

# Timber Resource Statistics For Eastern Oregon, 1999

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Resource Bulletin  
PNW-RB-238  
October 2004  
REVISED



United States  
Department of  
Agriculture



Forest  
Service



Pacific Northwest  
Research Station



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## Abstract

**Azuma, David L.; Dunham, Paul A.; Hiserote, Bruce A.; Veneklas, Charles F. 2004.** Timber resource statistics for eastern Oregon, 1999. Rev. Resour. Bull. PNW-RB-238. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 42 p.

This report is a summary of timber resource statistics for eastern Oregon, which includes Baker, Crook, Deschutes, Gilliam, Grant, Harney, Jefferson, Klamath, Lake, Malheur, Morrow, Sherman, Umatilla, Union, Wallowa, Wasco, and Wheeler Counties. Data were collected as part of a statewide multiresource inventory. The inventory sampled all private and public lands except those administered by the National Forest System. The National Forest System provided area statistics from their regional inventories of the various forests. Statistical tables summarize all ownerships and provide estimates of land area, timber volume, growth, mortality, and harvest.

**Keywords:** Forest surveys, forest inventory, statistics (forest), timber resources, resources (forest), eastern Oregon.

## Summary

Eastern Oregon has an estimated 42.2 million acres of land. About 32 percent of this land is forested with 76 percent of the forested portion being nonreserved timberland. About 71 percent of the timberland exists on National Forest System lands. Within the timberland area outside of national forests, net volume of growing stock is estimated as 3.5 billion cubic feet. About 41 percent of the growing-stock volume is on forest industry land, 48 percent on other private land, and 11 percent on other public land. Approximately 99 percent of the total growing-stock volume is in coniferous species, with ponderosa pine accounting for 43 percent followed by Douglas-fir at 22 percent of the conifer volume. Estimated net annual growth of growing stock for nonfederal lands is 59 million cubic feet, and average annual mortality for this timber is an estimated 45 million cubic feet.

## Preface

Forest Inventory and Analysis (FIA) is a nationwide program of the USDA Forest Service authorized by the Forest and Rangeland Renewable Resources Research Act of 1978. Work units, located at Forest Service research and experiment stations, conduct forest resource inventories throughout the 50 states. The FIA Program of the Pacific Northwest Research Station in Portland, Oregon, is responsible for forest inventories in Alaska, California, Hawaii, Oregon, and Washington.

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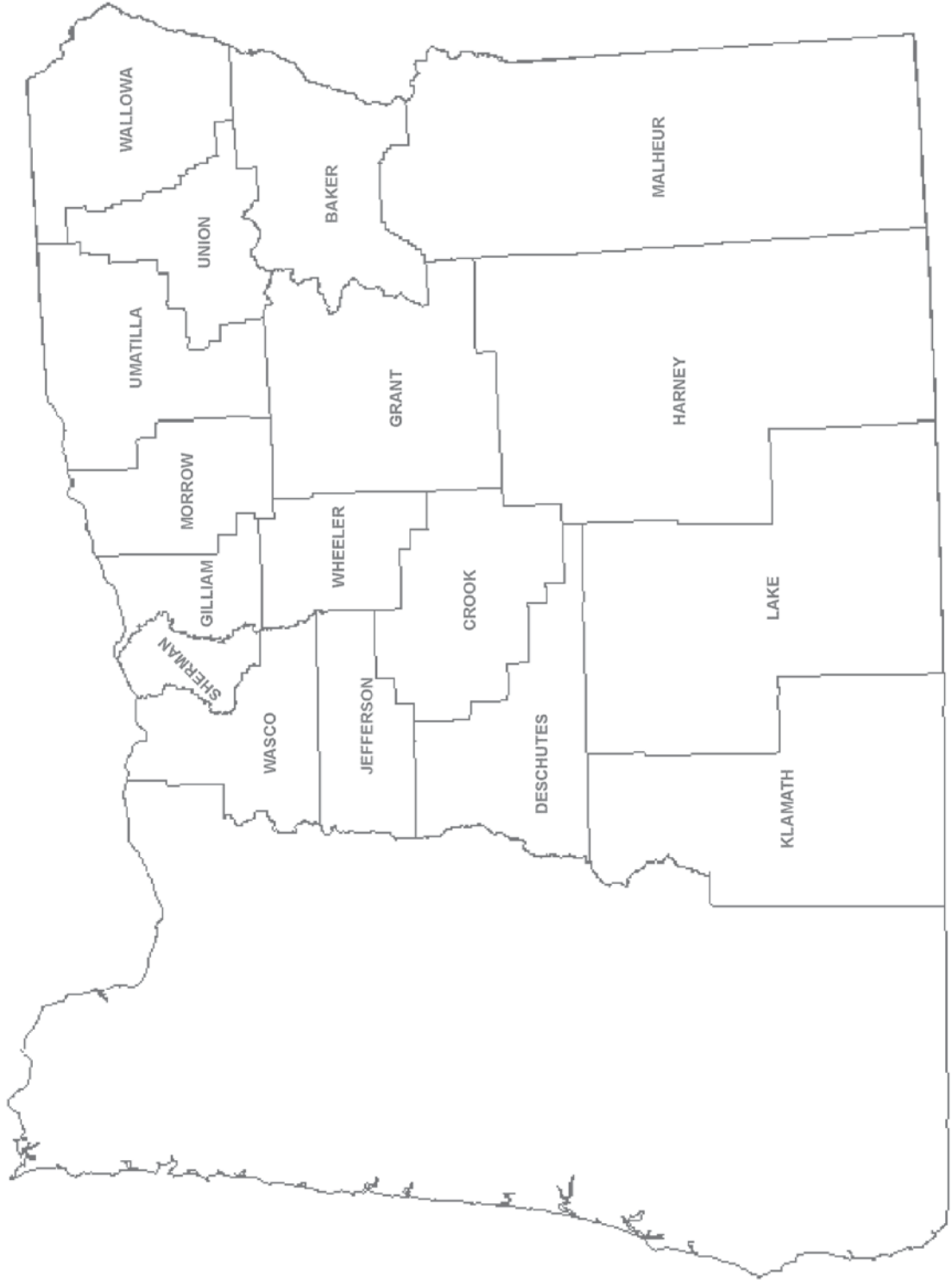
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# Counties in eastern Oregon



## Introduction

The Forest Inventory and Analysis (FIA) unit of the Pacific Northwest Research Station conducted a multiresource inventory in eastern Oregon's forests in 1998 and 1999. This inventory included all lands except those administered by the USDA Forest Service. This report summarizes the timber resource statistics for eastern Oregon's forests. Some statistical tables include inventory data provided by the USDA Forest Service for area on their lands. Other resources sampled but not included in this report include understory vegetation, crown cover, coarse woody debris, and snags. These data will lead to further analysis of the status of eastern Oregon's forests.

The FIA unit has been reporting statistics for eastern Oregon since the 1930s. Bolsinger and Berger (1975), Farrenkopf (1982), and Gedney et al. (1989) reported inventory statistics in the 1960s, 1970s and 1980s, respectively. The current sampling system is a systematic grid of plots implemented in the early 1960s. McKay et al. (1994) used an updated 1992 data set to report the latest forest statistics for eastern Oregon.

This report contains statistical tables that provide current estimates of forest land area, number of trees, timber volume, growth, mortality, and harvest. In several tables, data supplied for the 1997 Resources Planning Act (RPA) (Smith et al. 2001) by the National Forest System are incorporated. Estimates are provided of change in volume and area of nonfederal lands between the 1980s and the present inventory. Change estimates are not available for federal lands. The national forest statistics include areas that are withdrawn from full production but still meet the FIA definition of timberland. National forest lands are not all equally available for timber production owing to various management decisions.

## Inventory Procedures (Nonfederal Lands)

Eastern Oregon was inventoried by using a double sampling for stratification scheme (Cochran 1977). The sampling is implemented on a permanent systematic grid producing an even geographic distribution of both secondary (field) and primary (photo) plots across the state. Photo plots are placed at random inside each square of the grid.

The primary sample for eastern Oregon consists of a grid of nearly 70,000 points established in 1987 by using aerial photography from 1982 with some updates from 1994. Data collected on each point included, but were not limited to, land use, plant community, and stage of development. For conifer stands, percentage of crown cover and a height code also were collected. The primary sample is used for the stratification of the secondary sample points to increase the precision of estimates.

The secondary sample consisted of 4,378 forest and nonforest field locations established in previous inventories and remeasured or reclassified in the 1998-99 period. This sample represents about a 1 in 16 subsample of the primary grid. The ratio of 1 field to 16 photo plots provides a sufficient number of plots to meet the required sampling precision for estimates of forest area and volume.

The national forest plots were taken on a similar grid system with a different plot design (Max et. al 1996). The data were collected for these inventories between 1993 and 1996.

The 1998 FIA inventory also included reserved lands, which were excluded from previous FIA inventories. The major addition is from Crater Lake National Park with about 220,000 acres.

In 1986, a cluster of five subplots covering an area of about 8 acres was installed at timberland grid locations. At that time, the cluster of subplots sampled a single homogeneous condition, by moving subplots into the condition if necessary. At each subplot, variable-radius sampling was used to select trees over 5 inches diameter at breast height (d.b.h.), and a fixed-radius plot was used to sample seedlings and saplings.



In 1998, the sampling design was modified to remove potential bias inherent in the 1986 procedures. The term “condition class” was defined for the modified design to identify different situations that could occur on a plot. A condition class, or “condition,” refers to an area with a distinct land class (timberland, woodland, nonforest, etc.) and vegetative condition (forest type, stand age, etc.). The modified design requires that all subplots for a cluster (the plot) remain fixed. For plots that straddle two or more conditions, we now sample all conditions by mapping the boundaries around each condition essentially subdividing the plot. The information pertinent to each condition was recorded as condition class attributes. When multiple conditions exist on a plot, all data in one condition are processed together. This can impact the amount of information available for classifying stand characteristics, such as forest type, stand size, and stand age. For example, on 4,378 secondary sample locations outside of national forest lands in the 1998 inventory, 4,768 condition classes were sampled, of which 586 were timberland conditions. On the 464 plots that contained a timberland condition, roads were the most common nonforest condition followed by grassland steppe or high desert shrub land.

## **Land and Water Area Updated**

The Bureau of the Census compiles and publishes the area of land and water in the United States every 10 years. These area figures, available by state and county, are accepted and used by FIA in Portland as the gross number of acres to be inventoried in each county. The previous inventory was based on 1980 census data, and the current inventory uses 1990 census figures. Raster-scanned U.S. Geological Survey topographic maps and a geographic information system are now used by the Bureau of the Census to identify water bodies and landforms and to determine the size of areas much smaller than was possible previously. As a result, the definition of inland water was changed to reflect the finer resolution: streams with a minimum width of 200 feet are now recognized, compared to 660 feet in 1980; and small water bodies are now at least 4.5 acres in size, compared to 40 acres in the past.

## **Change in Ownership Definitions**

Lands owned by Native Americans are now classified as “other private.” In the 1988 inventory, these lands were defined as “other public.” Forest industry is no longer divided into two categories: “forest industry with mills” or “forest industry without mills”; instead both are now classed as forest industry.

## **Analysis of Change Between Inventories for Nonfederal Lands**

To analyze change in forest statistics, the 1987 data were recompiled to account for technical changes in the 1998-99 inventory. The summaries presented in tables 29 through 31 have been developed from remeasured plots outside of National Forest System lands and include recompiled data from the 1987 inventory. Volume in the change tables is based on trees that were either measured twice, or measured for the first time in the 1998-99 inventory and were projected backward for the 1987 values. Caution should be used in comparing present statistics and those published by Gedney et al. (1989), because of the procedural changes.

Access was denied on and trees were not projected forward from the previous inventory on 137,000 acres representing approximately 197 million cubic feet in the 1988 inventory. The volume and area for these plots are shown as losses in the area and volume change tables. These lands are not actually withdrawn from the resource base but are reported as losses for comparison purposes.

