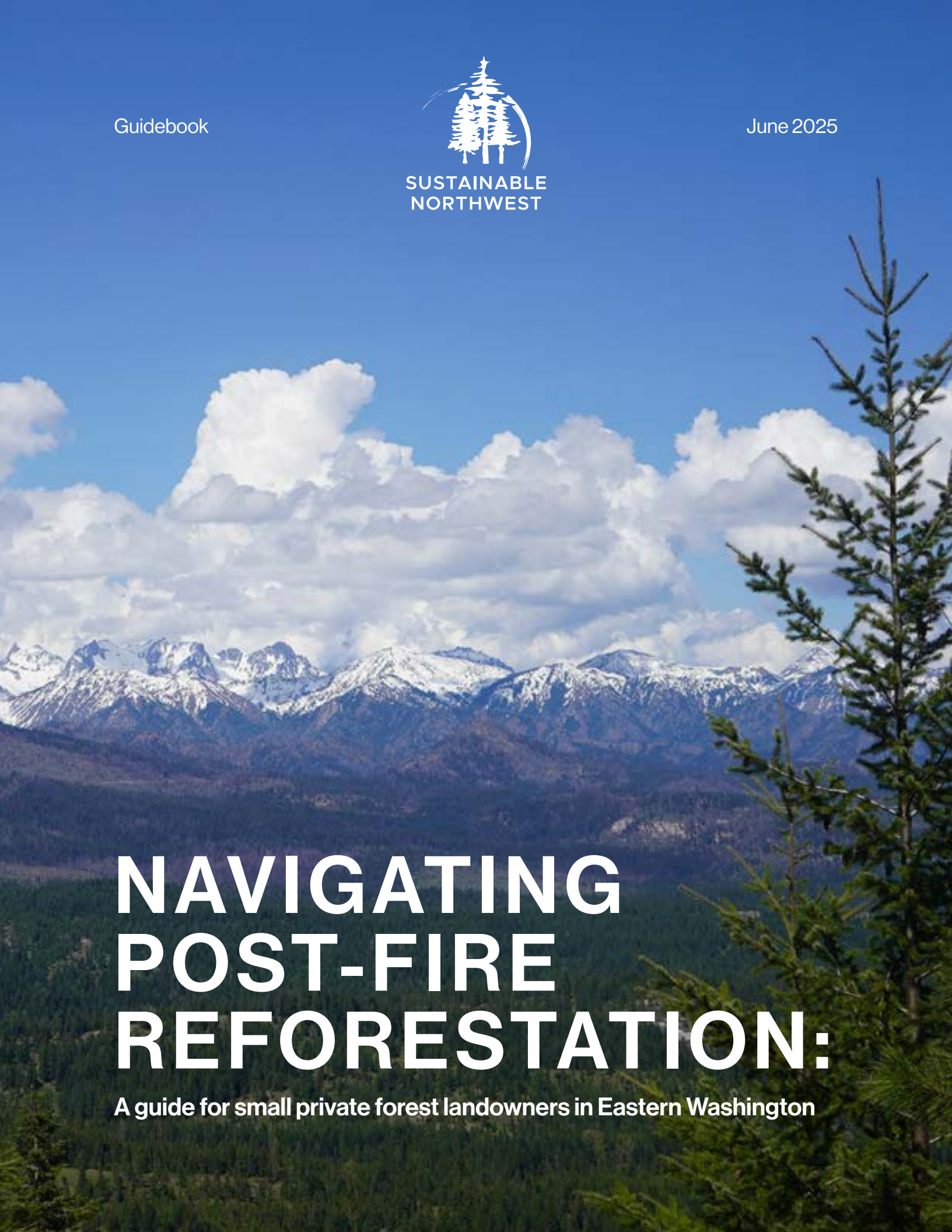
Guidebook

SUSTAINABLE NORTHWEST

June 2025



NAVIGATING POST-FIRE REFORESTATION:

A guide for small private forest landowners in Eastern Washington

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About Sustainable Northwest

We partner with communities throughout the Northwest on projects that promote smart water use, clean energy, and healthy forests, farms, and ranches.

Our solutions are as unique as the problems we solve and include entrepreneurship, policy, market innovations, public and private investment, collaboration, and technical assistance – but the ultimate success of our work is based on relationships, trust, and inclusion.

SUSTAINABLE NORTHWEST

Sustainable Northwest was founded in 1994 to forge collaborative solutions for conserving forest and community health. Today, our challenges have multiplied with climate change, catastrophic wildfires, and persistent drought harming our region. Yet we remain optimistic that nature, people, and local economies can thrive together. For more information, visit our website at www.sustainablenorthwest.org.

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Contents

INTRODUCTION

Wildfire can leave deep and lasting impacts on both the landscape and the people who steward it. In eastern Washington, where forests are diverse, fire-adapted, and increasingly vulnerable to high-severity wildfires, recovery can be especially complex. Yet forests, like their stewards, are remarkably resilient. With thoughtful planning and care, fire-impacted forests can return stronger, healthier, and better adapted to future conditions.

This guide was created with you in mind: the small forest landowner navigating the challenging and often uncertain path of post-fire recovery. It is designed to support informed decision-making throughout your restoration process, offering clear guidance at every step.

Within these pages, you'll find practical tools, expert guidance, and connections to trusted partners to help you restore your land in alignment with your values and long-term vision. The guide begins by outlining the technical and financial assistance available to support your recovery – resources we recommend exploring early in the process. From there, the guide follows a general sequence of reforestation activities: assessing post-fire conditions, developing a restoration plan, securing seedlings, preparing the site, planting, and post-planting care.

A Timeline of key activities and decisions is provided on page 34 & 35 to help you stay organized and plan ahead. Throughout the guide, you'll find references to external resources with some sections featuring resource tables for quick access. Relevant programs and resources are shared throughout the document. A comprehensive **Directory** and **Appendix** with referenced materials can be found at the end.

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Post-fire recovery is a complicated and often emotional process that takes time. This guide is dedicated specifically to the reforestation component of that process. For information and support related to other aspects of post-fire recovery, we encourage you to visit the After the Fire Washington website [1].

Wherever you are in your recovery process, we hope this resource provides the knowledge, tools, and encouragement you need to navigate the unique challenges of forest restoration in eastern Washington as a small forest landowner.

SECTION 1

TECHNICAL AND FINANCIAL ASSISTANCE

The post-fire recovery process can be long and complex, but you don't have to navigate it alone – nor should you. Many organizations and funding programs are available to support you, offer guidance, and help you make informed decisions along the way. This section provides an overview of key resources available to forest landowners in Washington State, organized into two categories: technical assistance and financial assistance.

- **Technical assistance.** This refers to expert advice, education, and planning support provided by professionals such as foresters, conservation specialists, and other land management experts. This can include site assessments, reforestation planning, and guidance on best practice
- **Financial assistance.** This includes funding programs, cost-share opportunities, and grants that help offset the costs of recovery and forest management activities.

We've chosen to highlight organizations and programs that have consistently served non-industrial forest landowners. However, resources change and program offerings may shift over time and new organizations may emerge. To ensure you're accessing the most up-to-date and relevant support, check with a technical service provider such as a WA DNR Service Forester, WSU Extension Forester, or your local conservation district. Stay connected with these professionals throughout the life of your project to help you make the most of the resources available, as this information will continue to change during your recovery process.

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WASHINGTON STATE UNIVERSITY EXTENSION

Washington State Conservation Commission

NRCS Natural Resources Conservation Service

“DNR [provided] seedlings, a bag of native grass seed, and consultation. The Spokane Conservation District also provided consultation, and they did offer seedlings. We purchased and broadcasted 150 lbs. of native grass seed. We also dug up and relocated small trees from another small piece of property we own.”

– Landowner, post-fire recovery from the 2023 Gray Fire

1.1 Partners in your recovery

The primary organizations providing technical and financial assistance in Washington are listed here. For partner contact information, see the Directory on page 70.

Washington Department of Natural Resources (WA DNR)

WA DNR has regional offices throughout the state with Service Foresters who offer free consultations, technical assistance, and financial support to landowners for forest stewardship and planning. Use DNR’s online Find Your Forester tool [2] to get in contact with a Service Forester. Additionally, DNR’s Small Forest Landowner Office [3] offers regulatory guidance as well as financial assistance programs, both intended to protect the health, productivity, and long-term economic viability of small forestlands.

Conservation Districts

Conservation districts are local units of government established through state legislation, with the unique purpose of providing technical assistance, grants, educational outreach, and other conservation services to landowners, land managers, and the general public. Closely connected with state and federal partners, conservation districts are well-positioned to help you identify and access funding opportunities available in your region and are an excellent resource for referrals to funding programs across multiple organizations. The programs and support offered will vary by county. To locate your local conservation district, visit Washington State Conservation Commission’s Find your Local Conservation District [4] webpage.

Washington State University Extension (WSU Ext.)

WSU Ext. provides information and education to landowners and the general public through their Extension Forestry Program [5]. As WSU is Washington’s land grant university, the university transfers knowledge and research to the public through training, workshops, webinars, and publications. Extension agents work closely with funding agencies and will be aware of the funding opportunities available in your area. They often respond to natural disasters by developing outreach, educational programming, and other resources to facilitate community learning and response. Connect with your region’s extension forester for their advice early in your process.

USDA Natural Resources Conservation Service (USDA NRCS)

NRCS is a federal agency within the United States Department of Agriculture that serves agricultural and forest landowners through county-level offices. The agency promotes voluntary conservation measures on private lands through technical support, such as

development of forest management plans, and financial assistance programs that help landowners improve natural resources and meet their land management goals. Visit the NRCS Washington State Office webpage [6] for more information.

Nonprofits and Long-Term Recovery Groups

Other organizations providing assistance to landowners may work at the community, regional or state level. Examples include:

- **Statewide:** Washington Tree Farm Program, Washington Farm Forestry Association, Family Forest Foundation
- **Local/Regional:** Okanogan Long-Term Recovery Group, Spokane Long-Term Recovery Group, Pine Creek Community Restoration, Blue Mountain Regional Long Term Recovery Group

1.2 Technical Assistance

Some of the entities listed above provide technical assistance to small private forest landowners. This includes DNR Service Foresters, conservation districts, consulting foresters who are available for hire, as well as federal, state and local organizations that provide these services free of charge as capacity allows. This support can benefit every stage of your post-fire recovery process, including:

- Property assessments
- Determining your priorities and needs
- Developing a forest management plan, replanting plan, and/or other planning materials
- Determining your priorities and needs
- Identifying funding or in-kind support for your restoration work
- Identifying forestry contractors, mills, seed banks, and tree nurseries
- Discussing forest operations and understanding the requirements of the Washington State Forest Practices Rules [7]
- and more!

These entities tailor their services to the specific needs and priorities of the landowner. They are also essential to preparing you to apply for and receive funding support from financial assistance programs, which often require a landowner to have a current forest management plan that reflects post-fire conditions.

1.3 Financial Assistance

Financial assistance is available in a variety of forms, including disaster relief programs, cost-share opportunities, small grants, and low-interest loans. Some programs may even coordinate and pay contractors directly on your behalf. Below is a list of trusted and frequently used programs and supplemental resources.

(Important note: This is not an exhaustive list and it is important to check with local organizations or your conservation district, as available resources will change.)

Organization	Assistance offered
USDA (general)	USDA's Disaster Resource Center [8] can help you determine which funding programs across all USDA agencies are available for your post-disaster recovery. Supplemental resources: • Disaster Assistance Discovery Tool [9] • Disaster Assistance Programs At-A-Glance Brochure [10]
USDA Farm Service Agency (FSA)	The Emergency Forest Restoration Program (EFRP) [11] is triggered when the USDA makes a disaster declaration, and is often the first source of funding available to forest landowners after a fire or other event. EFRP helps owners of non-industrial private forests restore damaged forests due to natural disasters such as wildfires. Financial assistance is available for debris removal and replanting. FSA provides financial assistance while foresters from the WA Department of Natural Resources support landowners with technical assistance through the process. The Emergency Loan Program [12] is available for those unable to obtain financing elsewhere. These loans cover up to $500,000, requiring repayment within 1-7 years, with interest rate caps. Supplemental resources: • Loan Assistance Tool – Quick Start Guide [13] • Producer Loan Assistance Tool [14]
USDA Natural Resources Conservation Service	Through the Environmental Quality Incentives Program (EQIP) [15], landowners can receive financial direct assistance from NRCS for post-fire restoration activities. This cost-share program accepts applications year-round, but ranks and selects participants during key dates. Special enrollment periods are also offered after major wildfire events.

Organization	Assistance offered
Washington Department of Natural Resources	Financial Assistance for Wildfire Resilience and Forest Health Program [16] is a cost-share program which provides both financial and technical assistance to landowners. The Post-Fire Recovery Program [17] supports activities which specifically pertain to wildfire-affected lands and communities. The Small Forest Landowner Regulation Assistance Program [18] assists landowners in navigating the state's Forest Practices Rules [7], including forest operations required for restoration and reforestation. Supplemental resources: • Landowner Assistance Portal [19] • Small Forest Landowner Office [3] • After the Fire Washington website [1]

Each financial assistance program is structured differently. Regardless of the entity offering the program, these are common features and key considerations you should discuss with the funder and your technical assistance provider(s) before committing to a project:

- **Emergency or disaster assistance programs.** These funding opportunities are triggered by emergencies or disaster declarations, and are often one-time opportunities. They tend to be deployed rapidly after a wildfire event and are often the first to be available for wildfire recovery. They may focus on site stabilization, debris removal, and hazard tree removal, but can also cover replanting activities. These programs often require a landowner contribution to the costs of the project.

