Backyard Forest Stewardship in Eastern Washington

WASHINGTON STATE UNIVERSITY EXTENSION • EM028E

Table of Contents

The USDA Forest Service provided funding for the development of this publication.

Authors: Amy T. Grotta and Janean H. Creighton

Cover photo by Kristi McClelland
Adapted, with permission, from material developed by the
Washington State Department of Natural Resources

Backyard Forest Stewardship in Eastern 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 written specifically for people who live "in the woods" of eastern 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 wildfire, improving the health of your trees, 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 insect pests.
- Improve wildlife habitat in and around your forest.
- Care for your woodland so that it will continue to thrive for many years to come.

Preparing for Success

Set Goals

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

Be specific. For instance, improving habitat for wildlife is often important for many small acreage owners, but what species are most desired? Is hunting an important consideration or bird watching, etc.? Perhaps you are interested in improving the access in your forest for hiking or cross-country skiing. Or maybe improving the overall visual aesthetic is what interests you most. The goals you set should be as specific as possible.

Develop a plan. Having a plan of work for your property will help guide you toward reaching your goals and help you save both 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.

Forest health is a major concern in eastern Washington. Overcrowding ("overstocking"), drought, and exploding populations of natural and exotic pathogens combine to put pressure on these forests. This section will discuss a few of the most common problems that forest landowners may encounter.

Environmental Factors

Stress from long-term drought conditions or from overcrowding can weaken trees and make them susceptible to attack by other agents, such as bark beetles. In general, if many trees of different species

Figure 1. Drought is one example of an environmental cause of tree deaths such as these. (Photo courtesy of USDA Forest Service—North Central Research Station Archive, USDA Forest Service, Bugwood.org.)

exhibit common symptoms, the cause is probably environmental or human (Figure 1). If damage is limited to an individual 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. Thinning forest stands will improve tree vigor and help trees cope with environmental stresses.

Diseases

Root diseases such as Armillaria, Annosus, and laminated root rots (Figures 2 and 3) are caused by fungi that attack the roots of Douglas-fir, grand-fir, and some pine species. Look for trees with crowns that have yellowing foliage, thinning foliage, or

Figure 2. Typical appearance of the crown of a tree affected by root disease. (Photo courtesy of G. W. Wallis, Bugwood.org.)

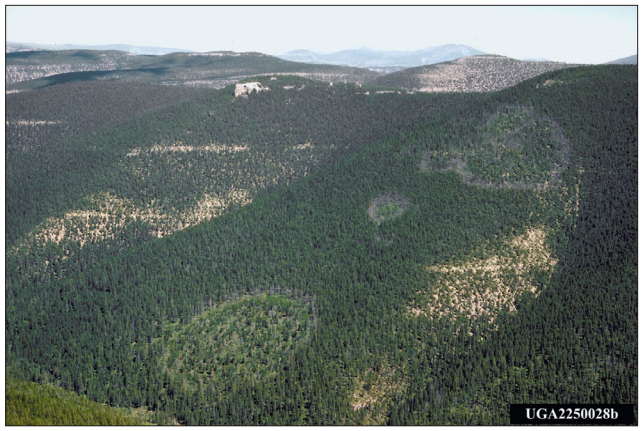

Figure 3. Trees growing close together may all share in a root rot infection, in what is known as a "root rot pocket." (Photo courtesy of Ralph Williams, USDA Forst Service, Bugwood.org.)

reduced height growth. Trees in areas of root disease may show varying stages of decline. Remove infected trees along with neighboring trees that are likely to also be infected through root contact. Replant with root rot-resistant species. Contact a WSU Extension forester or Washington DNR Stewardship forester for site-specific planting recommendations.

Insects

Bark Beetles. Insects such as mountain pine beetles, western pine beetles, and Douglas-fir beetles attack stress-weakened trees by boring into the bark and killing them (Figure 4). Trees that are already infested cannot be saved. By learning to identify the signs and symptoms of beetle infestation you have a greater chance of saving trees that are not yet infected. The best way to reduce bark beetle damage is to thin forest stands to improve tree vigor and provide resistance to bark beetle attack.

Possible indications of bark beetle activity:

- Large amounts of pitch on the trunk, either popcorn-shaped masses or streaming.
- Reddish-brown dust within the bark crevices or on the ground at the tree's base.
- Signs of heavy woodpecker activity, such as flaked bark on the tree trunk and flakes of bark on the ground below. Figure 4 shows trees in which woodpeckers have removed the bark.