## **Highlights**

National forest timber harvests have dramatically declined in the 1990s. From 1970 to 1989, timber harvest volume from national forests averaged 1.16 billion board feet per year. That number dropped to 0.47 billion per year between 1990 and 2000, with an average of 0.24 billion from 1994 to 2000, a decrease of 79 percent from the 1970 to 1989 period.

## Reliability of Inventory Data

Private lands, composing only 28 percent of the timberland in eastern Oregon, produced on average, 34 percent of the harvest volume per year in the 1980s, and 62 percent from 1990 to 2000. There has been a decline in standing volume on private lands from the 1988 inventory of 4.7 to 3.5 billion cubic feet in 1999. In the last 11 years, periodic removals are about 2.5 percent greater than the periodic gross growth. If mortality is included as lost volume, the volume lost is 27 percent greater than growth.

Less than 3 percent of timberland outside of the National Forest System has a large sawtimber size class (average stand d.b.h. greater than 21 inches). Of forest industry timberland, 56 percent has a small sawtimber size class (average stand d.b.h. between 9 and 21 inches); the percentage for other lands outside of national forests is 69 percent. The small sawtimber size class accounts for 83 percent of the growing-stock volume and 87 percent of the sawtimber volume in eastern Oregon.

There was little net change in land use in eastern Oregon between 1988 and 1999. An estimated 50,000 acres of the 2.9 million timberland acres went to another land use, 32,000 acres going to urban uses and the rest to roads. An estimated 40,000 acres moved into the timberland class; most of these areas had marginal tree stocking at the previous inventory. The timber volume associated with plots leaving timberland designation was about 95 million cubic feet; the volume on land becoming timberland was about 3 million cubic feet. The net loss in volume is much more substantial than the loss in acres.

Access was denied to about 137,000 acres in the 1998 inventory.

Inventories are designed to provide sampling errors consistent with national standards set by the USDA Forest Service. The target sampling errors for total timberland area are 3 percent per million acres, and 10 percent per billion cubic feet of growing-stock volume.

The sample design for this inventory provides the highest precision when estimates are aggregated for all of eastern Oregon. As the sample is divided into smaller units, the confidence intervals increase as a proportion of the estimate. Confidence intervals are quantitative expressions of the variability inherent in the sampling and estimation procedures. The tabulation below indicates, for instance, a 68-percent (one standard error) chance that the true timberland area outside of national forest (estimated at 2,945,000 acres) is within the range of 2,867,000 to 3,023,000 acres.

Area estimates and standard errors for timberland outside of national forests, by owner class, are displayed below:

<b>Owner</b>	<b>Timberland area</b>	<b>Net volume</b>
	<i>Thousand acres</i>	<i>Million cubic feet</i>
Other public	236±30	428±78
Forest industry	1,603±75	1,558±99
Other private	1,105±74	1,839±148
All owners	2,945±78	3,825±184

Confidence intervals vary with the size of the estimate and the amount of variance associated with the estimate. The following is a set of approximate confidence intervals calculated by using a regression analysis between actual standard error and the estimate involved. These approximate intervals allow the user to estimate the error around all values in the following tables. These regressions have r-square values greater than 0.80, indicating that 80 percent of the variance in the relation was explained by the equation. The actual error estimates for cells in tables can be obtained from the Portland FIA unit.

Timberland area			Growing-stock volume		
Estimate	Confidence interval		Estimate	Confidence interval	
-- Thousand acres --		Percent	-- Million cubic feet --		Percent
3,000	±93	3	6,000	±326	5
2,000	±76	4	4,000	±230	6
1,500	±66	4	2,000	±134	8
1,000	±54	5	1,000	±86	9
800	±48	6	800	±77	10
600	±42	7	600	±67	11
400	±34	8	400	±58	14
200	±25	12	200	±48	24
100	±18	18	100	±43	43
50	±13	26	50	±41	82
25	±10	40			
15	±8	53			
10	±6	60			
5	±5	99			

## Terminology

**Available other forest land**—Forest land incapable of growing 20 cubic feet per acre per year (mean annual increment at culmination in fully stocked, natural stands) of industrial wood because of adverse conditions such as sterile soils, dry climate, poor drainage, subalpine sites, steepness, or rockiness but available for harvest.

**Bureau of Land Management land**—Land administered by the U.S. Department of the Interior, Bureau of Land Management.

**Class of timber**—A classification of trees as growing stock, cull, and salvable dead. Growing-stock trees are divided into poletimber and sawtimber trees.

**Condition class**—A mapped area on a plot with a distinct land class (for example, timberland, oak woodland, nonforest) or a distinct vegetative condition (for example, forest type, stand size). The condition identified at plot center is the only condition that is remeasured and used for the analysis of periodic change.

**County and municipal lands**—Lands owned by county and other municipalities.

**Cull trees**—Live trees of noncommercial species, and live trees of commercial species that are more than 75 percent defective. Noncommercial species are junipers, Pacific yew, Pacific dogwood, apple, and willow. Cull trees are not growing-stock trees.

**Cull trees, rotten**—Cull trees with defect caused primarily by rot.

**Cull trees, sound**—Trees of noncommercial species or cull trees of commercial species with defect caused primarily by poor form and roughness.

**Diameter class**—A classification of trees based on diameter outside the bark measured at breast height, 4½ feet above the ground. The common abbreviation for diameter at breast height is d.b.h. Trees are grouped into 2-inch classes up to 21 inches d.b.h., after which the class intervals become broader.

**Even-aged stands**—Stands where 70 percent or more of the tree stocking falls within three adjacent 10-year age classes.

**Farmer-owned lands**—Lands owned by the operators of farms.

**Forest industry lands**—Lands owned by companies that grow timber for industrial use. Includes companies both with and without wood processing plants.

**Forest land**—Land at least 10 percent stocked with live trees, or land that had this minimum tree stocking in the past and is not currently developed for nonforest use. The minimum area recognized is 1 acre.

**Forest types**—Stands are assigned a pure softwood, pure hardwood, softwood-hardwood mix, or hardwood-softwood mix. Stands with 70 percent or more of the stocking in live softwood trees are classified as pure softwood types and are assigned the type name of the softwood species with the greatest stocking among all softwoods on the condition class plot. Stands with 70 percent or more of the stocking in live hardwood trees are classified as pure hardwood types and are assigned the type name of the hardwood species with the greatest stocking among all hardwoods on the condition class plot. Mixed species types are assigned if softwood stocking is between 31 to 69 percent total stocking on the plot: stands with 50 to 69 percent of the stocking in live softwood trees are classed as softwood-hardwood types, and receive a type name that includes the softwood species with the greatest softwood stocking, followed by the hardwood species with the greatest hardwood stocking; stands with 51 to 69 percent of the stocking in live hardwood trees are classed as hardwood-softwood types, and receive a type name that includes the hardwood species with the greatest hardwood stocking, followed by the softwood species with the greatest softwood stocking. For ease in reporting, the secondary forest type will be identified after a slash as “softwood” or “hardwood” in the summary tables

**Growing-stock trees**—All live trees except cull trees (see “cull trees”).

**Growing-stock volume**—Net volume in cubic feet of live sawtimber and poletimber growing-stock trees from the top of a stump 12 inches tall to a minimum 4-inch top (of central stem) inside the bark. Net volume is gross volume less deductions for rot and missing bole sections.

**Growth, current net annual, growing stock**—The increase in growing-stock volume on timberland during the last year of the period between the previous and current inventories. Components of current net annual growth for growing-stock volume include (a) the increment in net volume of poletimber and sawtimber growing-stock trees alive at the beginning of the year and surviving to year end; plus (b) ingrowth, the net volume of growing-stock trees reaching poletimber or sawtimber size during the year; minus (c) mortality, the net volume of poletimber and sawtimber growing-stock trees that died during the year.

**Growth, current net annual, sawtimber**—The increase in sawtimber volume on timberland during the last year of the period between the previous and current inventories. Components of current net annual growth for sawtimber volume include (a) the increment

in net volume of sawtimber trees alive at the beginning of the year and surviving to year end; plus (b) ingrowth, the net volume of trees reaching sawtimber size during the year; minus (c) mortality, the net volume of sawtimber trees that died during the year.

**Growth, periodic gross, growing stock**—The increase in growing-stock volume between the previous and current inventories that is attributable to increasing tree size. Periodic gross growth includes (a) the increment in net volume of poletimber and sawtimber growing-stock trees alive at both the previous and current inventories; (b) the increment in net volume of poletimber and sawtimber growing-stock trees alive at the previous inventory and harvested between inventories; and (c) ingrowth, the net volume of growing-stock trees reaching poletimber or sawtimber size between inventories.

**Growth, periodic gross, sawtimber**—The increase in sawtimber volume between the previous and current inventories that is attributable to increasing tree size. Periodic gross growth includes (a) the increment in net volume of sawtimber trees alive at both the previous and current inventories; (b) the increment in net volume of sawtimber trees alive at the previous inventory and harvested between inventories; and (c) ingrowth, the net volume of trees reaching sawtimber size between inventories.

**Hardwoods**—Nonconiferous trees, usually broadleaved. See “Names of Trees” for a list of hardwood species in this report.

**Industrial wood**—All commercial roundwood products except fuelwood. Roundwood includes logs or bolts that are in straight sections at least 8 feet long for hardwoods and 12 feet long for softwoods.

**Land area**—Area reported as land by the Bureau of the Census (U.S. Department of Commerce 1990). 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 200 feet wide; and lakes, reservoirs, and ponds less than 4.5 acres in area.

**Land class**—A classification of land by major use. The minimum area for classification is 1 acre.

**Mean annual increment (MAI) at culmination**—A measure of the productivity of forest land expressed as the average increase in cubic-foot volume per acre per year. For a given species and site index, the mean is based on the age at which the MAI culminates for fully stocked natural stands. The MAI is based on the site index of the plot.

**Mortality, average annual, growing stock**—The annual net volume of poletimber and sawtimber growing-stock trees that died between the previous and current inventories.

**Mortality, average annual, sawtimber**—The annual net volume of sawtimber trees that died between the previous and current inventories.

**Mortality, periodic, growing stock**—The net volume of poletimber and sawtimber growing-stock trees that died between the previous and current inventories not including removals.

**National forest lands**—Federal lands that have been designated by Executive order or statute as national forest or purchase units and other lands under the administration of the U.S. Department of Agriculture, Forest Service, including experimental areas and Bankhead-Jones Title III lands.

**Native American lands**—Tribal lands, and allotted lands held in trust by the federal government. Native American lands are grouped with farmer and miscellaneous private lands as other private lands.

**Net volume**—Gross volume less deductions for sound and rotten defects. Growing-stock net volume is gross cubic-foot volume less deductions for rot and missing bole sections on poletimber and sawtimber growing-stock trees. Sawtimber net volume is gross board-foot volume less deductions for rot, sweep, crook, missing bole sections, and other defects that affect the use of sawtimber trees for lumber.

**Noncommercial species**—A tree species not commonly used for industrial wood products: junipers, Pacific yew, Pacific dogwood, apple, and willow. Noncommercial species will not be included in growing-stock volume tables; however, if one or more of these species dominate on a plot, the forest type might be classified as a noncommercial species.

**Nonforest land**—Land that has never supported forests or formerly was forested and currently is developed for nonforest uses. Included are lands used for agricultural crops, Christmas tree farms, cottonwood plantations, improved pasture, residential areas, city parks, constructed roads, operating railroads and their right-of-way clearings, powerline and pipeline clearings, streams more than 30 feet wide, and 1- to 40-acre areas of water classified by the Bureau of the Census, U.S. Department of Commerce, as land. If intermingled in forest areas, unimproved roads and other nonforest strips must be more than 120 feet wide, and clearings or other areas must be 1 acre or larger to qualify as nonforest land.

**Nonstocked areas**—Timberland less than 10 percent stocked with live trees. Recent clearcuts scheduled for planting are classified as nonstocked area.

