AFM
American Forest Management
11415 NE 128th St Suite 110 Kirkland WA 98034 • (425)820-3420 • FAX (425)820-3437
www.americanforestmanagement.com

Forest Assessment Report
Brugger's Bog Park
Shoreline, Washington

Report Prepared By:
American Forest Management, Inc.
Bob Layton

July 28, 2016

Table of Contents

Introduction 2
Forest Stewardship Vision 2
Purpose of Plan, Land Owners Objectives and Goals 2
Property Description 2
Resource Category I. Soils 3
Resource Category II. Water Resources 3
Resource Category III. Forest Inventory 3
Resource Category IV. Forest Health/ Invasive Species/Wildfire 6
Resource Category VI. Wildlife 9
Resource Category VII. Protection of Special Resources 9
Resource Category VIII. Aesthetics & Recreation 9
Tree Risk Management 10
Forest Management Considerations 11
Type 1 11
Type 2 11
Type 3 11
Summary of Forest Management Recommendation Priorities 12

SUPPLEMENTAL MATERIALS

COVER TYPE MAP - ORTHOPHOTO
COVER TYPE MAP - TOPOGRAPHY
ENHANCING WILDLIFE ON PRIVATE WOODLANDS BULLETIN
TIPS FOR CREATING SNAGS
BLACKBERRY CONTROL
IVY CONTROL

Introduction

This report or plan identifies current forest health conditions and invasive species concerns. The plan is written to provide the King Conservation District with baseline information for the future development of a Forest Stewardship Program on the property.

Forest Stewardship Vision

The landowner recognizes the multiple values that this urban open-space parkland provides. Maintaining and enhancing the property's forest and natural resources benefits surrounding properties, the local community, and the overall environment.

Purpose of Plan, Land Owners Objectives and Goals

The purpose of this report or plan is to identify current forest conditions and considerations for management over time. The landowner's primary objective is to manage the property as a forest preserve.

Landowner goals include but are not limited to maintaining and improving forest health, enhancing wildlife habitat, encouraging a diversity of native trees, shrubs and plants, monitoring and treating invasive species, riparian/stream enhancement to improve the capacity to clean and filter storm water runoff, and protecting sensitive areas.

This report provides a description of the resources found on the ownership and summarizes management considerations for the future. The report/plan should be periodically updated and amended to reflect the state of the forest resources, current knowledge and understanding of natural resources, as well as changing landowner goals.

Property Description

The property or park comprises one tax parcel (0426049049) totaling roughly 4.3 acres. The park is accessible from the east via 25th AVE NE.

The property is relatively flat. A stream meanders through the middle of the property. A wetland associated with the stream exists in the southeast portion of the property.

Elevation above sea level ranges between 230 and 250 feet. The property is surrounded by development on all sides, both residential and commercial. Refer to the ortho-photo and topographic maps found at the back of this report in the supplemental materials section.

Approximately half of the park (+/- 2 acres) is maintained where the grass is routinely mowed. A playground exists in the northwest portion. Natural areas exist primarily adjacent to the stream and on park perimeters.

Resource Category I. Soils

There is no recorded soil survey data for the subject area. When the majority of lands across King County were surveyed in 1973, this area was not included for whatever reasons. Based on adjacent surveys, it is assumed the soils are likely the Alderwood gravelly sandy loams found on 0% to 8% slopes.

Alderwood soils are moderately well drained and moderately deep over a hardpan. They are formed in glacial till. Elevation of near sea level to 550'. Permeability is moderately rapid above the hardpan and very slow through it. Available water capacity is low. Effective rooting depth is usually 20" to 40". Runoff is rapid and the hazard for soil erosion is high. Springs or seep areas are common.

Commonly found tree species include mostly Douglas-fir; with lesser but potentially moderate components of western hemlock, western red cedar, and red alder. Common forest understory plants include salal, Oregon grape, red huckleberry, bracken fern, and sword fern.

Soils across the site are stable. No evidence of mass wasting was observed during the site inspection. Other than normal erosion in stream banks, no significant erosion was observed on the property.

The Douglas-fir 50-year site index is 142. This means that from the time a tree is planted or naturally seeds in, on average it will grow to a height of roughly 142 by the time it is 50 years of age. The soils are very productive for growing trees.

Resource Category II. Water Resources

A perennial stream meanders along the properties north perimeter and then crosses the property draining into a culvert near the southeast corner. The perennial water source above is unknown. Additionally, this stream channel carries storm water runoff from surrounding developed areas. Minor normal erosion of the stream bank caused by periods of heavy rain and park users was observed.

There is also a mapped wetland in the southeast portion of the property and along the south perimeter. This wetland is considered a forested wetland. Forested wetlands are wetlands dominated by woody vegetation at least 20' in height. Wetlands provide many ecological functions. Some of the benefits they provide include water purification, groundwater recharge, and streamflow maintenance. Wetlands also provide rare habitat for many species.

