



Oregon Forest
Resources Institute

FOREST SUSTAINABILITY FAQs

Why are some forests selectively logged and others clearcut?

While some forests are selectively logged, clearcutting is often used in others to create optimal conditions for species such as Douglas-fir that need full sun to thrive. Clearcutting is the harvest of nearly all trees in an area that creates an open space to grow young trees in their place. This is the most common harvest method in western Oregon, where most of the state's timber is grown.

Different tree species have different growth habits and tolerances. Some shade-tolerant species, such as western hemlock, grow well in the shade of larger, older trees. These forests can be regenerated successfully with selective logging. Other species, such as Douglas-fir, are shade intolerant; as young trees, they need full sunlight to survive and grow well. Clearcutting is commonly used to harvest forests consisting of shade-intolerant species because it is an effective way to mimic these ideal growing conditions, which would otherwise be created by natural disturbances such as wildfires. After clearcutting (and, sometimes, heavy selective cutting), replanting of tree seedlings is required by Oregon law.



Is it necessary to use pesticides in forests?

Pesticides are chemicals that are used to control pests. Types of pesticides include insecticides, which kill targeted insects; fungicides, which control fungi; and herbicides, which control weeds.

Insecticides and fungicides are not commonly used in forests. Some exceptions include tree nurseries, where seedlings are grown for planting in the forest, and urban forests — trees growing in cities and parks. But many forest landowners, especially in the Coast Range and in southern Oregon, use herbicides to control weeds that would otherwise outcompete newly planted trees.

The use of herbicides is subject to rigorous regulation. The U.S. Environmental Protection Agency plays a crucial role in approving labels for all types of pesticides. The Oregon Department of Agriculture manages the herbicide applicator certification and licensing program to ensure those who apply them are qualified. The Oregon Forest Practices Act further regulates herbicide application on forestlands and establishes buffer distances around sensitive areas where herbicide use is prohibited, such as drinking water intakes.

Herbicides are usually applied at very dilute rates, measured in ounces of herbicide per acre within a 10-gallon water solution. Applicators must take care to keep the spray on target vegetation by carefully monitoring wind, air temperature and relative humidity. Oregon law requires leaving unsprayed buffer strips along streams and near homes and schools.

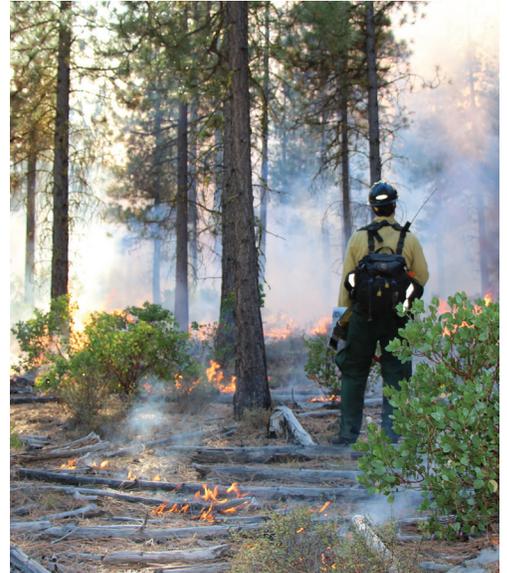


Why can't we stop all wildfires in our forests?

Wildfires are a natural part of western U.S. ecosystems, including forests. Lightning strikes during summer months start some fires, while others are human-caused. Every year, the Oregon Department of Forestry, Keep Oregon Green and other organizations lead a public information campaign aimed to limit the number of human-caused fires, which are the leading cause of fire starts in Oregon, but lightning-caused ignitions can't be prevented.

During fire season, state and federal agencies, as well as private landowners, work to fight wildfires to help keep Oregonians safe and limit damage to homes, property and forestlands. Rapid initial attack is the key to success, but sometimes the number of fires burning on the landscape exceeds the resources available to fight them.

Forest management strategies, including thinning and prescribed burning to reduce fuels for fires, can play a vital role in limiting the severity of wildfires. These proactive measures aim to create a more resilient landscape, mitigating the potential impact of wildfires on both ecosystems and communities.



Do different forest owners manage differently?