**Other private lands**—Private lands not owned by forest industry. Native American lands, farmer-owned lands, and miscellaneous private lands are included.

**Other public lands**—Lands administered by public agencies other than the U.S. Department of Agriculture, Forest Service and U.S. Department of the Interior, Bureau of Land Management. Other public lands do not include Native American lands, which are included with other private lands.

**Poletimber stands**—Stands with a quadratic mean diameter (mean diameter weighted by basal area) from 5.0 to 9.0 inches at breast height if a softwood stand and from 5.0 to 11.0 inches at breast height if a hardwood stand.

**Poletimber trees**—Live growing-stock trees of commercial species that are 5.0 inches in d.b.h. or larger but smaller than sawtimber trees.

**Reserved other forest**—Forest land incapable of growing 20 cubic feet per acre per year (mean annual increment at culmination in fully stocked, natural stands) of industrial wood that has been dedicated to noncommodity use through statute, ordinance, or administrative order.

**Reserved timberland**—Forest land capable of growing 20 cubic feet or more per acre per year (mean annual increment at culmination in fully stocked, natural stands) of industrial wood that has been dedicated to noncommodity use through statute, ordinance, or administrative order.

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

**Sapling and seedling stands**—Stands with a quadratic mean diameter (mean diameter weighted by basal area) less than 5.0 inches at breast height.

**Sapling and seedling trees**—Live trees of commercial species that are less than 5.0 inches in d.b.h. with a minimum height of 6.0 inches and have no diseases, defects, or deformities likely to prevent their becoming poletimber trees. Saplings have a minimum diameter of 1.0 inch.

**Saw-log portion**—The bole of sawtimber trees between the stump and the saw-log top. Saw-log top is 7.0 inches in diameter outside bark on softwoods and 9.0 inches in diameter outside bark on hardwoods.

**Sawtimber stands**—Stands with a quadratic mean diameter (mean diameter weighted by basal area) 9.0 inches and larger at breast height if a softwood stand and 11.0 inches and larger at breast height if a hardwood stand. Small sawtimber stands are sawtimber stands with a mean diameter (weighted by basal area) less than 21.0 inches at breast height. Large sawtimber stands are sawtimber stands that have a mean diameter 21.0 inches or larger at breast height.

**Sawtimber trees**—Live softwood trees of commercial species at least 9.0 inches in d.b.h. and live hardwood trees of commercial species at least 11.0 inches in d.b.h. At least 25 percent of the board-foot volume in a sawtimber tree must be free from defect. Softwood trees must contain at least one 12-foot saw log with a top diameter of not less than 7 inches outside bark; hardwood trees must contain at least one 8-foot saw log with a top diameter of not less than 9 inches outside bark.

**Sawtimber volume**—Net volume of sawtimber trees measured in board feet. Softwood volume is estimated from the top of a stump 12 inches tall up to a minimum 6-inch top diameter, inside bark, and hardwood volume is estimated from the top of a stump 12 inches tall up to a minimum 8-inch top diameter, inside bark. Net sawtimber 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 locally in eastern Oregon to determine sawtimber volume. Scribner volume is estimated in terms of 16-foot logs for softwoods and hardwoods. See “Sawtimber volume” for utilization limits.

**Site class**—A classification of the potential productivity of forest land expressed as mean annual increment (MAI) at culmination in fully stocked natural stands. Six classes in this report are based on a range of MAI values that were calculated on every plot.

**Site index**—A measure of the productivity of forest land expressed as the average height of dominant and codominant trees at a specified age.

**Softwoods**—Coniferous trees, usually evergreen, with needles or scalelike leaves. See “Names of Trees” for a list of softwood species in this report.

**Stand age**—The 10-year age class that best characterizes the stand. See “even-aged stand” and “uneven-aged stand” for more details.

**Stand-size class**—A classification of stands based on tree size. Stand-size classes are sawtimber, poletimber, and sapling-seedling stands.

**State lands**—Lands owned by states or administered by state agencies.

**Timber harvest**—Volume of roundwood removed from forest land for products. Timber harvest statistics reported in table 32 were collected by the Oregon Department of Forestry.

**Timber volume**—Includes the net volume in cubic feet of poletimber and sawtimber trees and salvable dead sawtimber trees, and the net volume in cubic feet of cull trees of commercial species. In table 17, the volume of cull trees includes the gross volume of noncommercial species. Volume is measured from the top of a stump 12 inches tall to a minimum 4-inch top diameter, inside bark.

**Timberland**—Forest land capable of growing 20 cubic feet or more per acre per year (mean annual increment at culmination in fully stocked, natural stands) of industrial wood and not in a reserved status through removal of the area from timber utilization by statute, ordinance, or administrative order; and not in a withdrawn status where it is pending consideration for reserved status.

**Uneven-aged stands**—Stands where less than 70 percent of the tree stocking falls in three adjacent 10-year age classes.

**Upper stem portion**—The bole of sawtimber trees above the saw-log top—7.0 inches diameter outside bark for softwoods and 9.0 inches diameter outside bark for hardwoods to a minimum top diameter of 4.0 inches inside bark, or to the point where the central stem divides into limbs.

## Names of Trees

Common name	Scientific name <sup>1</sup>
Softwood:	
Douglas-fir	<i>Pseudotsuga menziesii</i> (Mirb.) Franco
Engelmann spruce	<i>Picea engelmannii</i> Parry ex Engelm.
Grand fir	<i>Abies grandis</i> (Dougl. ex D. Don) Lindl.
Incense-cedar	<i>Calocedrus decurrens</i> (Torr.) Florin
Jeffrey pine	<i>Pinus jeffreyi</i> Grev. & Balf.
Lodgepole pine	<i>Pinus contorta</i> Dougl. ex Loud.
Mountain hemlock	<i>Tsuga mertensiana</i> (Bong.) Carr.
Noble fir	<i>Abies procera</i> Rehd.
Pacific silver fir	<i>Abies amabilis</i> Dougl. ex Forbes
Pacific yew	<i>Taxus brevifolia</i> Nutt.
Ponderosa pine	<i>Pinus ponderosa</i> Dougl. ex Laws.
Shasta red fir	<i>Abies shastensis</i> (Lemmon)
Subalpine fir	<i>Abies lasiocarpa</i> (Hook.) Nutt.
Sugar pine	<i>Pinus lambertiana</i> Dougl.
Western hemlock	<i>Tsuga heterophylla</i> (Raf.) Sarg.
Western juniper	<i>Juniperus occidentalis</i> Hook.
Western larch	<i>Larix occidentalis</i> Nutt.
Western redcedar	<i>Thuja plicata</i> Donn ex D. Don
Western white pine	<i>Pinus monticola</i> Dougl. ex D. Don
White fir	<i>Abies concolor</i> (Gord. & Glend.) Lindl. ex Hildebr.
Whitebark pine	<i>Pinus albicaulis</i> Engelm.
Hardwoods:	
Black cottonwood	<i>Populus trichocarpa</i> (Torr. & Gray)
Cherry	<i>Prunus</i> spp.
Oregon white oak	<i>Quercus garryana</i> Dougl. ex Hook.
Quaking aspen	<i>Populus tremuloides</i> Michx.
White alder	<i>Alnus rhombifolia</i> Nutt.
Willow	<i>Salix</i> spp.

<sup>1</sup> Nomenclature per Little (1979).



## Acknowledgments

Many people were involved in the collection of data and the design of the inventory. Thanks go to the data collection staff: Brett Anderson, Christina Anthony, Joy Archuleta, Dale Baer, Jennifer Baker, Del Barge, Adam Blackwood, Steve Bolon, Sarah Butler, Perry Colclasure, Shaun Curtis, Brian Daum, Sebastien DeLion, Peter DelZotto, Paul Dunham, Szilard Farkas, Perttu Finni, Andrei Fiodorov, Jennifer Gomoll, Walter Grabowiecki, Erica Hanson, Kalle Harkonen, Sarah Hedrich, Mike Hogan, Ellie Husk, Jari Jokinen, Dana Katz, Juha Kauppila, Kim Kuhne, J.D. Lloyd, Kitty McCovey, Tom Meade, Cecilia Meyers, Scott Nelson, Dominic Ortiz, Mikko Paivinen, Melissa Patterson, Aimee Porcaro, Bob Rhoads, Tony Rodriguez, Sam Solano, Julie Theil, Chuck Veneklase, Mark Weber, and Len Zeoli. Thanks to Darius Adams, Chuck Bolsinger, Steve Fairweather, Mike Huschmann, and Gary Lettman, who provided valuable reviews. Dale Weyermann provided the maps and Paul Dunham the cover photograph. A special thanks to the many landowners who allowed field crews on their lands to visit plots and measure trees.

## Metric Equivalents

1 acre = 0.405 hectare  
1 acre = 4046.86 square meters  
1,000 acres = 404.7 hectares  
1,000 cubic feet = 28.3 cubic meters  
1 cubic foot per acre = 0.07 cubic meter per hectare  
1 foot = 0.3048 meter  
1 inch = 2.54 centimeters  
1 mile = 1.609 kilometers

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**Table 1—Estimated land area, by county, land class, and administrative status, eastern Oregon, 1999<sup>a</sup>**

County	Forest land				Total forest	Non-forest	All land <sup>c</sup>
	Available timberland	Reserved timberland	Available <sup>b</sup> other forest	Reserved other forest			
<i>Thousand acres</i>							
Baker	641	47	54	8	750	1,214	1,964
Crook	445	17	487	—	949	958	1,907
Deschutes	865	121	149	—	1,135	797	1,932
Gilliam	—	—	1	—	1	770	771
Grant	1,495	180	375	—	2,050	848	2,898
Harney	459	0	394	—	853	5,633	6,486
Jefferson	352	27	342	—	721	419	1,140
Klamath	2,304	330	283	5	2,922	882	3,804
Lake	1,181	18	284	15	1,498	3,709	5,207
Malheur	12	—	72	—	84	6,244	6,328
Morrow	187	—	20	—	207	1,094	1,301
Sherman	—	—	—	—	—	527	527
Umatilla	539	21	44	—	604	1,454	2,058
Union	658	109	62	—	829	474	1,303
Wallowa	523	472	41	9	1,045	968	2,013
Wasco	391	—	271	—	662	862	1,524
Wheeler	257	13	246	—	516	581	1,097
<b>Total</b>	<b>10,306</b>	<b>1,355</b>	<b>3,125</b>	<b>37</b>	<b>14,823</b>	<b>27,434</b>	<b>42,260</b>

— = less than 500 acres.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error. Includes data for the national forests from their regional surveys, submitted to 1997 RPA, Smith et al. 2001.

<sup>b</sup> Includes estimates for western juniper forests from Gedney et al. 1999.

<sup>c</sup> Source: U.S. Department of Commerce 1990.

**Table 2—Estimated area of reserved timberland outside of national forests, and other forest land, by forest type, eastern Oregon, 1999<sup>a</sup>**

Forest type	Reserved timberland	Other forest		Total
		Available	Reserved	
<i>Thousand acres</i>				
Softwood:				
Douglas-fir	—	75	—	75
Engelmann spruce	—	2	—	2
Incense-cedar	—	8	—	8
Lodgepole pine	62	15	—	77
Mountain hemlock	53	8	5	66
Ponderosa pine	—	311	—	311
Shasta red fir	27	—	—	27
Western juniper <sup>b</sup>	—	2,239	6	2,245
White fir	—	—	—	—
Total	142	2,658	11	2,811
Hardwood:				
Black cottonwood	—	7	—	7
Oregon white oak	—	10	—	10
Quaking aspen	—	—	—	—
Total	—	17	—	17
Nonstocked	2	24	—	26
All types	144	2,699	11	2,854

— = less than 500 acres found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Juniper area from Gedney et al. 1999.