Resource Category III. Forest Inventory

The forest cover or tree cover is generally clumpy or patchy in structure due to past maintenance and site improvements. It is primarily found adjacent to the stream, in small clumps containing one to five trees and in a large cluster in the southwest portion of the property. The park contains a wide variety of tree species of differing age classes. Species include both native and non-native specimens. Native species observed at the site include

Douglas-fir, western hemlock, western red cedar, big leaf maple, black cottonwood, bitter cherry, red alder, Scouler's and Pacific willow, and shore pine. Non-native trees include weeping willow, horse chestnut, European white birch, Austrian pine, Scots pine, Many trees have been planted at the park in years past, particularly at the edge of the stream corridor or riparian zone. Planted trees include different varieties of pine, western red cedar and grand fir.

The forest cover has been delineated into three cover types based on tree species composition and shrub cover. Refer to the ortho-photo cover type map in the supplemental materials section.

Type 1 (0.9 acres) encompasses the stream and wetland area in the southeast portion of the park. Tree species are primarily native deciduous species; comprised of Pacific willow, Scouler's willow and red alder. There are also minor components of black cottonwood. Some non-native volunteer species also exist, these include horse chestnut, weeping willow and European white birch. Three young Douglas-fir trees exist in the eastern portion. These appear to have been planted roughly 10 years ago.

Tree density or stocking is low to moderate. Understory vegetation is heavy to invasive species, primarily Himalayan blackberry. Native vegetation species are minor and consist mostly of sword fern and trailing blackberry.

Type 2 (0.86 acres) is the large, broken up grouping of trees in the southwest portion. Species are comprised primarily of native species of Douglas-fir, western red cedar, western hemlock, big leaf maple and bitter cherry. There is also a minor component of pacific madrone. Dominant trees are estimated at 50 to 60 years of age.

Understory vegetation density is light to moderate. The lower shrub layer is comprised of swordfern, creeping blackberry and Oregon grape or Mahonia. The mid-shrub layer is primarily Indian plum; and the upper shrub layer is primarily beaked hazelnut.

Overall invasive plant species cover is low to moderate with dense Himalayan blackberry infestations on the type edges. English holly was observed scattered throughout the type.

Type 3 (0.54 acres) contains very few trees. This type is primarily comprised of brush or shrub species. The few trees are comprised of Pacific and scouler's willow. Invasive cover is high and is primarily Himalayan blackberry and morning glory.

Resource Category IV. Forest Health/ Invasive Species/Wildfire

The overall state of forest health is fair. Tree ages range from young seedlings to more than 70 years. No atypical disease or insect infestations were observed. There are a few recently dead trees on the property and some in decline. This appears to be mainly attributable to drought stress. The forest health issues observed are discussed below.

The small grouping of two young to semi-mature Douglas-fir trees at the front of the property is stressed, evident by dieback of upper crown components, dead and thinning foliage. The decline appears to be drought related.

Recent decline of semi-mature Douglas-fir trees off of 25th AVE NE

Another older Douglas-fir tree has also recently died. It is located on the south perimeter on the west side of the property. This tree is believed to be infected with Armillaria root disease, evident by the heavy pitching or exudation of sap from the lower trunk.

Ganoderma applanatum, a white rot fungus was observed on a mature black cottonwood tree at the southwest edge of Type 1. The fruiting body photographed below indicates only decay at one location on the root crown.

The decay pathogens found at the site are native and frequently found in forests across the Puget Sound Region. These pathogens all play a role in forest succession and their presence does not necessarily suggest an unhealthy forest ecosystem.

Invasive Plant Species

The presence of non-native invasive species on the property is high overall. There are significant infestations of Himalayan blackberry throughout. Other invasive plant species observed include morning glory, English ivy, reed canary grass, and purple nightshade. The maps in the supplemental materials section shows invasive species densities in each cover type.

Himalayan and evergreen blackberry are European species of blackberry that are highly invasive and difficult to control. General recommendations for treatment and control of non-native blackberry includes mechanical treatment (mowing) prior to seed set, and or application of herbicides during periods of active growth. Herbicides containing glyphosate, triclopyr, 2,4-D, and metsulfuron are known to be effective. A preferred measure for treatment holly is removal by pulling the plant from the ground. Repeated cutting can also be effective.

Consult the King County Noxious Weed Control Program for information regarding the control of these exotic invasive species at http://www.kingcounty.gov/environment/animals-and-plants/noxious-weeds.aspx This web page provides a list of species along with species

profiles (including identification and control methods) in PDF format. Control fact sheets are included in the supplemental materials section for the dominant species on the property.

Animal Damage

No significant signs of animal damage was observed on the property. Animal damage is not a concern on the property.

Wildfire Risk

The current wildfire risk on the property is low. Under normal weather conditions, the risk of fire spreading through the forest is very low.

The threat of forest fire in 'West-side' forests is becoming increasingly higher. Drier than normal conditions over the last several years have dramatically increased this threat. All management activities should consider this risk and precautions taken to minimize the risk of fire.

Resource Category VI. Wildlife

The park provides valuable wildlife habitat to the area. It is a refuge for small mammals such as gray and red squirrels, raccoons, opossums and mountain beaver.

