



REFORESTATION IN OREGON

GUIDANCE FOR SUCCESSFULLY REPLANTING TREES IN OREGON'S FORESTS

Reforestation is one of the most important steps in forest stewardship. Planting and establishing the next generation of trees after timber harvest ensures Oregon's forests continue to provide wood products, wildlife habitat, clean water and recreational opportunities for generations to come.

Planting new trees to replace those harvested is both a legal requirement in Oregon, and a long-term investment in your land. In this publication, you'll find practical guidance and information about additional resources to help get you started on the path to successfully growing your next forest.

TRACK THROUGH FERNS

Landowners must submit a Notice of Operations to the Oregon Department of Forestry (ODF) using its Forest Activity Electronic Reporting and Notification System (FERNS) before starting a forest operation, including those related to reforestation, such as herbicide application. The notice identifies planned activities and provides ODF with key information used to ensure protection of Oregon's natural resources. Learn more about FERNS at ferns.odf.oregon.gov/E-Notification.

DID YOU KNOW?

Young forests, also known as early seral forests, provide important habitat for many of Oregon's most beloved songbirds and other wildlife. Learn more in the Oregon Forest Resources Institute (OFRI) publication *Wildlife in Managed Forests: Early Seral-Associated Songbirds*. Download or order a free copy using the publication library at OregonForests.org.



Photo: Jon Cox



PLANTING A NEW FOREST

In Oregon, reforestation isn't just the best management practice. It's the law.

Reforestation has been part of Oregon law since 1941, when the state adopted the Oregon Forest Conservation Act. In 1971, Oregon became the first state in the country to adopt a comprehensive Forest Practices Act, reflecting a longstanding commitment to keeping forestland productive.

After harvest, landowners are required to replant within two years and ensure that within six years those trees are successfully established and "free to grow." That means they are vigorous and tall enough to outcompete grass and brush and will grow into a new forest.

A LONG-TERM INVESTMENT

Healthy young forests provide future economic value through timber and other forest products, supporting local jobs and businesses. Reforestation also helps maintain important environmental benefits, including carbon storage, soil and water protection, and diverse wildlife habitats.

Reforestation is not a single step, but a process that begins before harvest and continues for years after. From planning and site preparation to planting, vegetation management and monitoring, each stage plays an important role in establishing the next forest and reaching free-to-grow conditions.

While these steps are often presented in sequence, they are interconnected and sometimes repeated. Site conditions, weather, wildlife browsing, competing vegetation and seedling survival all influence what actions are needed and when. Landowners may revisit earlier steps, such as vegetation management or replanting, to ensure seedlings become established and meet required stocking levels.



ABOUT THE OREGON FOREST RESOURCES INSTITUTE

The Oregon Forest Resources Institute supports the forest sector and the stewardship of natural resources by advancing Oregonians' understanding of the social, environmental and economic benefits of our forests. Learn more at OregonForests.org.



Planning for successful reforestation

If you're planning a forest harvest, it's time to start planning for reforestation. Decisions made before and during harvest will influence the success of your efforts to establish the next forest. Consider hiring a consulting forester to help plan your harvest and reforestation, connect you with contractors and seedling sources, and provide quality control throughout the process.

COMMUNICATE WITH YOUR CONTRACTORS. As part of the logging contract, agree upon how to reduce impacts on the soil and how logging debris will be managed during the harvest operation. Addressing these items during the harvest is often more efficient and less expensive than dealing with them afterwards.

UNDERSTAND YOUR SITE. Knowing the unique attributes of your planting site is a critical next step. Soil type, moisture, slope and aspect all influence which tree species will grow best and how seedlings will perform over time. Evaluating these conditions can help guide species selection, planting strategies and long-term management decisions.

CAREFULLY SELECT YOUR TREES. Selecting the right tree species or mix of tree species to plant is one of the most important planning decisions. The chosen species should meet the Oregon Forest Practices Act requirements and align with site conditions and management goals, among other considerations. Seed zone maps can help guide these decisions and ensure seedlings are well suited to survive and thrive in your location.

The seedling stock type, which refers to the size, age and growing method (container-grown or bare-root) of a young tree, should be selected based on site conditions and planting methods.

PLACE YOUR SEEDLING ORDER EARLY. Choosing a nursery and placing orders early, typically a year or more in advance, is crucial, as seedling availability can be limited. Because it generally takes one to two years for nurseries to produce seedlings, landowners should plan to order them before their timber is harvested.

Planning also includes determining planting specifications such as spacing, stocking rates and layout. Many landowners choose to work with professional contractors or consultants who can provide expert guidance on this step, but you can also consult the resources sidebar on this page if you'd like to create your own reforestation plan.