Table 3—Estimated area of timberland, by county and owner class, eastern Oregon, 1999<sup>a</sup>

County	Public						Private				
	National forest	Bureau of Land Management	State	County	Total public	Forest industry	Native American	Miscellaneous private	Total private	All owners	
Baker	523	6	—	—	530	41	—	71	112	642	
Crook	367	—	—	—	367	52	—	26	78	445	
Deschutes	762	14	3	—	779	62	—	23	85	864	
Gilliam	—	—	—	—	—	—	—	—	—	—	
Grant	1,294	17	16	—	1,327	91	—	77	168	1,495	
Harney	448	5	—	—	453	—	—	5	5	458	
Jefferson	140	—	—	—	140	72	112	27	211	351	
Klamath	1,449	71	37	—	1,557	595	—	151	746	2,303	
Lake	897	7	—	—	904	225	—	51	276	1,180	
Malheur	4	—	—	—	4	3	—	5	8	12	
Morrow	123	—	—	—	123	45	—	20	65	188	
Sherman	—	—	—	—	—	—	—	—	—	—	
Umatilla	344	3	7	—	354	72	17	95	184	538	
Union	444	—	—	—	444	127	—	86	213	657	
Wallowa	268	9	8	4	289	127	—	107	234	523	
Wasco	155	—	16	—	171	25	171	24	220	391	
Wheeler	143	12	—	—	155	65	—	37	102	257	
<b>Total</b>	<b>7,361</b>	<b>144</b>	<b>88</b>	<b>4</b>	<b>7,597</b>	<b>1,603</b>	<b>300</b>	<b>805</b>	<b>2,707</b>	<b>10,304</b>	

— = less than 500 acres found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error. Includes data for national forests from their regional surveys submitted for 1997 RPA, Smith et al. 2001.

**Table 4—Estimated area of timberland outside of national forests, by county and forest type, eastern region, 1999<sup>a</sup>**

Forest type	County														Total			
	Baker	Crook	Deschutes	Gilliam	Grant	Harney	Jefferson	Klamath	Lake	Malheur	Morrow	Sherman	Umatilla	Union		Wallowa	Wasco	Wheeler
<i>Thousand acres</i>																		
Softwood:																		
Douglas-fir	20	3	—	—	57	—	63	23	—	3	27	—	79	44	128	108	24	579
Engelmann spruce	8	—	—	—	—	—	8	—	—	—	5	—	7	—	12	—	—	36
Grand fir	—	—	—	—	—	—	16	—	—	—	—	—	7	20	33	17	5	104
Incense-cedar	—	—	—	—	—	—	—	13	—	—	—	—	—	—	—	—	—	13
Lodgepole pine	8	—	20	—	24	—	8	235	57	—	—	—	22	16	9	8	—	408
Mountain hemlock	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24	—	24
Ponderosa pine	52	58	76	—	92	11	110	393	118	—	26	—	59	83	69	39	62	1,246
Shasta red fir	—	—	—	—	—	—	—	7	—	—	—	—	—	—	—	—	—	7
Western hemlock	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7	—	7
Western juniper	—	6	—	—	2	—	7	5	7	4	6	—	—	—	2	—	—	40
Western larch	—	—	—	—	—	—	—	—	—	—	—	—	—	23	—	2	6	30
White fir	8	5	6	—	17	—	—	105	74	—	—	—	—	—	—	—	6	221
Total	97	72	103	—	192	11	212	782	255	8	65	—	175	185	253	204	103	2,716
Hardwood:																		
Oregon white oak	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24	—	24
Quaking aspen	—	—	—	—	—	—	—	7	15	—	—	—	—	—	—	—	—	21
Total	—	—	—	—	—	—	—	7	15	—	—	—	—	—	—	24	—	46
Nonstocked	21	6	—	—	8	—	—	66	14	—	—	—	19	28	2	8	12	183
All types	118	78	103	—	201	11	212	855	284	8	65	—	195	213	255	236	114	2,945

— = less than 500 acres found.

<sup>a</sup>Totals may be off because of rounding; data subject to sampling error.

**Table 5—Estimated area of timberland outside of national forests, by county and stand-size class, eastern Oregon, 1999<sup>a</sup>**

County	Large sawtimber	Small sawtimber	Poletimber	Seedling- sapling	Nonstocked <sup>b</sup>	All classes
<i>Thousand acres</i>						
Baker	1	52	8	34	21	118
Crook	—	58	14	—	6	78
Deschutes	—	74	—	29	—	103
Gilliam	—	—	—	—	—	—
Grant	—	165	11	17	8	201
Harney	—	5	5	—	—	11
Jefferson	24	149	32	7	—	212
Klamath	24	455	125	184	66	855
Lake	—	144	86	40	14	284
Malheur	—	8	—	—	—	8
Morrow	—	59	—	6	—	65
Sherman	—	—	—	—	—	—
Umatilla	—	140	20	15	19	195
Union	2	109	36	38	28	213
Wallowa	1	203	23	26	2	255
Wasco	16	131	33	47	8	236
Wheeler	2	72	22	7	12	114
<b>Total</b>	<b>70</b>	<b>1,825</b>	<b>416</b>	<b>450</b>	<b>183</b>	<b>2,945</b>

— = less than 500 acres found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Nonstocked areas are less than 10 percent stocked with live trees.

**Table 6—Estimated area of timberland outside of national forests, by forest type and owner class, eastern Oregon, 1999<sup>a</sup>**

Forest type	Other public	Forest industry	Other private	All owners
<i>Thousand acres</i>				
Softwood:				
Douglas-fir	28	257	294	579
Engelmann spruce	4	17	16	36
Grand fir	8	55	41	104
Incense-cedar	6	7	—	13
Lodgepole pine	37	271	100	408
Mountain hemlock	—	—	24	24
Ponderosa pine	97	701	449	1,246
Shasta red fir	7	—	—	7
Western hemlock	—	—	7	7
Western juniper	—	11	28	40
Western larch	—	21	10	30
White fir	21	176	25	221
Total	208	1,515	993	2,716
Hardwood:				
Oregon white oak	16	—	8	24
Quaking aspen	—	8	14	21
Total	16	8	22	46
Nonstocked <sup>b</sup>	12	81	90	183
All types	236	1,603	1,105	2,945

— = less than 500 acres found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Nonstocked areas are less than 10 percent stocked with live trees.



**Table 7—Estimated area of timberland outside of national forests, by owner class, stand-size class, and forest type group, eastern Oregon, 1999<sup>a</sup>**

<b>Stand-size class</b>	<b>Other public</b>	<b>Forest industry</b>	<b>Other private</b>	<b>All owners</b>
<i>Thousand acres</i>				
Large sawtimber:				
Softwood	8	14	48	70
Hardwood	—	—	—	—
Total	8	14	48	70
Small sawtimber:				
Softwood	166	904	755	1,825
Hardwood	—	—	—	—
Total	166	904	755	1,825
Poletimber:				
Softwood	7	291	96	393
Hardwood	16	—	7	23
Total	23	291	103	416
Seedlings and saplings:				
Softwood	26	306	95	428
Hardwood	—	8	15	23
Total	26	314	110	450
All stand-size classes:				
Softwood	207	1,515	994	2,716
Hardwood	16	8	22	46
Nonstocked <sup>b</sup>	12	81	90	183
Total	236	1,603	1,105	2,945

— = less than 500 acres found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Stand-size class and forest type group were not determined for nonstocked stands. Nonstocked areas are less than 10 percent stocked with live trees.

**Table 8—Estimated area of timberland, by cubic-foot site class and owner class, eastern Oregon, 1999<sup>a</sup>**

Owner	Site class (cubic feet) <sup>b</sup>						All classes
	≥225	165-224	120-164	85-119	50-84	20-49	
	<i>Thousand acres</i>						
National forest	—	57	177	1,605	4,255	1,266	7,360
Other public	—	7	8	23	63	136	236
Forest industry	—	—	17	104	591	892	1,603
Other private	—	—	29	73	366	636	1,105
All owners	—	64	231	1,805	5,275	2,930	10,304

— = less than 500 acres found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Site class is the mean annual increment cubic-foot growth per acre at culmination in fully stocked, natural stands.

**Table 9—Estimated area of timberland outside of national forests, by forest type and stand-size class, eastern Oregon, 1999<sup>a</sup>**

Forest type	Large sawtimber	Small sawtimber	Poletimber	Seedling- sapling	All classes
<i>Thousand acres</i>					
Softwood:					
Douglas-fir	22	451	51	56	579
Engelmann spruce	—	28	8	—	36
Grand fir	—	65	30	9	104
Incense-cedar	—	13	—	—	13
Lodgepole pine	—	108	81	218	408
Mountain hemlock	—	24	—	—	24
Ponderosa pine	43	939	163	101	1,246
Shasta red fir	5	—	—	1	7
Western hemlock	—	7	—	—	7
Western juniper	—	24	9	7	40
Western larch	—	17	—	14	30
White fir	—	148	52	22	221
Total	70	1,825	393	428	2,716
Hardwood:					
Oregon white oak	—	—	16	8	24
Quaking aspen	—	—	7	15	21
Total	—	—	23	23	46
Nonstocked <sup>b</sup>	—	—	—	183	183
All types	70	1,825	416	634	2,945

— = less than 500 acres found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Nonstocked areas are less than 10 percent stocked with live trees.

**Table 10—Estimated number of growing-stock trees on timberland outside of national forests, by species and diameter class, eastern Oregon, 1999<sup>a,b</sup>**

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	21.0-28.9	29.0+			
<i>Thousand trees</i>															
<b>Softwood:</b>															
Douglas-fir	26,434	16,307	13,389	11,531	8,619	7,069	4,572	2,753	1,801	1,401	1,666	321	95,862		
Engelmann spruce	1,050	2,433	2,672	2,91	339	232	186	221	189	110	219	107	8,048		
Grand fir	23,923	9,601	5,823	2,718	2,683	1,422	1,195	615	394	289	360	14	49,038		
Incense-cedar	4,224	2,015	2,134	1,988	873	285	214	103	99	162	69	51	12,217		
Jeffrey pine	—	—	—	—	—	—	38	47	—	—	8	—	93		
Lodgepole pine	73,687	27,048	13,118	7,530	5,851	3,186	2,145	898	392	142	127	—	134,124		
Mountain hemlock	1,823	729	202	1,094	442	317	489	412	438	146	66	—	6,157		
Noble fir	—	729	902	248	252	317	156	36	59	—	69	11	2,780		
Pacific silver fir	2,187	1,094	528	565	167	510	144	184	29	92	20	—	5,522		
Ponderosa pine	70,408	47,471	33,604	28,212	18,227	12,976	9,766	7,237	3,544	2,678	3,430	610	238,162		
Redwood	—	—	245	324	174	55	96	—	—	—	31	—	925		
Shasta red fir	2,800	—	—	—	—	60	40	32	47	20	80	82	3,162		
Sitka spruce	645	322	—	—	—	—	—	—	—	—	—	—	967		
Subalpine fir	4,426	1,471	649	335	85	126	44	34	59	21	—	—	7,252		
Sugar pine	930	620	339	119	123	198	40	64	44	—	24	13	2,514		
Western hemlock	4,010	1,823	703	295	93	248	100	23	30	23	13	—	7,337		
Western larch	2,483	1,434	1,969	1,389	1,036	1,278	767	467	328	140	93	—	11,385		
Western redcedar	1,458	365	228	263	—	64	43	—	—	—	81	7	2,510		
Western white pine	—	—	—	—	—	—	—	—	—	—	8	14	22		
White fir	34,380	25,328	13,635	9,716	7,754	3,446	2,183	1,474	686	489	459	113	99,663		
Whitebark pine	360	—	—	174	—	—	45	—	—	—	—	—	580		
<b>Total</b>	255,227	138,790	90,140	66,793	46,718	31,789	22,264	14,579	8,141	5,715	6,823	1,344	688,320		
<b>Hardwood:</b>															
Black cottonwood	—	—	—	—	—	—	—	—	—	—	30	8	38		
Cherry	3,803	360	218	—	—	—	—	—	—	—	—	—	4,381		
Oregon white oak	1,094	2,121	1,921	471	227	185	101	—	—	—	—	—	6,119		
Quaking aspen	2,286	2,551	1,004	250	190	300	—	95	—	23	18	—	6,718		
<b>Total</b>	7,183	5,032	3,143	721	417	486	101	95	—	23	47	8	17,256		
<b>All species</b>	262,410	143,822	93,283	67,514	47,135	32,275	22,365	14,674	8,141	5,737	6,870	1,352	705,576		

— = fewer than 500 trees found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Growing-stock trees are all live trees except cull trees (noncommercial species are classified as sound cull trees).

