

BACKYARD FORESTRY IN WESTERN WASHINGTON

WASHINGTON STATE UNIVERSITY EXTENSION

EM026E



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Authors: Amy T. Grotta and Janean H. Creighton

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Backyard Forestry in Western Washington

Owning a home in the woods is a dream come true for many people, but living in a forested setting presents unique challenges. This guide to Backyard Forest Stewardship is specifically written for people who live “in the woods” of western Washington, whether it be on 1 acre, 5 acres, 10 acres, or more of undeveloped land.

Whether your interests are providing wildlife habitat, reducing the risk of fire, improving the health of your trees and forest floor shrubs and plants, or a mix of many interests, this guide will show you some basic activities you can do “on the ground” to help you reach your objectives.

This guide will show you how to:

- Identify your long-term objectives and goals for your property.
- Learn to recognize what is living and growing on your property.
- Reduce the risks to your home and property from natural hazards including wildfire and wind storms.
- Improve wildlife habitat in and around your forest.
- Care for your woodland so that it will continue to thrive for many years to come.

SET GOALS

An important first step for land stewardship is to identify clearly your goals and objectives for your property. Worksheet 1 (at the end of this publication) provides a framework upon which to begin this discovery.

Be specific. For instance, improving habitat for wildlife is often an important objective for many small acreage owners, but what species are most desired? Is hunting an important consideration? Or bird watching? Perhaps you are interested in improving the access in your forest for walking or other activities. Or maybe improving the overall visual aesthetic is what interests you most. Whatever your objectives are, the goals you set should be as specific as possible. You may have more than one objective for your land. Managing for multiple objectives

takes more planning, but often can be fairly easy to accomplish.

Develop a plan. Having a plan of work for your property will help guide you towards reaching your goals, as well as help you save time and money. Worksheet 1 suggests dividing your property into levels of use: heavy use, intermediate use, and natural areas. Then you can decide whether you want to retain an area in its current use or change it. For example, perhaps you have a large lawn that you would like to convert to a more natural area; or you want to add some hiking trails in an area that has a lot of brush and/or is thick with a lot of small diameter trees; there may be areas where you might reduce the level of human use in order to encourage more use by wildlife; or perhaps you want to restore a small stream or wetland area on your property so your grandkids can go fishing.

Identify objectives. Objectives are intended to help you meet your goals. To begin developing a plan you will need to identify and prioritize your objectives. There may be dozens of management activities you want to do on your property, and prioritizing them will help you complete them successfully. Worksheet 2 (at the end of this publication) asks you to identify potential objectives and then rank them in order of importance.

FOREST HEALTH

It is important to maintain the health of the trees on your property regardless of your other objectives. Healthy trees live longer, present fewer hazards, and contribute to the overall value of a property.

Many factors can influence the health of trees and forests in western Washington. Following are some of the most common ones that you may observe.

Environmental Factors

Drought. Extended periods of drought during the growing season can kill or damage trees. Trees on

gravelly or sandy soils and species such as western hemlock and western redcedar are particularly susceptible to drought. Whole branches or tree tops whose needles have turned bright red may be a symptom of drought damage. Sometimes, the damage may not be apparent until the next growing season after the dry conditions have occurred. Note that western redcedar trees often exhibit scattered patches of red foliage throughout their crowns in the fall (see Figure 1); this is a normal occurrence and is not a concern.



Figure 1. A western redcedar showing “flagging.” This often occurs in fall and is not related to drought stress. (Photo by Daniel Omdal.)

High winds. Storms from the Pacific periodically damage or blow down trees. Check for root disease and hazard trees before the next wind storm. Stands of trees suddenly exposed to wind, such as those at the edge of newly cleared land or timber harvest areas are especially susceptible to wind throw. Thinning of stands beginning when the trees are young will help individual trees to withstand high winds.

Dry easterly winds. On sunny winter days, an easterly wind can severely dehydrate foliage and may even kill tree tops.

Temperature extremes. Sudden heat waves or deep freezes often cause damage. Small trees may be killed. Large trees usually recover.

Ice and snow. Periodically, large loads from freezing rain and heavy snow cause excessive damage to trees and forests. Tree tops and branches are often broken, and whole trees can be bent over or uprooted. Corrective pruning and staking may be required for ornamental trees. Salvage harvesting may be needed in for-

est stands. Thinning forest stands starting when trees are young will help trees resist ice and snow breakage.

High water. Poor soil drainage and high water tables during the winter can suffocate, that is, drown, tree roots. Flooding can also damage or kill trees if water stands for an extended period. Planting species that can thrive under these conditions is the best approach. Avoid planting Douglas-fir in wet sites. Shore pine (lodgepole pine), grand fir, and western redcedar are better choices. You may also wish to encourage alder or poplar to grow in these areas.

Overcrowded forests. Many forest stands are too dense. Competition between trees results in small crowns, poor diameter growth, and reduced tree health and vigor. One way to assess whether a stand is overcrowded is to examine the understory—the plants that grow below the tree canopy. A healthy forest will have a variety of shrubs growing throughout, whereas an overcrowded stand will be dark with little to no live vegetation on the ground. Thinning will help to keep trees healthy and growing vigorously and allow a healthy understory to develop. See the section on Thinning, below, for specific information on improving stand density.

Diseases

Root diseases. Root diseases are widespread in Washington and are caused by native fungi that persist in soil and tree roots. Laminated Root Rot is a particular problem, primarily in Douglas-fir stands. The root rot fungus spreads by root-to-root contact. Conifer trees of all ages and sizes may be killed or blown over in high winds. Sparse or yellow foliage, short top growth, and excessive cone crops may be signs of root diseases (Figure 2). Trees blown down with few or no roots attached usually indicate root disease (Figure 3). Look for forest openings or groups of affected trees called “root rot pockets.” Trees near the center of such pockets will be most severely affected, perhaps dead or blown down. Visible signs decrease as you progress outward from the center. Trees on the edge of the root rot pocket will be infected before visible signs appear. Once trees are infected, there is no direct control. Remove affected trees, especially if they are near structures or other areas of heavy human activity. Avoid replanting with



Figure 2. A typical crown of a tree affected by root disease.

(Photo courtesy of G. W. Wallis, Bugwood.org)



Figure 3. Wind-thrown 60-year-old *Pseudotsuga menziesii*, showing advanced decay in the roots and root collar. Note how the roots broke close to the root collar, creating “root balls.” (Photo courtesy of G.W. Wallis, Bugwood.org.)

Douglas-fir. Good choices for replanting include Western white pine, western redcedar, or hardwoods such as alder and maple species.

