey project, Pacific Northwest Forest and Range Experiment Station. National Forest lands were inventoried in 1964, 1968, and 1969 for the Colville, Umatilla, and Kaniksu National Forests, respectively. Lands outside the National Forests were inventoried in 1968. No updating was done to bring data to a common date. The same general standards and definitions were used for both National Forests and lands outside the National Forests, except as follows.

National Forest Lands

For the Umatilla and Colville National Forests, field plots were distributed on a systematic grid at 1.7 - and 4.0-mile intervals, respectively. The Kaniksu National Forest chose field plots from a photo grid on randomly selected photos.

Field plots on all three National Forests consisted of 10 sample points distributed systematically over an acre. The variable-radius plot sampling principle was used at each point to select the trees to be tallied. Where no trees were tallied, a ground cover class was recorded. Summations of the 10-point tally expressed the timber resources and conditions for that acre and were used to estimate forest area and volume. There were 223, 37, and 78 plots established on the Colville, Kaniksu, and Umatilla National Forests, respectively.

Growth estimates for the National Forests were based on readings from increment borings. Multiple regression equations were used to estimate tree diameter 1 year prior to 1968 on the 10-point plots, and net volume was computed for both present and past diameters. Gross growth was obtained by subtracting past from present net volume.

Estimates of annual mortality were based on the tally of trees estimated to have died within the 5 years preceding the data of the present inventory except on the Umatilla National Forest where mortality was determined from remeasurement of plots established 10 years previously.

Lands Outside National Forests

A double sampling design was used for lands outside the National Forests. In the first stage, aerial photo sample plots were distributed systematically across the area. Photo plots were classified into one of the three major land classes — commercial forest, noncommercial forest, and nonforest — and the commercial forest plots were further classified into stand volume classes. All photo plots were classified by kind of owner from public records. Approximately 10,200 photo plots were examined. The second stage consisted of a basic systematic grid of field plots 3.4 miles apart with supplemental plots added. A total of 414 field plots were established at photo plot locations. Plots consisted of 10 sample points distributed systematically over an acre. Other plot procedures used were the same as previously described for the National Forests.

In addition to the two-stage sample using 10-point variable-radius plots, previously established 1/5-acre plots were remeasured in all of the State's Inland Empire Counties. The

remeasured data were used to develop multiple regression equations of diameter growth, which in turn was used to estimate diameter for the year prior to 1968 for all trees on the 10-point variable-radius inventory plots. Net volume was computed for both past and present diameters, and gross growth was obtained by subtracting past from present net volume. Variables in the regression equations included d.b.h., average stand diameter, basal area per acre, tree age, crown ratio, site index, and combinations of these.

Annual mortality estimates were based on the tally of dead trees recorded as live on the originally established 1/5-acre subplots.

Timber Harvest

The timber harvest figures used in this report have been obtained from various agencies using varying standards and methods of reporting. These timber cut figures are therefore not strictly comparable with Forest Survey's reported volume statistics but are considered adequate for the analyses made.

DEFINITIONS OF TERMS

Land Area

Total Land Area

Includes dry land and land temporarily or partially covered by water, such as marshes, swamps, and river flood plains; streams, sloughs, and canals less than one-eighth mile wide; and lakes, reservoirs, and ponds less than 40 acres in area.

Forest Land Area

Land at least 16.7 percent stocked by trees of any size, or formerly having such tree cover, and not currently developed for nonforest use. Minimum area of forest land recognized is 1 acre.

Nonforest Land Area

Land that has never supported forests and land formerly forested where use for timber management is precluded by development for other uses. Included are areas used for agricultural crops, improved pasture, residential areas, city parks, improved roads of any width and right-of-way clearings, powerline clearings of any width, and 1- to 40-acre areas of water classified by the Bureau of the Census as land. If intermingled in forest areas, unimproved roads and other nonforest strips must be more than 120 feet wide, and clearings, etc., more than 1 acre in size, to qualify as nonforest land.