- **Reimbursement-based.** Many financial assistance programs require landowners to pay up-front costs before being reimbursed by the funding organization. If this presents a hardship to landowners, loan services from a conservation district or USDA's Farm Service Agency may be available.

- **Cost-share requirement.** Many programs provide partial funding for the costs of a restoration project, but generally require a landowner contribution of cash or in-kind labor. These percentages vary by program and by year. Ask your conservation district if they have funding opportunities to help mitigate the cost-share requirement of a state or federal program.

- **Maximum award limits.** Financial assistance programs may have a maximum dollar figure that a landowner can receive per contract.

- **Maintenance requirements and duplicative payments.**

  — Most financial assistance programs require landowners to maintain the practice(s) that the program funds for a certain length of time, which is referred to as the "lifespan" of the practice.

  — It is important to maintain the integrity of an implemented practice during its lifespan. You may find it difficult to secure funding to re-do a practice that failed due to lack of maintenance. Many financial assistance programs do not allow "duplicative payments" and will not repeat the same investment on the same property during the original practice's lifespan.

- **USDA requirements.** Several important recovery programs for forest landowners are administered by USDA agencies like Natural Resources Conservation Service (NRCS) and Farm Service Agency (FSA). These agencies have specific requirements that may differ from other funders: for instance, first-time clients will need to establish a business profile with USDA's Farm Service Agency, and will need to fill out forms to facilitate an environmental assessment of their property to comply with federal law. Landowners cannot exceed a maximum adjusted gross income (AGI) for most USDA funding programs. Check with your local Farm Service Agency office to determine adjusted gross income limits or AGI waiver opportunities.

- **Historically underserved.** Many programs carry additional benefits for landowners that qualify as "historically underserved," "socially disadvantaged," or "beginning farmer or rancher." This may include a greater likelihood of being selected for funding, or a lower cost-share requirement. The USDA resource, Get Started! A Guide to USDA Resources for Historically Underserved Farmers and Ranchers[20], describes the opportunities for historically underserved landowners, as well as helpful agency definitions of related terms.

- **Loan programs.** Emergency or conservation loans may be useful tools to help a landowner pay upfront for treatments in a reimbursement-based program, or to cover landowner cost-share. These are typically low-interest products, and may require you to first seek traditional lending options.

- **Taxable income.** Financial assistance for post-fire restoration work may be considered taxable income. Consult with your funding partner, your tax specialist, and refer to resources such as the Forest Landowners Guide to the Federal Income Tax [21] and Oregon State University Extension's Tax Considerations for those impacted by wildfire or other natural disasters recorded webinar [22] for more information.

- **Carbon Financing.** See spotlight on pages 16 - 17.

SPOTLIGHT: CARBON FINANCING

Forest carbon projects offer landowners a way to generate income from their trees beyond traditional timber sales and can be used to pay for reforestation. As trees grow, they capture carbon dioxide from the atmosphere. Carbon projects measure this stored carbon and create "carbon credits" that companies purchase to offset their emissions. Each credit represents one ton of carbon dioxide removed.

How it works

Not all properties qualify for carbon projects. They must comply with specific rules set by standards bodies like Verra, American Carbon Registry, and Climate Action Reserve. Project developers evaluate your land to ensure it meets these scientific and ethical requirements.

High-quality reforestation carbon projects must meet three key criteria:

- **Additionality.** The forest growth and carbon capture wouldn't have happened without the financing from the carbon project.
- **Permanence.** The carbon must stay locked up long-term (typically 40-100+ years), which restricts the amount of timber harvest allowed during that period.
- **No double-counting.** Each ton of stored carbon generated from a project can only be claimed once to maintain project integrity.

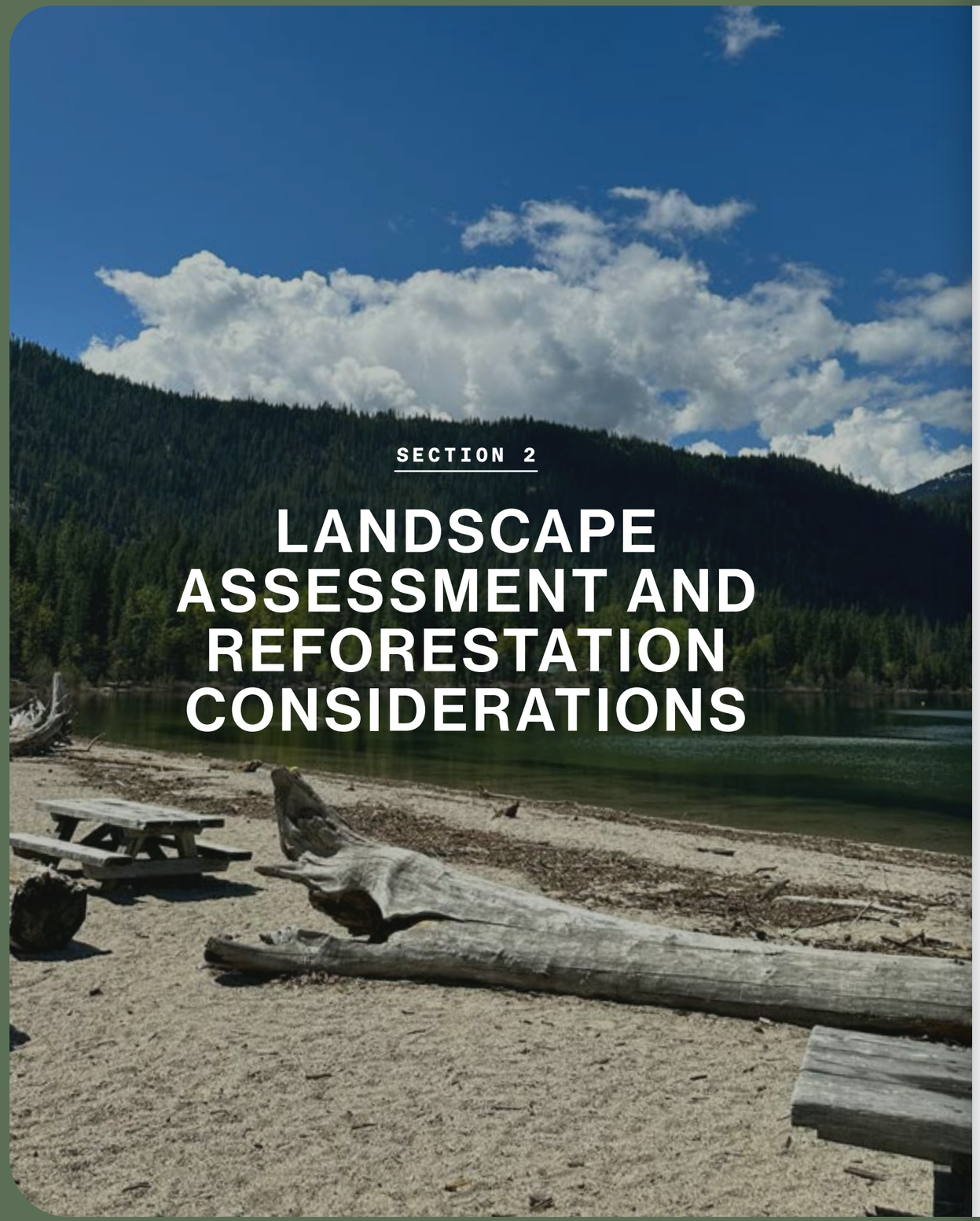
Carbon project developers use different models to develop and fund their projects, so it's important to understand what the project offers you as the landowner, how it aligns with your land use objectives, and the length and terms of the project agreement.

Key considerations and risks

- **Feasibility assessment fees.** Developers will need to assess if your property is suitable for carbon financing. This usually involves several conversations and at least one site visit. Be aware that some developers may charge substantial fees for a full feasibility assessment, while others offer it at no charge. Discuss this with the project developer before beginning the assessment.
- **Responsibility, revenue, risk.** Developers may use different business models. Clarify who handles project setup and long-term maintenance, how the project generates income, and if there is additional compensation or costs to you as the landowner.
- **Long-term management restrictions.** Carbon projects require "permanence", meaning your trees must be allowed to grow for 40-100+ years. This could impact the amount of timber harvesting and other activities that are allowed during the project lifespan. In addition to following state forestry laws, some developers will work with you to design plantings that consider local ecology and forest health—as long as the project still makes financial sense. Since restrictions vary significantly between developers, discuss exactly what you can and can't do on your land before signing any agreement.
- **Contract terms.** Reforestation projects typically come with long-term binding agreements. Before signing, understand how the contract affects your ability to sell your property and what obligations transfer to future owners. Consult with an attorney and tax specialist to review any agreement before committing.
- **General considerations.** The carbon market is still evolving after 30+ years, which carries inherent risks. Most US forest carbon projects currently focus on improved management of existing forests (and focus on management like extended harvest rotations), but reforestation projects are becoming more common due to increasing wildfire recovery needs. University extension services like Oregon State University and Penn State offer additional resources to help you understand carbon markets and evaluate opportunities for your property.

For more information, refer to resources such as:

- Oregon State University's Introduction to Forest Carbon, Offsets and Markets[23], which explains forest carbon markets and how you might incorporate carbon financing into your forest management planning.
- The Natural Capital Program Consideration Pocket Guide[24] provides suggested questions to ask when considering a funding program.



SECTION 2

LANDSCAPE ASSESSMENT AND REFORESTATION CONSIDERATIONS

2.1 Post-Fire Assessment

The first step in planning for landscape recovery is understanding the post-fire condition of your land. A forestry professional, such as a DNR Service Forester or a conservation district Forester, can conduct an initial assessment to evaluate wildfire impacts and help determine what your land needs to recover. This assessment will identify immediate risks, clarify your goals as a landowner, and outline potential treatment options. It also helps define next steps and available resources, including seedling needs, a restoration timeline, and whether developing a formal reforestation plan is appropriate.

Assessments typically cover:

Pre-Fire Conditions

What types of trees and plants dominated your landscape before the fire? Understanding the ecological history of your land can provide insight into which species are most likely to thrive. Restoration efforts should align with the native vegetation of your region to promote survival and landscape health.

Post-Fire Conditions and Assessment of Burn Severity

Understanding burn severity is the first step in identifying both immediate and long-term treatment needs. The assessment will evaluate the immediate mortality and potential survivability of trees and vegetation, identify erosion potential, and assess the post-fire establishment of native and non-native species. It is important to note that conditions can range widely based on the timing of your assessment.

In addition to vegetation impacts, burn severity assessments should include evaluations of overstory tree mortality and stress, as these factors can elevate the risk of post-fire beetle outbreaks. High tree stress and partial crown scorch can make surviving trees especially vulnerable to pine bark beetle infestations, which can cause additional delayed mortality.

Assessments should also consider terrain and physical hazards, particularly on steep slopes where the potential for debris flows and landslides is heightened. Post-fire conditions may have destabilized soils and root structures, increasing the risk of slope failure during storm events.

Finally, it is critical to monitor post-fire weather patterns, including rainfall intensity, high winds, and freeze-thaw cycles, which can exacerbate erosion, increase tree fall hazards, and influence the trajectory of vegetation recovery. Integrating this information into your post-fire response planning will support more adaptive and effective restoration actions.

- **Overstory Assessment.** Typically, trees that experience crown scorching, defined as having 50% or more of their leaf or needle coverage burned – though this varies by species – will have a very low probability of survival. Assessing live versus dead trees will help determine the potential for natural regeneration, the need for hazard tree removal, and the feasibility of conducting a salvage logging operation (see Spotlight on Salvage Logging on page 24).

  Refer to the Tree Survival Rapid Assessment [25] and Removing Dead and Fire-Weakened Trees After a Fire [26] factsheets for more information on tree mortality and removal.

- **Soil and Understory Vegetation.** Assessing the burn severity, particularly in terms of soil conditions and understory vegetation, will help you understand the immediate risks of erosion and occupation of invasive plant species. When fire burns deep into the soil's organic layer, it can destroy beneficial microorganisms, reduce the soil's ability to retain moisture, and increase vulnerability to erosion, especially on slopes or during heavy rain. The post-fire soil conditions will determine immediate remediation needs such as seeding for erosion mitigation, control of invasive vegetation, and selection of tree species for reforestation.

  An assessment of the establishment of invasive grasses, shrubs, or trees that could outcompete native species will be needed to develop a vegetation management plan to control and mitigate their spread. Post-fire vegetative conditions can range widely based on the timing of your assessment. For instance, if one or multiple growing seasons have passed before you are able to conduct an initial assessment, the area will have established new vegetation. Areas regenerating with desired native species should be identified and marked for exclusion from treatment. These areas can save you time and money. Conversely, areas colonized by invasive species will need to be prioritized for removal treatment and the planting of native species (see Spotlight on Common Types of Invasive Plant Species on page 21).

- **Surviving Trees.** When a wildfire leaves live trees within its footprint, these surviving trees can serve as a valuable seed source for the natural regeneration of new trees (see Natural Regeneration on page 32). To support this process, it's important to first identify and protect these surviving trees. Healthy, mature trees with full crowns are especially valuable, as they tend to produce more viable seed. To foster natural regeneration from surviving trees, maintain tree health by: 1) avoiding unnecessary stressors such as overgrazing or mechanical damage, and 2) minimizing ground disturbance to preserve seedbeds.

SPOTLIGHT: COMMON INVASIVE PLANT SPECIES OF EASTERN WASHINGTON

- **Annual grasses.** Species like cheatgrass (Bromus tectorum), Ventenata (Ventenata dubia), and Medusahead (Taeniatherum caput-medusae) are highly flammable and rapidly invade fire-disturbed areas, increasing fire frequency and intensity. Their dense growth prevents the regeneration of native plants.