Foliage diseases. The cool, moist climate in western Washington is ideal for many foliage diseases. Foliage diseases can weaken trees but will rarely kill them. Thinning and pruning to increase air circulation is helpful. Preventive applications of fungicides may be needed for ornamentals or Christmas trees. However, this is rarely an option in forest stands. Periodic fertilizer applications can sometimes help trees maintain sufficient foliage and grow out of disease-susceptible stages.

Insects

Bark Beetles. These insects are usually not the

primary damaging agent in western Washington. They typically attack trees already under stress from some other factor such as drought, root damage, or overcrowding. Bark beetle-infested trees normally cannot be saved. Salvage of large blown-down Douglas-fir within one year will help control the spread of Douglas-fir bark beetles.

Foliage Insects. Several species of insects can cause foliage damage or loss. Aphids, adelgids, tent caterpillars, sawflies, leaf beetles, and loopers are just a few common examples. Direct control may be possible for ornamental trees but is rarely feasible or necessary in forest stands. Damage is often cyclic, that is, worse in some years than others. Most trees will recover from this type of insect attack.

If many trees of different species exhibit common symptoms, the cause is probably environmental or human. If damage is limited to a single species, the problem may be insects or disease.

Human Activities

Human activities such as excavating, filling, road construction, and timber harvesting can damage trees directly or indirectly by affecting root function or changing soil drainage. Heavy equipment traffic underneath and around trees can cause compact the soil, which is damaging to roots. Plan to protect trees and their root zones during development or construction activities—and be aware that the root zone extends well beyond the drip line of the tree. Damaged trees may either die suddenly or deteriorate slowly. Trees stressed by human-caused damage are often highly susceptible to secondary damage-causing agents such as bark beetles.

People also sometimes unknowingly introduce exotic pests and weeds that have can cause extensive damage to western Washington trees and forests. The European Gypsy Moth, which “hitchhikes” on vehicles and possessions and moved here from the eastern U.S., is one example. Your alertness and cooperation with Washington State Department of Agriculture pest monitoring programs will help minimize the potential for damage from exotic pests. Noxious weeds are common and may influence the development of your forest floor vegetation. See Noxious and Invasive Weeds, (page 8).

Animal Damage

Both wildlife and domestic animals can damage trees, shrubs, and particularly young seedlings. Paper or fabric bud caps, rigid plastic tubing, and repellents can help control feeding damage to trees by deer, elk, mountain beaver, rabbits, and rodents (Figure 4). Use fences to keep horses and cattle away from trees and forest vegetation, especially along streams.

Livestock left to graze in forested areas for prolonged periods can cause damage to both mature and young trees. Forest soils are easily compacted by animal traffic that may in turn lead to root damage. Horses and cattle may also rub against trees, causing bark damage. If you own horses or other livestock, keep them out of your forest, especially during wet months.



Figure 4.
Elk damage
on a birch tree
trunk.

*(Photo courtesy of
Thomas E. Hinds,
USDA Forest Service;
Bugwood.org.)*

Diagnosing Problems

In general, if many trees of different species exhibit common symptoms, the cause is probably environmental or human. If damage is limited to a single species, the problem may be insects or disease. Most insects and diseases are specific to individual tree species, or closely related groups of species, and will not spread to others in the forest.

Consult your local Extension office for help with diagnosing tree problems, and see *Forest Health: Diagnosing Your Sick Trees*, under Additional Reading at the end of this publication.

TENDING YOUR FOREST

Thinning

Thinning (Figure 5) is one of the most beneficial tasks most Washington forest owners can perform to improve the health and vigor of their woodlands and to reduce the potential for damage from catastrophic wildfire.

Reasons to thin

Many forest stands in Washington are overcrowded. Growing too close together causes stressed and unhealthy trees, which can result in several problems. When trees compete for sunlight, nutrients, and moisture, the problems can include:

Poor growth and health. Overcrowded and stressed trees have poor diameter growth and small crowns. Stressed trees are more susceptible to health problems than vigorous trees.

Poor wildlife habitat. If too little sunlight reaches the forest floor, shrubs and forbs, which are beneficial to wildlife, are shaded out.

High wildfire hazard. When crowns of adjoining trees touch, fire can spread quickly.

When to thin

When branches of adjoining trees touch, it is time to thin. Short tree crowns are also a sign of overcrowding. Healthy trees should have approximately 40% of their total height in live green branches.

How to thin

Here are some guidelines for thinning that may prove helpful:

Save the biggest and best. Retain the tallest trees with larger diameters and large, healthy crowns.

Remove competitors. Remove trees with below-average diameters, shorter crowns, or disease, insect, or other problems, in order to benefit their more desirable neighbors. Do not make the mistake of trying to “release” poorer quality, lower level trees by removing larger, better trees growing above them.

Retain trees for wildlife. Consider leaving a few small clumps of unthinned and unpruned trees to provide habitat diversity. Dead or hollow



Figure 5. A stand of trees before thinning (left of the center tree) and after thinning (to the right of the center tree). (Photo by P. Duniho.)

trees should be retained as snags for wildlife habitat, unless those trees present a hazard.

Watch out for fire hazard. Debris (slash) left from thinning and pruning may result in a fire hazard if a significant accumulation occurs. Slash may need to be piled, burned, or chipped. State law requires excessive slash to be removed from within 100 feet of a public road and 500 feet of buildings. Consult the Forest Fire Prevention and Safety section of this publication for more information.

Remove enough trees. We know that most forest landowners really love their trees, but a common error is to remove too few of them, resulting in a “thinned” stand which is still stressed and overcrowded. After thinning, branches from the crowns of adjoining trees should be several feet apart with open sky visible between trees.

To determine how far apart your trees should be spaced after thinning, use the “D + 6” rule:

1. Pick the 10 “best” trees that you plan to retain after the thinning. Measure their circumferences at 4½ feet above the ground, using an ordinary tape measure.
2. Divide by 3 to estimate the diameter (for example, a tree 12 inches in circumference is approximately 4 inches in diameter).
3. Add diameters and divide by 10 to get the average diameter.
4. Add 6 to this number to get the approximate minimum spacing, in feet, between tree

trunks after thinning. (For instance, if the average diameter of the retained trees is 8 inches, they should be spaced at least 14 feet apart after thinning.)

Example. Let’s say you have measured the 10 “best” trees you plan to retain after thinning. Using the procedure described above in steps 1 and 2, you estimate the diameter of each tree as follows: 8.7, 7.3, 8, 8.7, 7.7, 8.3, 9, 7.3, 8.3, and 8.7. Adding these numbers and dividing by 10 gives an average diameter of 8.2 inches. Adding 8.2 and 6 gives you 14.2. So when you thin your stand, you should leave approximately 14 feet between the trees that will remain.