Yes, different forest landowners manage their forests differently, depending on their specific goals and objectives.

In Oregon, 64% of forests are under public ownership and are managed by federal and state agencies. Federal lands are managed primarily for ecosystem values, while state lands tend to be managed for multiple values.

The remaining 36% of Oregon's forests are privately owned and are managed by timber companies, families, nonprofits, Native American tribes and other groups. Private industrial forestlands are managed primarily for timber production, to meet society's need for wood products. These private lands account for more than 75% of Oregon's timber harvest. However, even on these timberlands, management practices include considerations for ecosystem values such as providing wildlife habitat, maintaining water quality and protecting soil health.

Family forestlands are managed for multiple values. Tribal forests are managed primarily for ecosystem values.



Do forests need to be certified to be sustainable?

Forest certification systems were designed to document compliance with standards for forest sustainability. However, forest sustainability does not require certification.

In Oregon, forest certification is limited primarily to private lands. Public lands such as national forests are usually not certified, but they have well-developed management plans and are governed by legal and regulatory frameworks that embed principles of sustainable management.

On private lands, some sustainable practices — such as reforestation after timber harvest and protection of streams and wildlife habitat — are required by the Oregon Forest Practices Act.

How much of Oregon’s annual timber harvest comes from land certified by each forest certification system?

Oregon has about 29.7 million acres of forestland and produces an annual timber harvest of around 3.8 billion board feet. About 36%, or 10.7 million acres, are privately owned (including tribal land). This private forestland accounts for about 76% of Oregon’s annual timber harvest, or about 2.9 billion board feet.

In Oregon in 2022, about 4.8 million acres, or 44%, of the private forestland in the state was certified. An estimated 1.3 billion board feet of timber is harvested each year from certified forestland in Oregon. Here’s a breakdown of how much timber is estimated to come from forestland certified under each system:

- 81% of Oregon’s certified forestland is certified under the Sustainable Forestry Initiative (SFI), and accounts for an estimated 1.05 billion board feet of the state’s annual timber harvest.
- 15% is certified under the American Tree Farm System (ATFS), and accounts for an estimated 194 million board feet of annual timber harvest.
- 4% is certified under the Forest Stewardship Council (FSC), and accounts for an estimated 46 million board feet of annual timber harvest.

CERTIFICATION SYSTEMS



Oregon’s certified and uncertified forestland

MMBF = million board feet

Ownership	Acres	Estimated annual harvest (2017-21)
ALL OWNERSHIP	29,656,000	3,800 MMBF
PUBLIC	18,987,000	912 MMBF
PRIVATE	10,669,000	2,888 MMBF
UNCERTIFIED	5,888,492	1,594 MMBF
CERTIFIED	4,780,508	1,294 MMBF
SFI	3,889,098	1,054 MMBF
ATFS	719,106	194 MMBF
FSC	172,304	46 MMBF

Source: U.S. Forest Service, SFI, ATFS and FSC (acreage data) and Oregon Department of Forestry (harvest data)

The relatively low amount of FSC-certified timber produced in Oregon has led some mass timber building specifiers who want FSC-certified wood to use wood grown outside of Oregon and not subject to the Oregon Forest Practices Act. As an alternative, some specifiers use SFI-certified wood grown in Oregon or find other ways to verify wood sourcing from sustainable forests.

Is it feasible to use small-diameter timber from federal forest restoration treatments for mass timber?

Yes. Small-diameter Douglas-fir logs thinned from western Oregon's federal forests are routinely manufactured into mass plywood products by Freres Engineered Wood in Lyons, Oregon. The commercial value for these small logs helps offset the cost of much-needed federal forest restoration projects that reduce fire fuel and improve wildlife habitat.

The picture is more challenging for eastern Oregon's federal forests, where expensive fuels reduction and forest restoration projects produce large volumes of small, low-value ponderosa pine, lodgepole pine, and grand and white fir logs that have limited markets.

Sourcing federal timber for building products and wood products manufacturing helps support these projects that improve forest landscape resiliency. It also supports local logging businesses and mills that rely heavily on federal timber. Improving markets for the timber harvested during these projects would allow many more acres of federal forests to be treated with forest restoration measures.