- **Knapweeds.** Species including diffused knapweed (Centaurea diffusa), spotted knapweed (Centaurea stoebe), and Russian knapweed (Rhaponticum repens) can rapidly take over burned areas and outcompete native plants. This can reduce food and cover resources for wildlife and increase the potential for reburn. Additionally, knapweed spines can cause injuries to livestock, and Russian knapweed is toxic to horses.

- **Weedy shrubs.** Plants like blackberries (Rubus fruticosus), Scotch broom (Cytisus scoparius), and other nonnative shrubs often thrive after fire due to their ability to quickly regenerate and spread through seed or root systems. These species can outcompete native shrubs and trees, reducing biodiversity and altering habitats.

- **Tree species.** Certain nonnative trees, such as tree-of-heaven (Ailanthus altissima) and Russian olive (Elaeagnus angustifolia), may be introduced to fire-affected areas. These trees can dominate ecosystems by crowding out native species, leaching allelochemicals into the soil, and monopolizing soil moisture.

For more information, refer to resources such as:

- WSU Extension – Invasive Weeds of Eastern Washington [27]
- Eastern Washington Field Guide: Noxious Weeds That Harm Washington State [28]

2.2 Reforestation Considerations

As a landowner, one of the key decisions you'll face is whether to reforest all or part of your fire-affected land, and if so, how to go about it. This decision depends on a variety of factors, including legal requirements, financial implications, your land management goals, and the long-term resilience of your forest in a changing climate. Your initial assessment will help inform how you address these factors. If you think that reforesting may help meet your land management objectives, the following considerations are important to review and discuss with a forestry professional.

Desired Future Conditions

Establishing clear objectives for the future of your land is essential, as these goals will shape decisions around forest restoration, species selection, and long-term management practices. Objectives may include a range of goals reflecting your values, such as wildlife habitat, timber production, recreation, or conservation. It's important to clearly define and communicate these desired future conditions to your local forestry professional.

Equally important is discussing what is feasible for you in terms of time, effort, and budget. Forest management is an ongoing process that extends beyond initial reforestation. Future activities such as maintenance, thinning, or invasive species control, can involve additional costs and time commitments. Being upfront about your financial capacity will help your forestry professional recommend realistic strategies that align with both your goals and your resources. Since forest management often spans generations, it's also important to consider succession planning as part of the process. Will others in your life eventually take over the management of your forest? If so, involving them early in the planning can help ensure that the future forest reflects shared goals and supports long-term stewardship.

Some common forest management objectives include:

- Generating revenue from timber and other forest products
- Enhancing, preserving, or creating wildlife habitat
- Supporting woodland pasture and livestock grazing
- Promoting species diversity
- Increasing resilience to climate change and wildfires
- Improving drought tolerance and water retention
- Retaining privacy and/or property aesthetic
- Managing for non-timber forest products

Legal Considerations: Are You Required to Replant?

In the wake of a wildfire, you may wonder whether you are legally required to replant your forest. For landowners in eastern Washington, there are several laws and regulations to consider.

- **Forest Practices Rules.** Washington State has rules and regulations which regulate timber harvests, road construction, and reforestation activities to protect natural resources such as soil stability, wildlife habitat, and water quality. While these rules apply to all forestland owners, non-industrial private landowners may encounter specific requirements related to replanting after a harvest or wildfire. Review Washington's Forest Practices Rules [7]

- **Salvage Logging.** In some cases, salvage logging (sometimes referred to as post-fire harvest) – the removal of dead or dying trees with existing commercial value – may be a beneficial option for landowners as it removes hazardous trees and allows landowners to potentially make a profit from the sale of timber (see Spotlight on Salvage Logging on page 24 for more information). However, it is essential to be aware of restocking requirements under Washington's Forest Practices Rules 7. These rules outline specific guidelines for establishing a forest following a logging operation, including replanting deadlines, species requirements, and restocking thresholds. Failing to meet these requirements could result in fines or other legal consequences, so staying informed is important. Contact the DNR Small Forest Landowner Regulation Assistance Program [18], which provides educational resources on your reforestation requirements following a wildfire.

- **Tax Deferral.** If your property is in tax deferral, Washington State law requires you to replant to restore the land's value to what it was before the fire. Landowners must actively manage and reforest post-wildfire, unless soil or terrain changes make replanting unfeasible. Failing to replant within a reasonable amount of time could result in losing tax deferral status, leading to deferred taxes, penalties, and interest. Contact your county tax assessor to understand your legal requirements and time allotment to avoid a potential tax arrearage. Consult a local forester or the DNR for guidance and resources.

SPOTLIGHT: SALVAGE LOGGING

Definition: salvage logging is the harvesting of trees after disturbances, such as wildfire, with primary motivations to recover economic value or reduce the risk of subsequent disturbances

To salvage log or not is one of the first decisions you will have to make as a landowner whose forest land has been impacted by wildfire. Salvage logging can be an appealing option for some, as it provides landowners the opportunity to remove hazardous trees (which is necessary to prepare your site for replanting) while also making profit from the sale of timber. However, it requires careful consideration of the legal, financial, and environmental factors associated.

1. Timing

Timing is a critical factor in salvage logging because burned trees deteriorate quickly due to insects, fungi, and weather exposure, reducing their market value. Prompt action also helps mitigate safety risks from falling trees. Since salvage logging decisions affect both economic returns and long-term forest health, landowners must evaluate their options as soon as possible after a wildfire.

2. Restocking Requirement

While potentially lucrative, salvage logging often triggers a legal requirement to replant after harvest. This is especially true under the Forest Practices Rules 7, which mandates that landowners restock harvested areas to maintain sustainable forest management. While salvage logging can help clear fire-damaged trees, you'll need to plan for replanting or other restoration efforts to meet these restocking requirements.

3. Ineligibility for Funding Resources

In some cases, landowners who engage in salvage logging may find themselves ineligible for certain financial resources. You'll need to weigh the financial benefits of harvesting against the potential loss of funding opportunities for replanting.

4. Environmental Concerns & Soil Health

Salvage logging can raise significant environmental concerns, especially related to soil health. The degree of soil disturbance – and resulting impacts such as erosion and changes to site hydrology – can vary based on factors like the type of logging operation (e.g., ground-based yarding or cut-to-length systems), the use of heavy equipment, and the timing of operations (particularly whether soils are dry or frozen). These conditions can hinder both natural regeneration and successful replanting efforts. Because of these potential long-term effects, it's essential to consult with a forestry professional before beginning salvage logging to evaluate the ecological trade-offs and plan accordingly.

If you do decide to harvest your land post-fire, you may have questions about permitting or locating a reliable contractor. For more information, refer to resources such as:

- DNR's Small Forest Landowner Office [3] is available to help answer questions.
- Refer to the Forest Landowners: Forest Management Decisions Post-Fire & Salvage Logging factsheet [29] for a timeline and information for hiring a logging contractor.

Financial Considerations

Forest restoration can be expensive, and many landowners face significant financial challenges after a wildfire. The cost of replanting can vary widely depending on the size of the affected area, the type of forest, and the species planted. Since costs are highly variable, it is important to be in touch with a forestry professional to help you understand your needs, create a reforestation plan, and get connected with available programs and resources to reduce costs. If your property has enough surviving trees, waiting for natural regrowth may be a more cost-effective and ecologically sound option. A list of financial programs and supplemental resource tools can be found on page 11 in Section 1.3 of this guide.

Adapting to a Changing Climate

As eastern Washington faces increasing temperatures and changing precipitation patterns, it is important to be mindful of the effects a changing climate may have on your forest land and what that means for the decisions you make today. Seedling and tree mortality can result from various factors including drought, high temperatures, competing vegetation, rodents, disease, or even repeat fires – which are exacerbated by a warming climate. Due to eastern Washington's arid climate and seasonal drought, your forest land may be especially vulnerable to these stressors. The following tools can help you understand your land, inform your reforestation decisions, and ensure you are asking the right questions.

Resources and Tools to Help You Plan for the Future of Your Forest:

- **Forestry professionals.** Consulting with a local forester or professional forestry consultant can provide valuable insight into how climate trends may impact your specific site. They can help you integrate climate-adaptive strategies into your reforestation and management plans.

- **Nursery and seed suppliers.** When purchasing seeds or seedlings, it's important to ask suppliers about the climate adaptability of the species. Choosing plant stock suited to future climate conditions can increase seedling survival and support long-term forest resilience. Nursery staff can provide detailed guidance on selecting the most appropriate species and seedling stock for your site and long-term management goals. See page 37 for more information on species mix and stock.

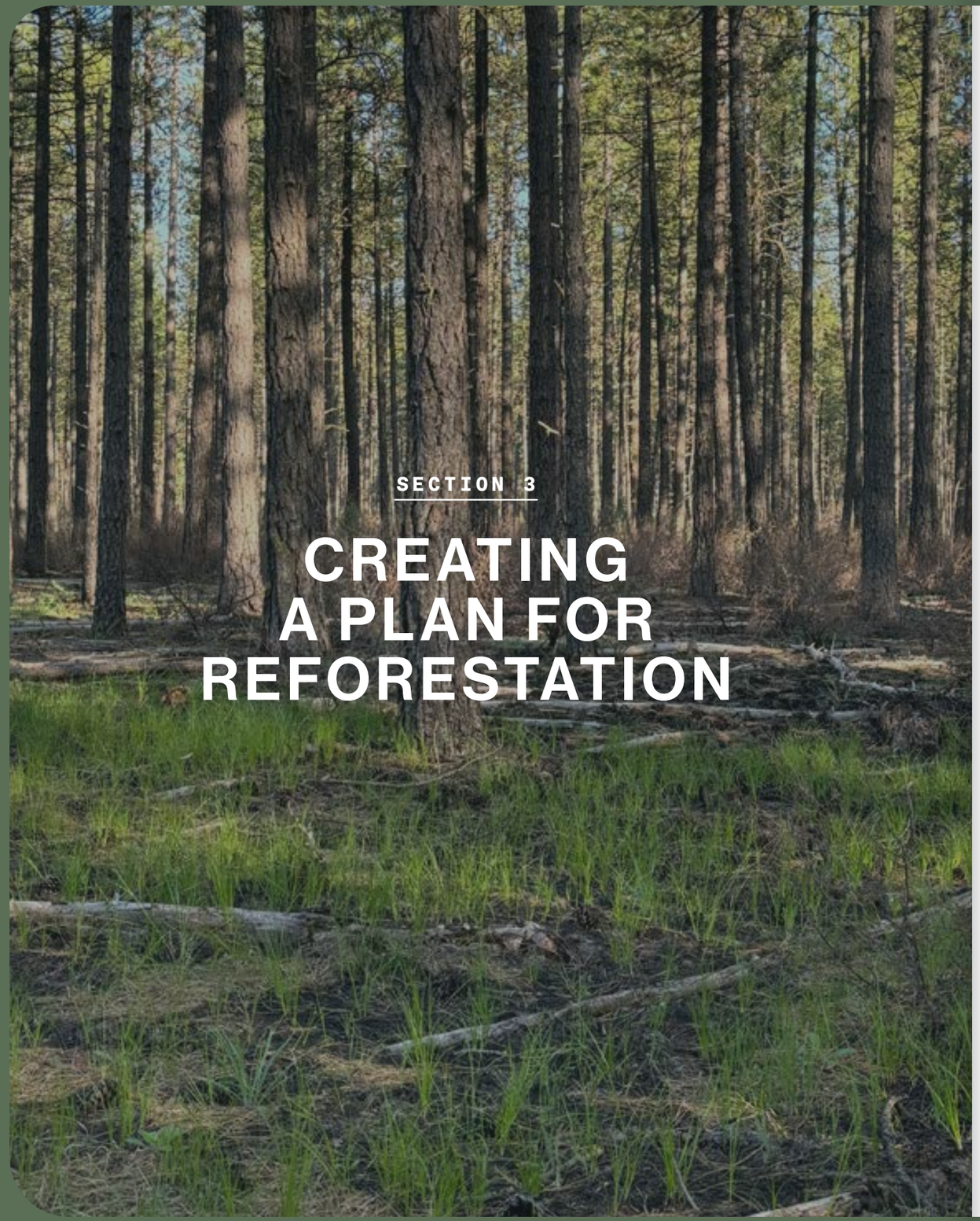
- Seed Lot Selection Tool [30]. In addition to guidance from your nursery or seed supplier, the Seed Lot Selection Tool is a GIS-based application which helps match seed lots to appropriate planting sites by factoring in changing climate conditions.

- A Climate Resilience Guide for Small Forest Landowners in Eastern Washington [31]. This guide can help you to understand the region's latest climate research and how trends could affect your land. It also highlights actions you can take to increase the resiliency of your forest.

Alternatives to Reforestation

You may determine that reforestation, whether through planting or natural regeneration, is not feasible or does not align with your land management goals. Depending on factors like your location, fire severity, drought conditions, etc. it might be more suitable to convert your forest property to a new or different forest type or a non-forest cover type, such as grassland, meadow, or even cover crop. When considering alternatives, it is important to consider the ecological, economic, and tax implications of your decision.

For instance, if your property is enrolled as designated forest land with the Washington Department of Revenue under a tax deferral program, discontinuing active timber management may affect your eligibility and could result in changes to your tax status.



SECTION 3

CREATING A PLAN FOR REFORESTATION

Every piece of land is unique. Subtle differences in slope, soil, sunlight, and water – known as microtopography – can dramatically affect how trees grow on your property. Recognizing and working with these natural features is key to selecting the right species, planting in the right places, and anticipating potential challenges.