Snags on the property are important habitat components for various bird species that feed on insects and nest in cavities. Snags should be created from trees that have died or existing snags retained unless they pose a danger to human life or a structure. See the information on habitat snagging in the supplemental materials section.

The Woodland Workbook "Enhancing Wildlife Habitat on Private Woodlands", 2002 is included in the supplemental materials section for your use. This publication provides valuable information pertaining to site specific applications to increase wildlife use.

Resource Category VII. Protection of Special Resources

The writer of this plan is unaware of any historic or pre-historic cultural resources on the property.

High conservation value forests are forests of recognized importance due to their environmental, social, biodiversity or landscape values; or their connection with the landowner. An area of relic old growth may be considered a high conservation value forest.

Given the degree of development around this fragmented piece of patchy native second-growth forest, many may consider this forest as 'High Conservation Value'.

Resource Category VIII. Aesthetics & Recreation

Landowner goals are to maintain a healthy forest ecosystem which is critical to recreation and aesthetics. A healthy forest ecosystem will increase recreational opportunities such as birding and nature viewing.

Tree Risk Management

A few problematic tree conditions were observed during the site inspection. These primarily involve recently dead trees.

A small cluster of recently dead bitter cherry trees (pictured below) was found in the southwest portion of the park. These lean over a grassy area and are hung up in adjacent trees. Removal is recommended to maintain risks at acceptable levels.

The large dead Douglas-fir tree on the south perimeter is also problematic. Overtime as upper crown components naturally decay and degrade, they will be susceptible to breakage. Because the suspected cause of death is Armillaria, root structure has not likely been compromised and the potential for wind-throw or whole tree failure is low. To maintain risks at acceptable levels, consider habitat snagging this tree at roughly 20' above ground. See the information on habitat snagging in the supplemental materials section.

The recently dead smaller Douglas-fir tree at the front of the property off of 25th AVE NE will also be problematic over time as upper components degrade and become more susceptible to breakage. Current risk if failure is low to moderate. To maintain risks at acceptable levels, consider removing this tree within the next year.

Forest Management Considerations

Type 1

Future restoration work should be focused on Type 1 to improve stream/wetland riparian functions. The majority of tree cover is currently deciduous. Much of the tree cover is in short-lived willow species. The deciduous tree cover allows the invasive Himalayan blackberry to increase in density and advance. The establishment of native coniferous species within the type is the only way to eventually eradicate the blackberry. Blackberry is not shade tolerant and therefore cannot survive in the understory shade of coniferous trees.

Shade tolerant trees species such as western red cedar, Sitka spruce and western hemlock seedlings should be established in the understory to eventually take the place of the over-story hardwood as it naturally declines and dies out. The use of mechanical brush cutters can be employed to clear out planting locations while providing access around the property. Planting locations or circles should be cleared to a radius of at least six feet in diameter. Coniferous trees should be spaced 16' to 20' apart to allow them to develop full crowns and good form or structure. Planting trees too close together results in tall, skinny trees, as they compete with one another for sunlight and space.

Many trees have been planted in recent years on the edge of the type. These should be maintained or managed so they are not being overtaken by brush. The planted trees will need to be periodically maintained. Seedlings shall be kept in a 'free-to-grow' condition. A seedling that is taller than the adjacent vegetation is considered 'free-to-grow'. The brush may need to be periodically cut back until trees reach a height where they are no longer in danger of being over-topped by brush. Deer browse is not likely a concern on the property and therefore seedling protectors are not likely necessary.

Type 2

Invasive species cover ranges from low to high. Due to the predominance of coniferous species within the type, Himalayan blackberry is confined primarily to the edges of the type where it is exposed to sunlight and along the south perimeter of the property. English holly is also present within the type. Holly, when small, is best eradicated by hand-pulling. Larger holly can be treated with herbicide injections.

Type 3

Invasive species cover in Type 3 is very high. This type is basically a buffer strip between the park and adjacent development. Very few trees exist within this type. If restoration of this type is wanted, it can be mowed down or masticated, and then treated with an herbicide once invasive plants re-sprout to eradicate them. Then the type can be replanted to native tree and shrub species.

Summary of Forest Management Recommendation Priorities

- Habitat snag large dead Douglas-fir tree on the south perimeter
- Remove fallen/hung-up bitter cherry trees at back of property
- Remove dead Douglas-fir tree at front of property within one year

1) Type 1

- Major invasive plant infestation in most of type. Priority area for restoration work.
- Prepare 6' to 8' radius planting locations with a manual gas-powered brush cutter, and then establish/plant shade-tolerant conifer species to eventually replace the hardwood over-story and shade out and kill invasive blackberry.
- Periodically cut back brush to maintain planted trees in a 'free-to-grow' condition.