**Table 11—Estimated net volume of growing-stock and sawtimber on timberland outside of national forests, by class of timber, owner class, and species group, eastern Oregon, 1999<sup>a</sup>**

Class of timber and owner class	Average volume	Species group		All species
		Softwoods	Hardwoods	
	<i>Cubic feet per acre</i>	<i>----- Million cubic feet -----</i>		
Growing-stock: <sup>b</sup>				
Other public	1,813	420	8	428
Forest industry	972	1,550	9	1,559
Other private	1,664	1,824	15	1,839
Total, growing-stock	1,299	3,795	32	3,825
	<i>Board feet per acre</i>	<i>----- Million board feet -----</i>		
Sawtimber (Scribner rule): <sup>c</sup>				
Other public	7,639	1,798	6	1,803
Forest industry	3,415	5,453	22	5,475
Other private	6,849	7,528	40	7,568
Total, sawtimber	5,041	14,779	67	14,846

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Includes growing-stock trees 5.0 inches in d.b.h. and larger.

<sup>c</sup> Includes softwood sawtimber trees 9.0 inches in d.b.h. and larger and hardwood sawtimber trees 11.0 inches in d.b.h. and larger.

**Table 12—Estimated net volume of growing-stock on timberland outside of national forests, by species and diameter class, eastern Oregon, 1999<sup>a,b</sup>**

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+	
<i>Million cubic feet</i>											
Softwood:											
Douglas-fir	23	56	82	101	107	87	80	85	152	73	846
Engelmann spruce	5	2	3	5	4	8	11	8	22	23	92
Grand fir	10	16	30	25	30	22	20	17	33	3	205
Incense-cedar	4	6	5	3	3	2	3	5	4	9	44
Jeffrey pine	—	—	—	—	1	2	—	—	1	—	4
Lodgepole pine	25	44	68	60	55	30	18	9	9	—	318
Mountain hemlock	—	4	5	5	10	13	18	7	6	—	69
Noble fir	1	2	3	6	5	2	4	—	10	2	35
Pacific silver fir	1	3	2	10	4	7	1	5	2	—	35
Ponderosa pine	54	117	154	177	210	217	147	148	289	133	1,647
Shasta red fir	—	—	—	1	1	1	1	1	6	11	20
Subalpine fir	1	1	1	1	1	1	1	1	—	—	8
Sugar pine	—	1	1	2	—	1	1	—	3	3	13
Western hemlock	2	3	—	6	3	—	2	1	—	—	17
Western larch	7	10	11	16	10	7	5	2	2	—	71
Western redcedar	—	2	—	2	2	—	—	—	6	1	13
Western white pine	—	—	—	—	—	—	—	—	1	4	5
White fir	21	42	62	47	39	38	25	23	30	22	351
Whitebark pine	—	—	—	—	1	—	—	—	—	—	1
Total	155	308	427	466	486	438	340	313	575	286	3,795
Hardwood:											
Black cottonwood	—	—	—	—	—	—	—	—	3	1	4
Cherry	1	—	—	—	—	—	—	—	—	—	1
Oregon white oak	4	2	2	2	2	—	—	—	—	—	12
Quaking aspen	1	2	1	4	—	3	—	1	1	—	14
Total	7	4	3	6	2	3	—	1	4	1	31
All species	162	312	430	473	488	441	340	314	580	287	3,825

— = less than 500,000 cubic feet found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Includes growing-stock trees 5.0 inches in d.b.h. and larger.

**Table 13—Estimated net volume of sawtimber on timberland outside of national forests, by species and diameter class, eastern Oregon, 1999<sup>a,b</sup>**

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	21.0-28.9	29.0+	
<i>Million board feet, Scribner rule</i>									
Softwood:									
Douglas-fir	254	375	455	402	390	433	824	443	3,576
Engelmann spruce	11	21	19	41	56	46	125	149	469
Grand fir	92	90	120	97	96	74	158	16	743
Incense-cedar	7	6	7	8	11	20	15	36	110
Jeffrey pine	—	—	4	8	—	—	4	—	16
Lodgepole pine	217	242	253	143	93	47	49	—	1,044
Mountain hemlock	13	16	38	52	74	31	28	—	252
Noble fir	10	26	24	9	20	—	60	13	163
Pacific silver fir	8	39	18	34	7	27	10	—	144
Ponderosa pine	430	618	856	957	697	742	1,556	810	6,666
Shasta red fir	—	2	2	2	5	4	28	59	102
Subalpine fir	3	4	5	2	3	3	—	—	21
Sugar pine	2	7	2	5	6	—	15	22	58
Western hemlock	—	25	14	—	9	5	—	—	53
Western larch	33	54	35	24	17	8	5	—	176
Western redcedar	—	7	7	—	—	—	33	7	54
Western white pine	—	—	—	—	—	—	8	25	33
White fir	168	156	151	154	112	108	140	107	1,096
Whitebark pine	—	—	2	—	—	—	—	—	2
Total	1,248	1,688	2,015	1,938	1,598	1,546	3,059	1,686	14,779
Hardwood:									
Black cottonwood	—	—	—	—	—	—	15	6	21
Oregon white oak	—	5	3	—	—	—	—	—	8
Quaking aspen	—	13	—	13	—	5	7	—	38
Total	—	18	3	13	—	5	22	6	67
All species	1,248	1,706	2,018	1,952	1,598	1,551	3,081	1,692	14,846

— = less than 500,000 board feet found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Includes softwood sawtimber trees 9.0 inches in d.b.h. and larger, and hardwood sawtimber trees 11.0 inches in d.b.h. and larger.

**Table 14—Estimated net volume of growing-stock on timberland outside of national forests, by species and owner class, eastern Oregon, 1999<sup>a,b</sup>**

Species	Other public	Forest industry	Other private	All owners
<i>Million cubic feet</i>				
Softwood:				
Douglas-fir	66	312	468	846
Engelmann spruce	7	9	76	92
Grand fir	18	96	91	205
Incense-cedar	7	24	13	44
Jeffrey pine	2	2	—	4
Lodgepole pine	15	165	138	318
Mountain hemlock	—	—	69	69
Noble fir	—	—	35	35
Pacific silver fir	—	—	35	35
Ponderosa pine	230	667	751	1,647
Shasta red fir	20	—	—	20
Subalpine fir	—	—	8	8
Sugar pine	6	7	—	13
Western hemlock	—	—	17	17
Western larch	4	36	30	71
Western redcedar	—	—	13	13
Western white pine	2	1	2	5
White fir	43	232	75	351
Whitebark pine	—	—	1	1
Total	420	1,550	1,824	3,795
Hardwood:				
Black cottonwood	—	2	3	4
Cherry	—	—	1	1
Oregon white oak	8	2	3	12
Quaking aspen	—	5	9	14
Total	8	8	15	31
All species	428	1,558	1,839	3,825

— = less than 500,000 cubic feet found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Includes growing-stock trees 5.0 inches in d.b.h. and larger.



**Table 15—Estimated net volume of sawtimber on timberland outside of national forests, by species and owner class, eastern Oregon, 1999<sup>a b</sup>**

Forest type	Other public	Forest industry	Other private	All owners
<i>Million board feet, Scribner rule</i>				
Softwood:				
Douglas-fir	272	1,200	2,105	3,576
Engelmann spruce	37	30	403	469
Grand fir	53	354	335	743
Incense-cedar	22	57	32	110
Jeffrey pine	8	8	—	16
Lodgepole pine	43	527	474	1,044
Mountain hemlock	—	—	252	252
Noble fir	—	—	163	163
Pacific silver fir	—	—	144	144
Ponderosa pine	1,058	2,476	3,132	6,666
Shasta red fir	102	—	—	102
Subalpine fir	—	—	21	21
Sugar pine	37	22	—	58
Western hemlock	—	—	53	53
Western larch	6	93	76	176
Western redcedar	—	—	54	54
Western white pine	13	8	12	33
White fir	147	679	270	1,096
Whitebark pine	—	—	2	2
Total	1,798	5,453	7,528	14,779
Hardwood:				
Black cottonwood	—	7	14	21
Oregon white oak	6	—	3	8
Quaking aspen	—	14	23	38
Total	6	22	40	67
All species	1,803	5,475	7,568	14,846

— = Less than 500,000 board feet found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Includes softwood sawtimber trees 9.0 inches in d.b.h. and larger and hardwood sawtimber trees 11.0 inches in d.b.h. and larger.

**Table 16—Estimated net volume of growing-stock on timberland outside of national forests, by forest type and stand-size class, eastern Oregon, 1999<sup>a,b</sup>**

Forest type	Large sawtimber	Small sawtimber	Poletimber	Seedling sapling	All classes
<i>Million cubic feet</i>					
Softwood:					
Douglas-fir	54	905	49	14	1,021
Engelmann spruce	—	89	13	—	102
Grand fir	—	151	10	—	161
Incense-cedar	—	14	—	—	14
Lodgepole pine	—	234	56	51	341
Mountain hemlock	—	118	—	—	118
Ponderosa pine	76	1,346	130	17	1,569
Shasta red fir	19	—	—	—	19
Western hemlock	—	37	—	—	37
Western juniper	—	7	—	—	7
Western larch	—	51	—	4	55
White fir	—	250	49	14	313
Total	149	3,203	308	99	3,758
Hardwood:					
Oregon white oak	—	—	12	1	13
Quaking aspen	—	—	8	1	9
Total	—	—	20	2	22
Nonstocked <sup>c</sup>	—	—	—	—	46
Total, all types	149	3,203	328	101	3,826

— = less than 500,000 cubic feet found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Includes growing-stock trees 5.0 inches in d.b.h. and larger.

<sup>c</sup> Nonstocked areas are less than 10 percent stocked with live trees.

**Table 17—Estimated net volume of sawtimber on timberland outside of national forests, by forest type and stand-size class, eastern Oregon, 1999<sup>a,b</sup>**

Forest type	Large sawtimber	Small sawtimber	Poletimber	Seedling- sapling	All classes
<i>Million board feet, Scribner rule</i>					
Softwood:					
Douglas-fir	282	3,808	110	31	4,231
Engelmann spruce	—	461	45	—	506
Grand fir	—	609	39	—	648
Incense-cedar	—	63	—	—	63
Lodgepole pine	—	902	160	80	1,141
Mountain hemlock	—	466	—	—	466
Ponderosa pine	405	5,337	295	47	6,084
Shasta red fir	98	—	—	—	98
Western hemlock	—	130	—	—	130
Western juniper	—	26	—	—	26
Western larch	—	202	—	4	206
White fir	—	879	98	26	1,002
Total	786	12,884	746	187	14,603
Hardwood:					
Oregon white oak	—	—	17	1	18
Quaking aspen	—	—	25	—	25
Total	—	—	41	1	42
Nonstocked <sup>c</sup>	—	—	—	201	201
Total, all types	786	12,884	788	189	14,846

— = less than 500,000 board feet found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Includes softwood sawtimber trees 9.0 inches in d.b.h. and larger and hardwood sawtimber trees 11.0 inches in d.b.h. and larger.

<sup>c</sup> Nonstocked areas are less than 10 percent stocked with live trees.