This section guides you through the essential elements of creating a successful reforestation plan tailored to your land and available resources. Whether you're working with professionals or going it alone, starting with a clear plan helps you make smart, informed decisions and avoid costly mistakes down the road. Use this section as a practical starting point for developing a strategy that fits your land, goals, and resources.

SPOTLIGHT: FOREST MANAGEMENT PLANS (FMPS)

Creating a plan for your reforestation efforts is an important step in successful land management. You may have heard of this referred to as a Forest Management Plan (FMP), which is a formal document that outlines goals, strategies, and actions for managing your forest land. Different agencies use different names for similar types of plans. For example:

- Forest Stewardship Plan – Washington Department of Natural Resources
- Conservation Planning Activity (CPA 106) – Natural Resources Conservation Service
- Tree Farm Management Plan – American Tree Farm System
- Timber Management Plan – WA Department of Revenue

To bring consistency across programs, Washington State has adopted the Integrated Forest Management Plan Guidelines and Template[32]. This framework is shared across the different agencies listed above.

Do You Need a Formal Plan?

A formal FMP is a valuable tool, but it can also be time-consuming and costly to develop. For landowners pursuing financial assistance through federal or state programs, an up-to-date FMP is often a requirement. This means that if

you already have a FMP, it will most likely need to be updated to reflect your property's post-fire conditions and your new management goals. In some cases, funding may be available to help cover the cost of developing one.

However, you don't always need a formal FMP, especially if you're financing the project yourself or managing it on a smaller scale. What's most important is that you have some kind of clear, thoughtful plan in place.

Where to Start

Even if you're not creating a formal FMP, the Integrated Forest Management Plan Template is an excellent reference for best practices. It offers a comprehensive approach to planning your forest management activities. WSU Extension Forestry offers Forest Stewardship Coached Planning Courses to help forest owners develop their own plans using this template with the support of professional foresters.

Whether you decide to pursue a formal FMP or not, this "Create a Reforestation Plan" section of the guidebook focuses on the key elements of a successful plan. Use it as a practical starting point for developing a strategy that fits your land, goals, and resources.

3.1 Plan to Your Property's Strengths

Climate and Weather

Climate and weather patterns at your project site influence several critical reforestation decisions and concerns:

- **When to plant.** Determine the optimal time of year for tree establishment on your property. See Time of Year on page 54.
- **What to plant.** Ensure selected species and their stock-type are well-suited to current and future conditions. See Seed Procurement on page 41.
- **How much to plant.** Balance competition, growth rates, and resource availability such as sun, moisture, and nutrients. See Spacing and Species on page 56.
- **Long-term viability.** Assess and plan for changing climate conditions. See Adapting to a Changing Climate on page 26.

Both current and projected climate conditions will determine which species can thrive over time. Key factors to consider include:

- **Temperature.** Evaluate average temperatures, length of the growing season, frost dates, and potential temperature extremes that may stress seedlings.
- **Precipitation.** Assess annual rainfall and seasonal distribution. Some species tolerate drought, while others require consistent moisture.
- **Wind exposure.** Strong winds can increase water loss and damage young trees. Identifying wind-prone areas can help determine the need for windbreaks or strategic planting techniques.

By integrating climate data into your planning process, you can improve seedling survival rates, enhance forest resilience, and ensure long-term success. See Adapting to a Changing Climate section on page 26 for resources on climate adaptation.

Site Characteristics and Microtopography

Assessing site geography and local topography allows you to leverage favorable conditions while avoiding areas that may be difficult to manage or unlikely to support successful tree establishment. Key factors to evaluate include:

- **Slope, aspect, and grade.** Sun exposure and moisture retention vary by slope position, influencing species selection. On steeper slopes, erosion control measures may need to be implemented before planting. South and west aspects are typically the hottest and driest aspects.
- **High, dry, wind-exposed, well-draining soils.** These areas are best suited for drought-tolerant species such as Ponderosa pine, arid-adapted shrubs, or native grasses.
- **Lowland depressions with poor drainage.** These areas support moisture-adapted species like western redcedar, fir or lodgepole pine, or hardwoods such as red alder, black cottonwood, water birch, and quaking aspen.
- **Shaded areas.** Shade-tolerant species like grand fir and red cedar can thrive with limited sunlight. Stumps and logs can provide essential shade for seedlings, which can reduce their exposure to sunlight and wind.

- **Sun exposed.** Consider the variance of sunlight exposure within the site, as most tree species require ample sunlight to grow, but too much can cause seedlings to dry out. Plant drought-resistant species in warm, dry, sunny areas.
- **Soil texture type.** Different tree species thrive in different soil types. For example, conifers such as pines often thrive in sandy or well-drained soils, while hardwood species like oaks prefer loamy or clay-rich soils. Understanding your soil composition will help guide your decisions on which species to plant in specific areas.Tools such as the NRCS Web Soil Survey Tool [33] can help you determine your soil type as well as various other characteristics of your property.

Natural Regeneration

In areas where desirable vegetation is naturally regenerating, fostering this growth can be a cost-effective and ecologically beneficial approach. This is particularly useful for hardwoods like maples and oaks, which can be difficult to source from nurseries. Where natural hardwood regeneration occurs, it is often best to support its development. When planting conifers, create a reasonable buffer distance from hardwood clusters to balance species composition and avoid future crown damage. (See the Conifer and Hardwood Mixing section on page 57 for more guidance). Natural regeneration is generally more affordable than hand planting but may occur at a slower pace. To understand natural regeneration patterns, consider the natural buffer effect: areas closest to live seed trees will regenerate more densely, while edges further away may see lower seedling establishment. If uniform tree spacing is desired, supplemental planting may be necessary in areas with low natural regeneration, and early thinning may be required near seed trees to create and maintain desired densities. For more information, see the Consider Natural Regeneration section on page 58.

3.2 Forest management planning assistance

Organization	Assistance offered
Washington Department of Natural Resources	Following qualifying disaster events, DNR supports the implementation of FSA's Emergency Forest Restoration Program (EFRP) [11] by providing technical assistance to participating landowners, and writing forest planning documents required by that program.
USDA Natural Resources Conservation Service	Through the NRCS Environmental Quality Incentives Program (EQIP) [15], landowners may receive funding for the development of a Forest Management Plan by a qualified forester. By having an FMP you may then be eligible to receive EQIP financial assistance for implementing practices within your plan. Supplemental resource: • Healthy Woods Start with a Plan factsheet [34]
Conservation Districts	Some but not all districts will have the capacity to write full FMPs for landowners. It's always good to check with your conservation district to explore the assistance they have available.
Consulting Foresters	Many landowners work directly with private consulting foresters to develop a Forest Management Plan. Be sure to consult with the forester about the funding sources you intend to pursue to ensure their qualifications and the FMP template they utilize will meet program requirements.
Consulting Foresters	There are many resources available to help landowners understand the forest management planning process and draft their own plan. Educational entities, like WSU Extension, may offer workshops or "coached planning" sessions where groups of landowners work through the forest planning process together. This is especially common during times of high need, such as after a significant wildfire. Resources: • WSU Ext. – Coached Forest Stewardship Planning [35] • American Tree Farm System – Management Plan Template [36] • Northwest Natural Resource Group – Management Planning Resources [37]

Initial Burn Event

Anytime after burn/when you're ready

Site assessment

Create reforestation plan (after assessment)

Debris removal and mulching

1-3 months after burn

Salvage log (if applicable)

Erosion control & native grass seeding

Hazard tree removal

1-2 years before planting

Option A: Procure seed & nursery space for custom seedling production

Option B: Purchase already-grown seedlings

3-6 months in advance of work

Arrange agreements for contracted work (i.e., site prep, planting, etc.)

Season prior to planting

Site preparation (late winter / early spring or late summer / early fall)

Planting

Spring or Fall – depends on species and planting site

1-2 years post-planting

Annually, vegetation management "Spring Release"

1-5 years post-planting

Annually, monitoring & survival survey

3-5 years post-planting

Free to grow (no more veg management required)

Every 1-2 years

Continued monitoring

10-12 years post-planting

Precommercial thinning (PCT) assessment

SECTION 4

PREPARING FOR IMPLEMENTATION

Once you have a reforestation plan, the next steps include procuring seedlings and deciding how the work will be done (i.e., whether you plan to do it yourself or hire a contractor). This section emphasizes the importance of early planning and provides guidance on different methods accomplishing each of these stages.

Sections 4.1 and 4.2 focus on species mix selection and seedling procurement, an often complex task for those new to the process. Be sure to utilize forestry professionals and resources such as the Reforestation, Nurseries, and Genetic Resources website [38], which is a growing information base of reforestation research publications, a business directory, and more. Additionally, the Target Concept Framework [39] provides more detailed information of the concepts provided in Sections 4 - 6 of this guide.

4.1 Determine Species Mix

Regardless of how you obtain your seedlings, which will be described in the next section, you will need to select the appropriate mix of species. Several factors need to be prioritized and considered.

Seed zone and local adaptation

Seed zones are geographic areas where tree, shrub, and other plant species have genetically evolved and are adapted to specific climatic and ecological conditions. Choosing species with the right genetic adaptation to your planting site will increase the chances of survival. To avoid planting trees that may not be suitable for your location, consider the following:

- **Seed zone and local genotypes.** Seed zones refer to geographical regions where specific tree species thrive most effectively. Most forest management agencies and nurseries classify seeds according to these zones to promote optimal growth. Ensure you choose species that are locally adapted for the site and that the genetic traits are suited to the planting location. Seeds from local sources are adapted to the regional climate, soil types, and pest pressures, enhancing their likelihood of success. However, one strategy to enhance climate resilience is to plant trees with genetics from more southerly seed zones in expectation that they will be more adapted to the future climate of that area.

  Resources like the Seed Lot Selection Tool [30] and the Washington Tree Seed Transfer Zone Book [40] are helpful in choosing which seed zone to source from. Always adhere to seed zone guidelines for the species you intend to cultivate.

- **Native Species.** Prioritize planting native species which will be adapted to your local climate, soil, and ecological conditions. Native trees are more resilient to local pests, diseases, and climate conditions, and they provide critical habitat for wildlife.

- **Species diversity.** Aim for a mix of species that complement one another. For example, a combination of fast-growing pioneer species (like alder or aspen) and slower-growing climax species (such as oaks or conifers) can help create a more diverse and resilient forest structure. This mix will also allow for different layers of canopy and undergrowth, which will improve habitat complexity.

- **Fire-resilient species.** After a wildfire, planting species that are fire-resilient (such as certain conifers like Ponderosa Pine or drought-tolerant hardwoods such as Oregon White Oak – see Spotlight on Fire-Resilient Trees of WA) can improve the long-term stability of your forest. Consider including species with thicker bark, deep root systems, or those that are naturally adapted to fire-prone areas.

- **Insects and disease.** Consider the vulnerability of the species you intend to plant to local pest pressures, as well as non-native pests that are likely to establish in the region. Planting a mix of species will safeguard you from significant pest damage in the future.

SPOTLIGHT: FIRE-RESILIENT NATIVE TREES OF EASTERN WASHINGTON

In fire-prone landscapes like those in eastern Washington, some native tree species are better adapted to survive and recover after wildfire. With fire-adapted traits such as thick bark, high canopies, and the ability to resprout, these species may be an excellent option for reforesting.

- **Ponderosa pine (Pinus ponderosa) —** One of the most fire-resilient conifers due to its thick bark and self-pruning branches. Mature trees often survive low to moderate-intensity fire. Widely planted in eastern Washington for its drought tolerance and ability to stabilize dry sites. Widespread across eastern Washington, especially in low to mid-elevation dry forests and foothills.

- **Western larch (Larix occidentalis) —** A deciduous conifer that tolerates fire thanks to its thick bark and sparse lower limbs. It grows quickly and is well suited for cold, dry climates. Regenerates well from seed in burned areas. Found in northeastern Washington and higher-elevation forests of the eastern Cascades.

- **Douglas-fir (Pseudotsuga menziesii) —** Moderately fire-resistant. Younger trees are vulnerable, but older stands can withstand moderate fire as bark thickens over time. In eastern Washington, Doug-firs are common in mid to upper-elevation forests and mixed conifer stands.

- **Oregon white oak (Quercus garryana) —** A fire-adapted broadleaf tree that resprouts vigorously from the base after fire. Oregon white oak supports a wide range of wildlife and is highly drought tolerant. Oaks are an important species along the foothills of the Columbia Gorge in south-central and southeastern Washington. For more information and resources for stewarding this ecosystem, turn to the Eastern Cascades Oak Partnership [41].

- **Black cottonwood (Populus trichocarpa)—** Not highly fire-resistant, but regenerates aggressively in wetlands and along rivers and streams. Useful for stabilizing streambanks and reestablishing vegetative cover after fire in wetter microsites.
- **Oregon white ash (Fraxinus latifolia)—** Less common but notable for its ability to resprout following fire. Typically found in wetter areas or along streams, where it contributes to habitat diversity and post-disturbance recovery.

Stock Type

Stock type is a reference to seedling root characteristics. Seedling stock comes in various forms, each suited for different reforestation goals. Select the appropriate stock type and seedling size based on your planting site conditions, budget, and reforestation objectives. The two main categories are:

- **Bare-root seedlings.** Young trees are grown in a nursery and sold, typically at 2 years old, without soil around their roots. They require careful handling to avoid root desiccation and damage. Bare-root seedlings require precise care and planting technique. Due to their fragility and handling needs, these seedlings should be managed and planted by experienced professionals. Since bare-root seedlings lack soil in their root structure at delivery, they are best suited for locations with organic soil material and a deep mineral soil layer to avoid rooting issues. Be mindful of the soil type if you choose to plant bare-root seedlings in eastern Washington, as many areas tend to have drier soils.