PLAN FOR ADDITIONAL COSTS. Lastly, be sure to plan for the costs associated with reforestation beyond purchasing seedlings, including the expenses for site preparation and planting, as well as early maintenance such as vegetation and animal damage control. Setting aside a portion of your timber harvest revenue is one way to help ensure funds are available to successfully establish your next forest.

RESOURCES FOR REFORESTATION PLANNING

The following resources can help with planning a successful reforestation effort:

Seed zone maps for a variety of native tree species can be found in the Oregon Department of Forestry's publication *Sources of Native Forest Nursery Seedlings*, available at oregon.gov/odf/working/pages/replanting.aspx. It also includes a list of nurseries in the Pacific Northwest that grow seedlings for landowners in the region.

The Oregon Forest Industry Directory at orforestdirectory.com can help identify nurseries, seedling suppliers and forestry contractors.

Oregon Small Woodlands Association (OSWA) members often have experience with local contractors and can share their experiences and contacts. Seedlings may also be available through your local OSWA chapter, and many host annual seedling sales. Find an OSWA chapter in your area at oswa.org.

The Oregon State University Extension Service publication *Contracts for Woodland Owners* outlines key considerations for forestry-related agreements, including those with contractors that offer tree planting services. It can be downloaded, along with other publications with tips for hiring forestry contractors, from the Partnership for Forestry Education website, KnowYourForest.org.

Landmapper is a simple online tool found at landmapper.ecotrust.org that helps landowners create maps showing soils, topography, streams and other important features. These maps can support reforestation planning decisions and help you and potential contractors better understand your property.

Preparing the site

Preparing the planting site is a critical step in successfully establishing the next generation of trees. After harvest, conditions on the ground can vary widely, and site preparation helps create the environment seedlings need to survive and thrive.

MANAGING WOODY DEBRIS left behind after logging is one of the first priorities. In many cases, this involves piling and burning slash to reduce fuel loads, improve access and create suitable planting spots,

SAFE AND REGULATED PRACTICES



Slash burning and herbicide use are carefully regulated in Oregon. Smoke management programs help minimize air quality impacts, while pesticide laws ensure products are applied safely and according to label requirements.

The OFRI publications *Managing Logging Slash Piles in Western Oregon* and *Oregon's Forest Protection Laws: An Illustrated Manual* provide guidance on safe and effective slash treatment and herbicide application. Both can be ordered or downloaded at OregonForests.org.

More information about Oregon's regulations regarding slash burning, smoke management and herbicide use can also be found on the Oregon Department of Forestry website, oregon.gov/odf/working/pages/fpa.aspx.

although leaving some slash can help shade seedlings, regulate temperature and moisture, and protect them from wildlife browsing. Discussing slash management before the harvest begins may allow this work to be completed during logging operations, which is often more efficient and less expensive.

VEGETATION CONTROL is also a key component of site preparation. Competing plants such as grass can quickly limit the light, water and nutrients available to young trees, and can harbor rodents that will gnaw at the base of seedlings. With climate change creating warmer and drier conditions that make it harder for newly planted trees to get established, effective vegetation control is especially important. It can be the determining factor contributing to reforestation success or failure.

A widely used approach to vegetation control is integrated pest management, or IPM, which combines multiple strategies such as monitoring, timing treatments, and using mechanical, biological or chemical methods to manage competing vegetation in an effective and environmentally responsible way. Herbicides are the most common and effective tools for controlling competing vegetation, often used as part of an integrated pest management approach.

PEST DETERRENCE is another consideration to make before planting. If your harvest is in an area that is also used by deer and elk, or you're planting a species that's particularly palatable, such as western redcedar, preparing the seedlings for animal damage is important. Methods commonly used to protect seedlings from browsing are tubing and repellants.

Other animals, such as mountain beavers, can cause severe damage and mortality to seedlings as well. Trapping is one of the most effective management tools to control mountain beaver populations.

TIMING is an important factor in all site preparation activities. Herbicide treatments are most effective while trees are still dormant and before vegetation becomes well established.

Under the Oregon Forest Practices Act, site preparation and planting must also occur within required timelines following harvest to support successful reforestation. Replanting is required within two years of harvest, making early planning and implementation essential.

Planting

Planting is where planning and site preparation come together. Getting seedlings in the ground after slash has been burned and competing vegetation has been controlled gives them the best chance to survive and grow. Timing is also critical. In most of Oregon, planting typically occurs during the cooler, wetter months when soil moisture is high and seedlings are less likely to experience stress.