Use this formula as an approximate guideline. Nature is not uniform, so do not strive for exact spacing between all of the trees left. Retention of the best trees should take precedence over exact spacing. If you want a “park-like” appearance, you may wish to space the trees further apart.

Selling your thinned trees

In some cases, thinning projects remove enough trees of sufficient size to make selling the culled trees commercially an option. Neighbors can work together to create an economically viable project. In recent years, markets for small-diameter trees have improved. In most areas, small-scale logging operators are available. If conducted properly, thinning projects can have positive environmental and economic results.

Pruning

Proper pruning keeps shade trees healthy, safe, and attractive. In the forest, pruning can reduce fire risk while improving aesthetics and timber quality.

Tree topping is not pruning! Topping trees is an unnecessary and damaging practice. When necessary, reduce the height of hardwood trees by selectively removing upper branches. For view enhancement, tree crowns can be thinned by removing selected lateral branches. Tree removal and replacement with a more appropriate species may be preferable to excessive pruning.

When to prune

Prune at the right time. Hardwoods are best

pruned during the dormant season. Flowering shrubs should be pruned immediately after flowering.

Pruned limbs from forest trees may attract bark beetles depending on when you prune. Avoid pruning forest trees from January through July to minimize the potential for bark beetle infestation, because bark beetles are actively seeking freshly downed material then.

How to prune

See Figure 6 for a diagram of the series of cuts required to remove large limbs without damaging the tree. Make partial undercut A first, then make cuts B and C–D.

Make pruning cuts at “intersections,” not in mid-branch (Figure 6). Avoid “crew cut” pruning. Cut where two limbs intersect or where limbs intersect the main tree trunk.

Make your cut at the branch bark collar (Figure 6). Avoid “flush cuts” that remove the

branch bark collar or “stub cuts” which leave branch stubs protruding.

Use proper pruning tools. Use shears or a saw designed for pruning and keep them sharpened. Use a chain saw only for limbs too large for hand tools. Never use an ax. Use recommended safety equipment, such as eye protection, hard hat, gloves and sturdy footwear.

Remove the right amount of branches. With forest conifers, all limbs are normally removed up to a height of 17–18 feet. This height is good for aesthetic enhancement and fire hazard reduction, and will improve timber quality in the first 16 feet of a tree. Smaller trees should be pruned in stages, retaining approximately 40 percent of the total height in live green branches after pruning.

Manage the debris

Woody debris should be left on the forest floor unless it poses an excessive fire hazard. Downed wood 4 inches in diameter or larger contributes very little to fire spread. Smaller limbs may be chipped or removed from the area if they are deemed a fire hazard. For a discussion of burning debris, read the section on Fire Prevention and Safety (page 14).

HAZARD TREES

Trees or parts of trees which are structurally weakened may pose a threat to people and structures. Dead, dying, or damaged trees may be hazards if they are within striking range of structures, parking areas, or other areas with heavy human activity, should the tree fall (Figure 7).

Identify Hazard Trees

Check the trees near your home and yard for the hazard signs such as:

- Dead or dying, poorly attached limbs
- Old wounds and obvious signs of decay (fungal conks, hollow trunks)
- Leaning trees
- Cracks in soil that indicate root movement
- Shortened height growth
- Sudden large crop of cones
- Signs of root damage (including excavation

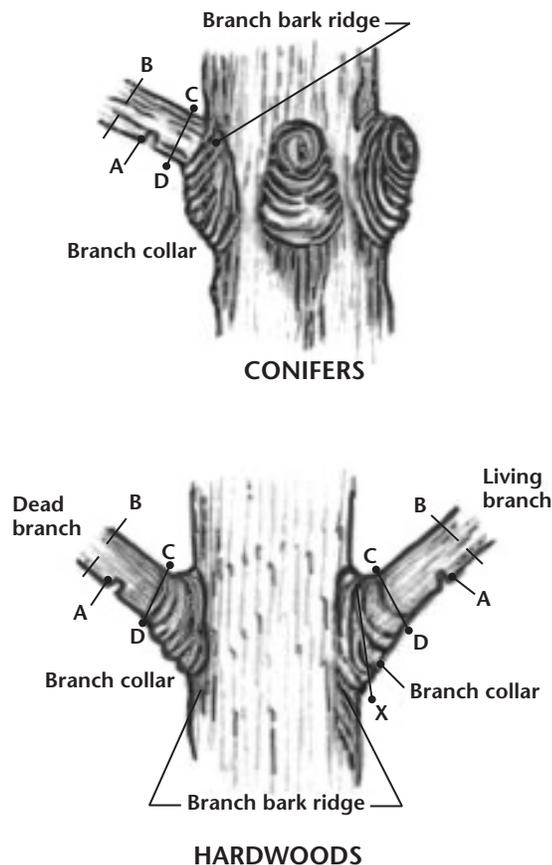


Figure 6. Pruning Cuts (Source: Washington DNR)



Figure 7. A hazard tree threatening power lines, buildings, and human activities.

(Photo by Joseph LaForest, University of Georgia, Bugwood.org.)

in the root zone, or compaction, pavement, or fill over the root zone)

- Yellowing, reddening, or thinning foliage out of season.

Some of these indicators may be signs of normal change or environmental challenges such as drought. But some, such as shortened height growth or unexpectedly large crops of cones, may be indicators of root disease that can make a tree a windfall hazard.

Some foliage discoloration and loss of older foliage is normal. Most conifers have some foliage near the interior of branches that turns yellow or reddish and drops from the tree each fall. This may be more pronounced in drought years. It may be particularly noticeable in pines and cedars.

If the problem is confined to a single branch, corrective pruning may solve the problem. If all or most of the tree is affected, removal is likely necessary. Trees that exhibit symptoms of overall decline can rarely be saved.

You can obtain information about the most common tree problems in your area by contacting your local WSU Extension office. A professional consulting forester can help you with problem diagnoses on forest trees. A professional arborist can help confirm a diagnosis and determine whether a tree must be removed near your home or other

structures. Check your yellow pages and look for individuals or firms that employ ISA Certified Arborists.

Create Wildlife Habitat

If you have a hazard tree, consider converting the tree to a short snag or wildlife tree as an alternative to complete removal. Cut the tree to a height at which it will not pose a threat if it falls. As the tree decays, many species of birds and mammals may use the tree for forage and shelter. See Tips for Creating Snags, (page 12).

Another alternative is to have the hazard tree felled and left in place. The downed woody debris will provide additional wildlife habitat.

NOXIOUS AND INVASIVE WEEDS

Many non-native plants have spread into western Washington's forests and natural areas. They get introduced in a variety of ways, including human activity or from droppings from livestock and birds or other native wildlife.