Defoliating Insects. These insects eat the foliage of certain host tree species. The two insects of greatest concern in eastern Washington are the western spruce budworm (Figure 5) and the Douglas-fir tussock moth (Figure 6), which feed primarily on Douglas-fir and grand fir but may feed on other species as well. Direct

Figure 4. The thorough loss of bark on these trees is evidence of a bark beetle infestation.

Figure 5. Spruce bud worms require both spruce and Douglas-fir trees to complete their life cycle.

Figure 6. Tussock moths defoliate Douglas-fir and grand fir trees, weakening or even killing the trees. (Photo courtesy of Donald Owen, California Department of Forestry and Fire Protection, Bugwood.org.)

control is often not practical. Retain less susceptible species, such as pine and larch.

Some signs to look for:

- Shriveled, reddish-brown damaged needles that soon fall
- Bare branch tips
- Thin crowns and dead tops of trees
- Defoliation from top down and outside in
- Grayish-brown forest when viewed from a distance

Parasites

Dwarf Mistletoe. This is a parasitic plant that infects most coniferous species (Figure 7). It seldom kills the tree outright, but mistletoe does reduce tree vigor, making the tree susceptible to other damaging agents. Look for dense abnormal "broom-like" clumps of foliage—known as witch's broom—that may look like a bird's nest from a distance. Heavy infection will eventually kill the tree. Remove heavily infected trees and/or remove infected limbs from lightly infected trees. Mistletoe is a parasite, so killing the tree also kills the mistletoe plant. Unless the infected tree poses a risk of falling on your house, trees can be killed through girdling and left as a valuable wildlife snag.

Forest Health Care

Thinning

Thinning is one of the most beneficial activities most eastern Washington forest owners can perform to

Figure 7. Dwarf mistletoe is a parasitic plant spread by birds. It seldom kills a tree, but weakens it, leaving it vulnerable to other infections and attackers.

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.

Figure 8. A stand of trees during a thinning operation. (Photo courtesy of Chris Schnepf, University of Idaho, Bugwood.org.)

In eastern Washington, August through December is the best time to thin forest stands. Avoid creating any pine slash between January and July to reduce the potential for Ips bark beetle infestation. Ips bark beetles are native forest insects that overwinter and breed in pine slash with branches and bole wood over 4 inches in diameter. When large amounts of slash are present, populations of Ips can grow and become a serious problem, emerging from the slash and colonizing otherwise healthy trees. It is best to burn or dry out slash in the sun so it is not a suitable host for the Ips beetle.

How to Thin

Here are some guidelines for thinning that may prove helpful:

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

Remove competitors. Remove trees with below-average diameters, shorter crowns, or disease, insect, or other problems to benefit their more desirable neighbors. Don't make the mistake of trying to promote the growth of lower level trees by removing the larger, better trees growing above them—there is a reason that the neighboring trees are smaller.

Retain the best suited species. On most eastern Washington sites, pine species and larch are preferable to Douglas-fir and grand fir, which are more susceptible to drought and fire.

Retain trees for wildlife. Dead or hollow trees should be retained, unless they are in an unsafe location. Consider leaving a few small clumps of unthinned and unpruned trees to provide habitat diversity.

Be wary of fire hazards. Debris (slash) left from thinning and pruning may result in a fire hazard if 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 from buildings. Consult the "Living With Wildfire" section of this publication for more information.

Remove enough trees. A common error is to remove too few trees, so that the resulting stand is still overcrowded and stressed. 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 trees should be spaced after thinning, use the diameter spacing D+8 formula:

1. Pick the 10 "best" trees that you plan to retain after 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 8 to this number. This value should be the approximate spacing in feet between tree trunks after thinning.

Example. Let's say you have measured the 10 "best" trees you plan to retain after thinning. By using the procedure described above in steps 1 and 2, you estimate the diameter of each tree as follows: 4, 5.3, 4, 4, 3, 5.3, 8, 4, 8, and 3. Adding these numbers and dividing by 10 gives an average diameter of 4.9 inches. Adding 8 and 4.9 gives you 12.9. So when you thin your stand, you should leave approximately 13 feet between the trees that will remain.

Use this formula as an approximate guideline. Nature is not uniform, so don't 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 farther apart.

Pruning

Proper pruning in the forest can reduce fire risk while improving aesthetics and wood quality.

Tree topping is not pruning! Topping trees is often an unnecessary and damaging practice. When necessary, reduce tree height by selectively removing upper branches. Tree removal may be preferable to excessive pruning, especially near power lines.