Cross-laminated timber (CLT) in the U.S. is typically made with two-by-six lumber, which is primarily cut from logs that are 12 inches or larger in diameter. CLT can be made from two-by-fours cut from trees as small as 6 inches in diameter, but it is much more costly. Ongoing research at TallWood Design Institute and Oregon State University's Department of Wood Science is examining the properties and use of small-diameter ponderosa pine and white fir logs in custom CLT panels with the goal of providing benchmark data and proof of concept for manufacturers and designers.



How many trees are planted for each tree that is harvested in Oregon?

An informed estimate suggests that Oregon forest landowners plant approximately three trees for every one tree they harvest.

This is a conservative estimate based on the lower end of the spectrum of tree-planting-to-harvesting ratios across Oregon. The number of trees landowners plant or harvest per acre can vary based on several factors, such as the planting site's tree-growing productivity, tree spacing, and the age or size of the trees when they are harvested.

Planting is commonly done using 10-by-10-foot spacing, which equals 436 trees per acre (TPA). Some landowners plant tighter and some plant farther apart. The Oregon Forest Practices Act requires landowners to plant 100 to 200 TPA after clearcutting, but most foresters recommend planting 300 to 500 TPA to account for the possibility that some of the seedlings won't survive.

The number of trees harvested per acre in a clearcut ranges from 75 to 150, depending on site quality, age and size of trees at harvest. Therefore, the same replanting density will yield different planted-to-harvested ratios on different sites. For example, a 50-year-old stand in western Oregon might have 150 TPA, resulting in a planted-to-harvested ratio of three to one if 450 TPA are planted. In contrast, a 70-year-old stand that was never thinned might have about 110 TPA, leading to a ratio of four to one when replanted at the same density. Finally, a 70-year-old stand that was commercially thinned at age 40 might have about 75 TPA, resulting in a six-to-one ratio if 450 TPA are planted.



What is thinning, and why aren't more forests thinned?

Thinning is selectively cutting some of the trees from a forested area where all the trees are typically around the same age.

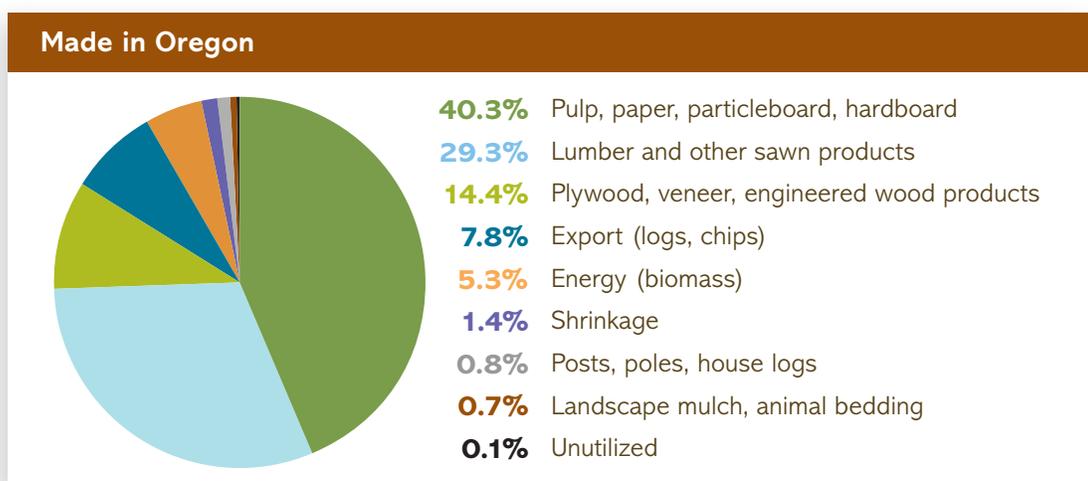
There are a couple of different kinds of thinning. Thinning for forest health, also known as precommercial thinning, is done to areas with younger trees that have grown too dense. Removing some of the trees helps improve the overall health and resiliency of the forest by reducing the competition among the remaining trees for sunlight, water and soil nutrients. Since the trees that are cut down during this type of thinning are not large enough to be marketed, landowners usually chip or burn them or leave them on-site to decompose. Commercial thinning is done in stands of trees that are 20 to 40 years old and large enough to be sold to a mill.