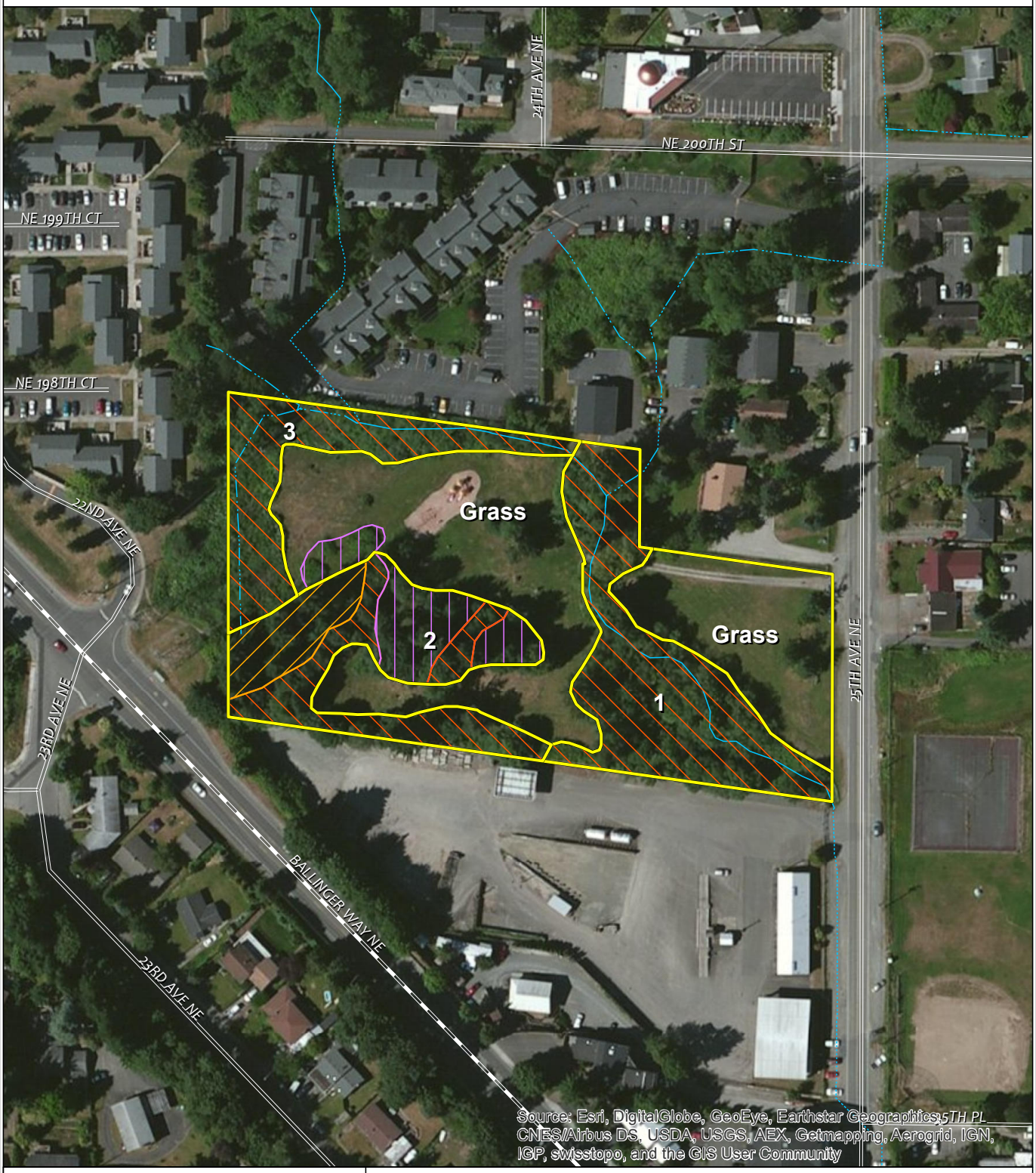
2) Type 2

- Control blackberry at type edges mechanically or chemically. Remove minor invasive plant species (holly, morning glory) from type by hand-pulling.

3) Type 3

- Mow or masticate vegetation to prepare site for restoration planting.
- Establish mix of native trees and shrubs

City of Shoreline Bruggers Bog **ORTHOPHOTO**



1 inch = 150 feet

0 150 Feet

Map date: 7/26/2016

AFM American Forest Management

N

Cover Type

- 1 (0.9 acres)
- 2 (0.86 acres)
- 3 (0.54 acres)
- Grass (2.06)