When to Prune

Prune at the right time. 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 some species of bark beetles are actively seeking freshly downed material then.

How to Prune

Make pruning cuts at "intersections," not in mid-branch (Figure 9). Avoid "crew cut" pruning. Cut

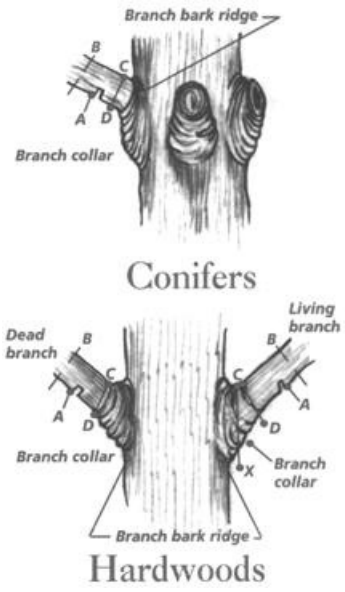

Figure 9. Pruning cuts: make an initial partial cut on the underside of a limb at "A," then a second cut completely through the limb at "B." Finally, remove the stub by cutting from "C" to "D." (Source: Washington Department of Natural Resources.)

where two limbs intersect or where limbs intersect the main tree trunk.

Make your cut at the branch bark collar. Avoid "flush cuts" that remove the branch bark collar or "stub cuts" that 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. Wear recommended safety equipment, such as eye protection, hard hat, gloves, and sturdy footwear.

Remove the right amount of branches. Prune conifers so that at least 50 percent of the total height of the tree remains in live green branches, with no fewer than four whorls of branches. Never remove more than two-thirds of live crown and consider not pruning branches on the stand's south and west sides to prevent sunscald.

Noxious and Invasive Weeds

Many non-native plants have spread into eastern Washington's forests and natural areas. They get introduced in a variety of ways, including human activity or from droppings of 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 our ecosystems and wildlife by displacing native plants. Displacement of native plants can reduce the amount of available forage and reduce overall productivity and biodiversity. Other noxious weeds may be toxic to wildlife or domestic animals. On slopes and along streams, invasive weeds can create soil erosion problems if they displace areas previously occupied by woody plants with more developed root systems.

Managing Weeds

Invasive weeds are those species that are not on the noxious weed list, but are nevertheless a problem. In eastern Washington, some of the most common noxious weeds in forests include knapweed (Figure 10), Dalmatian toadflax, and rush skeleton weed.

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 Resources section at the end of this publication for some Web sites with good weed photos and descriptions.

Figure 10. Spotted knapweed is an aggressive non-native weed that crowds out other plants and poisons the soil for native plants and forage crops in meadows, pastures, and forest land.

Don't buy invasive plants at nurseries. 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/Eastern_Garden_Wise_Web.pdf.

Don't dump potted plants in your forest. Many forests become 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.

Wash vehicles, livestock, and pets, and check clothing to prevent the spread of weed seeds.

Control weeds with integrated pest management techniques. Hand pulling, mowing, chemical, and biological control applications 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. Competition from desirable plants can inhibit weed growth by reducing available water, light, and nutrients. 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. County weed boards may also designate additional noxious weeds if they pose a specific threat to that region. Current lists of noxious weeds are available at: http://www.nwcb.wa.gov/weed_list/weed_list.htm.

Hazard Tree Recognition and Management

Trees or parts of trees that 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 11).

Figure 11. A hazard tree threatening power lines, buildings, and human activities. (Photo courtesy of Joseph LaForest, University of Georgia, Bugwood.org.)

Identify Hazard Trees

Check the trees near your home and yard for the following signs:

- Dead or dying, poorly attached limbs, and loose or cracked bark
- Old wounds or girdling, and obvious signs of decay (mushrooms, fungal conks, hollow trunks, bird nesting, and foraging holes)
- Leaning trees
- Cracks in soil that indicate root movement
- Shortened height growth
- Sudden large crop of cones
- Signs of root damage or exposure (including excavation in the root zone or compaction, pavement, or fill over the root zone)
- Yellowing, reddening, or thinning foliage.

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 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 very 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 International Society of Arboriculture (ISA) Certified Arborists.

Planting Trees and Shrubs

Plant Selection

Pick the right plant for the space. Many species can grow to be 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 (close to homes, under power lines, near sewer or water lines, or near driveways). If space is limited, select a smaller tree species.

Pick the right plant for the environmental conditions. Some 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 the climate, or those susceptible to insect and disease problems. Use native trees whenever possible.