**Table 18—Estimated net volume of growing-stock on Timberland outside of national forests, by forest type and owner class, eastern Oregon, 1999<sup>a,b</sup>**

<b>Forest type</b>	<b>Other public</b>	<b>Forest industry</b>	<b>Other private</b>	<b>All owners</b>
<i>Million cubic feet</i>				
<b>Softwood:</b>				
Douglas-fir	77	352	592	1,021
Engelmann spruce	7	20	75	102
Grand fir	13	71	76	161
Incense-cedar	9	6	—	14
Lodgepole pine	15	161	166	341
Mountain hemlock	—	—	118	118
Ponderosa pine	216	686	667	1,569
Shasta red fir	19	—	—	19
Western hemlock	—	—	37	37
Western juniper	—	2	5	7
Western larch	—	35	20	55
White fir	58	211	44	313
<b>Total</b>	<b>414</b>	<b>1,544</b>	<b>1,800</b>	<b>3,758</b>
<b>Hardwood:</b>				
Oregon white oak	12	—	1	13
Quaking aspen	—	1	8	9
<b>Total</b>	<b>12</b>	<b>1</b>	<b>9</b>	<b>22</b>
<b>Nonstocked<sup>c</sup></b>	<b>2</b>	<b>13</b>	<b>31</b>	<b>46</b>
<b>Total, all types</b>	<b>428</b>	<b>1,558</b>	<b>1,839</b>	<b>3,825</b>

— = less than 500,000 cubic feet found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Includes softwood sawtimber trees 9.0 inches in d.b.h. and larger and hardwood sawtimber trees 11.0 inches in d.b.h. and larger.

<sup>c</sup> Nonstocked areas are less than 10 percent stocked with live trees.

**Table 19—Estimated net volume of sawtimber on timberland outside of national forests, by forest type and owner class, eastern Oregon, 1999<sup>a,b</sup>**

<b>Forest type</b>	<b>Other public</b>	<b>Forest industry</b>	<b>Other private</b>	<b>All owners</b>
<i>Million board feet, Scribner rule</i>				
Softwood:				
Douglas-fir	336	1,271	2,624	4,231
Engelmann spruce	37	80	390	506
Grand fir	42	297	309	648
Incense-cedar	36	27	—	63
Lodgepole pine	41	506	594	1,141
Mountain hemlock	—	—	466	466
Ponderosa pine	956	2,480	2,649	6,084
Shasta red fir	98	—	—	98
Western hemlock	—	—	130	130
Western juniper	—	6	19	26
Western larch	—	115	91	206
White fir	232	640	130	1,002
<b>Total</b>	<b>1,778</b>	<b>5,423</b>	<b>7,402</b>	<b>14,603</b>
Hardwood:				
Oregon white oak	17	—	1	18
Quaking aspen	—	—	25	25
<b>Total</b>	<b>17</b>	<b>—</b>	<b>26</b>	<b>42</b>
Nonstocked <sup>c</sup>	8	52	140	201
<b>Total, all types</b>	<b>1,803</b>	<b>5,475</b>	<b>7,568</b>	<b>14,846</b>

— = less than 500,000 board feet found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Includes softwood sawtimber trees 9.0 inches in d.b.h. and larger and hardwood sawtimber trees 11.0 inches in d.b.h. and larger.

<sup>c</sup> Nonstocked areas are less than 10 percent stocked with live trees.

**Table 20—Estimated net volume of timber on timberland outside of national forests, by class of timber and species group, eastern Oregon, 1999<sup>a,b</sup>**

Class of timber	Softwood species	Hardwood species	All species
	<i>Million cubic feet</i>		
Growing-stock trees:			
Sawtimber trees			
Saw-log portion	3,193	14	3,207
Upper stem portion	138	3	141
Total, sawtimber	3,331	17	3,348
Poletimber trees	464	13	477
All growing-stock trees	3,795	30	3,825
Cull trees:			
Sound cull	50	1	51
Rotten cull	33	2	35
Total, cull trees	83	3	86
All timber	3,878	33	3,911

— = less than 500,000 cubic feet found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Includes growing-stock trees 5.0 inches in d.b.h. and larger.

**Table 21—Estimated current gross annual growth of growing-stock on timberland outside of national forests, by owner class and species group, eastern Oregon, 1999<sup>a</sup>**

Owner class	Average volume	Species group		All species
		Softwoods	Hardwoods	
	<i>Cubic feet per acre</i>	<i>----- Thousand cubic feet -----</i>		
Growing-stock: <sup>b</sup>				
Other public	49	11,428	166	11,594
Forest industry	35	54,613	1,327	55,941
Other private	41	45,439	360	45,799
Total, growing-stock	38	111,480	1,854	113,334

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Includes growing-stock trees 5.0 inches in d.b.h. and larger.

**Table 22—Estimated current net annual growth of growing-stock on timberland outside of national forests, by forest type and owner class, eastern Oregon, 1999<sup>a b c</sup>**

<b>Forest type</b>	<b>Other public</b>	<b>Forest industry</b>	<b>Other private</b>	<b>All owners</b>
<i>Thousand cubic feet</i>				
Softwood:				
Douglas-fir	167	6,783	7,968	14,918
Engelmann spruce	67	646	209	923
Grand fir	514	720	628	1,861
Incense-cedar	87	213	—	300
Lodgepole pine	289	2,250	1,276	3,815
Mountain hemlock	—	—	-1,117	-1,117
Ponderosa pine	4,802	20,403	12,561	37,766
Shasta red fir	-176	—	—	-176
Western hemlock	—	—	-2	-2
Western juniper	—	78	27	105
Western larch	—	555	136	691
White fir	167	3,505	-80	3,592
<b>Total</b>	<b>5,917</b>	<b>35,154</b>	<b>21,605</b>	<b>62,675</b>
Hardwood:				
Oregon white oak	245	—	1	246
Quaking aspen	—	634	153	787
<b>Total</b>	<b>245</b>	<b>634</b>	<b>154</b>	<b>1,033</b>
Nonstocked <sup>d</sup>	27	280	470	777
<b>All types</b>	<b>6,189</b>	<b>36,068</b>	<b>22,228</b>	<b>64,486</b>

— = less than 500 cubic feet found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Includes growing-stock trees 5.0 inches in d.b.h. and larger.

<sup>c</sup> Negative net annual growth is the result of annual mortality exceeding gross annual growth.

<sup>d</sup> Nonstocked areas are less than 10 percent stocked with live trees.

**Table 23—Estimated current net annual growth of sawtimber on timberland outside of national forests, by forest type and owner class, eastern Oregon, 1999<sup>a b c</sup>**

<b>Forest type</b>	<b>Other public</b>	<b>Forest industry</b>	<b>Other private</b>	<b>All owners</b>
<i>Thousand board feet, Scribner rule</i>				
<b>Softwood:</b>				
Douglas-fir	1,310	37,881	50,779	89,970
Engelmann spruce	470	2,110	4,158	6,738
Grand fir	1,446	6,433	3,843	11,722
Incense-cedar	624	1,273	—	1,897
Lodgepole pine	670	13,846	6,218	20,734
Mountain hemlock	—	—	-4,208	-4,208
Ponderosa pine	26,083	87,113	65,027	178,223
Shasta red fir	-646	—	—	-646
Western hemlock	—	—	398	398
Western juniper	—	296	160	456
Western larch	—	4,724	1,231	5,955
White fir	1,198	22,280	749	24,226
<b>Total</b>	<b>31,153</b>	<b>175,955</b>	<b>128,354</b>	<b>335,463</b>
<b>Hardwood:</b>				
Oregon white oak	602	—	6	607
Quaking aspen	—	—	955	955
<b>Total</b>	<b>602</b>	<b>—</b>	<b>961</b>	<b>1,563</b>
<b>Nonstocked<sup>d</sup></b>	<b>164</b>	<b>2,243</b>	<b>2,606</b>	<b>5,013</b>
<b>All types</b>	<b>31,919</b>	<b>178,199</b>	<b>131,921</b>	<b>342,039</b>

— = less than 500 board feet found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Includes softwood sawtimber trees 9.0 inches in d.b.h. and larger and hardwood sawtimber trees 11.0 inches in d.b.h. and larger.

<sup>c</sup> Negative net annual growth is the result of annual mortality exceeding gross annual growth.

<sup>d</sup> Nonstocked areas are less than 10 percent stocked with live trees.



**Table 24—Estimated average annual mortality of growing-stock on timberland outside of national forests, by forest type and owner class, eastern Oregon, 1999<sup>a,b</sup>**

Forest type	Other public	Forest industry	Other private	All owners
<i>Thousand cubic feet</i>				
Softwood:				
Douglas-fir	994	4,357	7,001	12,352
Engelmann spruce	85	352	1,197	1,634
Grand fir	188	1,175	1,201	2,563
Incense-cedar	109	71	—	180
Lodgepole pine	239	2,826	2,979	6,044
Mountain hemlock	—	—	2,058	2,058
Ponderosa pine	2,122	6,808	6,677	15,607
Shasta red fir	411	—	—	411
Western hemlock	—	—	706	706
Western juniper	—	18	43	61
Western larch	—	480	336	816
White fir	1,067	3,585	956	5,608
Total	5,215	19,671	23,154	48,040
Hardwood:				
Oregon white oak	176	—	11	187
Quaking aspen	—	22	108	130
Total	176	22	119	317
Nonstocked <sup>c</sup>	15	180	297	491
Total, all types	5,405	19,872	23,570	48,848

— = less than 500 cubic feet found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Includes growing-stock trees 5.0 inches in d.b.h. and larger.

<sup>c</sup> Nonstocked areas are less than 10 percent stocked with live trees.

**Table 25—Estimated average annual mortality of sawtimber on timberland outside of national forests, by forest type and owner class, eastern Oregon, 1999<sup>a,b</sup>**

<b>Forest type</b>	<b>Other public</b>	<b>Forest industry</b>	<b>Other private</b>	<b>All owners</b>
<i>Thousand board feet, Scribner rule</i>				
Softwood:				
Douglas-fir	4,074	15,106	29,943	49,123
Engelmann spruce	443	1,483	5,788	7,715
Grand fir	444	4,245	4,657	9,346
Incense-cedar	442	312	—	754
Lodgepole pine	489	7,711	9,883	18,083
Mountain hemlock	—	—	8,532	8,532
Ponderosa pine	9,266	23,906	25,919	59,090
Shasta red fir	2,088	—	—	2,088
Western hemlock	—	—	2,684	2,684
Western juniper	—	60	154	214
Western larch	—	1,483	1,549	3,032
White fir	3,888	10,110	2,715	16,713
<b>Total</b>	<b>21,135</b>	<b>64,416</b>	<b>91,823</b>	<b>177,375</b>
Hardwood:				
Oregon white oak	210	—	22	232
Quaking aspen	—	—	297	297
<b>Total</b>	<b>210</b>	<b>—</b>	<b>319</b>	<b>529</b>
Nonstocked <sup>c</sup>	68	682	1,343	2,093
<b>Total, all types</b>	<b>21,413</b>	<b>65,098</b>	<b>93,485</b>	<b>179,996</b>

— = less than 500 board feet found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Includes softwood sawtimber trees 9.0 inches in d.b.h. and larger and hardwood sawtimber trees 11.0 inches in d.b.h. and larger.

<sup>c</sup> Nonstocked areas are less than 10 percent stocked with live trees.