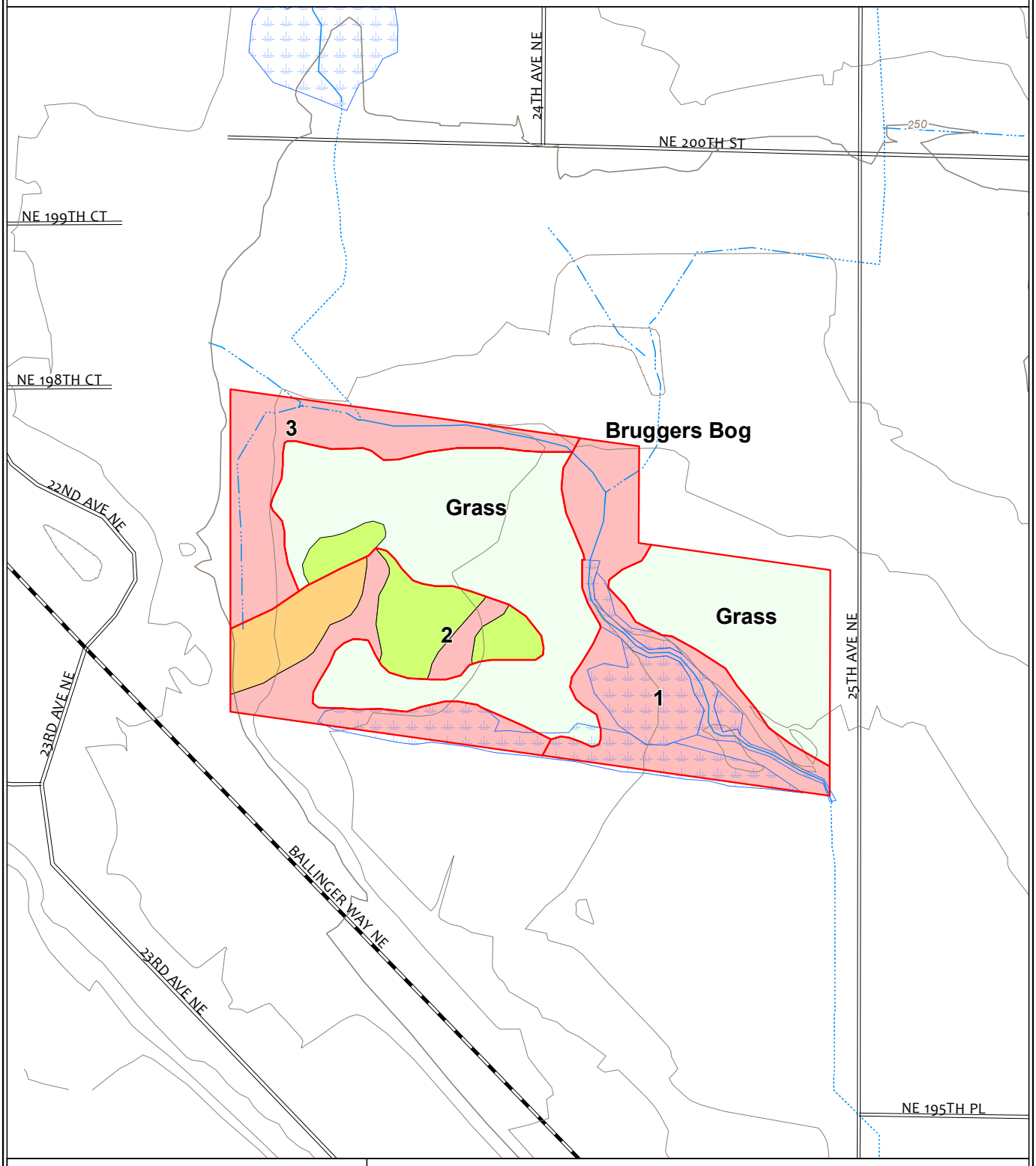
- High invasive cover
- Moderate invasive cover
- Low invasive cover

State Water Type

- F: Contains Fish Habitat
- Piped
- Not Typed

City of Shoreline Bruggers Bog

TOPOGRAPHY



1 inch = 150 feet

0 150 Feet

Map date: 7/26/2016

AFM American Forest Management

N

Cover Type		
1 (0.9 acres)	High invasive cover	Wetland
2 (0.86 acres)	Moderate invasive cover	10' contour
3 (0.54 acres)	Low invasive cover	50' contour
Grass (2.06)		

THE WOODLAND WORKBOOK

MULTIPLE USE

EC 1122 • Reprinted June 2002 $2.00

Enhancing Wildlife on Private Woodlands

D.S. deCalesta

Contents

What is enhancement? 2
How do we get enhancement? 2
Enhancing habitat 2
Habitat diversity 2
Habitat quantity 2
Habitat placement 3
Special requirements 4
Constraints on enhancement 4
Conifer damage 4
Conflicts with timber production 5
Neighbors 6
Matching what you want with what you've got 6
What wildlife do you want? 6
What habitat(s) do you have? 7
Make a plan 7
Where to go for help 7
For more information 8

David S. deCalesta, former Extension wildlife specialist, Oregon State University.

Wildlife is an integral part of woodlands. Where there are forests, meadows, and streams, there is wildlife. Wildlife means many things to people, but for purposes of our discussion we'll divide it into three basic categories. The most common category is *game*—birds and mammals that one hunts for recreation, fur, and food.

Another category is *pest animals*—those that damage conifer seedlings, seeds, and in some cases larger trees.

A third category, a catch-all, is *nongame species.* This includes songbirds, reptiles, amphibians, and other animals that are neither hunted nor do they cause problems. Rather, they are observed by birdwatchers, photographers, hikers, and others enjoying outdoor recreation. Rare or endangered species such as the bald eagle and spotted owl usually are included in this category.