Tree Planting

Plant trees 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 most areas of eastern Washington, good planting months are March to May. Avoid planting on excessively hot, cold, or windy days.

Plant your tree right. See Figure 12 for proper planting technique. Use the natural soil to fill the planting hole and don't add soil amendments or fertilizer.

Tree Establishment

Give your new tree a helping hand. Control competing grasses, brush, and weeds around small seedlings in the forest. For ornamental planting, establish a "tree well" and mulch the area around newly planted shade trees. Mulch keeps weeds down, conserves moisture, adds nutrients as the mulch breaks down, and protects trees from lawn mowers and weed trimmers. It may also be necessary to install protective barriers to prevent wildlife (rodents, rabbits, deer, elk, and moose) from feeding on young trees.

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

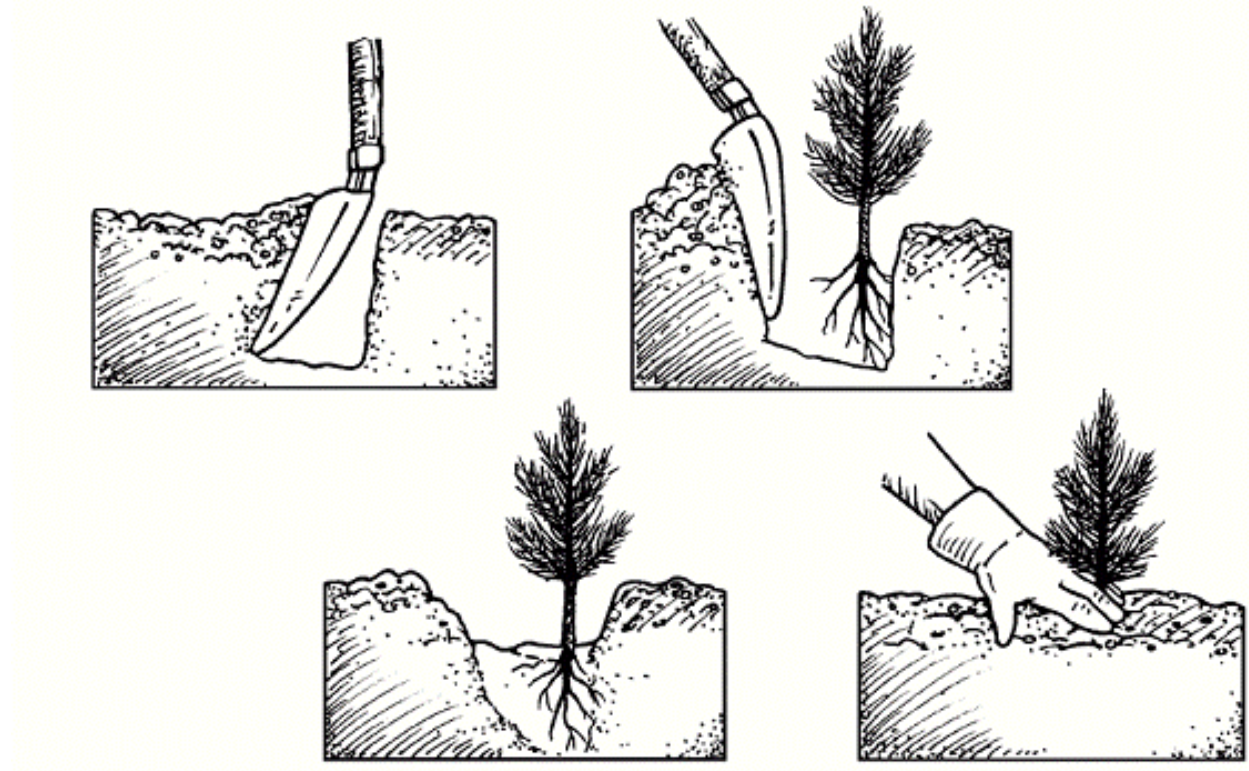

Figure 12. Diagram showing the steps for planting a seedling correctly. (Source: Washington Department of Natural Resources.)

Strategies for tree seedling survival

(Source: W. Carey, Auburn University)

Do not allow seedlings to dry out. Ample moisture is the key factor in seedling survival; seedlings must never be allowed to dry out from the nursery to planting. Plant immediately in the field, and remember "if they dry, they die."

Transport seedlings carefully. Rough handling can damage root systems and predispose seedlings to stress.

Avoid temperature extremes. Fluctuations in temperature, especially excessive heat, during storage and transport can result in seedling trauma during planting.