- **Containerized seedlings.** Grown in plastic pots or styrofoam trays, these seedlings typically take one year to produce, have a more compacted root system, and are more resistant to root damage during planting. Container seedlings are commonly referred to as “plugs” or as Styro-types, the latter denoting the size of the container where the seedlings are cultivated. Because container seedlings have a developed root system that includes soil as part of the plug, they are an excellent choice for shallow, dry soils with low organic matter and primarily mineral soil, which are common characteristics of eastern Washington’s arid landscapes.

Root and Shoot Size

Regardless of the stock type, the ratio between the dimensions of the root system below ground and the stem with foliage above ground matters. Recent research indicates that seedlings exhibiting a 1:1 root-to-shoot ratio tend to have a higher survival rate compared to those with larger stems relative to their roots. While more developed seedlings with larger stems and abundant foliage may outwardly appear more viable for establishment, they face greater risks from sun and wind exposure, which can lead to water loss through their leaves or needles.

4.2 Procuring Seedlings

There are two primary approaches to obtaining seedlings for reforestation: growing your own from seed in a reserved nursery space, or through direct purchase.

Option A. Seed Purchase and Seedling Production

This option requires more planning and coordination but provides the greatest control over seedling quality. It involves acquiring seed of the appropriate species and genetic source, and securing nursery space to grow seedlings tailored to your site’s conditions. While more time- and resource-intensive, this method ensures that the species mix,

seed zone, and stock type are well suited to your planting site, increasing the likelihood of successful establishment and long-term forest resilience.

If you choose to grow seedlings from seed, review the following considerations regarding seed sourcing and reserving nursery space and be sure to discuss them with your service providers.

Seed Procurement: Sourcing the Right Genetic Material

When sourcing seeds and reserving nursery space, it's best to coordinate with both the seed supplier and the nursery at the same time. Nurseries require key details – such as seed germination rates and the number of seeds per pound – to calculate how much seed is needed to produce the desired number of seedlings. Clear and timely communication during this phase helps ensure accurate seed procurement and smooth seedling production, keeping your project aligned with its timeline.

State seed banks, nurseries, and other seed suppliers can assist you or your reforestation professional in sourcing the appropriate genetic seed stock and seed zone for each tree species planned for the project area (refer to the Directory at the end of this guide for a list of nurseries who serve small forest landowners). By providing basic site details – such as county, site elevation, and desired species mix – seed suppliers can match your project with the correct genetic material for nursery propagation. Supplying additional information, such as the legal land description (Township, Range, and Section), can further improve seed selection to ensure better site adaptability and long-term forest health.

Information to provide your seed supplier:

- **Site details:** State, county, site elevation, and legal land description (Township, Range, Section), if available
- **Species & quantities:** Desired species mix and number of seedlings needed per species
- **Stock preferences:** Whether you want bare-root or containerized seedlings
- **Project timeline:** Date when nursery will need the seed to ensure enough time for seed treatment and seedling production in time for planting

To ask your seed supplier:

- At a minimum, reputable seed suppliers will provide:
  - — Germination percentage and when testing was done
  - — Number of seeds per pound
  - — Seed zone or coordinates of where seed was collected
  - — Seed age
- Some seed suppliers may also provide:
  - — Seed fill – the proportion of filled seeds
  - — Purity – the proportion of actual seed versus all materials (which includes empty seeds and other debris)
  - — Seed storage information – this can be helpful for nursery growers to consider when they prepare for sowing

Purchasing and timing

- **Order early.** Seed availability varies significantly by species, seed zone, and season. Some native tree species only produce good seed crops every few years, and supplies can become scarce in certain regions after major wildfire years when demand spikes. Start sourcing seeds several months (and up to a year) before the nursery needs to start seedling production to ensure availability and avoid project delays. Sometimes, when seed is not available, targeted collections are needed, which may add months or years to the project timeline, which is why early planning is essential (refer to the Timeline on page 34).
- **Quality check.** Work with credible suppliers who provide seeds of known origin from appropriate seed zones for your location. Understand your seed lot quality, including seeds per pound, as well as germination, purity, and fill rates. When seed supplies are limited, you may have fewer seed lot options to choose from. An experienced nursery can use this seed quality information to calculate exactly how much seed is needed to produce your target number of seedlings.
- **Consult experts.** Check with local forestry experts (nurseries or key partners) about species selection, seed zones, or sourcing locations for recommendations based on your regional climate, soil, and restoration goals..

Acquire nursery space: preparing for seedling growth

Locate a local nursery to germinate and grow the sourced seeds. It is crucial to find a nursery that can meet your seedling development needs. Some nurseries have minimum order requirements that must be met. It is also ideal to locate a nursery that is within reasonable proximity to your project area. Often, nurseries can help identify potential seed sources during the seed procurement process.

Choosing a nursery

- **Commercial nurseries.** Many private landowners work with commercial nurseries for growing their seedlings. Ensure that the nursery is reputable and experienced in growing the species you are planting. Confirm that the nursery can provide the required stock type (e.g., bare-root or containerized seedlings) and that they are knowledgeable about best practices for growing climate-resilient, fire-adapted species.
- **Public nurseries.** Landowners may also be able to grow seedlings at public nurseries, such as Washington DNR's Webster Nursery [42]. Public nurseries are also a great resource for information on stock types, seedling storage handling and care, and planting instructions.

Nursery planning considerations

- **Minimum order requirements.** Find a nursery that can meet your order quantity. If your need is relatively small, you may need to work with a nursery that will accept fewer seedlings. See list of Nurseries in the Directory.
- **Public nurseries.** Landowners may also be able to grow seedlings at public nurseries, such as Washington DNR's Webster Nursery 42. Public nurseries are also a great resource for information on stock types, seedling storage handling and care, and planting instructions.
- **Determine seedling stock and type.** Bare-root and container seedlings have different development timelines. Typically, container seedlings are ready for planting with only one year of growth, while bare-root seedlings are ready for planting at two years old. The timing of when the seedlings are ready for planting will establish the timing for the site preparation treatment and the post-planting vegetation management treatments (see Section 6.1 for more information). Determine your planting season and seedling type to develop a treatment timeline for reforestation.

Option B. Direct Seedling Purchase

This option involves buying ready-to-plant seedlings from a nursery or a seedling distribution program. This option is less labor intensive and can accelerate the reforestation timeline, especially if seedlings are available shortly after a wildfire. Planting sooner can reduce site preparation and vegetation management costs. However, availability is often limited, and you may not receive the ideal species, genetic source, or stock type for your specific site conditions. For instance, purchasing bare-root seedlings instead of containerized seedlings for a dry, low-organic soil site may lead to low survival rates, especially if the area experiences a prolonged drought or other disturbances. If you can acquire appropriate seedlings directly, you should take advantage of this as receiving grown seedlings will help reduce the additional planning steps involved with ordering seed and procuring nursery space.

Securing seedlings for your property following a major wildfire can be challenging due to high demand. This challenge can be even greater for small-acre forest landowners because some nurseries require large-scale orders and work mainly with large industrial or government land managers. However, there are many options for sourcing seedlings if you know where to look.

- **Partner-led seedling programs.** Several organizations have helped landowners secure seedlings for wildfire recovery. These seedlings are often sourced through donations from One Tree Planted and the Arbor Day Foundation, or from surplus stock provided by the DNR's Webster Nursery or industrial timber companies. These opportunities can change year-to-year so be sure to check in with your technical assistance provider about current opportunities.

  As described in Section 4.1, successful seedling establishment relies on matching your seedlings to your site. Planting 'bargain seedlings' or free seedlings from a different seed zone (called "off-site") are unlikely to thrive or even survive.
- **Native plant sales.** Some conservation districts offer annual or biannual native plant sales sourced by local nurseries. If your reforestation project is small, discuss this option with your conservation district to understand your ordering options, the appropriateness of the available seed stock, and to ensure you are prepared to plant as soon as you receive your order.
- **Regional nurseries.** Although some tree nurseries have minimum tree order requirements catering to larger landowners, many nurseries are happy to take small orders. In 2024, a regional survey identified a list of nurseries in Washington and Oregon that would accept orders as small as 500 trees. See Directory for a list of nurseries and their contact information.

4.3 Implementation Methods

Landowners typically have two main options for carrying out their reforestation plan, particularly in regard to the site preparation and tree planting phases. You can hire contractors to do the work or take a Do-It-Yourself (DIY) approach. Each option has its trade-offs. The right choice depends on your experience, time, and the complexity of the project. While hiring a contractor may be more expensive, it often allows for faster and more efficient completion, especially for large-scale or technically demanding work, thanks to their specialized equipment and expertise. Contractors often bring years of experience and can handle work more efficiently than individuals who may be learning new techniques as they go. On the other hand, completing treatments yourself can reduce costs, but will generally take more time and effort.

Be sure to explore locally available financial assistance options before making a decision, as they may pay for some or all contractor implementation costs.

Do-It-Yourself

DIY approaches are best suited for smaller-scale projects or less complex activities, particularly for landowners who enjoy hands-on involvement or have support from family and friends. Landowners should consult the Small Forest Landowner Office[3] and the Forest Practices Rules[7] to ensure they comply with all forest practice laws and regulations. The Small Forest Landowner Office can direct landowners toward information on the Forest Practice Application process, permitting, reforestation standards, and any legal considerations for timberland management.

While this guidebook is not designed to teach landowners how to complete reforestation projects entirely on their own, it does provide a clear overview of the steps involved. For more technical guidance, refer Section 1, which includes additional planting resources and references.

Keep in mind that reforestation is a complex and labor-intensive process. Mistakes can be costly, sometimes more so than hiring expert help, so weigh the benefits and risks carefully before going the DIY route.

Hiring Contractors

Landowners aiming to simplify the reforestation process should consider hiring skilled professionals for optimal outcomes. Start by identifying which parts of the process – such as site preparation, planting, post-planting vegetation management, etc. – will be carried out by contractors, and secure those services well in advance. For instance, once you've arranged for seed and nursery space, you'll receive a seedling delivery date. This date will help you schedule the necessary treatments, each with its own timeline. Using these projected treatment dates, begin connecting with potential contractors. In general, it's recommended to finalize contracts 3-6 months ahead of each treatment. In periods of high demand, even more lead time may be necessary. Contact service providers early to ensure their availability and align your contract timeline with your overall reforestation plan.

Local resources such as stewardship forests, conservations districts, and NRCS conservation district offices may have a list of contractors in your area that can help with your treatment needs.

When selecting a contractor, landowners should:

- Research experience and past projects. Ask for references and examples of previous related work.
- Verify proper licensing and certifications. Ensure that contractors handling herbicide applications hold the necessary certifications for chemical use and comply with state regulations.
- Obtain multiple bids and detailed contracts. A clear agreement outlining the scope of work, timeline, and expectations helps prevent misunderstandings.

Special Considerations for Herbicide Application

If vegetation control involves herbicide application, it is critical to hire a contractor with the proper herbicide applicator certification. This ensures compliance with state regulations and helps prevent environmental risks. Landowners can check with WA State's Department of Agriculture[43] for a list of certified applicators.

4.4 Assistance for Finding a Contractor

Type of Assistance	Resources
Online Databases	The following organizations maintain databases of contractors: • WSU Ext. – Consulting Forester Directory [44] • WSU Ext. – Washington State Small Scale Sawmill Directory [45]
Referrals	Many NRCS service centers, conservation districts, and extension agents maintain their own lists of local contractors. Seek out personal referrals from those who have worked directly with forestry contractors, such as neighbors, conservation districts and watershed councils.
Educational Publications	There are many publications that can provide guidance on how to choose a contractor. Here is an example of a resource we like: • OSU Ext. – Choosing the Right Forestry Services Contractor: Practical, Ethical and Environmental Considerations [46]

SECTION 5

IMPLEMENTING LAND MANAGEMENT ACTIVITIES

Once your plant materials are secured and your implementation plan is in place, it's time to begin on-the-ground work. This section guides you through the various land management activities to prepare your site for planting, along with important planting considerations and techniques to help ensure successful tree establishment.

5.1 Pre-Planting and Site Preparation

Certain land management activities are essential to preparing your land for planting trees. These treatments address hazardous post-fire conditions, stabilize soils to prevent erosion, prevent or address the incursion of unwanted vegetation, and generally create favorable conditions for tree establishment and survival.

Site Stabilization

If your site is on a slope or in an erosion-prone area, it's wise to implement erosion control measures like silt fences, erosion control blankets, and/or seeding with native grasses, wildflowers, and shrubs to stabilize the soil. Keep in mind that native seedings may be affected by subsequent site preparation and may require re-establishment after tree planting. However, establishing native grasses, flowers, and shrubs early on can help mitigate erosion before reforestation efforts commence. Erosion has the potential to wash away topsoil, which is crucial for the survival of seedlings. Erosion control measures should be implemented as soon as possible, as wildfire-affected sites are most vulnerable during peak precipitation events in the fall, winter, and spring that typically follow the fire season.

Debris Removal

After a wildfire, your land may be covered with fire-related debris such as standing dead trees, fallen logs, and scorched vegetation. It's important to remove large debris and downed trees that could hinder planting efforts or increase future wildfire risk. At the same time, consider leaving smaller organic materials such as logs, snags, and large-diameter woody debris in place, as they can provide valuable habitat, support soil health, and promote biodiversity.

Refer to resources such as the Removing Dead and Fire-Weakened Trees After a Fire factsheet [26] for information on removing hazards and standing dead trees.

Removal of Standing Dead Trees

You may need to address dead standing trees on your property if you do not opt to conduct salvage logging or a post-fire harvest. These snags may present a falling hazard and risk the safety of people or property. They may also increase your property's on-site fuels and wildfire danger in the event of a future wildfire. Selective cutting can preserve living, healthy trees and target the most hazardous dead standing trees - while leaving non-hazardous snags for wildlife habitat.