**Table 26—Estimated area, net volume of growing-stock, and net volume of sawtimber on timberland outside of national forests, by stand age and owner class, eastern Oregon, 1999<sup>a</sup>**

Stand age	Other public			Forest industry			Other private			All owners		
	Area Thousand acres	Growing- stock volume Million cubic feet	Sawtimber volume Million board feet <sup>b</sup>	Area Thousand acres	Growing- stock volume Million cubic feet	Sawtimber volume Million board feet <sup>b</sup>	Area Thousand acres	Growing- stock volume Million cubic feet	Sawtimber volume Million board feet <sup>b</sup>	Area Thousand acres	Growing- stock volume Million cubic feet	Sawtimber volume Million board feet <sup>b</sup>
Even aged:												
0-9	—	—	—	51	—	—	15	—	—	67	—	—
10-19	32	8	14	225	41	57	78	15	30	334	65	101
20-29	4	—	—	283	142	389	101	59	142	388	202	532
30-39	7	3	8	22	12	41	7	—	—	36	16	49
40-49	7	10	34	33	31	96	23	11	29	63	51	159
50-59	8	10	11	66	70	217	20	40	125	95	120	353
60-69	13	29	127	108	97	321	32	56	199	154	182	648
70-79	7	18	82	55	128	474	88	185	694	150	332	1,249
80-89	10	6	21	160	242	873	117	178	771	288	426	1,665
90-99	3	3	16	82	94	324	86	191	767	171	289	1,107
100-109	10	16	79	27	35	135	36	45	181	72	96	395
110-119	—	—	—	19	36	162	21	57	257	40	93	419
120-129	11	19	91	—	—	—	—	11	—	11	19	91
130-139	—	—	—	—	—	—	4	11	54	4	11	54
140-149	—	—	—	—	—	—	—	—	—	—	—	—
150-159	—	—	—	—	—	—	—	—	—	—	—	—
160-169	—	—	—	—	—	—	—	—	—	—	—	—
170-179	1	3	20	6	3	12	—	—	—	7	6	31
180-189	—	—	—	—	—	—	—	—	—	—	—	—
190-199	—	—	—	—	—	—	—	—	—	—	—	—
200-299	—	—	—	—	—	—	41	133	671	41	133	671
300+	—	—	—	—	—	—	—	—	—	—	—	—
Total even aged	113	127	503	1,137	932	3,101	669	981	3,921	1,921	2,040	7,525
Uneven aged:												
0-49	20	19	69	50	42	134	23	11	52	92	72	255
50-99	69	202	852	278	369	1,379	223	428	1,744	570	999	3,975
100-149	20	58	275	74	130	520	123	257	1,103	217	445	1,898
150-199	7	19	94	43	74	290	28	56	222	77	149	606
200-299	—	—	—	6	4	16	24	66	359	31	70	374
300+	—	—	—	5	7	29	—	—	—	5	7	29
Total uneven aged	116	299	1,290	456	625	2,368	421	818	3,479	992	1,741	7,137
Nonstocked <sup>c</sup>	6	2	11	11	1	6	16	40	168	33	44	185
All classes	235	428	1,804	1,604	1,558	5,475	1,106	1,839	7,568	2,946	3,826	14,846

— = less than 500 acres, 500,000 cubic feet, or 500,000 board feet found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Scribner rule (16-foot rule).

<sup>c</sup> Nonstocked areas are less than 10 percent stocked with live trees.

**Table 27—Estimated gross annual growth, average annual mortality, and average annual removals of growing-stock on timberland outside of national forests, by owner and species, eastern Oregon, 1999<sup>a, b</sup>**

Species	Other public			Forestry industry			Other private			All owners																																																																																																																																																																																																																																																																																																																																																																	
	Current gross annual growth	Average annual mortality	Average annual removals	Current gross annual growth	Average annual mortality	Average annual removals	Current gross annual growth	Average annual mortality	Average annual removals	Current gross annual growth	Average annual mortality	Average annual removals																																																																																																																																																																																																																																																																																																																																																															
<i>Thousand cubic feet</i>																																																																																																																																																																																																																																																																																																																																																																											
Softwood:													Douglas-fir	1,459	710	624	9,857	3,340	15,959	12,154	5,007	12,220	23,469	9,057	28,804	Engelmann spruce	153	85	—	490	184	124	1,195	1,263	—	1,838	1,532	124	Grand fir	812	407	—	3,213	1,746	8,036	3,019	1,657	1,261	7,044	3,810	9,297	Incense-cedar	123	113	—	748	387	1,607	212	213	—	1,084	714	1,607	Jeffrey pine	151	16	—	24	14	—	—	—	—	174	29	—	Lodgepole pine	528	266	916	5,245	2,966	12,426	3,241	2,601	4,655	9,015	5,833	17,997	Mountain hemlock	—	—	—	—	—	—	474	740	4,123	474	740	4,123	Noble fir	—	—	—	—	—	—	627	933	629	627	933	629	Pacific silver fir	—	—	—	—	—	—	222	1,022	38	222	1,022	38	Ponderosa pine	6,624	2,173	617	25,899	6,203	44,206	21,167	7,249	23,306	53,690	15,625	68,129	Shasta red fir	214	452	160	—	—	—	—	—	—	214	452	160	Subalpine fir	—	—	—	—	—	109	163	98	—	163	98	109	Sugar pine	94	56	—	347	60	470	—	—	—	442	116	470	Western hemlock	—	—	—	—	—	—	375	183	—	375	183	—	Western larch	59	66	—	515	611	1,124	431	510	479	1,005	1,187	1,603	Western redcedar	—	—	—	—	—	—	155	134	—	155	134	—	Western white pine	8	21	—	13	12	138	1	22	—	22	55	138	White fir	1,204	916	302	8,287	4,224	16,830	1,974	1,666	2,601	11,465	6,807	19,733	Whitebark pine	—	—	—	—	—	—	30	22	—	30	22	—	<b>Total</b>	<b>11,428</b>	<b>5,279</b>	<b>2,618</b>	<b>54,640</b>	<b>19,748</b>	<b>101,030</b>	<b>45,439</b>	<b>23,320</b>	<b>49,311</b>	<b>111,507</b>	<b>48,348</b>	<b>152,959</b>	Hardwood:													Black cottonwood	—	—	—	40	25	—	33	42	—	74	67	—	Cherry	—	—	—	—	—	—	59	13	—	59	13	—	Oregon white oak	166	126	—	—	25	—	59	50	—	249	200	—	Quaking aspen	—	—	—	1,263	75	—	212	146	—	1,475	220	—	<b>Total</b>	<b>166</b>	<b>126</b>	<b>—</b>	<b>1,327</b>	<b>124</b>	<b>—</b>	<b>364</b>	<b>250</b>	<b>—</b>	<b>1,858</b>	<b>500</b>	<b>—</b>	<b>All species</b>	<b>11,594</b>	<b>5,405</b>	<b>2,618</b>	<b>55,967</b>	<b>19,872</b>	<b>101,030</b>	<b>45,803</b>	<b>23,570</b>	<b>49,311</b>	<b>113,364</b>	<b>48,848</b>	<b>152,959</b>
Douglas-fir	1,459	710	624	9,857	3,340	15,959	12,154	5,007	12,220	23,469	9,057	28,804																																																																																																																																																																																																																																																																																																																																																															
Engelmann spruce	153	85	—	490	184	124	1,195	1,263	—	1,838	1,532	124																																																																																																																																																																																																																																																																																																																																																															
Grand fir	812	407	—	3,213	1,746	8,036	3,019	1,657	1,261	7,044	3,810	9,297																																																																																																																																																																																																																																																																																																																																																															
Incense-cedar	123	113	—	748	387	1,607	212	213	—	1,084	714	1,607																																																																																																																																																																																																																																																																																																																																																															
Jeffrey pine	151	16	—	24	14	—	—	—	—	174	29	—																																																																																																																																																																																																																																																																																																																																																															
Lodgepole pine	528	266	916	5,245	2,966	12,426	3,241	2,601	4,655	9,015	5,833	17,997																																																																																																																																																																																																																																																																																																																																																															
Mountain hemlock	—	—	—	—	—	—	474	740	4,123	474	740	4,123																																																																																																																																																																																																																																																																																																																																																															
Noble fir	—	—	—	—	—	—	627	933	629	627	933	629																																																																																																																																																																																																																																																																																																																																																															
Pacific silver fir	—	—	—	—	—	—	222	1,022	38	222	1,022	38																																																																																																																																																																																																																																																																																																																																																															
Ponderosa pine	6,624	2,173	617	25,899	6,203	44,206	21,167	7,249	23,306	53,690	15,625	68,129																																																																																																																																																																																																																																																																																																																																																															
Shasta red fir	214	452	160	—	—	—	—	—	—	214	452	160																																																																																																																																																																																																																																																																																																																																																															
Subalpine fir	—	—	—	—	—	109	163	98	—	163	98	109																																																																																																																																																																																																																																																																																																																																																															
Sugar pine	94	56	—	347	60	470	—	—	—	442	116	470																																																																																																																																																																																																																																																																																																																																																															
Western hemlock	—	—	—	—	—	—	375	183	—	375	183	—																																																																																																																																																																																																																																																																																																																																																															
Western larch	59	66	—	515	611	1,124	431	510	479	1,005	1,187	1,603																																																																																																																																																																																																																																																																																																																																																															
Western redcedar	—	—	—	—	—	—	155	134	—	155	134	—																																																																																																																																																																																																																																																																																																																																																															
Western white pine	8	21	—	13	12	138	1	22	—	22	55	138																																																																																																																																																																																																																																																																																																																																																															
White fir	1,204	916	302	8,287	4,224	16,830	1,974	1,666	2,601	11,465	6,807	19,733																																																																																																																																																																																																																																																																																																																																																															
Whitebark pine	—	—	—	—	—	—	30	22	—	30	22	—																																																																																																																																																																																																																																																																																																																																																															
<b>Total</b>	<b>11,428</b>	<b>5,279</b>	<b>2,618</b>	<b>54,640</b>	<b>19,748</b>	<b>101,030</b>	<b>45,439</b>	<b>23,320</b>	<b>49,311</b>	<b>111,507</b>	<b>48,348</b>	<b>152,959</b>																																																																																																																																																																																																																																																																																																																																																															
Hardwood:																																																																																																																																																																																																																																																																																																																																																																											
Black cottonwood	—	—	—	40	25	—	33	42	—	74	67	—																																																																																																																																																																																																																																																																																																																																																															
Cherry	—	—	—	—	—	—	59	13	—	59	13	—																																																																																																																																																																																																																																																																																																																																																															
Oregon white oak	166	126	—	—	25	—	59	50	—	249	200	—																																																																																																																																																																																																																																																																																																																																																															
Quaking aspen	—	—	—	1,263	75	—	212	146	—	1,475	220	—																																																																																																																																																																																																																																																																																																																																																															
<b>Total</b>	<b>166</b>	<b>126</b>	<b>—</b>	<b>1,327</b>	<b>124</b>	<b>—</b>	<b>364</b>	<b>250</b>	<b>—</b>	<b>1,858</b>	<b>500</b>	<b>—</b>																																																																																																																																																																																																																																																																																																																																																															
<b>All species</b>	<b>11,594</b>	<b>5,405</b>	<b>2,618</b>	<b>55,967</b>	<b>19,872</b>	<b>101,030</b>	<b>45,803</b>	<b>23,570</b>	<b>49,311</b>	<b>113,364</b>	<b>48,848</b>	<b>152,959</b>																																																																																																																																																																																																																																																																																																																																																															

— = less than 500 cubic feet found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Includes growing-stock trees 5.0 inches in d.b.h. and larger.