Plant promptly. Once seedlings are lifted, minimize storage time, especially early in the season, and avoid extended transport time.

Do not trim or prune seedling roots. Seedlings need every single tiny root to absorb moisture and nutrients from the ground: the more root surface, the better the growth.

Do not wash or shake gel from seedling roots. Gel applied to roots at the nursery prevents drying out during transport, decreases planting shock, and improves acclimation to the planting site.

Plant bare root seedlings in the spring from March through May. Cooler temperatures are more conducive to seedling survival and healthy growth.

Plant seedlings deeply. Greater exposure to the soil and its water content—even one-half inch of added depth of planting—significantly improves survival rates (Figure 13).

Do not attempt to plant seedlings that have frozen in the pack. Freezing irreversibly damages the root system, leading to seedling death.

Figure 13. A freshly planted evergreen seedling.

trees as important habitat (Figure 14). Look for dead or dying trees with large holes, peeling bark, and fungal conks. These trees can be retained for use by wildlife. 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 where they will not pose a safety hazard.

Figure 14. A snag showing evidence of multiple users and residents, including shelf fungi. (Photo courtesy of James E. Johnson.)

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.

Word of caution!

Snags can be dangerous. Locate them well away from trails, roads, buildings, and other structures.

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; however, smaller diameter snags are used by many cavity nesters and foragers (Figure 15).
- 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 which are at least 3 feet high. 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.

Figure 15. Evidence of woodpecker activity in a tree trunk. (Photo courtesy of James E. Johnson.)

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.

Variable Density Thinning

Variable density thinning is a method of thinning a forest stand in such a way that promotes a mix of small open areas with unthinned patches (Figure 16). The openings allow sunlight to reach the forest floor and stimulate the growth of plants beneficial to wildlife, while clumps of lightly thinned or unthinned and unpruned trees provide places for animals to hide from predators and the elements.

Understory Material

Retain understory vegetation and downed logs.

Figure 16. Variable density in a forest, as a result of thinning. (Photo courtesy of Dave Powell, USDA Forest Service, Bugwood.org.)

Shrubs and woody debris should be retained unless they pose an excessive fire hazard. Down wood 6 inches in diameter or larger contributes very little to fire spread. Maintain trees and shrubs along stream banks. If your property is too 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 also offers a variety of plant species and sizes.

A good overall wildlife seed mix (spread on trails, roads, and in openings)

- 2 lbs White Dutch Clover
- 5 lbs Idaho or Sheep fescue
- 11 lbs Blue Bunch Wheatgrass or Orchard grass

Sow 18 lbs of seed per acre of the mixture to cover approximately 200’ x 200’.

Nest Boxes

You can provide additional habitat for cavity-dependent species by providing wooden nesting boxes and bat roosting boxes. Make sure you place

Plants to attract wildlife

Bunchberry
Snowberry
Paper Birch
Cottonwood
Chokecherry
Hawthorn
Mountain Ash
Serviceberry
Wild Rose
Blue Elderberry
Ninebark
Kinnikinick
Willow
Twinberry
Redosier Dogwood

Figure 17. Blue elderberry provides shelter and food for a variety of wildlife. (Photo courtesy of Dave Powell, USDA Forest Service, Bugwood.org.)

Figure 18. Serviceberry, also known as Saskatoon berry, is a native understory plant with berries that are edible for humans as well as for wildlife. (Photo courtesy Dave Powell, USDA Forest Service, Bugwood.org.)

the boxes in areas that are protected from heat and wind.

Nest boxes of varying sizes will host many species, such as wood ducks and swallows. They 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.

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. Thoroughly clean bird feeders on a regular basis.
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.

Riparian Areas: Streams and Wetlands

Riparian zones are areas that surround water sources, such as streams and ponds (Figure 19). They support high soil moisture and associated moisture-loving vegetation. These are areas of high biodiversity that often provide necessary elements for wildlife survival—food, water, and cover—in the same location.

Riparian Management

The most important consideration in riparian zone management is avoiding bank erosion. Erosion occurs primarily because of vegetation removal during construction and landscaping. When vegetation is removed the resulting changes in water flow (flooding, for example), water temperature, and water chemistry may harm fish, aquatic invertebrates, amphibians, and some songbirds.

Figure 19. Riparian zone vegetation includes a wide variety of plants and supports a diverse animal population.

Riparian plants also serve as filters for any soil, pesticides, or fertilizers entering into the stream.