Some non-native plants are invasive—they spread rapidly and are difficult to control. These invasive weeds threaten ecosystems and wildlife by displacing native plants. Invasive weeds such as Japanese knotweed (Figure 8), can create soil erosion problems on slopes and along streams if they displace areas previously occupied by woody plants with more developed root systems. Noxious weeds may be toxic to wildlife or domestic animals, and some weeds such as Scotch broom and gorse pose a serious fire hazard.

Invasive versus noxious

Invasive weeds may or may not be on the noxious weed list, but are, nevertheless, a problem. In western Washington, some of the most common invasive weeds in forests include Himalayan blackberry, English ivy, English holly, and Scotch broom.

You can improve your property's aesthetic values and ecological health by controlling noxious and invasive weeds. Here are some suggestions for success:

- Educate yourself on how to identify noxious and invasive weeds. See the Additional Reading section at the end of this publication for

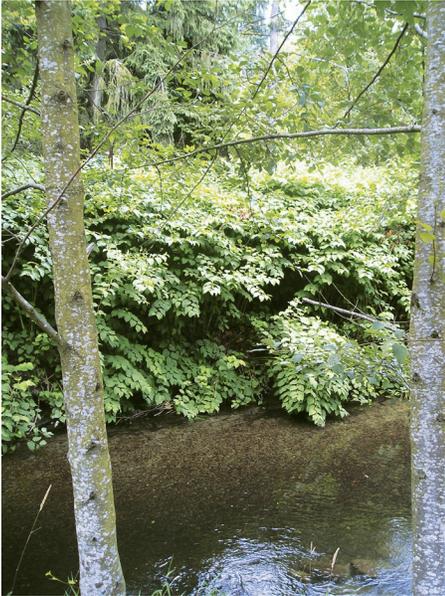


Figure 8.
Knotweed
growing along
a stream.

*(Photo courtesy of
Sasha Shaw.)*

some Web sites with good weed photos and descriptions.

- Don't buy invasive plants at nurseries. Most regulated noxious weeds cannot legally be sold at retail nurseries, but many nurseries carry highly invasive plants. Learn which are which and purchase accordingly. Garden Wise is an excellent guide to non-invasive plant choices for landscaping: http://www.nwcb.wa.gov/education/Western_Garden_Wise_Web.pdf.
- Don't dump potted plants in your forest. Many forests are invaded because landowners unintentionally introduce weedy plants in this way. Dispose of unwanted plant material in a compost pile or through your local yard waste disposal program. Invasive plants are best disposed through a local yard waste program since home composting may not get hot enough to destroy seeds and roots.
- Control weeds with integrated pest management techniques. Hand pulling, mowing, and chemical application each have their place for managing weed populations. Consult your local Noxious Weed Control Board for specific recommendations for your area and weed of concern.
- Control small, isolated patches of weeds first. Early detection and control are critical to keep newly invaded areas from becoming a larger problem. It requires much less effort and time to eradicate a small infestation than a large one.

- Replant areas where weeds have been removed and monitor for reinvasion. Nature abhors a vacuum, and weeds will re-establish on cleared ground quickly, either from root sprouts or newly germinating seeds. Plant native ground covers and shrubs, and check regularly for re-sprouting weeds.

Landowner responsibility

In order to reduce the spread of harmful plants in Washington, state law requires landowners to control certain noxious weeds, generally those that are not yet widespread in an area. The Washington State Noxious Weed Control Board determines which plants are designated as noxious weeds and specifies regions where different species are required to be controlled. Current lists of noxious weeds are available at: http://www.nwcb.wa.gov/weed_list/weed_list.htm.

From Chapter 17.10.010 of the Revised Code of Washington (RCW):

"Noxious weed" means a plant that when established is highly destructive, competitive, or difficult to control by cultural or chemical practices.

"State noxious weed list" means a list of noxious weeds adopted by the state noxious weed control board. The list is divided into three classes:

- Class A consists of those noxious weeds not native to the state that are of limited distribution or are unrecorded in the state and that pose a serious threat to the state;
- Class B consists of those noxious weeds not native to the state that are of limited distribution or are unrecorded in a region of the state and that pose a serious threat to that region;
- Class C consists of any other noxious weeds.

For more information, visit <http://apps.leg.wa.gov/RCW/default.aspx?cite=17.10>.

PLANTING TREES AND SHRUBS

Trees can enhance the aesthetic, environmental, and economic value of your property. For the best outcome, choose the right trees, buy them from a reputable source, plant them correctly, and give them a hand as they become established.

Plant Selection

Pick the right plant for the purpose. What is the plant's purpose? If for shade, a tree should be large and sturdy. For aesthetics, a tree should feature a graceful form and showy foliage or flowers. For wildlife, berry-producing shrubs are useful. For ornamental purposes, a wide variety of species and sizes are available. For forest plantings, seedlings of native tree and shrub species are preferred.

Pick the right plant for the available space. Many species become very large. If planted in a confined area, a large species tree may become a problem. Avoid planting large forest or shade tree species in areas with limited space for root or crown growth (next to homes, under power lines, near sewer or water lines or driveways). If space is limited, select a smaller tree species.

Pick the right plant for the environmental conditions. Many species require full sunlight and well-drained soils and will not survive in shady or wet sites. Match the species' requirements with the site conditions and avoid planting species not suitable for our climate, or those susceptible to insect and disease problems. Use native plants whenever possible.

Tree Planting

Use seedlings from the right seed source. Forest seedlings should come from the same approximate latitude and elevation as the planting site. When purchasing seedlings from a nursery, ask about the seed source and confirm that it is appropriate for your location.

Plant at the right time. Trees should be planted when they are dormant. Avoid planting during the growing season or when the soil is frozen. In Western Washington, January through April is best for forest seedlings. Avoid planting on excessively hot, cold, or windy days.

Handle seedlings with care. Do not expose delicate roots to cold or wind, as they dry out quickly. Place seedlings in a pail or planting bag, keeping roots covered with wet cloth or similar moist material but not under water. Remove one seedling at a time from the planting container.

Plant your tree right. Take the extra time to dig a planting hole that will be large enough to

accommodate all of the roots. Avoid planting errors such as tangled roots, air pockets, foreign objects in the hole, and planting too deep or too shallow. Use the local, natural soil to fill the planting hole (Figure 9).