Vegetation Management

The presence of invasive or non-native species may hinder reforestation efforts. Wildfires frequently enable invasive species to thrive, especially aggressive grasses and shrubs that outcompete young trees for water, light, and nutrients. Timely management of these invasive species is essential. Herbicides, mechanical removal, or controlled burning (when safe and suitable) can be used to curb their spread. Regular monitoring is vital to mitigate any new invasions.

Typically, competing vegetation is treated before planting, as part of site preparation, and one and two years after planting, known as a "spring release" treatment (See page 63 for more information). This is to ensure tree seedlings have optimal conditions to reach the "free-to-grow" size (as discussed in section 5.1), when trees are 5 feet or taller in height. The number of treatments and the intensity level will depend on the site and the duration between disturbance and initial treatment. The more established the vegetation, the more intensive the treatment will need to be.

Mastication, Brushing, and Mulching

Mechanical treatments such as mastication, brushing, grubbing, and mulching may be necessary before planting to manage reemerging woody shrubs and dense vegetation. These methods help clear planting sites and produce mulch that can remain on-site to retain moisture, suppress weeds, and protect soil structure, especially beneficial during the early stages of seedling establishment. In some cases, pre-treatment with herbicides may be needed to effectively manage persistent woody or non-woody species. Applying herbicide before mechanical treatment can increase its efficacy by allowing time for absorption and translocation within the target plants.

For landowners seeking to minimize chemical use, manual methods such as hand-pulling can serve as a localized spring release technique. However, these approaches are labor-intensive, costly, and may be difficult to contract. Additionally, both mechanical

and manual methods carry a risk of soil compaction or unintentional damage to young seedlings if not carefully timed and implemented. Thoughtful integration of these tools can enhance vegetation control and support successful reforestation outcomes.

Herbicide

Chemical applications are an effective and affordable method of vegetation control. For initial site preparation, when an abundance of non-tree vegetation is present, a broadcast application may work well during the spring or summer before planting the following spring. (See Timeline on page 34). For spring or summer release treatments, spot or point application can effectively address reemerging vegetation and minimize damage to seedlings. Some herbicides may be applied as a broadcast over seedlings prior to "bud break" (i.e., first new growth after dormancy) while other herbicides can be applied after bud break.

Consult your reforestation expert to create a herbicide treatment plan specific to your site's requirements. Various herbicides are suited for different application situations and timing. For sites where dense unwanted vegetation is present, a broadcast application of a broad-action herbicide will work well. Depending on the species present, there are a suite of herbicides which cover different species of plants. In other sites where application timing is prior to vegetation emergence, a pre-emergent herbicide will work well to control unwanted vegetation before it can grow. A forestry professional can help determine the most suitable herbicide, the correct chemical mixture, and the appropriate application strategy based on your vegetation management goals. For information regarding treatment for specific weed species consult the Pacific Northwest Weed Management Handbook [47].

Reminder: Work with a licensed herbicide application professional and follow state forest practice rules and regulations when applying herbicide treatments.

Broadcast and Pile Burning

Controlled burning, whether in the form of broadcast or pile burning, can act as an effective site prep method. Controlled burns, which are planned low-severity fires, effectively manage competing vegetation and enhance soil nutrients. In reforestation planning, controlled burns are best conducted during the fall burn season before planting the following spring. This approach minimizes the potential growth of competing vegetation during the summer and fall growing seasons following a burn in the spring. However, fall burns can be more challenging to execute due to narrower burn windows affected by seasonal drought, wildfire season, burn bans, and smoke regulations.

If you can source the correct seedlings for your site immediately following a wildfire, this can help reduce the need for site preparation as the fire has effectively prepped the site. The site will likely require some form of vegetation control during the first one to two years after planting. This is often managed through spring release treatments using chemical or manual spot applications to reduce competing vegetation.

Work with a Certified Burn Manager [48] to develop a burn plan for your site and follow all state and county burn permits and regulatory requirements. Additionally, you may reside in an area with a local Prescribed Burn Association (PBA). PBAs are an excellent source for resources and knowledge for prescribed fire and burn planning. Find your local PBA on the WA PBAs [49] website.

Woody Residue Treatment

Slash generated from both your dead tree removal and vegetation management will require treatment. Large-diameter woody debris may be left as-is for decomposition or can be lopped and scattered to minimize wildfire risk and fuel loading. Fine woody material can be left on the forest floor for decomposition if it does not present a fire hazard, while excess material is often piled and left for wildlife, or cured and then burned.

5.2 Planting

Once your property is prepared and ready to receive seedlings, it's finally time to plant! This section covers day-of logistics, planting techniques, spatial patterns and seedling protection. For further guidance and best practices, be sure to consult additional resources such as DNR's Planting Forest Seedlings pamphlet [50].

Time of Year

Once your property is prepared and ready to receive seedlings, it's finally time to plant! This section covers day-of logistics, planting techniques, spatial patterns and seedling protection. For further guidance and best practices, be sure to consult additional resources Source seedlings for your site and determine the planting season and year based on the seedling type and growing time. In eastern Washington, it has been common practice to plant in the spring. However, warmer summer months starting earlier in the year due to climate changes have increased the risk of drought, which can have detrimental effects on your seedlings.

Ultimately, it's best to consult with your seed and seedling provider or a forestry professional to determine the best planting season for your species and seed type.

Here are some seasonal considerations for when determining when to plant:

	Spring	Fall
Pros of Planting	– Aligns with nursery schedules and seedling availability – Well-established practices among contractors and foresters – Easier to schedule and coordinate labor and logistics – Typically ample moisture availability from snowmelt or spring rain	– Cooler temperatures and increasing soil moisture create ideal root growth conditions – Gives seedlings a head start before spring, potentially increasing survival – Reduces pressure on limited spring planting windows and labor availability
Cons of Planting	– The spring planting window is narrowing due to increasingly early transitions from cold and wet to hot and dry conditions – Higher risk of moisture stress and shock if planting is delayed – Root establishment may be limited before the onset of summer drought – Less flexibility with timing and inventory if seedling supply is tight	– Fewer nurseries grow seedlings for fall planting and thus requires advance planning and communication – Frost heave is a potential risk in exposed, freeze-thaw-prone soils (seen most often in colder regions or higher elevations) – Labor availability and site access may be limited in fall due to hunting seasons, wet roads, or early snowfall

Seedling Transportation

Careful transportation of seedlings can ensure they remain in good condition before planting. If you're moving seedlings from a nursery to the planting site, take care to minimize stress.

- **Minimize exposure.** During transport, keep seedlings cool and protected from direct sunlight and wind. Cover them with a tarp if necessary.
- **Protect roots.** For bare-root seedlings, ensure that the roots are kept moist and are not exposed to air for extended periods during transportation. Pack roots in damp burlap or other moisture-retaining materials.
- **Short transportation time.** Minimize transportation time as much as possible. Seedlings should be planted or stored in a cool, shaded area immediately upon arrival at the site.

Seedling Storage

If you are unable to plant seedlings immediately upon receiving them, proper storage is essential to maintaining their viability until planting.

- **Cooler storage, temperature and humidity.** Store seedlings in a cooler or refrigerated area with controlled humidity. The ideal temperature range is between 34°F and 40°F (1°C to 4°C), and humidity should be high to prevent the roots from drying out.
- **Root protection and moisture.** For bare-root seedlings, wrap the roots in moist burlap or other protective material to prevent them from drying out. Seedlings should be kept in the box or bag they arrived in to minimize disturbance to the roots and soil. For container seedlings, soaking the plugs in water before planting can help the seedling establish and increase survival rates.

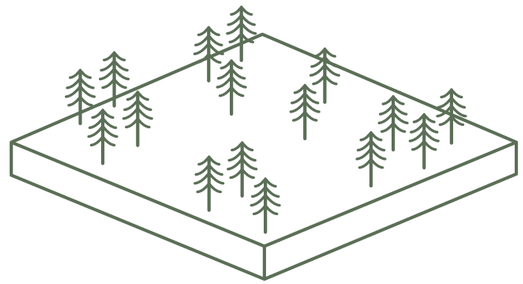
Spacing and Species

If you are managing for future timber products, your planting mix will most likely have fewer species diversity and higher densities. This will require intensive management throughout the life of the plantation and will incur frequent treatment costs. Be sure to develop a long-term forest management plan that identifies the future required treatments and their inherent timing to understand the future treatment needs and associated costs.

Although dense plantations can be good at yielding a high commercial value at stand maturity, know that the plantation is at a higher risk of future wildfire and will exhibit severe fire behavior in the event of a wildfire due to the high density of trees and the homogeneous structure of the species composition and tree spacing. Consider integrating fuel breaks into the planting design to help mitigate the risk of losing the re-established trees to a potential future wildfire.

Diversity and heterogeneity are essential for creating a resilient and ecologically balanced forest. A diverse mix of species can enhance biodiversity, improve ecosystem services, and increase resilience to pests, diseases, and climate stressors. Disrupting the continuity of the forest structure and density can reduce the risk of severe fire behavior and may help to minimize or even stop the spread of wildfires. Furthermore, clusters and gaps in vegetation communities provide valuable habitat benefits for wildlife.

- **Optimal spacing.** When trees are too close together, they compete for water, nutrients, and light, which can result in stunted growth or increased mortality rates. The appropriate spacing depends on your desired future outcomes for the property, future management activities, and the mix of species. An industrial standard is to space trees a specific distance apart from each other, depending on the desired average number of trees per acre (TPA). For instance, if you aim for an average of 150 TPA, seedlings should be spaced 12 by 12 feet apart. Uniform spacing promotes a uniform structure, which is beneficial for timber production, but it often decreases diversity and the ecological advantages offered by a heterogeneous structure. When planning to incorporate a heterogeneous structure, arrange the planting spacing into different areas according to species characteristics and site microclimates.
- **Clusters and clumps.** Planting in clusters or clumps can effectively mimic natural regeneration in areas where it may not occur due to conditions after a wildfire. If feasible, encourage natural regeneration that shows this pattern, interplanting within clusters as needed. Designing with a mix of clusters, clumps, and gaps tailored to the site's characteristics will leverage the site's strengths and promote diversity and future resilience, providing additional benefits for wildlife. Depressions in the microtopography where temperatures are cooler and water will be more abundant are good sites for clumps or clusters. Hills, ridges, or rocky or shallow soils are great spots for gaps or avoiding planting at high densities.



- **Conifer and hardwood mixing.** When incorporating hardwood species into your mix, consider the future canopy structure. Hardwoods generally have broad crowns, in contrast to conifers that feature a uniform taper and a wider drip line at the base of their crown. If you plant conifers and hardwoods at standard spacing, the mature trees may end up interlocking their limbs within the canopy, potentially damaging both species and leading to product loss or tree mortality. When planting hardwoods, it's beneficial to group them in clumps while maintaining sufficient spacing between adjacent conifer seedlings. This spacing helps prevent crown encroachment from either species. Typically,

hardwoods regenerate naturally in clusters, so leveraging these natural groupings of hardwoods can help lower reforestation expenses. Pay attention to the growth rates of various species; while some, such as grand fir and red alder, grow quickly, others like red cedar and white oak, establish themselves more slowly. Be mindful of competition when planting a mix of species, as they may impede the growth of neighboring seedlings.

- **Target spacing for diversity.** When planting a mix of species, adjust the spacing slightly according to each species' growth habits. Fast-growing varieties may require additional space to prevent overshadowing their slower-growing counterparts. Leverage the strengths of both the species and the planting environment. Position drought-tolerant species in arid uplands, while placing drought-intolerant varieties in the wetter lowland areas.

Consider Natural Regeneration

- **Natural regeneration potential.** After a wildfire, sites may naturally regenerate through seed banks or by reseeding through the surviving legacy trees within and adjacent to the site. However, this is influenced by the severity of the wildfire. The more severe the wildfire, the longer and more difficult it will be for the area to reestablish trees through natural regeneration. During the initial assessment following the wildfire, note the tree mortality and determine the number of surviving trees, as well as their location and distribution throughout the area.

  The typical rule of thumb for legacy reseeding is that you can expect the surviving trees to reseed the general area within two times the height of the surviving tree. Prevailing winds, slope, and microtopography can influence the density and distribution of natural seedling.

- **Timing.** Avoid planting in areas where natural regeneration is likely to occur, as this could create competition between newly planted seedlings and naturally regrowing plants. By allowing natural regeneration in these areas, you can save on planting costs while fostering the ecological restoration of the site. Monitor the site annually to determine where areas are successfully establishing seedlings naturally. Assess the competing vegetation to determine vegetation management needs to foster the successful growth of seedlings.

- **Inter-planting.** In areas where natural regeneration is sparse or absent, planting may be necessary to ensure that the desired species are re-established. Planting may also be required in areas with little to no surviving overstory to support natural regeneration.

Planting Technique

Proper planting technique ensures that your seedlings are well established and have the best chance of growing into healthy, mature trees.

Bare-Root Planting

- **Digging the hole.** In areas where natural regeneration is sparse or absent, planting may be necessary to ensure that the desired species are re-established. Planting may also be required in areas with little to no surviving overstory to support natural regeneration.

- **Placing the seedling.** Gently place the seedling into the hole, ensuring that the root collar is level with or slightly below the soil line. Fill the hole with soil, firming it gently around the roots to eliminate air pockets. Ensure the seedling is not J-rooted, where the root is bent horizontally during placement.

Containerized Planting

- **Remove from the container.** If planting containerized seedlings, gently remove the seedling from the container, taking care not to disturb the root plug. If possible, soak the plugs in water to increase the soil moisture within the plug prior to planting.