Forest Land Classes

Commercial Forest Land Area

Forest land which is producing or capable of producing industrial wood and not withdrawn from timber utilization.

Noncommercial Forest Land Area

Unproductive forest land incapable of yielding crops of industrial wood because of adverse site conditions, and productive public forest land withdrawn from commercial timber use through statute or administrative regulation.

Productive-reserved. — Public forest land withdrawn from timber utilization through statute, ordinance, or administrative order, but which otherwise qualifies as commercial forest land. Also included are forest lands managed exclusively for Christmas tree production and deferred lands on National Forests set aside for study as to land use allocation.

Unproductive. — Forest land incapable of yielding crops of industrial wood products because of adverse site conditions such as sterile soil, poor drainage, high elevation, steepness, and rockiness.

Forest Types

Forest types are determined on the basis of species plurality of all live trees that contribute to stocking, considering both size and spacing.

Tree Classes

Growing-stock Trees

Sawtimber trees, poletimber trees, saplings, and seedlings, i.e., all live trees except cull trees.

Sawtimber trees (11.0-inch d.b.h. and larger). — Live trees of commercial species. Softwood trees must contain at least one

12-foot saw log with a top diameter not less than 6 inches inside bark; hardwood trees must contain at least one 8-foot saw log with a top diameter not less than 8 inches inside bark. At least 25 percent of the board-foot volume in a tree must be free of defect.

Poletimber trees (5.0- to 10.9-inch d.b.h.). — Live trees of commercial species not less than 50-percent sound on a cubic-foot basis and with no disease, defects, or deformities which are likely to prevent their becoming growing-stock sawtimber trees.

Sapling and seedling trees (less than 5.0-inch d.b.h.). — Live trees of commercial species with no disease, defects, or deformities which are likely to prevent their becoming growing-stock poletimber trees.

Nongrowing-stock Trees

Cull trees. — Trees of noncommercial species and trees of commercial species which are too defective or which are unlikely to become growing-stock trees due to deformity, disease, low vigor, etc.

Sound cull trees. — Trees of noncommercial species or with excessive defect due to form, roughness, etc.

Rotton cull trees. — Trees with excessive defect due primarily to rot.

Mortality trees. — Trees of commercial species which have died from natural causes within a specified period and which were not cull trees at the time of death.

Salvable dead trees. — Standing or down dead trees of commercial species 11.0 inches or more in diameter that contain 25 percent or more of sound volume and at least one merchantable 16-foot log if a softwood or one merchantable 8-foot log if a hardwood.

Stand-size Classes

Sawtimber Stand

Stand at least 16.7 percent stocked with growing-stock trees, with half or more of this stocking in sawtimber and poletimber trees, and with sawtimber stocking equal to or greater than poletimber stocking.

Large sawtimber stand. — Stand in which the majority of the sawtimber stocking is in trees 21.0-inch d.b.h. and larger.

Small sawtimber stand. — Stand in which the majority of the sawtimber stocking is in trees from 11.0- to 20.9-inch d.b.h.

Poletimber Stand

Stand at least 16.7 percent stocked with growing-stock trees, with half or more of this stocking in sawtimber and poletimber trees, and with poletimber stocking exceeding sawtimber stocking.

Sapling and Seedling Stand

Stand at least 16.7 percent stocked with growing-stock trees, with more than half of this stocking in saplings and/or seedlings.

Nonstocked Area

An area of commercial forest land less than 16.7 percent stocked with growing-stock trees.

Stocking

Stocking is an expression of the extent to which growing space is effectively utilized by present or potential growing-stock trees of commercial species. "Percent of stocking" is synonymous with "percentage of growing space occupied" and means the ratio of actual stocking to full stocking for comparable sites and stands. Basal area is used as a basis for measuring stocking.

Age

Stand Age

Stand age is based upon growing-stock stocking. In order for a stand to be even-aged, a majority of the growing-stock stocking must be in two adjacent age classes. Stands that do not meet this criterion are classified as uneven-aged.

Old-growth Sawtimber Stand

Sawtimber stand in which 50 percent or more of the growing stock is in trees at least 140 years old.