HOW MANY TREES TO PLANT

depends on your management goals, site conditions, species and required stocking levels. It's also a good idea to plant more trees than required or desired to account for mortality. The number of trees planted is often expressed as trees per acre, or TPA, and spacing between trees directly influences that number. See the spacing and number of trees per acre chart on the following page for help calculating TPA.

PROPER HANDLING and storage of seedlings as they travel from the nursery to the planting site is essential. Seedlings should be kept cool, moist, and protected from wind and sun prior to planting. Even short periods of exposure to the elements can reduce survival. Careful handling in the field helps ensure seedlings remain healthy until they are planted.

PLANTING TECHNIQUES also matter. Seedlings should be planted at the correct depth with roots fully extended and soil firmly packed around them to eliminate air pockets. Selecting good planting spots, or microsites, can improve survival by providing better moisture, protection and reduced competition. Check planting quality and spacing as work is completed. Catching problems quickly can improve seedling survival.

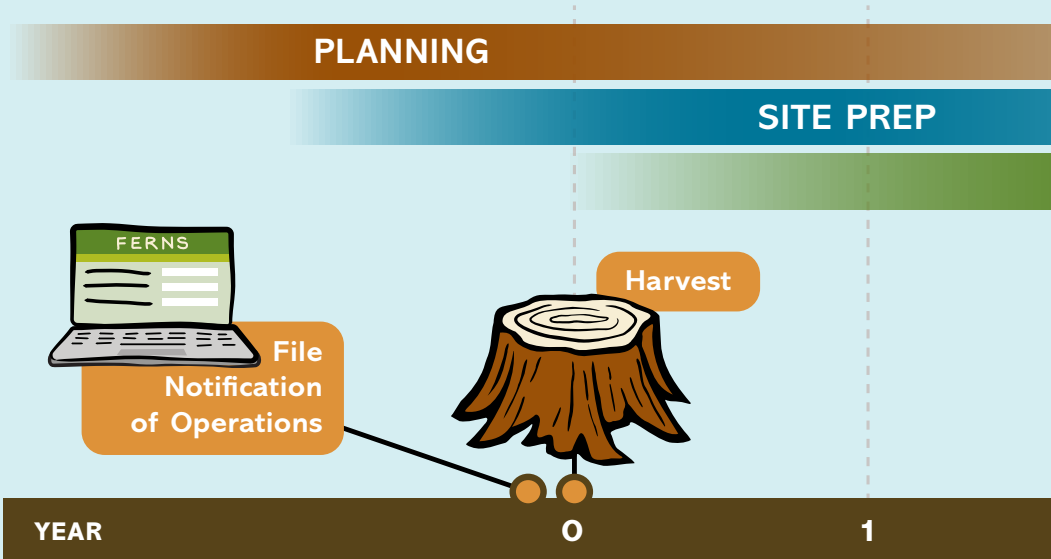
Reforestation timeline

(0-6 YEARS)

Note that steps may overlap or repeat depending on conditions.

WHAT'S REQUIRED

- Replant within two years of harvest.
- Meet stocking standards.
- Achieve free to grow within six years.



Above: A properly planted tree should have the roots fully extended with the soil packed firmly around them to eliminate air pockets.

Right: Newly planted seedlings are vulnerable to damage from animals, insects and environmental stress. Taking steps to reduce wildlife browse, manage competing vegetation and monitor early survival can help protect your investment.



MORE GUIDANCE ON TREE PLANTING AND FOREST MANAGEMENT

Explore the OFRI publications *Establishing and Managing Forest Trees in Western Oregon* and *Understanding Eastside Forests* for region-specific information on tree species selection, planting practices and early stand development. Both can be ordered or downloaded at OregonForests.org.

Spacing and number of trees per acre (TPA)

SPACING (feet)	TREES per acre
6 x 6	1,210
8 x 8	681
10 x 10	436
12 x 12	302
14 x 14	222