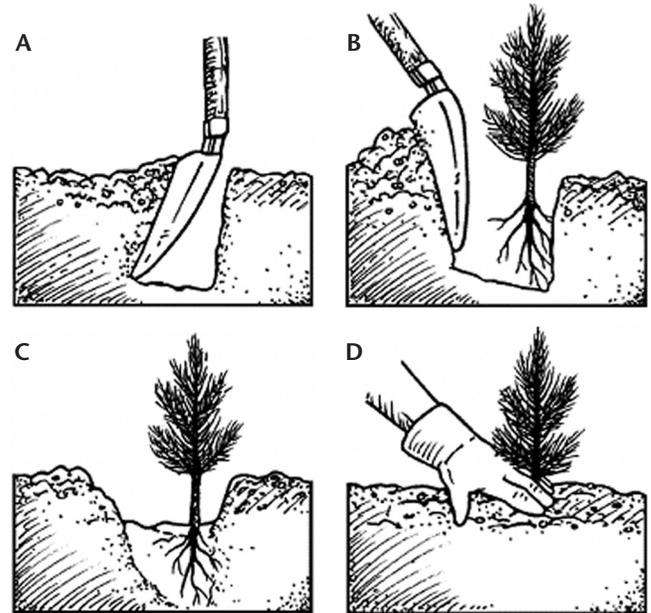


Figure 9. Diagram showing the steps for planting a seedling correctly. (Source: Washington Department of Natural Resources.)

Tree Establishment

Protect young trees from browsers. After planting, provide protection for the seedlings from animal damage: use tubing or bud caps until the tree gets a good start.

Give your new tree a helping hand. Control competing brush and weeds around small seedlings in the forest. For ornamental plantings, establish a "tree well" and mulch the area around newly planted trees. Mulch keeps weeds down, conserves moisture, adds nutrients as the mulch breaks down, and protects trees from lawnmowers and weed trimmers. Use supplemental irrigation or shade where necessary until the tree is established.

WILDLIFE AND WILDLIFE HABITAT

Most people enjoy watching wildlife in their yards and forests. Wildlife cannot distinguish between private and public lands, and they depend on both for food, living space, shelter from predators and adverse weather, and a

place to rear their young. There are a number of things you can do to help improve wildlife habitat on your property.

Snags

Retain and maintain dead or dying trees as snags. Snags are essential habitat for cavity-nesting species such as woodpeckers. But other species such as bats, songbirds, and some small mammals also utilize dead trees as important habitat (Figure 10). If too few snags exist on your property, more can be created by killing live trees that should be thinned or removed anyway. Snags should only be retained or created in places where they will not pose a safety hazard.

Create Snags

Snags may be created from living trees if there is a shortage of safe, natural snags. Created snags can be expected to last for a long time. Poor quality or deformed trees, such as those with broken tops or large branches, make excellent snags.

Tips for creating snags

- Select conifers for snag creation as they normally last longer than deciduous trees. Snag trees should be at least 14 inches in diameter, but smaller diameter snags are used by many cavity nesters and foragers (Figure 11).



Figure 10. A snag showing evidence of multiple users and residents, including shelf fungi.

(Photo by James E. Johnson)



Figure 11. Woodpecker activity in a tree trunk.

(Photo by James E. Johnson)

- Top or girdle a live tree at or above the first whorl of branches, if possible, and at least 14 feet high (ideally, much higher). Shorter trees are useful for some cavity nesters and especially for foraging birds, as are stumps that are at least 3 feet tall.
- A jagged top will decay faster and supply more habitat than a smooth-topped tree. Jagged cuts, grooves, and cavity starts can also be added to the trunks of trees when they are topped or girdled for snag-dependent wildlife. These additional cuts allow decay-causing fungus to enter the stem of the tree and accelerate the creation of structure for many species of birds and mammals including many bat species. Cuts should angle upward and be at least 2 inches wide and at least 6 inches deep. A shelf or cavity can be initiated by cutting a hole or opening at least 6 inches deep and about 4 inches in diameter.
- Large branches, extending at least 2 feet out from the trunk, can be cut to create foraging habitat on live trees not intended to be used as snags.

Caution! Snags can be dangerous!

Site snags well away from trails, roads, buildings, and other structures.

Variable Density Thinning

Variable density thinning will allow sunlight to reach the forest floor in some places (Figure 12) and stimulate the growth of a variety of plants beneficial to wildlife. Leave some dense clumps of unthinned, unpruned trees to provide places for animals to hide from predators and the elements.



Figure 12. Variable density in a forest, as a result of thinning. (Photo by Dave Powell, USDA Forest Service, Bugwood.org)

Understory Material

Retain understory vegetation and downed logs. Shrubs and woody debris should be retained unless they pose an excessive fire hazard. Downed wood 4 inches in diameter or larger contributes very little to fire spread, but is helpful for habitat creation. Maintain trees and shrubs along stream banks. If your property is too tidy and park-like, it will probably not attract a large variety of wildlife.

Habitat Diversity

Encourage habitat diversity. You will attract a wider variety of wildlife species if your property offers a variety of plant species and sizes.

Plant grass and groundcover plants along trails, roads, and in openings between trees where sunlight can reach the ground. A good overall seed mix for plants that support wildlife is:

- Fine fescue - 17 lbs/acre
- Big trefoil - 2 lbs/acre
- Annual rye grass - 1 lb/acre
- White Dutch clover - 2 lbs/acre

Plants to attract wildlife

For Upland Sites

Blue Elderberry*	Serviceberry
Cascara	Wild rose
Bitter Cherry	Western Mountain Ash
Pacific Dogwood	Kinnikinick
Hawthorn	

For Wet Sites and Along Streams

Willow	Western Oregon Ash
Cottonwood*	Red-osier dogwood

*Figure 13. Blue elderberry provides shelter and food for a variety of wildlife.

(Photo by Dave Powell, USDA Forest Service, Bugwood.org)



*Figure 14 Black cottonwood is a riparian, or streamside, tree native to the western US and Canada.

(Photo by Dave Powell, USDA Forest Service, Bugwood.org)

Nest Boxes

You can provide additional habitat for cavity-dependent species by providing wooden nesting boxes and bat roosting boxes. Make sure you place the boxes in areas that are protected from excess heat and wind.

Nest boxes of varying sizes will host many species such as wood ducks and swallows. Nest boxes can be erected in most forest stands depending on target bird species and forest stand characteristics. Nest boxes, however, do not replace the need for snags. Do not put nest boxes on existing snags.

Do not put nest boxes on existing snags!

Nest boxes are meant as temporary substitutes for snags. If a nest box is placed on a snag and then occupied, it discourages other species from using the same snag as habitat.

Bird Feeders

Use bird feeders only if you are committed to taking care of them. If you commit to feeding birds you must keep the feeders clean and filled, especially during the harsh winter months. Thoroughly clean all feeders weekly to reduce the spread of disease from bird to bird. If you notice dead birds, take the feeders down immediately, clean them thoroughly, and stop feeding.

Follow these simple precautions:

1. Do not handle wild birds that are obviously sick or found dead.
2. Wear rubber gloves while filling or cleaning bird feeders.
3. Clean and disinfect bird feeders on a regular basis. Let them dry completely before refilling.
4. Clean up seed waste and bird droppings beneath feeders.
5. Wash hands with soap and water or alcohol wipes immediately after filling or cleaning bird feeders.