**Table 28—Estimated gross annual growth, average annual mortality, and average annual removals of sawtimber on timberland outside of national forests, by owner and species, eastern Oregon, 1999<sup>a, b</sup>**

Species	Other public			Forestry industry			Other private			All owners		
	Current gross annual growth	Average annual mortality	Average annual removals	Current gross annual growth	Average annual mortality	Average annual removals	Current gross annual growth	Average annual mortality	Average annual removals	Current gross annual growth	Average annual mortality	Average annual removals
<i>Thousand board feet, Scribner rule</i>												
Softwood:												
Douglas-fir	6,097	2,910	2,742	44,337	12,836	68,848	62,927	22,521	57,357	113,361	38,267	128,948
Engelmann spruce	913	443	—	865	692	630	6,076	6,282	—	7,854	7,418	630
Grand fir	2,816	1,128	—	16,609	5,964	29,737	17,017	5,973	3,977	36,442	13,065	33,713
Incense-cedar	548	363	—	3,090	921	4,684	449	514	—	4,087	1,798	4,684
Jeffrey pine	767	64	—	144	66	—	—	—	—	912	130	—
Lodgepole pine	1,339	623	2,937	20,269	8,184	37,890	11,787	8,190	16,377	33,395	16,997	57,204
Mountain hemlock	—	—	—	—	—	—	2,278	2,700	13,821	2,278	2,700	13,821
Noble fir	—	—	—	—	—	—	3,114	4,187	3,644	3,114	4,187	3,644
Pacific silver fir	—	—	—	—	—	—	995	4,128	—	995	4,128	—
Ponderosa pine	34,665	10,026	2,405	107,769	22,757	136,646	101,827	30,038	86,482	244,261	62,820	225,533
Shasta red fir	1,321	2,319	1,045	—	—	—	—	—	—	1,321	2,319	1,045
Subalpine fir	—	—	—	—	—	—	407	258	—	407	258	451
Sugar pine	623	341	—	1,449	198	2,196	—	—	—	2,071	538	2,196
Western hemlock	—	—	—	—	—	—	—	—	—	—	—	—
Western larch	127	108	—	1,208	1,562	1,492	1,522	572	—	1,522	572	—
Western redcedar	—	—	—	—	—	—	4,577	1,279	1,152	5,912	2,949	2,645
Western white pine	60	145	—	86	67	711	504	541	—	504	541	—
White fir	3,970	2,851	850	43,833	11,500	56,673	10,779	5,484	7,670	58,581	19,835	65,192
Whitebark pine	—	—	—	—	—	—	57	26	—	57	26	—
<b>Total</b>	<b>53,246</b>	<b>21,319</b>	<b>9,979</b>	<b>239,659</b>	<b>64,747</b>	<b>339,957</b>	<b>224,320</b>	<b>92,831</b>	<b>190,481</b>	<b>517,225</b>	<b>178,897</b>	<b>540,417</b>
Hardwood:												
Black cottonwood	—	—	—	222	119	—	209	239	—	431	348	—
Oregon white oak	86	94	—	—	—	—	46	43	—	132	138	—
Quaking aspen	—	—	—	3,416	232	—	849	381	—	4,265	613	—
<b>Total</b>	<b>86</b>	<b>94</b>	<b>—</b>	<b>3,638</b>	<b>351</b>	<b>—</b>	<b>1,104</b>	<b>654</b>	<b>—</b>	<b>4,828</b>	<b>1,099</b>	<b>—</b>
<b>All species</b>	<b>53,332</b>	<b>21,413</b>	<b>9,979</b>	<b>243,297</b>	<b>65,098</b>	<b>339,957</b>	<b>225,424</b>	<b>93,485</b>	<b>190,481</b>	<b>522,053</b>	<b>179,996</b>	<b>540,417</b>

— = less than 500 board feet found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Includes growing-stock trees 5.0 inches in d.b.h. and larger.

**Table 29—Estimated changes in area of timberland outside of national forests, by owner class, eastern Oregon, 1988, 1999<sup>a,b</sup>**

Description of change	Other public	Forest industry	Other private	All owners
	<i>Thousand acres</i>			
Timberland area published in 1988	522	1,523	933	2,978
New estimate of timberland area for 1988, Based on remeasured plot only	538	1,555	986	3,079
Adjustments to 1988 area:				
Reclassification of Native American ownership (public to private)	-308	—	308	—
Access denied area Not remeasured or projected <sup>c</sup>	—	-20	-117	-137
Adjusted timberland area for 1988	230	1,535	1,177	2,942
Area change (1988-1999) owing to:				
Changes in land class—				
Timberland to rights-of-way	-7	-13	—	-20
Timberland to urban	-11	—	-19	-30
Nonforest to timberland <sup>d</sup>	7	7	45	59
Other forest to timberland	8	15	—	23
Net change	-3	9	26	32
Changes in ownership—				
From other public	—	—	—	—
From forest industry	8	-8	—	—
From other private	8	58	-66	—
Net change	16	50	-66	—
Timberland area in 1999, based on remeasured plots only	242	1,594	1,137	2,973
Timberland area in 1999, based on all sampled plots	236	1,603	1,105	2,945

— = less than 500 acres found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Negative values are losses of timberland and positive values are gains in timberland. Losses are shown by the 1984-86 owner and gains are shown by the 1999 owner.

<sup>c</sup> Acres from plots where access was denied and which were not projected.

<sup>d</sup> Includes 42,000 acres that changed because of plot design changes.

**Table 30—Estimated changes in net volume of growing-stock on timberland outside of national forests, by species group and owner class, eastern Oregon, 1988, 1999<sup>a,b,c</sup>**

Description	Softwood species				Hardwood species			
	Other public	Forest industry	Other private	All owners	Other public	Forest industry	Other private	All owners
	<i>Million cubic feet</i>							
Volume published in 1988	1,307	2,017	1,503	4,713	3	7	13	22
Estimate of 1988 volume based on re-measured plots only	1,210	1,770	1,272	4,252	4	6	14	24
Adjustments to 1986 volume:								
Reclassification of Native American Ownership (public to private)	-832	—	832	—	—	—	—	—
Access denied	—	-35	-162	-197	—	—	—	—
Not re-measured or projected <sup>d</sup>	—	—	—	—	—	—	—	—
Adjusted volume for 1988	378	1,735	1,942	4,055	5	6	14	24
Volume changes due to:								
Changes in land class—								
Timberland to nonforest	-42	-27	-23	-92	—	—	—	—
Nonforest to timberland <sup>e</sup>	25	22	41	88	—	—	—	—
Net change	-17	-5	18	-4	—	—	—	—
Changes in owner—								
From other public	—	—	—	—	—	—	—	—
From forest industry	4	-4	—	—	3	-3	—	—
From other private	8	65	-73	—	—	—	—	—
Net change	12	61	-73	—	3	-3	—	—
Growth, mortality, and harvest—								
Periodic gross growth	124	598	495	1,217	4	1	5	10
Periodic mortality	-26	-117	-154	-297	-1	—	-2	-3
Periodic removals	-27	-812	-421	-1,260	—	—	—	—
Net change	71	-331	-80	-340	3	1	3	7
Total volume in 1999, based on re-measured plots only	444	1,454	1,803	3,702	8	5	18	31
Total volume in 1999 based on all sample plots	420	1,550	1,824	3,795	8	8	15	31

— = less than 500,000 cubic feet found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Includes growing-stock trees 5.0 inches in d.b.h. and larger.

<sup>c</sup> Negative values are losses of timberland and positive values are gains of timberland.

<sup>d</sup> Growing-stock volume from the 1988 inventory that was on access-denied land that was not projected.

<sup>e</sup> Includes updates of owner or land class assigned to a plot in 1988.

**Table 31—Estimated changes in net volume of sawtimber on timberland outside of national forests, by species group and owner class, eastern Oregon, 1988, 1999<sup>a,b,c</sup>**

Description	Softwood species				Hardwood species			
	Other public	Forest industry	Other private	All owners	Other public	Forest industry	Other private	All owners
	<i>Million board feet, Scribner rule</i>							
Volume published in 1988	5,600	7,594	5,095	18,289	—	13	16	30
Estimate of 1988 volume based on re-measured plots only	5,127	6,450	4,620	16,197	—	9	22	31
Adjustments to 1986 volume:								
Reclassification of Native American Ownership (public to private)	-3,636	—	3,636	—	—	—	—	—
Access denied	—	-155	-593	-748	—	—	—	—
Not re-measured or projected <sup>d</sup>	—	—	—	—	—	—	—	—
Adjusted volume for 1988	1,491	6,292	7,663	15,449	—	9	22	31
Volume changes owing to:								
Changes in land class—								
Timberland to nonforest	-126	-136	-88	-350	—	—	—	—
Nonforest to timberland <sup>e</sup>	147	70	180	397	—	—	—	—
Net change	21	-66	92	47	—	—	—	—
Changes in owner—								
From other public	—	—	—	—	—	—	—	—
From forest industry	19	-19	—	—	4	-4	—	—
From other private	23	229	-252	—	—	—	—	—
Net change	42	210	-252	—	4	-4	—	—
Growth, mortality, and harvest—								
Periodic gross growth	538	2,419	2,183	5,140	2	5	13	20
Periodic mortality	-102	-337	-528	-967	-1	—	—	-1
Periodic removals	-109	-3,468	-1,809	-5,385	—	—	—	—
Net change	327	-1,386	-154	-1,212	1	5	13	19
Total volume in 1999, based on re-measured plots only	1,881	5,051	7,346	14,278	6	10	34	50
Total volume in 1999 based on all sample plots	1,798	5,453	7,528	14,779	6	22	40	67

— = less than 500,000 board feet found.

<sup>a</sup> Totals may be off because of rounding; data subject to sampling error.

<sup>b</sup> Includes softwood sawtimber trees 9.0 inches in d.b.h. and larger and hardwood sawtimber trees 11.0 inches in d.b.h. and larger.

<sup>c</sup> Negative values are losses of timberland and positive values are gains of timberland.

<sup>d</sup> Sawtimber volume from the 1988 inventory that was on access-denied land that was not projected

<sup>e</sup> Includes updates of owner or land class assigned to a plot in 1988.



**Table 32—Timber harvest volume by year and owner class, eastern Oregon, 1962 to 2000**

<b>Year</b>	<b>National forest</b>	<b>BLM</b>	<b>Private</b>	<b>Other public</b>	<b>All owners</b>
<i>Thousand board feet, Scribner rule</i>					
1962	852,700	19,547	594,821	1,380	1,468,448
1963	966,700	21,456	561,068	5,575	1,554,799
1964	1,064,700	22,756	635,467	2,477	1,725,400
1965	1,181,800	11,571	656,107	13,857	1,863,335
1966	1,089,900	42,559	666,340	3,783	1,802,582
1967	1,133,900	27,311	578,027	1,360	1,740,598
1968	1,182,548	39,307	717,585	2,869	1,942,309
1969	1,230,907	26,326	791,521	8,757	2,057,511
1970	1,017,762	23,291	740,612	2,397	1,784,062
1971	1,147,075	35,768	930,701	2,875	2,116,419
1972	1,319,580	33,961	784,993	10,158	2,148,692
1973	1,237,425	45,891	654,524	9,742	1,947,582
1974	1,178,107	25,666	958,359	9,423	2,171,555
1975	1,151,508	16,662	835,393	0	2,003,563
1976	1,257,108	29,403	679,472	8,056	1,974,039
1977	1,123,840	39,060	641,383	6,666	1,810,949
1978	1,191,396	24,660	606,507	4,003	1,826,566
1979	998,422	32,590	545,576	4,850	1,581,438
1980	836,395	15,818	677,712	4,937	1,534,862
1981	795,876	14,602	570,967	5,849	1,387,294
1982	736,877	12,242	715,460	7,582	1,472,161
1983	1,202,214	38,021	671,860	15,442	1,927,537
1984	1,283,996	39,841	329,538	5,859	1,659,234
1985	1,401,873	16,209	514,193	4,748	1,937,023
1986	1,528,419	24,634	518,138	15,607	2,086,798
1987	1,366,157	45,164	588,899	11,291	2,011,511
1988	1,249,876	39,848	602,512	694	1,892,930
1989	1,368,712	37,808	765,787	15,390	2,187,697
1990	1,001,303	49,806	634,308	6,862	1,692,279
1991	1,068,605	54,459	728,749	5,124	1,856,937
1992	785,918	13,102	924,660	1,167	1,724,847
1993	685,830	22,557	827,654	6,766	1,542,807
1994	340,074	8,620	737,902	5,204	1,091,800
1995	317,565	14,355	600,399	8,828	941,147
1996	211,554	34,854	581,163	3,754	831,325
1997	318,707	8,963	581,540	1,433	910,643
1998	199,927	10,743	617,483	2,740	830,893
1999	141,964	9,456	598,419	5,723	775,562
2000	140,083	3,290	491,504	11,886	646,763

Source: Oregon Timber Harvest Reports, Oregon Department of Forestry.

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