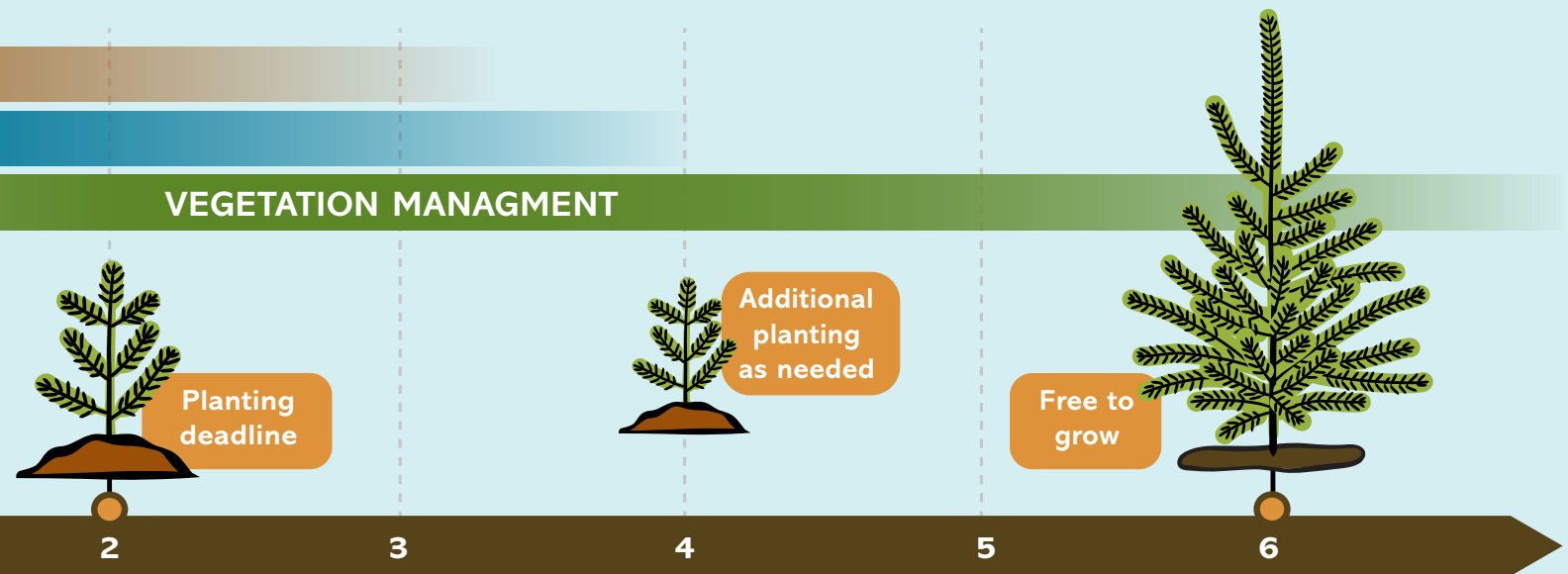
To calculate other spacing, use the following equation:

$$TPA = 43,560 \text{ sq. ft. per acre} \div \text{desired spacing sq. ft.}$$

Example: You want to space your trees out on a 12 ft. x 10 ft. grid.

$$43,560 \div 120 \text{ (12 ft. x 10 ft. spacing)} = 363 \text{ TPA}$$

VEGETATION MANAGEMENT



Vegetation control: Giving seedlings a head start

After planting, young seedlings must compete with surrounding vegetation for sunlight, water and nutrients. Managing this competition is one of the most important steps in helping trees become established and grow toward “free to grow” status.

It’s also something you can start thinking about even before you harvest trees by noting the existing vegetation, seedbank and root systems in the area you want to harvest and using that information to plan for future vegetation management to give your newly planted seedlings the best chance of thriving.

VEGETATION CONTROL can be accomplished using herbicides, manual or mechanical methods, or a combination of two or more of these tools. Herbicides are often the most effective and efficient option on many sites, while manual or mechanical methods may be appropriate in certain situations depending on landowner preferences, site conditions and scale.

TIMING IS CRITICAL. Treatments are most effective while trees are still dormant and before competing vegetation becomes well established. In some cases, multiple treatments over several growing seasons may be needed to maintain adequate growing conditions for seedlings.

If you choose to apply herbicides on your property, always follow the product label. The label is the law and provides legally required directions for safe and effective use. In addition, the Oregon Forest Practices Act rules include restrictions on herbicide use near streams and drinking water sources.

MONITORING plays an important role in determining when and where vegetation control is needed. Regularly check planted areas to assess the type and density of competing vegetation, as well as overall seedling condition and growth. These observations help guide decisions about whether additional treatments are necessary.

If tree survival is below desired stocking levels after planting is completed, some additional interplanting may be needed to ensure successful reforestation.

Vegetation management and monitoring is not a one-time activity, but an ongoing process. Adjusting your approach based on site conditions and seedling performance will help keep your stand on track to eventually becoming free to grow.



Newly planted seedlings compete with surrounding vegetation for sunlight, water and nutrients.



One way to control vegetation that competes with seedlings is through the use of herbicides.

Free to grow: Reaching the next milestone

“Free to grow” is a key milestone in the reforestation process. A stand is considered free to grow when enough healthy, well-distributed trees are established and no longer at risk of being overtaken by competing vegetation.