One of the directing forces behind managing natural resources, particularly on small areas such as woodlots, is the benefit received. What sort of benefit(s) can you expect from investing time and money in wildlife?

If you're a hunter managing for game, your benefit would be harvesting more and/or bigger (i.e., trophy) animals. Also, perhaps, if your acreage is sufficiently large (600+ acres, or approximately 1 square mile), you might profit from leasing the right to hunt on your land. If you're a birdwatcher, your objective is to spot more birds and/or more bird species.

This publication discusses managing game and nongame wildlife in order to increase people's use of them. Pest wildlife is discussed only to the extent that land management for game and nongame species does not lead to increased pest damage. Controlling pest animal damage to conifers is covered in *Understanding and Controlling Deer Damage in Young Plantations,* EC 1201, and *Controlling Pocket Gopher Damage to Conifer Seedlings,* EC 1255 (see page 8).

Whether you manage land for game, nongame, or pest species, the objective is to increase, decrease, or maintain numbers of wildlife. Increased use of wildlife usually necessitates increasing numbers or quality of wildlife available for use, which is known as wildlife *enhancement.*

OREGON STATE UNIVERSITY
EXTENSION SERVICE

What is enhancement?

Enhancing wildlife populations means causing an increase in number and/or quality of animals within those populations. The objective might be, for example, to produce more deer or quail, to have more trophy-class animals, or to increase diversity (the number of species).

How do we get enhancement?

All wildlife species are products of their environment or habitat. Each species has specific habitat requirements that are different from those of other species. The habitat provides basic life requirements including food, protection from enemies and weather, and a place to rear young.

As the *amount* of specific habitats and the *diversity* of habitats increases, diversity and numbers of wildlife species on a given piece of land also increase. So, the question "How do you enhance wildlife species?" can be rephrased as "How do you enhance habitat?"

Enhancement must provide for year-round wildlife needs. For some species, such as deer and elk in eastern Oregon, quality and quantity of some habitat elements vary seasonally. The quality and quantity of forage in summer and fall determine the amount of fat animals store in preparation for the tough winter.

If forage is not plentiful and of high quality on summer ranges, the animals might starve on winter ranges where food typically is of low quality and quantity. Also, if deer and elk are not in prime condition in fall, they might not breed, and fawn and calf crops could fail in the spring.

Enhancing habitat

Habitat diversity

Vegetation (trees, shrubs, grasses) provides wildlife habitat. Different species live in different places within this structure. Various birds, such as some warblers, live only in the tops of conifer trees. Here they find food (insects), build nests, and take shelter from weather and predators. Other species, such as pocket gophers, live underground in grassy meadows.

Some species, such as certain frogs and salamanders, have a special requirement for the riparian zone—the moist, often forested area alongside streams. Most species, however, including deer, quail, and chipping sparrows, require combinations of habitat—meadows and other forest openings to feed in and timber for breeding sites and for protection from weather and predators.

Habitat variety is natural when natural events such as fire, windthrow, and insect and disease attacks open portions of forested areas. These areas usually are revegetated in stages, beginning with grasses, progressing to shrubs, then seedling trees, saplings, mature trees, and finally old-growth trees.

With each successive stage, different combinations of wildlife species likewise appear, persist awhile, and then decline (Figure 1a). The diversity of wildlife species depends on habitat diversity associated with these stages. Providing a diversity of habitats (and thus a diversity of wildlife species) requires a diversity of areas in different stages of vegetative development.

Clearcut logging works like nature in opening forest lands and beginning the progression of vegetative stages, starting with grassy meadows. Reforestation (planting conifer seedlings) and brush control provide other vegetative stages, but the time sequence is shortened (Figure 1b). The last stage, old growth, usually is not attained.

Habitat quantity

Can I grow deer on a 10-acre plot? How many acres does a covey of quail require? What quantities of habitat support viable, reproducing populations of wildlife species? The diversity and abundance of wildlife populations that a given parcel of land supports are directly related to the amount and kinds of land available.

Table 1 (page 5) gives minimum space requirements of representative species. Deer require a minimum of 30 acres per animal of combined forest lands and openings.

Quail require a minimum of 5 to 10 acres per bird of open meadows, with brushy

areas interspersed within the meadows and adjacent forest lands. Songbirds, such as chipping sparrows, require about 5 acres per bird, again of open areas adjacent to forested acreage.

The size and timing of timber harvest can be a major tool in simultaneous management of timber and wildlife. Instead of creating large (more than 100 acres) clearcuts in single cuttings, many smaller cuts can be spread over a number of years (40 to 60 acres could be cut every 5 to 7 years). This would even out the flow of dollar returns from timber and the supply of forage and habitat diversity for wildlife. Thinning timber also provides forage and habitat diversity.

Habitat placement

Wildlife species use different habitats to meet different needs (openings for food, forested areas for cover). These different habitats must be close enough to each other that wildlife can move readily from one to the other with minimal exposure to predation and weather. Wildlife species with small home ranges (songbirds, quail, grouse, rabbits, and deer and elk in western Oregon) must have these different habitats close together (mere hundreds of feet for quail and rabbits and usually less than 0.25 mile for deer and elk).