Here are a few things you can do to protect your important riparian areas:

1. Promote and plant native riparian plants. Important riparian species in eastern Washington include:

Black Cottonwood	Quaking Aspen
Golden Currant	Wood's Rose
Willow	Tufted Hairgrass
Redosier Dogwood	Snowberry

Figure 20. Black cottonwood is a riparian, or streamside, tree native to the western US and Canada. (Photo courtesy of Dave Powell, USDA Forest Service, Bugwood.org.)

2. Take care of plants and the streamside vegetation.
   - Promote dense vegetation to reduce runoff and to trap contaminants
   - Learn about native plants and use them when appropriate
   - Leave wood and other natural materials in streams
   - Don't straighten channels or place rubble or riprap in streams
   - Leave a live vegetation buffer as wide as possible next to the stream

Living with Wildfire

In rural, forested areas of eastern Washington fire is a natural part of the environment (Figure 21). But as more people move to rural areas the potential effects of fire on people and property increase. Fortunately, there are several steps you can take to help protect your home and property and reduce the potential damage to your forestland.

Figure 21. Valley fire. (Photo courtesy of Janean Creighton.)

Reducing Fire Risk on Your Woodland

Thin your woodland. Many forests in eastern Washington are overcrowded. Growing too close together makes trees more vulnerable to crown fires. When the crowns of adjoining trees touch or are so close together they form a contiguous fuel ladder, fire can spread quickly through the canopy. Thinning your woodlands can be very effective in reducing fire risk, especially when combined with the removal of ladder fuels such as brush, pruning lower tree limbs, and removing slash left over from a timber harvest. However, thinning should be done only between August and December to avoid creating habitat for bark beetles (see Forest Health Care in this publication).

Remove ladder fuels. In unthinned forest stands there are often many little trees in the understory. These small trees act as a "ladder" for fire and help carry it up into the crowns of bigger trees. Once a fire travels into the crown, tree death almost always occurs. These ladder fuels should be removed through thinning.

Prune trees. Tree branches that hang low to the ground are another kind of ladder fuel. Pruning the lower branches of trees can reduce the possibility of fire while improving aesthetics and timber quality. Increasing the distance between the ground and the lowest branches reduces the likelihood that a fire will move from the ground into the crown of a tree; a 10-foot "lift" is generally recommended for reducing this risk.

Treat slash. Slash is created after many forest management activities, such as pruning and thinning. Left on the ground, slash can increase the risk and spread of wildfire. Treating slash usually involves burning in piles or chipping. Many landfills offer designated days when yard debris can be disposed of for little or no cost. If you choose to burn, check local regulations regarding permit requirements and "burn ban" restrictions.

For burning on the improved areas of your property (yard and garden) contact the Department of Ecology or, if you are in Spokane County, Spokane Clean Air. For burning on the forested areas of your property, contact the Department of Natural Resources (DNR).

Making Your Home Safer from Fire

Create a defensible space. Defensible space is a buffer around your home designed to reduce the chance of a fire reaching it (Figure 22). To create this zone you will need to remove piles of debris near your house and landscape to decrease the amount of flammable vegetation close to the home. Within 100 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 roof and chimney. Keep your roof cleared of twigs and needles. Stack firewood and combustible materials well away from buildings. Fences made of wood or other flammable materials should not abut houses, outbuildings, or propane tanks. These structures can act as a fire corridor directing flames to the building.

Make sure firefighters can get to you. Make sure your address is easily visible for firefighters. Install an address sign with reflective numbers that are 4 inches high or larger. If it is not already wide enough, clear your driveway so that a fire truck can enter and turn