- **Placing the seedling.** Follow similar steps as bare-root planting, ensuring the top of the root plug is one centimeter below the surface of the surrounding soil.

Seedling Protection

Preventing seedling mortality is a top priority during the early stages of reforestation. Seedlings are most vulnerable during their first few years of growth, and mortality can be caused by various environmental stressors. Here's how you can prevent seedling loss:

Water Stress

- **Signs of water stress.** Yellowing or browning needles or leaves, wilting, crown loss, and stunted growth are all signs that seedlings may not be receiving enough water.
- **Prevention.** Regularly monitor the moisture levels in the soil, especially during dry periods. Ensure that seedlings are watered deeply and consistently, particularly during the first year after planting. Using mulch around the base of seedlings can help retain soil moisture and protect young roots.
- **Irrigation systems.** If natural rainfall is insufficient, consider setting up an irrigation system or providing supplemental watering during critical dry spells. Drip irrigation systems can be particularly effective for young trees, providing consistent water directly to the root zone.

Competition from Invasive and Aggressive Vegetation

- **Weed and invasive species growth.** Invasive plants and aggressive grasses can outcompete young trees for vital resources, leading to poor growth and seedling death. Look for areas where vegetation is crowding around your trees and observe if seedlings are showing signs of stunted growth or dieback.
- **Prevention.** Implement a consistent vegetation management plan to remove or control competing species, especially in the early stages of reforestation. This could include hand-weeding, mowing, herbicide applications, or mulching. Invasive species should be closely monitored, as they can quickly take over if left unchecked.

Pests and Disease

- **Signs of pest infestation.** Yellowing leaves, holes in leaves or bark, or visible pests like caterpillars, beetles, or aphids can indicate an infestation. Additionally, damaged bark or discoloration could be signs of fungal infections or other diseases.
- **Prevention.** Regularly inspect your seedlings for pests or diseases. Use integrated pest management (IPM) techniques, which combine biological, mechanical, and chemical control methods. If you notice pests or pathogens, take immediate action to prevent them from spreading and impacting a larger portion of your planting. Refer to the Pacific Northwest Pest Management Handbooks [51] for more information.
- **Healthy planting practices.** Ensure that seedlings are properly spaced to allow for good airflow and reduce the risk of fungal or mold growth. Keeping the planting area clear of excess vegetation can also help reduce the likelihood of pest and disease outbreaks.

Animal Damage

- **Signs of damage.** Animal browsing by deer, rabbits, or rodents can cause visible damage to seedlings, including chewed bark, needles, or broken branches. This risk is particularly high in early spring when animals seek new growth. To reduce animal damage you can utilize tools such as tree tubes or bud caps.
- **Prevention.** Install fencing or tree protectors to shield seedlings from animal damage. Additionally, using repellents or planting species that are less attractive to animals may help reduce browsing pressure. Bud caps are a relatively inexpensive and effective method for protecting seedlings from deer browse.

SECTION 6

POST-PLANTING MAINTENANCE & MONITORING

Monitoring plays a crucial role in effective reforestation, especially after a wildfire. Consistently checking your planted seedlings, evaluating their health, following up with needed vegetation controls, and recognizing potential threats can help keep your reforestation efforts on track. Taking early action when problems emerge can prevent long-term harm and enhance the chances of your forest flourishing. This section provides guidance on effectively monitoring the progress of your reforestation project, with particular emphasis on preventing seedling mortality.

6.1 Post-Planting Vegetation Control

After planting, young seedlings face competition from fast-growing vegetation that can limit their access to sunlight, water, and nutrients. Managing competing vegetation will support seedling survival and healthy forest regeneration.

- **Spring release.** The timing of the follow-up vegetation treatments, known as “spring release”, is typically one and two years after planting, and they are usually performed during the summer months. Determine whether these will be spot or broadcast treatments, and select your herbicide accordingly based on the application type. Special care and consideration is required to avoid damaging tree seedlings with herbicide treatments. If you intend to hand-weed the site, be sure to schedule well in advance to allow ample time to find a contractor and secure potential financial assistance, as this method can be quite costly and challenging to source the necessary workforce to complete the task.

- **Free-to-grow.** This stage is characterized by seedlings large enough to outcompete reemerging understory vegetation and tall enough to avoid animal browsing on the terminal bud. It is typically reached when trees are 5 feet or taller in height.

6.2 The Importance of Monitoring

Reforestation is an ongoing, long-term process, and monitoring offers vital insights into the health and growth of your seedlings. By observing the condition of your newly planted trees, you can make informed choices about necessary actions to keep the project on track. Monitoring is key to identifying issues like water stress, pest infestations, disease outbreaks, and competition from invasive species before they result in serious harm. Regular monitoring ensures that you stay proactive, not reactive, in managing your forest restoration.

- **Catch problems early.** Early detection of issues like disease, drought stress, or pest damage allows you to intervene quickly before they lead to seedling mortality or long-term damage.
- **Track growth and success.** Monitoring provides a clear picture of how well your seedlings are adapting to the site and progressing toward the desired reforestation goals.
- **Adjust management practices.** By monitoring, you can determine whether your vegetation management practices are effective, need adjustment, or require follow-up interplanting of additional seedlings.

Monitoring Techniques

Effective monitoring involves a combination of site visits, data collection, and consistent observation over time. Here's how you can track the progress of your reforestation project:

Site Visits

- **Frequency.** Within the first 3 to 5 years after planting, conduct visits at least 2 to 4 times a year, ideally once each season (spring, summer, fall, winter), to assess tree health and environmental conditions. See the table titled Monitoring Guidance for Each Season on page 65.
- **Key factors to monitor:**
  - **Tree growth**. Measure tree height, stem diameter, and general vigor. These metrics can provide an indication of how well the seedlings are growing in relation to their species and environmental conditions.
  - **Tree condition**. Look for signs of stress, such as discoloration, wilting, or early needle cast or leaf drop, which could indicate water stress, pest damage, or disease.
  - **Root condition.** Carefully dig up selected seedlings to examine roots for damage, mold, or signs of pests.
  - **Tree count and stand structure.** Assess the number of live and dead trees per acre. Note the average across the site and any areas experiencing significant die-off or increased stem density. Be sure to include any natural regeneration within the site.
  - **Competing vegetation.** Observe the surrounding vegetation growth to assess if the seedlings are affected by competition from herbaceous and woody plant communities.

Monitoring Guidance for Each Season

Spring

Check for Frost Damage:
New growth can be sensitive to late frosts. Assess whether seedlings have experienced frost damage and consider additional protection methods (e.g., frost covers, mulch).

Assess Competing Vegetation:
Observe establishing vegetation communities to determine vegetation management needs.

Summer

Monitor Water Stress:
During hot months, ensure seedlings are receiving adequate water. High summer temperatures can rapidly deplete soil moisture, so consider supplementary watering if possible.

Spring Release:
Conduct a spring release to control early-season weed growth and ensure seedlings are not competing for water and nutrients. For effective treatments, conduct spring release treatments after vegetation has reached full leaf out.

Monitor Pest and Disease:
Summer is a peak time for many pests. Check for signs of damage from insects or disease and take action immediately.

Fall

Prepare for Winter:
Assess seedling health and provide any necessary winterization, such as adding mulch around the base to insulate roots and protect against frost.

Final Weed Control:
Remove any persistent weeds that might hinder seedling growth over the winter months.

Protect From Animal Browse:
Hungry deer will seek out seedlings in the winter when forage options are limited. Apply a chemical deterrent or a physical barrier in the fall to prevent deer browse. Bud caps or tree tubes can be used to reduce browse pressure.

Winter

Assess Soil Moisture:
In the winter, check soil moisture levels to ensure that the trees are not desiccated. Ensure that mulch is intact and protects the roots. Check for events of frost heave and note areas impacted.

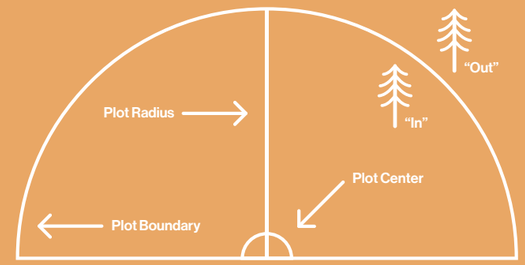
Data Collection

- **Record keeping.** Maintain detailed records of your monitoring visits, noting key observations and any changes in tree health or growth patterns. Records may be in the form of photographs, measurements, or written logs.

- **Linear sampling.** Sample seedling survival using linear plots placed randomly along each planted tree row. At each selected plot, assess tree seedlings or planting spaces to determine the number of live seedlings. A minimum of three randomly distributed plots per row is required to ensure representative sampling. This technique provides percent survival by row, helping inform technical recommendations to ensure the long-term function and integrity of the planting design. Sampled trees can be marked with flags or stakes to be re-measured over the monitoring period to track growth and damage over time.

- **Plot sampling.** Conduct random plot sampling by using a sample plot radius to collect the site TPA, seedling survival, and seedling mortality within the site. These plots can be monumented for resampling with a permanent or semi-permanent plot center marker, as well as marking with a GPS point. (See Spotlight on Fixed Radius Plot Guide for more information.)

SPOTLIGHT: FIXED RADIUS PLOT GUIDE



Plot Size:	Plot Radius:
1/100 acre	11'9" (11.8')
1/50 acre	16'7" (16.7')
1/20 acre	26'4" (26.3')
1/10 acre	37'2" (37.2')

Example: A 1/100-acre fixed plot has a radius of 11.8 feet. From the plot center, measure the 11.8-foot radius and spin a full circle, walking the outer circumference of the plot. Count the number of seedlings/trees within the plot. Sample multiple plots within the site to then average the number across the sample plots and multiply by the plot size (100 in this example) to get the average number of seedlings/trees within the site. Note the dead and surviving seedlings to understand the mortality rate within the site. When sampling on a slope, use a slope correction factor based on the percent of slope.

Supplemental resources:

- Linear Plot Guide (technical note) [52]

- **Track seedling survival rates.** Record the number of seedlings that survive each season. If survival rates are lower than expected, investigate potential causes such as competition, drought, disease, or poor planting techniques.
- **Growth rates.** Measure the seedling height and stem diameter at regular intervals (e.g., once a season). Tracking these parameters over time will help you understand how well the seedlings are adapting to the site and when seedlings have reached the free-to-grow stage.
- **Stand density.** As part of collecting data on the live and dead seedlings within your reforestation project, record the structure of the stem density across the site. As time passes and the seedlings grow, future treatments will likely be needed to manage the stand to maturity and ensure a healthy composition. Treatments to alter stand density and structure following reforestation typically occur 10 to 15 years post-planting. This is referred to as precommercial thinning (PCT) and consists of thinning down the TPA across the site by removing the nondominant or less healthy trees to increase the spacing between trees that have been left.

Final Thoughts

Restoring a forest is a significant undertaking, especially for a landowner who may be navigating post-fire recovery for the first time. We hope this guide has provided assurance that there are tools, resources, and options for creating your desired future conditions for your land. Most importantly, we hope it reminds you that you are not alone in this process.

With care and a long-term vision, your forest will recover and thrive for generations to come. We commend you for taking meaningful steps toward recovery, for yourself and the landscape you steward.

DIRECTORY

WA Department of Natural Resources	
Northeast Region	225 S. Silke Road, Colville, WA 99114-9369 (509) 684-7474 | www.dnr.wa.gov/northeast
Southeast Region	713 Bowers Road, Ellensburg, WA 98926-9301 (509) 25-8510 | www.dnr.wa.gov/southeast

USDA Natural Resources Conservation Service	
Washington Office	11707 East Sprague Ave, Suite 301, Spokane Valley, WA 99206 (509) 323-2900 www.nrcs.usda.gov/state-offices/washington

Eastern Washington Conservation Districts	
Adams Conservation District	118 E Main Avenue, Ritzville, WA 99169 (509) 659-1553 | www.adamscd.org
Asotin County Conservation District	1397 Port Drive, Clarkston, WA 99403 (509) 552-8117 | www.asotincd.org
Benton Conservation District	418 N. Kellogg St. Kennewick, WA 99336 (509) 736-6000 | www.bentoncd.org
Cascadia Conservation District	1350 McKittrick St., Ste B, Wenatchee, WA 98801 (509) 436-1601 | www.cascadiacd.org
Central Klickitat Conservation District	1107 S Columbus Ave Goldendale, WA 98620 (509) 773-5823 ext. 5 | www.ckcd.org
Columbia Basin Conservation District	903 W. 3rd Avenue, Moses Lake, WA 98837 (509) 765-9618 | www.columbiabasincd.org
Columbia Conservation District	202 S 2nd Street, Dayton, WA 99328 (509) 382-4273 | www.columbiacd.com

Eastern Washington Conservation Districts (Continued)	
Eastern Klickitat Conservation District	1107 S Columbus Ave Goldendale, WA 98620 (509) 773-5823 ext. 5 | www.ekcd.org
Ferry Conservation District	84 E Delaware Ave , PO Box 1045 , Republic, WA 99166 (509) 775-3473 ext 100 | www.ferrycd.org
Foster Creek Conservation District	203 S Rainier, 3rd Fl. Courthouse, Waterville, WA 98858 (509) 888-6372 | www.fostercreekcd.org
Franklin Conservation District	1724 East Superior St, Pasco, WA 99301 (509) 416- 0440 | www.franklincd.org
Kittitas County Conservation District	2211 W Dolarway Rd Suite 4 Ellensburg, WA 98926 (509) 925-3352 | www.kccd.net/
Lincoln Conservation District	1310 Morgan St , Davenport, WA 99122 (509) 725-4181 ext. 3 | www.lincolncd.com/
North Yakima Conservation District	1606 Perry Street Suite C Yakima, WA 98902 (509) 454-5743, Ext. 5 www.northyakimacd.wordpress.com
Okanogan Conservation District	1251 S 2nd Ave Room 102 Okanogan, WA 98840 (509) 422-0855 | www.okanogancd.org
Palouse Conservation District	1615 NE Eastgate Blvd. Suite H, Pullman, WA 99163 (509) 332-4101 | www.palousecd.org
Pend Oreille Conservatio District	121 N Washington Ave Newport, WA 99156 (509) 447-1155 | www.pocd.org
Pine Creek Conservation District	401 South SR 27, Oakesdale, WA 99158 (509) 285-5122 | www.pinecreekcd.org