FOREST FIRE PREVENTION AND SAFETY

Although wet weather is common much of the year, western Washington experiences periods of high fire danger during the dry summer months, and areas prone to easterly winds may experience extremely hazardous conditions. As more people move into forested areas, the potential for catastrophe increases. If you live in a wooded area, you should take steps now to protect your home and family.

Consider no-burn options before deciding to burn anything. Many landfills offer designated days when yard debris can be disposed of at little or no cost. WSU Extension offers a “how to” publication about composting (EB1784E), or contact your local Extension office for advice. On-site chipping may be feasible. Limbs and other debris may be piled for wildlife habitat—if piles are located where they do not pose a fire hazard.

Burning Trimmings and Debris

Careless or unnecessary debris or garbage burning is the cause of many wildfires, nuisance smoke problems, and diminished air quality. Smoke can be hazardous to persons with asthma or heart and lung problems.

Outdoor debris burning is subject to state and local fire safety and air quality regulations and may be restricted depending upon your location.

Burning in Residential Areas

Check local regulations for permit requirements and burn ban restrictions. Contact your local fire department or Fire Marshal for burning regulations in residential areas.

Since 2007, outdoor burning has been banned within defined urban growth areas throughout Washington. For more information, check with the Washington Department of Ecology. Outside urban growth areas, burning is usually regulated by local clean air agencies, and regulations vary by location.

Burning on Undeveloped Land

Burning in the undeveloped, forested portion of your property is regulated by the Washington

King, Kitsap, Pierce, and Snohomish Counties:
Puget Sound Clean Air Agency

Clark, Cowlitz, Lewis, Skamania, and Wahkiakum Counties:
Southwest Clean Air Agency

Island, Skagit, and Whatcom Counties:
Northwest Clean Air Agency

Clallam, Grays Harbor, Jefferson, Mason, Pacific, and Thurston Counties:
Olympic Region Clean Air Agency

San Juan County:
Department of Ecology

Department of Natural Resources (DNR). In forested areas protected by DNR, debris burning is permitted without a written permit only if all of the following conditions are met:

- Burn one pile at a time of forest debris that is less than 4 feet in diameter (July 1–October 15) or less than 10 feet in diameter (October 16–June 30). Exceptions: Piles may not exceed 4 feet in diameter at any time of the year in Island, King, Pierce, Kitsap, and San Juan Counties; piles may be up to 10 feet in diameter at any time of year in Clallam and Jefferson counties.
- Burn only natural vegetation or untreated wood products. (Accelerants in the piles such as tar paper, etc. are not permitted.)
- Burn piles are at least 50 feet from structures and 500 feet from any forest slash.
- The area is cleared around the burn pile of any flammable material.
- The winds are calm or light. It is too windy to burn if trees are swaying, flags are extended, or waves appear on open water.
- A connected water hose is maintained or at least five gallons of water and a shovel is nearby.
- The fire is attended until it is completely extinguished.
- You are prepared to extinguish the fire if it becomes a nuisance.

If any of these conditions cannot be met, a written DNR burning permit is required. To obtain a written burning permit, contact the DNR regional office in your area: <http://www.dnr.wa.gov/AboutDNR/Regions/Pages/Default.aspx>.

You must call 1-800-323-BURN to obtain updated burning information on the day of the burn as well as before you ignite, and you must follow the directives given for your area on that day.

Making Your Home Firesafe

A fire-resistant defensible space should encompass the 30 feet around a home.

Create a fire-resistant defensible space around your home and other valuable structures (Figure 15). Remove hazardous flammable materials, debris, and vegetation near your home. Within 30 feet of your house, landscape with native plants and mow lawn areas regularly. Thin and prune trees near your house, removing limbs that overhang your chimney. Keep your roof cleared of twigs and needles. Stack firewood and other combustible materials well away from buildings. Keep weeds and other debris away from propane tanks and sheds where gasoline or other petroleum products are stored.

Make sure firefighters can get to you. Make sure your address is easily visible for firefighters. If it is not already wide enough, clear your driveway so that a fire truck can enter and turn around. It may not be possible for firefighters to defend your home without good access, an adequate escape route, and defensible space around the home.

Stop sparks before they become fire. Screens on your chimney will help contain burning embers from your fireplace, wood stove, or furnace. Place screens on your home vents to block incoming burning embers from approaching wildfires. At re-roofing time, consider replacing your roof with one made of fire-resistant materials. Face exposed decks, porches, or foundations with skirting. Keep a hose and fire tools readily accessible, especially when you burn debris.

Keep fire safety equipment readily accessible inside and outside your home. Make sure the