Whether or not landowners choose to thin depends on the markets for logs, logging costs and the steepness of the slopes where the trees are growing. In areas with good markets for small-to-medium trees, thinning may be feasible if the terrain is gentle enough for ground-based logging. Steep slopes often require loggers to use a cable system to lift logs up the hill — and since this can be expensive, commercial thinning doesn't always pencil out. However, mechanized logging equipment that can cut logs to the right length in the forest has greatly reduced logging costs and made thinning more common.

What forest products are produced in Oregon, and what percentage of the annual timber harvest goes to each product class?

Every five to 10 years, the U.S. Forest Service funds research to track which types of forest products are produced in each state with a forest products industry. Oregon is the largest producer of lumber, plywood and engineered wood products in the U.S. The table on the right lists the major forest products made in Oregon and their percentages of the state's total volume, according to the latest Forest Service survey.

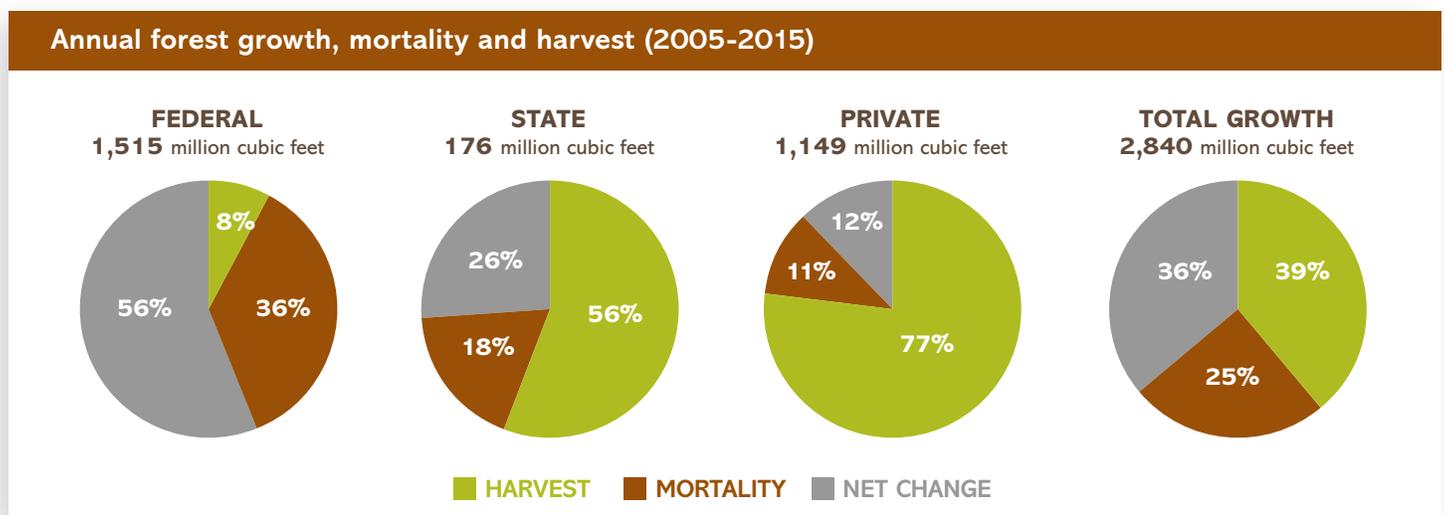


Source: U.S. Forest Pacific Northwest Research Station General Technical Report PNW-GTR-997, October 2021

How do we know that forest timber harvest is in balance with forest growth?

When forest harvests are in balance with forest growth over time, it's called "sustained yield." A forest that is under sustained yield is not being overcut.

The Forest Inventory and Analysis (FIA) program of the U.S. Forest Service has permanent plots on all types of forestlands in the United States. These plots are inventoried every 10 years in Oregon. The figure below shows the latest stats from the FIA program summarizing Oregon's forest growth, mortality and harvest.