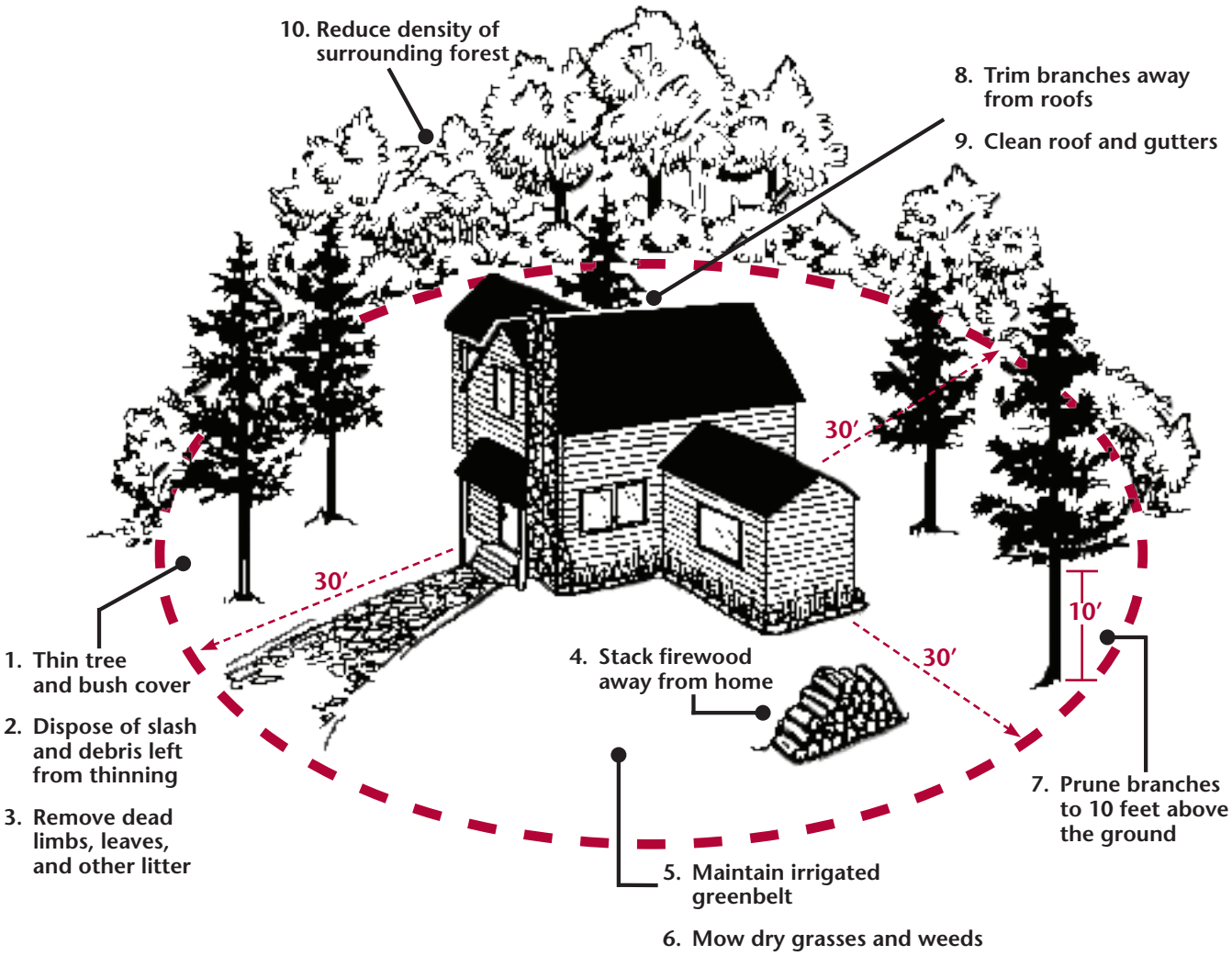

Figure 22. A fire-resistant defensible space is necessary protection for homes and buildings in a forest. (Source: US Forest Service.)

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 house 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 year round, especially when you burn debris. Store hoses in well-insulated locations to avoid freezing. Make sure spark arresters on lawn mowers, chain saws, string trimmers, and other gas-powered equipment are in place and functioning properly.

Keep fire safety equipment readily accessible inside and outside your home. Make sure the home has operable 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, starting 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.

Resources

For additional information on the topics in this publication, check out these resources:

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 Private 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 Department of Fish and Wildlife. http://wdfw.wa.gov/.

Planning

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

Trees of Washington. An easy-to-use tree identification guide. Available 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. Published by Natural Resource, Agriculture, and Engineering Service; publication number NRAES-184. Order at 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.

Fire and the Wildland/Urban Interface. Several publications from University of Idaho Extension. http://www.uidaho.edu/extension/forestry/content/fire/wildlandurbaninterface.

National Firewise. Website of the national Firewise Communities program. Has lots of good information and tips. http://www.firewise.org/.

Fire-resistant Plants for Home Landscapes. On-line publication from Oregon State University. http://www.firefree.org/images/uploads/FIR_FireResPlants_07.pdf.

Fire-Resistant Construction Checklist. One-page fact sheet from Oregon State University. http://extensionweb.forestry.oregonstate.edu/sites/default/files/uploaded-files/fwlistsz.pdf.

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

Forest Health: Diagnosing Sick Trees

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

What's Eating My Forest? Diagnose your sick trees with this on-line tool from Washington State University. http://nrs.wsu.edu/forestHealth/.