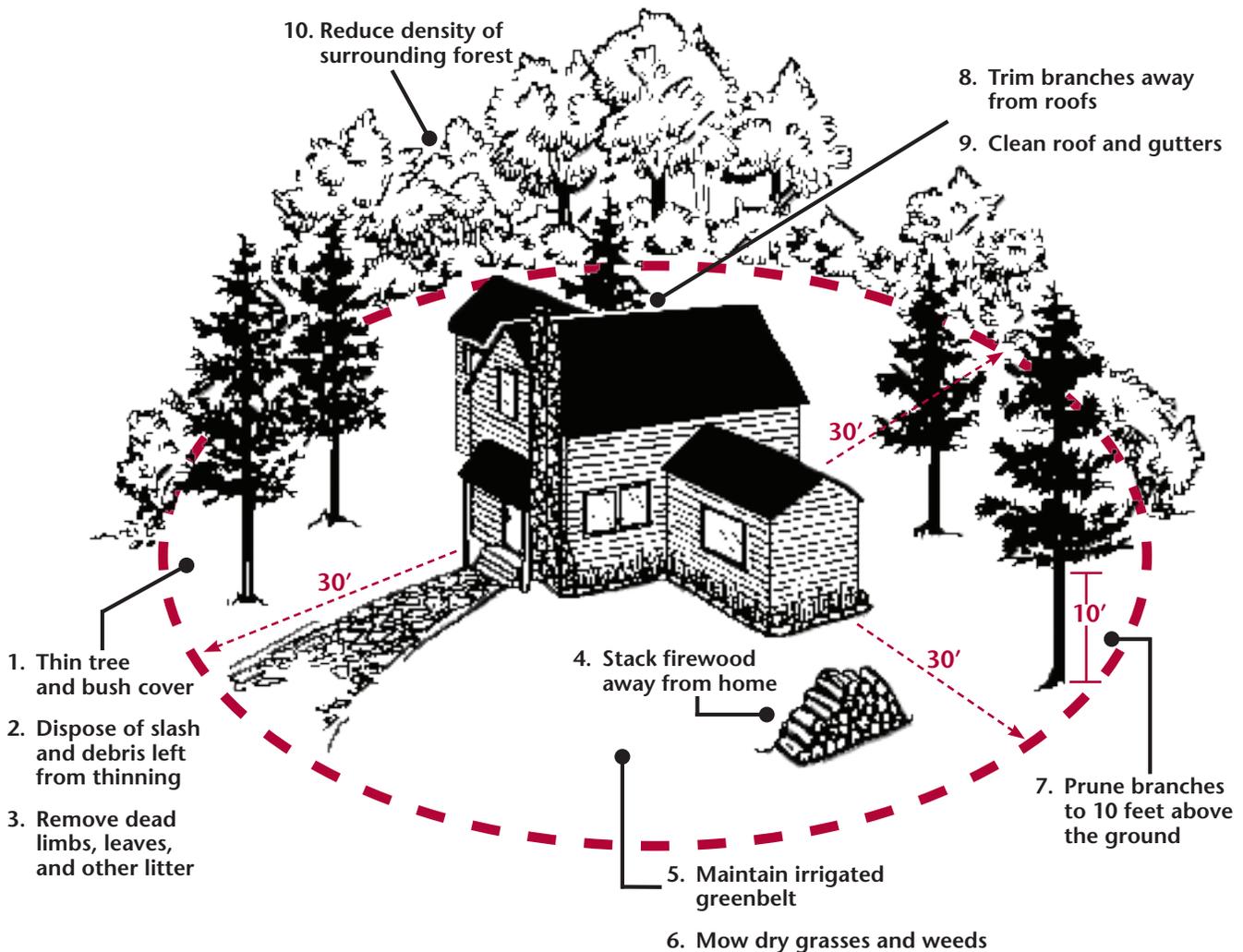


Figure 15. A fire-resistant defensible space. (Source: US Forest Service)

home has operational smoke detectors and fire extinguishers. Have fire tools and a connected hose readily at hand outside. Make sure all family members know where this equipment is, how to use it, and how to summon help in event of a fire.

Check for neighborhood hazards such as hazard trees or limbs that could fall and break power lines, sparking a fire. Notify your power company of potential hazards.

Spread the word to your neighbors. Neighbors working together can create better fire safety than individuals working separately. Ask your neighbors to join you in helping to make your neighborhood fire safe.

ADDITIONAL READING

Technical and Education Resources

Washington State University Extension.
<http://ext.wsu.edu/forestry/index.htm>

Washington Department of Natural Resources.
<http://www.dnr.wa.gov/Pages/default.aspx>

National Learning Center for Forest and Range Landowners.
<http://www.forestandrange.org/>

Natural Resources Conservation Service.
<http://www.nrcs.usda.gov/>

Washington Association of Conservation Districts.
<http://www.wadistricts.org/>

Washington Dept. of Fish and Wildlife.
<http://wdfw.wa.gov/>

Planning

Forest*A*Syst. An interactive Web site that helps you develop a working plan for your property. <http://www.forestasyst.org/>

Trees of Washington. An easy to use tree identification guide. Download for free at <http://cru.cahe.wsu.edu/CEPublications/eb0440/eb0440.pdf>, or contact your local WSU Extension forest educator.

Landscape Design for Wildlife. A publication available from Washington Department of Fish and Wildlife Mill Creek office, 425-775-1311.

The Woods in Your Backyard: Learning to Create and Enhance Natural Areas Around Your Home. Kays, Jonathan, J. Drohan, A. Downing, and J. Finley. Natural Resource, Agriculture, and Engineering Service. Pub # NRAES-184. May be ordered at: NRAES@Cornell.edu; 607-255-7654, or http://www.nraes.org/nra_order.taf?_function=detail&pr_booknum=nraes-184.

Living with Wildfire

Living with Fire: A Guide for Homeowners. <http://www.fs.fed.us/r3/publications/documents/livingwithfire.pdf>

Landscaping for Fire Protection. A three-part series from University of Idaho Extension. <http://www.cnr.uidaho.edu/extforest/April,%202008.htm>

National Firewise. Web site of the National Firewise Communities program. Has lots of good information and tips. <http://www.firewise.org/>

Tolt Firewise. An example of a western Washington Firewise community at <http://www.toltfirewise.org/>

Fire-resistant Plants. Online publication from Oregon State University. <http://extension.oregonstate.edu/emergency/FireResPlants.pdf>

Fire-resistant Home Construction. One-page fact sheet from Oregon State University. <http://www.cof.orst.edu/cof/extended/extserv/wildlandfire/fwlists%5B1%5D.pdf>

Fire Education for Landowners: Fuel Reduction Series. Learn about fire behavior and fuels reduction methods from Oregon State University. <http://www.cof.orst.edu/cof/extended/extserv/wildlandfire/woodlandowners.php>

Let's Clear the Air About Outdoor Burning. Washington State Dept. of Ecology Web site at http://www.ecy.wa.gov/programs/air/outdoor_woodsmoke/2007Burn_Ban_FAQ.htm

Forest Health: Diagnosing your sick trees

WSU Forest-health Online Diagnostic. Diagnose your sick trees with this online tool from Washington State University. <http://nrs.wsu.edu/forestHealth/>

Common Insect and Disease Problems. Online diagnostic tool from Oregon State University. Although it focuses on SW Oregon, it has information pertinent to Western Washington. <http://extension.oregonstate.edu/sorec/sick-tree-information>

Online Catalog of Western Forest Insects and Disease. Very in-depth online resource from the US Forest Service. <http://www.fs.fed.us/r6/nr/ffd/wid.shtml>

WSU Forest Health Notes. Fact sheets organized by insect/pathogen species from WSU. <http://ext.wsu.edu/forestry/foresthealth/foresthealthnotes.htm>

Hazard Trees

Hazard Tree Prevention. Produced by the Pacific Northwest Chapter of the International Society of Arboriculture (ISA). <http://pnwisa.org/media/http/index.html>

Thinning

Variable Density Thinning for Wildlife and Wood Production. Fact sheet from the WA Dept. of Natural Resources. <http://snohomish.wsu.edu/forestry/documents/VDT.pdf>

Timber Sales and Management

Managing Your Timber Sale. WSU Extension publication. <http://cru84.cahe.wsu.edu/cgi-bin/pubs/EB1818.html>

Thinning: An Important Management Tool. A publication focused on maximizing the value of wood fiber and increasing commercial marketability. <http://cru84.cahe.wsu.edu/cgi-bin/pubs/PNW0184.html>