Source: U.S. Forest Pacific Northwest Research Station General Technical Report PNW-GTR-971, October 2018

Oregon forests grow about 2.8 billion cubic feet of new wood per year. Overall, about 39% is harvested, 25% ends up in trees that die from natural causes, and 36% adds to the volume of standing timber.

On private forestland, where most of the state's timber harvest happens, the amount of wood harvested each year is about 77% of the annual timber growth. About 11% of that growth is offset by trees that die from causes such as fire, insects and disease.

On federal lands, only about 8% of the annual timber growth is harvested each year. The amount of timber that dies offsets annual growth by 36%. The remainder of the growth, a net change of 56%, adds to the volume of standing timber in those forests. On many federal forests in eastern and south-central Oregon, high growth combined with high mortality and low harvest has created unusually dense forests with stressed trees that are more prone to insect infestation, disease and uncharacteristically severe fire.

In recent years, the federal government, with support from the Oregon state government, has put significant effort into reducing the number of trees and cleaning up dead wood on federal forests through thinning and other fuels reduction treatments such as prescribed burning.

What is mass timber?

Mass timber construction uses large wooden building components made by gluing together smaller pieces of wood to create walls, beams, floors and roofs. Mass timber allows builders to replace some steel and concrete in buildings with wood, which can be sourced locally and is more environmentally friendly. Mass timber generally includes the use of a variety of engineered wood products, including:

- **Cross-laminated timber (CLT)** — a building product created by gluing together lumber into large panels that have three, five, seven or nine layers. Lumber in each layer is placed perpendicular to the layer below, then the panels are pressed and dried. These CLT panels can be used for walls, floors and roofs.
- **Mass plywood panels (MPP)** — building products created by gluing wood veneer, the same material used to create plywood, into very large panels and drying it under pressure. These MPP panels can be used for walls, floors and roofs.
- **Structural composite lumber (SCL)**, which includes laminated veneer lumber (LVL), parallel strand lumber (PSL), laminated strand lumber (LSL) and oriented strand lumber (OSL) — a family of engineered wood products created by layering dried and graded wood veneers, strands or flakes with moisture-resistant adhesive into blocks of material known as billets, which are subsequently resawn into specified sizes. SCL can be used as a substitute for larger boards and is commonly used in floor joists and trusses.
- **Glulam, or glue-laminated timber** — large pieces of timber created by gluing together smaller pieces of lumber. Glulam beams are commonly used as ceiling supports and as posts in large open spaces. They have load-bearing capacity greater than similarly sized solid wood beams, and they enable creation of very large pieces of wood from small trees. Laminated beams can also be curved as they are dried.



What is rotation age, and how is it determined?

In forests with trees that are all about the same age, which foresters call “even-aged forests,” the rotation age is the time between when the trees are planted and when they are harvested. In other words, it’s the age of the trees when a forest landowner decides to cut them down. Some landowners try to maximize return on the investment they have in their forests, and they generally choose shorter rotations of 35 to 60 years. Landowners who want to maximize the production of wood or carbon storage from their forests often prefer longer rotations of 80 to 120 years.



What are the major rules of the Oregon Forest Practices Act?

In 1971, Oregon became the first state to pass a comprehensive law to regulate forest practices and safeguard water, fish and wildlife habitat, soil and air. The Oregon Board of Forestry continuously reviews and updates the rules of the Oregon Forest Practices Act (OFPA) to keep pace with the most current scientific research. Most recently, the Oregon Legislature approved a major revision of the OFPA in 2022 following an agreement made between representatives from the state's timber industry and environmental groups to expand habitat protections for fish and amphibians in exchange for regulatory certainty for the forest sector.

Important rules currently include:

- Reforestation requirements
- Water and stream protections
- Wildlife habitat protections
- Limits on clearcutting
- Restrictions for logging on steep slopes
- Limits on chemical use



How do Oregon's land-use laws contribute to forest sustainability?

Forest sustainability requires that forests remain forests. Oregon's land-use planning system includes laws that help keep forestland and farmland from being converted for other uses. Compared to neighboring states, much less private forestland in Oregon has been converted for low-density housing or other urban development. That's largely due to how Oregon's land-use and forest-protection laws work in tandem to keep forestland and farmland in forest and farm uses.