Common Insect and Disease Problems. On-line diagnostic tool from Oregon State University. Although it focuses on southwest Oregon, it has information pertinent to the Inland Northwest. http://extension.oregonstate.edu/sorec/sick-tree-information.

Online Catalog of Western Forest Insects and Diseases. Very in-depth on-line resource from the U.S. Forest Service. http://www.fs.fed.us/r6/nr/fid/wid.shtml.

Field Guide to Diseases and Insect Pests of Northern and Central Rocky Mountain Conifers. http://www.idl.idaho.gov/bureau/ForestAssist/insect_disease/InsectAndDiseaseFieldGuide.pdf.

Hazard Trees

The Hazard Tree Prevention Webpage. Produced by the Pacific Northwest Chapter of the International Society of Arboriculture. http://pnwisa.org/media/htp/index.html.

Thinning

Guidelines for Thinning Ponderosa Pine for Improved Forest Health and Fire Prevention. Applied research results from the University of Arizona. http://cals.arizona.edu/pubs/natresources/az1397.pdf.

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

Timber Sales and Management

Managing Your Timber Sale. WSU Extension publication. http://cru.cahe.wsu.edu/CEPublications/eb1818/eb1818.pdf.

Thinning: An Important Timber Management Tool. A publication focused on maximizing value of wood fiber and increasing commercial marketability. Order at https://cru84.cahe.wsu.edu/ItemDetail.aspx?ProductID=14686&SeriesCode=&CategoryID=&Keyword=pnw0184.

Pruning

Conifer Pruning Basics for Family Forest Landowners. WSU Extension publication. http://cru.cahe.wsu.edu/CEPublications/eb1984/EB1984.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. Helpful information from the Washington State Department 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 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 WSU 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. 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 WSU Extension publication on managing woodlands for wildlife. http://cru.cahe.wsu.edu/CEPublications/eb1866/eb1866.pdf.

Washington Department of Fish and Wildlife 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 on-line newsletter from the Washington Department 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. On-line nest box plan from Oregon State University. 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 on-line tool from Oregon State University to help you examine stream conditions on your property. ftp://ftp-fc.sc.egov.usda.gov/WSI/pdffiles/Stream-A-Syst_2001.pdf.

Taking Care of Streams in Eastern Washington, Eastern Oregon and Idaho: A Homeowner's Guide to Riparian Areas. http://extension.oregonstate.edu/catalog/pdf/pnw/pnw557.pdf.

Taking Care of Streams in Eastern Washington, Eastern Oregon and Idaho: A Landowner's Guide to Riparian Areas. http://extension.oregonstate.edu/catalog/pdf/pnw/pnw559.pdf.

Noxious and Invasive Weeds

Landscaping with Native Plants in the Inland Northwest. MISC0267. WSU Extension publication on gardening with native plants. Order at http://www.wnps.org/landscaping/landscaping_why.html.

Washington State Weed I.D. On-line weed identification tool from the Washington State 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 Resources Conservation Service. You can search for invasive and noxious weeds by state. http://plants.usda.gov/.

Worksheet 1: Property description and goals

Complete the form below for your property.

Total # of acres owned	**Heavy use** (buildings, driveways, carports, etc.)	**Intermediate use** (lawns, gardens, orchards, pasture)	**Natural areas** (forested areas and/or 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? (to protect wildlife, pay for college, protect view, etc.)

_____

_____

In 10 years? _____

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

_____

[1] 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 objectives[2]

Complete the table below. Identify and rank your top five objectives for your property.

Objectives	Potential objective	Rank selected objective
Natural area improvement		
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:		
Wildlife habitat		
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:		
Forest products		
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:		
Riparian and water resources		
I want to create or enhance a riparian buffer		
I want to protect water quality in my streams/spring/seep		
Other:		
Other:		
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:		

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

WASHINGTON STATE UNIVERSITY
EXTENSION

You may order copies of this and other publications from WSU Extension at 1-800-723-1763 or http://pubs.wsu.edu.

Issued by Washington State University Extension and the U.S. Department of Agriculture in furtherance of the Acts of May 8 and June 30, 1914. Extension programs and policies are consistent with federal and state laws and regulations on nondiscrimination regarding race, sex, religion, age, color, creed, and national or ethnic origin; physical, mental, or sensory disability; marital status or sexual orientation; and status as a Vietnam-era or disabled veteran. Evidence of noncompliance may be reported through your local WSU Extension office. Trade names have been used to simplify information; no endorsement is intended. Published December 2011.

EM028E