Young-growth Sawtimber Stand

Sawtimber stand in which more than 50 percent of the growing stock is in trees less than 140 years old.

Timber Volume

Live Sawtimber Volume

Net volume in board feet of live sawtimber trees of commercial species. Net volume equals gross volume less deduction for rot, sweep, crook, and other defects that affect use for lumber.

Scribner rule. — The common board-foot log rule used in determining volume of sawtimber in Washington. Scribner volume in the Inland Empire area is measured in terms of 16-foot logs.

International ¼-inch rule. — The standard board-foot log rule adopted nationally by the Forest Service for the presentation of Forest Survey volume statistics.

Saw-log portion. — That part of the bole of sawtimber trees between the stump and the saw-log top. The saw-log top measured by the Scribner rule is variable and is 40 percent of d.b.h. but not less than 8.0 inches diameter outside bark. The top measured by the International rule is fixed at 6.0 inches diameter inside bark.

Upper-stem portion. — That part of the bole of sawtimber trees above the saw-log top to a minimum top diameter of 4.0 inches outside bark or to the point where the central stem breaks into limbs.

Growing-stock Volume

Net volume in cubic feet of live sawtimber trees and live poletimber trees from stump to a minimum 4.0-inch top (of central stem) outside bark. Net volume equals gross volume less deduction for rot and missing bole sections.

Net Annual Growth

The increase in net volume of a specified size class for a specific year. (Components of net annual growth include the increment in net volume of trees at the beginning of the specific year surviving to the year's end, plus net volume of trees reaching the size class during the year, minus the net volume of trees that died during the year, minus the net volume of trees that became culls during the year.)

Ownership Classes

National Forest Lands

Federal lands which have been designated by Executive Order or statute as National Forest or purchase units, and other lands under the administration of the Forest Service, including experimental areas and Bankhead-Jones Title III lands.

Other Public Lands

Federal lands other than National Forests, including lands administered by the Bureau of Land Management, Bureau of Indian Affairs, and miscellaneous Federal agencies, and lands owned by States, counties, and local public agencies, or lands leased by these governmental units for more than 50 years.

Forest Industry Lands

Lands owned by companies or individuals operating wood-using plants.

Farmer-owned Lands

Lands owned by operators of farms.

Miscellaneous Private—Corporate Lands

Lands owned by companies or corporations that do not operate wood-using plants. Included are corporate farms, some railroad lands, oil company lands, real estate and landholding company lands, and lands held by banks and other financial institutions and various other companies and corporations.

Miscellaneous Private—Noncorporate Lands

Privately owned lands other than forest industry, farmer-owned, or corporate lands. Included are lands owned by individuals who have permanent or summer homesite lands outside city limits.

TREE SPECIES

Principal tree species found on the commercial forest land in the Inland Empire of Washington include:

Softwoods:

- Douglas-fir (*Pseudotsuga menziesii*)
- Engelmann spruce (*Picea engelmanii*)
- Grand fir (*Abies grandis*)
- Subalpine fir (*Abies lasiocarpa*)
- Lodgepole pine (*Pinus contorta*)
- Ponderosa pine (*Pinus ponderosa*)
- Western white pine (*Pinus monticola*)
- Western hemlock (*Tsuga heterophylla*)
- Western larch (*Larix occidentalis*)
- Western redcedar (*Thuja plicata*)

Hardwoods:

- Black cottonwood (*Populus trichocarpa*)
- Quaking aspen (*Populus tremuloides*)
- Red alder (*Alnus rubra*)
- White alder (*Alnus rhombifolia*)
- Paper birch (*Betula papyrifera*)

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This report presents the findings of the latest inventory of the timber resources of Pend Oreille, Spokane, Stevens, Ferry, Lincoln, Whitman, Asotin, Garfield, Columbia, Adams, Franklin, and Walla Walla Counties, Washington. Accompanying the detailed tables of forest area, volume, growth, and mortality statistics is an analysis of the present timber resource, with emphasis on conditions that affect present and future timber production.

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