FOLLOW THE LAW. In Oregon, achieving free-to-grow status is required under the Forest Practices Act. Landowners must establish a minimum number of trees per acre within six years and ensure those trees are growing without significant competition. These requirements help ensure that forestland remains productive and continues to provide environmental and economic benefits over time.

CARE FOR YOUR TREES. A stand of planted trees reaching the point of being free to grow does not happen by chance. It is the result of careful planning, successful planting and ongoing management during the first several years after harvest. Even as stands approach this milestone, continued monitoring is important to confirm that trees remain healthy and well-spaced.



Free-to-grow trees after the competing vegetation has been controlled.

Adequate stocking levels, healthy seedling growth and manageable levels of competing vegetation are good indicators that your stand is progressing towards free to grow. If these conditions are not met, additional actions may be required. This can include further vegetation control, interplanting or other management activities to bring the stand into compliance with Oregon's reforestation requirements.

ADDRESS ISSUES EARLY. Failure to meet these requirements can result in additional costs, including the need for corrective actions, potential fines or impacts to forestland tax status and property value. Staying informed, monitoring progress and addressing issues early can help avoid these outcomes.

Reaching free to grow marks an important step, but it is not the end of forest stewardship. Ongoing care and management will continue to shape the health, productivity and resilience of your forest for years to come.

TECHNICAL ASSISTANCE IS AVAILABLE

Landowners do not have to navigate the process of complying with Oregon's reforestation requirements alone.

Technical and financial assistance opportunities are available through a variety of agencies and organizations. Resources can be found at **KnowYourForest.org** and the Oregon Department of Forestry (ODF) reforestation webpage, **oregon.gov/odf/working/pages/replanting.aspx**.

ODF foresters can help you achieve compliance with the Oregon Forest Practices Act reforestation requirements, including seedling stocking levels and acceptable tree species for replanting, as well as help ensure your reforestation efforts are successful by providing free technical assistance throughout your forest operation. You can find the ODF forester serving your area using the map on ODF's website at **oregon.gov/odf/working/pages/findaforester.aspx**.

The Oregon State University Forestry and Natural Resource Extension program also provides expert assistance to landowners on reforestation. Learn more and find a forestry and natural resources extension agent or specialist in your area at **forestry.oregonstate.edu/extension**.



Checklist for reforestation

Use this checklist to stay on track from harvest to a successfully established stand:

PLANNING

- ☐ Define goals and evaluate site conditions
- ☐ Create Landmapper maps to help evaluate site conditions
- ☐ Evaluate the cost and benefit of hiring a forestry consultant
- ☐ Contact your local ODF stewardship forester for guidance on all aspects of your project
- ☐ Find contractors for logging, reforestation and site preparation
- ☐ Select tree species and stock type, and confirm seed zone
- ☐ Determine seedling spacing and stocking targets
- ☐ Submit Notice of Operations for harvest to ODF
- ☐ Order seedlings early, at least one year in advance, and plan costs
- ☐ Report harvest completion to ODF or file for a continuation if operation is not complete

SITE PREPARATION

- ☐ Prepare site (manage slash, soil compaction during logging and competing vegetation control)
- ☐ Ensure site is ready for planting



PLANTING

- ☐ Plan for proper transportation, storage and inspection of seedlings during planting operations
- ☐ Plant at the right time using proper techniques and tools (use animal damage control, if needed)
- ☐ Map and track acres, stock type and density

VEGETATION CONTROL

- ☐ Evaluate competing vegetation and make appropriate prescription
- ☐ Submit Notice of Operations to ODF for vegetation control
- ☐ Monitor competing vegetation and seedling condition
- ☐ Apply vegetation control as prescribed (referring to herbicide label as needed)
- ☐ Reapply treatments as needed
- ☐ Report completion of vegetation control to ODF or file for a continuation if operation is not complete

STOCKING AND MONITORING

- ☐ Monitor seedling vigor and competing vegetation at bud break
- ☐ Check seedling survival and stocking levels at year one
- ☐ Interplant and treat weeds if needed
- ☐ Check progress at two-year mark

FREE TO GROW AND ONGOING STEWARDSHIP

- ☐ Meet required trees per acre and distribution
- ☐ Ensure trees are free from overtopping vegetation
- ☐ Confirm compliance with Oregon Forest Practices Act for trees to be free to grow at the six-year mark
- ☐ Continue monitoring and plan next steps (thinning, habitat improvements or fuels treatment)
- ☐ Seek technical or financial assistance if needed

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