Problems may arise in eastern Oregon with animals such as deer and elk. They

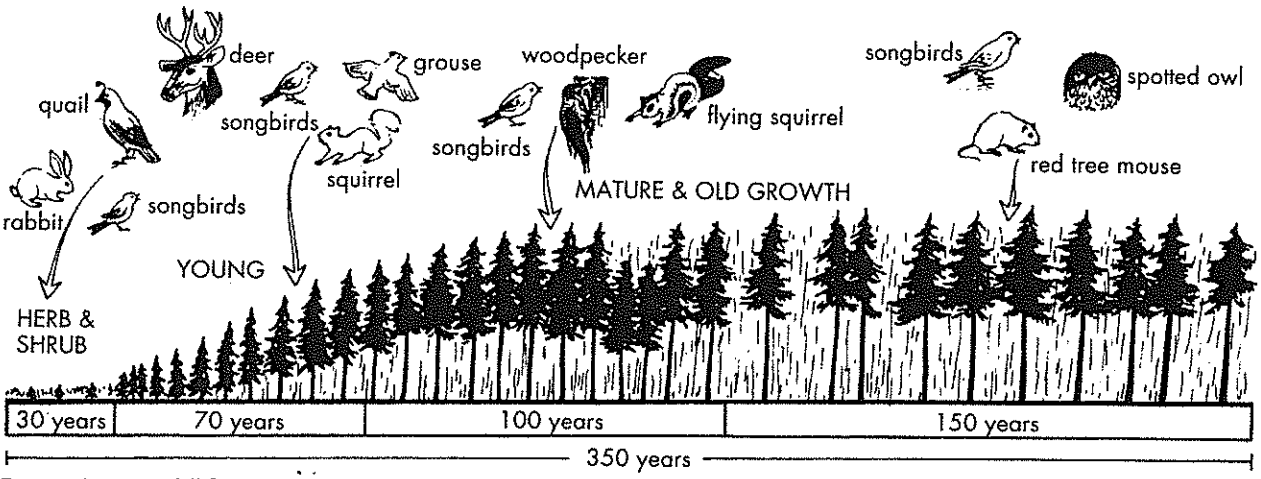


Figure 1a.—Wildlife species that live in a natural, unmanaged forest.

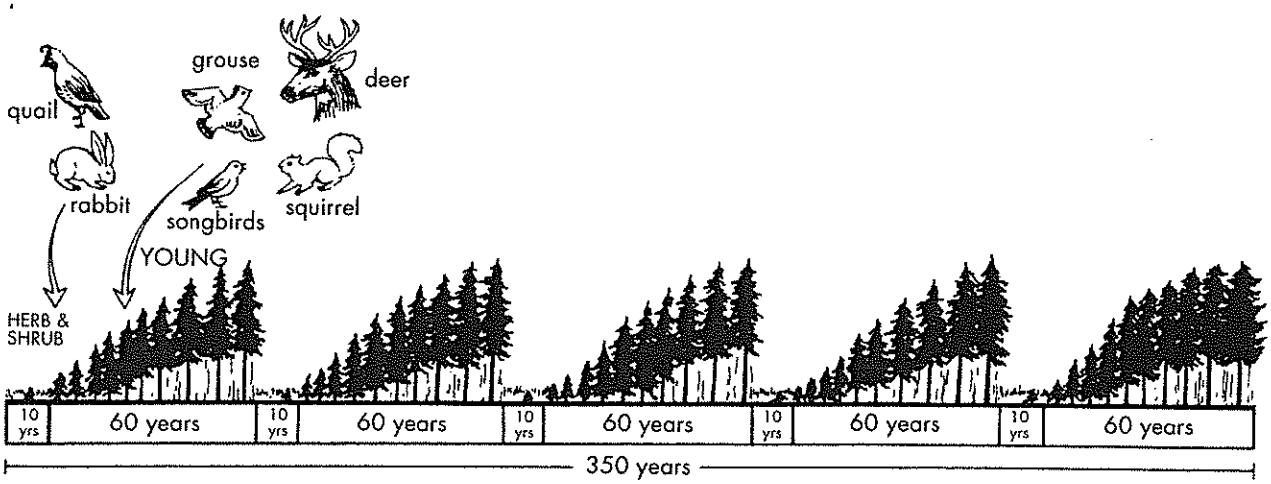


Figure 1b.—Wildlife species that live in a managed forest.

have seasonal habitats that are miles apart—summer range at higher elevations in mountain meadows, winter range down on sagebrush flats. Preserving migration corridors used for traveling to and from such seasonal ranges is another habitat requirement. If these migrating animals have to cross many logging roads, they are exposed to hunters and vehicles.

Deer and elk might be hunted when they are on summer range, on winter range, or traveling on migration corridors. If your property includes only one of these seasonally used habitats, your management of these animals could be influenced by management on land over which you have no control.

Enhancement doesn't stop at merely providing amounts, diversity, and habitat placement. Wildlife have additional habitat needs, primarily food and breeding places, that you can manage and thus indirectly influence wildlife numbers and well-being.