Eastern Washington Conservation Districts (Continued)

Pomeroy Conservation District	910 Main St, Pomeroy, WA 99347 (509) 843-5008 | www.pomeroycd.com
Rock Lake Conservation District	3 N Park St, St John, WA 99171 (509) 648-3680 | www.rocklakecd.org
South Douglas Conservation District	206 N Chelan Ave, Waterville, WA 98858 (509) 745-9160 | www.southdouglascd.org
South Yakima Conservation District	200 Cheyne Rd, PO Box 1766, Zillah, WA 98953 (509) 829-9025 | www.sycd.us
Spokane Conservation District	4422 E 8th Avenue, Spokane Valley, WA 99212 (509) 535-7274 | www.spokanecd.org
Stevens Conservation District	232 Williams Lake Rd, Colville, WA 99114 (509) 684-7579 www.stevenscountywa.gov/20843/stevens-county-conservation-district
Underwood Conservation District	171 NW Washington Street, PO Box 96, White Salmon, WA 98672 (509) 493-1936 | www.ucdwa.org
Walla Walla County Conservation District	325 N 13th Ave, Walla Walla, WA 99362 (509) 956-3777 | www.wwccd.net
Whitman Conservation District	614 N Mill St.. Colfax, WA 99111 (509) 288-4644 | www.whitmancd.org

Washington State University Extension

Program Coordinator **Eastern Washington Extension Forestry**	222 N Havana St. Ste 205, Spokane Valley, WA 99212 (509) 308-8224 | www.forestry.wsu.edu
Regional Specialist **Eastern Washington Extension Forestry**	400 Washington St., Wenatchee, WA 98801 (509) 630-4217 | www.forestry.wsu.edu

Long-Term Recovery Groups

Blue Mountain Regional Long Term Recovery Group	13 ½ E Main St, Ste 202, Walla Walla, WA 99362 (509) 529-1183 | www.uwbluemt.org/disaster-recovery
Okanogan Long-Term Recovery Group	P.O. Box 655, Pateros, WA 98846 (509) 733-0318 | www.okanogancountyrecovery.com
Pine Creek Community Restoration	P.O. Box 178, Malden WA 99149 (509) 939-6005 www.pinecreekcommunityrestoration.org
Spokane Region Long-Term Recovery Group	3718 N Monroe #3, Spokane, WA 99205 (509) 939-9589 | www.srltrg.org

Other Organizations

Washington Tree Farm Project	PO Box 1814, Olympia, WA 98507 (360) 602-1603 | www.watreefarm.org
Family Forest Foundation	PO Box 1364, Chehalis, WA 98532 (503) 975-5772 | www.familyforestfoundation.org
Washington Farm Forestry Association	P.O. Box 1010, Chehalis, WA 98532 (360) 388-7074 | www.wafarmforestry.com

Nurseries

This list includes Pacific Northwest nurseries that, based on a regional survey, confirmed they accept tree orders as small as 500 seedlings. While not an exhaustive directory of all nurseries in the region, it serves as a helpful starting point for sourcing planting material.

Cal Forest Nurseries, Inc	1838 Eastside Road, PO Box 719, Etna, CA 96027 (530) 467-5211 | www.calforest.com
Coeur d'Alene Nursery (US Forest Service)	3600 W Nursery Rd, Coeur d'Alene, ID 83815 (208) 765-7375 | www.fs.usda.gov/detail/ipnf/about-forest/districts/?cid=stelprdb5085769

Nurseries (Continued)	
CTUIR Native Plant Nursery (Confederated Tribes of the Umatilla Indian Reservation)	73820 OR-331, Pendleton, OR 97801 (541) 278-8525 | www.ctuir.org
Drakes Crossing Nursery	19774 Grade Rd SE, Silverton, OR 97381 (503) 873-4932 | www.drakescrossingnursery.com
Fourth Corner Nurseries	5652 Sand Rd, Bellingham, WA 98226 (360) 592-2250 | www.fourthcornernurseries.com
Heritage Seedlings & Liners Inc.	4194 71st Ave SE, Salem, OR 97317 (503) 585-9835 | www.heritageseedlings.com
Humble Roots Nursery	1550 Dry Creek Rd, Mosier, OR 97040 (503) 449-3694 | www.humblerootsnursery.com
Lewis River Reforestation	1203 NW Hayes Rd, Woodland, WA 98674 (360) 225-6357 | www.lrrinc.com
Pullman Plant Materials Center	4900 SE Terre View Drive, Pullman, WA 99163 (509) 330-5636 www.nrcs.usda.gov/plant-materials/wapmc
Sylvan Vale Nursery Ltd	2104 Kelland Rd, Black Creek, BC V9J 1G4, Canada (250) 337-8487 | www.svnltd.com
Webster Forest Nursery (Washington DNR)	9805 Blomberg St SW, Olympia, WA 98512 (877) 890-2626 www.dnr.wa.gov/programs-and-services/forest-resources/webster-forest-nursery

APPENDIX

1. **After the fire Washington | WA Resource Conservation and Development Council.** https://afterthefirewa.org/

2. **Find Your Forester | Washington Department of Natural Resources.** https://foresthealthtracker.dnr.wa.gov/FindYourForester/Index

3. **Small Forest Landowner Office | Washington Department of Natural Resources.** https://www.dnr.wa.gov/sflo

4. **Find Your Local Conservation District | Washington State Conservation Commission.** https://www.scc.wa.gov/conservation-district-map

5. **Extension Forestry Program | Washington State University.** https://forestry.wsu.edu/

6. **Washington State Office | Natural Resources Conservation Service.** https://www.nrcs.usda.gov/contact/state-office-contacts/washington-state-office

7. **Washington State Forest Practices Rules | Washington Department of Natural Resources.** https://www.dnr.wa.gov/about/boards-and-councils/forest-practices-board/rules-and-guidelines/forest-practices-rules

8. **Disaster Resource Center | United States Department of Agriculture.** https://www.usda.gov/about-usda/disaster-resource-center

9. **Disaster Assistance Discovery Tool | United States Department of Agriculture.** https://www.farmers.gov/protection-recovery/disaster-tool

10. **Disaster Assistance Programs at a Glance | United States Department of Agriculture (2022).** https://www.farmers.gov/sites/default/files/2022-07/farmersgov-disaster-assistance-brochure-07-21-2022.pdf

11. **Emergency Forest Restoration Program (EFRP) | Farm Service Agency.** https://www.fsa.usda.gov/resources/programs/emergency-forest-restoration-program-efrp

12. **Emergency Loan Program | Farm Service Agency.** https://www.fsa.usda.gov/programs-and-services/farm-loan-programs/emergency-farm-loans

13. **Loan Assistance Tool – Quick Start Guide | Farm Service Agency.** https://www.farmers.gov/sites/default/files/documents/fsa-lat-quick-start.pdf

14. **Producer Loan Assistance Tool | Farm Service Agency.** https://lat.fpac.usda.gov/producer

15. **Environmental Quality Incentives Program (EQIP) | Natural Resource Conservation Service.** https://www.nrcs.usda.gov/programs-initiatives/eqip-environmental-quality-incentives

16. **Financial Assistance for Wildfire Resilience and Forest Health Program | Washington Department of Natural Resources.** https://www.dnr.wa.gov/cost-share

17. **Post-Fire Recovery Program | Washington Department of Natural Resources.** https://www.dnr.wa.gov/postfirerecovery

18. **Small Forest Landowner Regulation Assistance Program | Washington Department of Natural Resources.** https://www.dnr.wa.gov/programs-and-services/forest-practices/small-forest-landowners/technical-assistance-landowners

19. **Landowner Assistance Portal | Washington Department of Natural Resources.** https://www.dnr.wa.gov/LandownerAssistancePortal

20. **Get Started! a guide to USDA resources for historically underserved farmers and ranchers | United States Department of Agriculture (2022).** https://www.nrcs.usda.gov/sites/default/files/2022-10/farmersgov-historically-underserved-factsheet-07-20-2022_0.pdf

21. **Forest Landowners' Guide to the Federal Income Tax Guide | United States Department of Agriculture (2013).** https://www.timbertax.org/taxpolicy/FS_Landowners_Tax_Guide.pdf

22. **Tax considerations for those impacted by wildfire or other natural disasters (Recorded) | Oregon State University Extension Service (2020).** https://extension.oregonstate.edu/video/tax-considerations-those-impacted-wildfire-or-other-natural-disasters-recorded

23. **Introduction to forest carbon, offsets and markets. | Forestry and Natural Resource Extension, Oregon State University (2024).** https://extension.oregonstate.edu/catalog/pub/pnw-775-introduction-forest-carbon-offsets-markets

24. **Natural Capital Program Consideration Pocket Guide | NCX (2024).** https://ncx.com/learning-hub/natural-capital-program-consideration-cheat-sheet/

25. **Tree Survival: A Landowner's Guide to Rapid Assessment | WA Resource Conservation and Development Council (2025).** https://afterthefirewa.org/wp-content/uploads/2025/05/FINAL-Is-my-tree-going-to-die-.pdf

26. **Removing Dead and Fire-Weakened Trees After a Fire | WA Resource Conservation and Development Council (2025).** https://afterthefirewa.org/wp-content/uploads/2025/05/FINAL-Dead-and-Fire-Weakened-Trees.pdf

27. **Invasive Weeds of Eastern Washington | Whitman County Extension, Washington State University (n.d.).** https://s3.wp.wsu.edu/uploads/sites/2072/2013/10/InvasiveWeedsEastWAEM005Epdf.pdf

28. **Eastern Washington Field Guide: Noxious Weeds That Harm Washington State | Washington State Noxious Weed Control Board (n.d.).** https://www.nwcb.wa.gov/pdfs/Eastern_WA_fieldguide.pdf

29. **Forest Management Decisions Post-Fire & Salvage Logging | WA Resource Development Council (2025).** https://afterthefirewa.org/wp-content/uploads/2025/05/FINAL-Forest-Management-Decisions.pdf

30. **Seedlot Selection Tool | United States Department of Agriculture.** https://seedlotselectiontool.org/sst/

31. **A climate resilience guide for small forest landowners in eastern Washington. | United States Department of Agriculture & University of Washington Climate Impacts Group (2023).** https://cig.uw.edu/wp-content/uploads/sites/2/2023/09/EastSFLOGuide-FinalEdits-091423.pdf

32. **Washington State Integrated Forest Management Plan Guidelines & Template | Washington State Department of Natural Resources, U.S. Department of Agriculture, Natural Resources Conservation Service, Washington Tree Farm Program, & Washington Department of Revenue (2017).** https://www.dnr.wa.gov/publications/fp_sflo_fs_intfmgmtgdlns.pdf

33. **Web Soil Survey | Natural Resources Conservation Service.** https://websoilsurvey.nrcs.usda.gov/app/

34. **Healthy Woods Start with a Plan | Natural Resources Conservation Service (2022).** https://www.nrcs.usda.gov/sites/default/files/2022-10/Forest%20Management%20Plans.pdf

35. **Eastern WA Classes and Events | Extension Forestry, Washington State University.** https://forestry.wsu.edu/northeast-region/classes-and-events/

36. **Tree Farm Management Plan Template | American Tree Farm System.** https://www.treefarmsystem.org/tree-farm-management-plan-templates

37. **Management Planning Resources | Northwest Natural Resource Group.** https://www.nnrg.org/resources/template-plans/

38. **Reforestation, Nurseries, & Genetic Resources | USDA Forest Service and Southern Regional Extension Forestry.** https://rngr.net/

39. **Meeting forest restoration challenges: Using the Target Plant Concept | Reforesta (2016).** http://dx.doi.org/10.21750/REFOR.1.03.3

40. **Washington Tree Seed Transfer Zone | U.S. Department of Agriculture & Washington Department of Natural Resources (2002).** https://www.dnr.wa.gov/publications/lm_wfn_seedzone_book.pdf

41. **Eastern Cascades Oak Partnership | East Cascades Oak Partnership.** https://eastcascadesoakpartnership.org/

42. **Webster Forest Nursery | Washington Department of Natural Resources.** https://www.dnr.wa.gov/programs-and-services/forest-resources/webster-forest-nursery

43. **Pesticide and SPI License Lists | Washington State Department of Agriculture.** https://agr.wa.gov/services/licenses-permits-and-certificates/pesticide-license-and-recertification/pesticide-and-spi-licensing/license-lists

44. **Consulting Forester Directory | Extension Forestry, Washington State University.** https://forestry.wsu.edu/consultingdirectory/directory/

45. **Small-Scale Sawmill Directory | Extension Forestry, Washington State University.** https://forestry.wsu.edu/sawmilldirectory/

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47. **Weed Management Handbook | Pacific Northwest Pest Management Handbooks.** https://pnwhandbooks.org/weed

48. **Certified Burner Program | Washington Department of Natural Resources.** https://www.dnr.wa.gov/certifiedburner

49. **WA PBAs | WA Resource Conservation and Development Council.** https://wapba.org/

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