Pruning

Conifer Pruning Basics for Family Forest Landowners. Washington State University Extension publication. <http://cru.cahe.wsu.edu/CEPublications/eb1984/EB1984.pdf>

Stand Management Pruning to Enhance Tree and Stand Value. Online publication from Oregon State University at <http://extension.oregonstate.edu/catalog/pdf/ec/ec1457.pdf>

The Myth of Tree Topping. Fact sheet from the WSU Puyallup Research and Extension Center. http://www.puyallup.wsu.edu/~Linda%20Chalker-Scott/Horticultural%20Myths_files/Myths/Tree%20topping.pdf

Planting Trees and Shrubs

Maintaining Tree Seedling Vigor. Fact sheet of helpful information from the Washington State Dept. of Natural Resources. http://www.dnr.wa.gov/Publications/lm_webster_seedling_vigor.pdf

Enhancing Reforestation: Success in the Inland Northwest. A thorough and detailed PNW publication. <http://extension.oregonstate.edu/catalog/pdf/pnw/pnw520.pdf>

Successful Reforestation: An Overview. A publication from Oregon State University. <http://extension.oregonstate.edu/catalog/pdf/ec/ec1498.pdf>

Tools for Tree Planting and Weed Control. A streaming video presentation and demonstration from Washington State University Extension. <http://ext.wsu.edu/forestry/video/weeds.html>

Small Trees for the Home Landscape. WSU Extension publication with recommendations for suitable trees in urban landscapes. Available for free download at <http://cru.cahe.wsu.edu/CEPublications/EB2036/eb2036.pdf>

Wildlife

Woodland, Fish and Wildlife. A series of publications covering many species of wildlife and fish. <http://www.woodlandfishandwildlife.org/>

Wildlife Ecology and Forest Habitat. A Washington State University Extension publication on managing woodlands for wildlife. <http://cru.cahe.wsu.edu/CEPublications/eb1866/eb1866.pdf>

WDFW Backyard Wildlife Sanctuary Program. A program for landowners with small acreages and/or big backyards. <http://wdfw.wa.gov/wlm/backyard/index.htm>

Crossing Paths. An electronic newsletter from the Washington Dept. of Fish and Wildlife with news and information about urban and suburban wildlife. http://wdfw.wa.gov/living/crossing_paths/

Build Nest Boxes for Wild Birds. Nest box plan from Oregon State University, available at <http://extension.oregonstate.edu/catalog/pdf/ec/ec1556.pdf>

Create Roosts for Bats in Your Yard. Information from Oregon State University on bats and plans for building bat houses and roosts. <http://extension.oregonstate.edu/catalog/pdf/ec/ec1555.pdf>

Streams and Wetlands

Stream*A*Syst. An online tool from Oregon State University to help you examine stream conditions on your property. <http://extension.oregonstate.edu/catalog/html/em/em8761/>

Taking Care of Streams in Western Washington, Western Oregon, and Coastal Alaska: A Homeowner's Guide to Riparian Areas. PNW552. <http://extension.oregonstate.edu/catalog/html/pnw/pnw552/>.

Taking Care of Streams in Western Washington, Western Oregon, and Coastal Alaska: A Landowner's Guide to Riparian Areas. PNW558. <http://extension.oregonstate.edu/catalog/html/pnw/pnw558/>.

Noxious and Invasive Weeds

Washington State Weed I.D. Online weed identification tool. From the Washington Noxious Weed Control Board. http://www.nwcb.wa.gov/weed_ID/weed_id_1.htm

Weeds Gone Wild. Web site from the National Park Service. <http://www.nps.gov/plants/alien/>

USDA PLANTS Database. Plant database from the Natural Resource Conservation Service. You can search for invasive and noxious weeds by state. <http://plants.usda.gov/>

Gardenwise. An online guide to non-invasive choices for landscaping in western Washington. http://www.nwcb.wa.gov/education/Western_Garden_Wise_Web.pdf

Complete the form below for your property.

Total number of acres owned	Heavy use: (buildings, driveways, carports, etc.)	Intermediate use: (lawns, gardens, orchards, pasture)	Natural areas: (forested areas; unmowed areas with small trees, shrubs, grass)
_____ acres*	% total property _____ %	% total property _____ %	% total property _____ %

*An acre is a square—210 ft on each side

When did you buy or acquire your land? _____

Why did you purchase your land? _____

Have your reasons for owning land changed since you bought or acquired it? If so, how? _____

What do you enjoy most about your land? _____

What do you enjoy least about your land? _____

What do you want from your woodland now? (eg. protect wildlife, pay for college, protect view) _____

What do you want from your woodland in 10 years? _____

How much land (if any) would you like to convert to a natural area? _____

Where is it? _____

¹Worksheets 1 and 2 adapted from: The woods in your backyard: Learning to create and enhance natural areas around your home. Kays, et al.

WORKSHEET 2. IDENTIFY AND RANK YOUR OBJECTIVES²

Potential Property Objectives	Selected Objectives	Rank of Selected Objectives
<i>Natural area improvement</i>		
I have a grassy lawn/pasture I want to plant in trees	_____	_____
I want to control exotic/noxious weeds	_____	_____
I want to improve the health of my forest	_____	_____
I want to improve forest regeneration	_____	_____
I want to remove hazard trees	_____	_____
Other:		
Other:		
<i>Wildlife habitat</i>		
I want to create snags for woodpeckers and other cavity-users	_____	_____
I want to provide more food and cover for wildlife	_____	_____
I want to discourage deer	_____	_____
I want to have more amphibians and reptiles on my property	_____	_____
I want to attract more wildlife	_____	_____
Species of interest _____		
Other:		
Other:		
<i>Forest products</i>		
I want to cut firewood for myself and others	_____	_____
I want to start a forest products enterprise for fun and extra money	_____	_____
Forest products of interest _____		
<i>Riparian and water resources</i>		
I want to create or enhance a riparian buffer	_____	_____
I want to protect water quality in my streams/spring/seep	_____	_____
Other:		
Other:		

(Continued on back)

¹ Adapted from: The woods in your backyard: Learning to create and enhance natural areas around your home.: . Kays, et al.

² Adapted from The woods in your backyard: Learning to create and enhance natural areas around your home.. Kays et al.

Potential Property Objectives	Selected Objectives	Rank of Selected Objectives
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Recreation

I want to build recreational trails	_____	_____
I want to create a special place in the woods for reflection, campfires, etc.	_____	_____
I want to create a place for nature study	_____	_____
I want to build a blind for wildlife viewing	_____	_____
I want to build a tree stand for hunting	_____	_____

Other:

Other:

Aesthetics

I want to block an unpleasant view or have more privacy	_____	_____
I want to create a scenic view	_____	_____
I want to protect some special trees or a special place	_____	_____

Other:

Other:



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