Special requirements

Managing forest lands for timber production generally provides a variety of habitats. However, practices such as brush control and snag removal alter or remove special habitats of some wildlife species. In some cases, one management practice can provide multiple habitat requirements, such as food and cover, for several species.

Leaving a few standing snags and allowing logs to remain on the ground provide nesting sites (cavities in snags) and a food source (insects that burrow into decaying wood) for birds. Slash often is removed from clearcut sites, usually by burning. Small amounts of this slash instead could be piled for quail and rabbits to use as protective cover, breeding sites, and food sources (berries and leaves).

Other management practices might provide for only a single need of wildlife. The rapid establishment of conifer seedlings on forested openings (clearcuts, small meadows, etc.) within 3 to 10 years greatly shortens the time that these areas would otherwise provide forage for deer (7 to 25 years). One way to provide additional forage for deer in the shortened time span is to plant forage on parts of clearcuts. Deer especially like grass and legume seedings. Quail, grouse, and rabbits also will take advantage of this additional food source.

You can't always maintain snags and other dead standing trees as nesting sites for cavity-nesting birds and mammals such as flying squirrels. However, you can build nest boxes for bluebirds, other songbirds, squirrels, and wood ducks and place the boxes in appropriate locations as an alternative to natural nest sites.

The key to providing special requirements is to identify those animals you wish to enhance, determine whether they have special requirements that current management does not provide and, if so, implement those activities that will benefit the desired populations.

Constraints on enhancement

One manages forest lands for a variety of reasons—for timber production and recreation as well as for wildlife. The manner of management on neighboring private or public lands can influence wildlife on your land. You must account for these factors in your management plan to avoid conflicts and to increase wildlife abundance.

Conifer damage

Game such as deer and elk can damage conifer seedlings. Managing habitat to enhance populations of these animals should not increase amounts of damage. However, habitat enhancement could increase populations of some animals to a level where they deplete normal food sources and begin to damage conifers.

Planting forage crops for deer might increase populations of pest species such as mice; they girdle conifer seedlings and can cause significant economic loss. Building brush piles provides food and cover for quail and rabbits; however, if you have too many brush piles close to conifer seedlings and not much forage available in winter, you could find the rabbits cause significant damage to the seedlings.

Table 1.—Habitat requirements of representative wildlife species.

Wildlife group	Representative species	Required habitats and acreages	Special habitat requirements
Meadow wildlife	California quail, brush rabbit, meadowlark	Open areas with grasses and forbs; some shrubs (15 acres)	Brush piles essential (one per 2 acres)
Meadow/forest	Deer, elk	Openings (50 acres); closed canopy (15+ years old); conifers (150 acres)	Migration corridors between seasonal ranges
	Chipmunk	Opening (15 acres); second-growth timber (15 acres)	
	Junco, bluebird	Opening (5 acres); second-growth timber (5 acres)	Snags with nest cavities
Young forest	Red squirrel	Mixture of 15- to 75-year-old conifer trees; understory of grasses, forbs (100 acres)	Cone-bearing trees for food
	Ruffled grouse	50-50 mixture of conifers and alder (15 acres)	Moist streamside
	MacGillivray's warbler	Mixture of 15- to 75-year-old conifers (15 acres)	
Mature forest wildlife	Flying squirrel	Conifers 75+ years old (100 acres); understory with forbs, small shrubs	Nest cavities in older trees (100+ years old)
	Spotted owl	Conifers 100+ years old (400 acres)	
	Pileated woodpecker	Conifers 100+ years old (100 acres)	Conifer snags; minimum 20 inches diameter at breast height (dbh) for nest trees
Riparian wildlife	Salamanders, frogs, snakes	Moist, streamside vegetation with closed canopy (0.25 to 2 acres); flowing streams	
Large predators	Bobcat, bear, coyote, goshawk	Mixtures of closed canopy with openings (300 to 1,500 acres)	Large (more than 15 inches dbh) trees for nesting or denning

Conflicts with timber production

Often the primary product on forest lands is timber. In some cases, increasing habitat for wildlife will reduce the yield of timber products. Keeping meadows open to produce deer forage precludes producing timber for market. Maintaining stands of old-growth forest for species such as spotted owls and pileated woodpeckers prevents the short-term rotation (50 to 80 years) required to maximize timber production on forest lands.

Maximizing diversity of wildlife species requires maximizing diversity and location of habitat sites. Altering vegetation to maximize diversity will lower production of timber on forest lands.

Neighbors

Forest management on neighboring land (private and public) could influence the wildlife on your land. If your habitat is an island of deer management surrounded by land with few deer—such as a large clearcut—few deer and elk will move in, and the population that's already on your land will have to sustain itself.

On the other hand, if the neighboring land is managed for deer and elk as well as for other forest resources, you might be providing an attractive area that will draw additional animals from neighboring lands. The influx could overwhelm your ability to keep the population low enough to prevent damage to your seedlings.

Matching what you want with what you've got

In any enhancement program, you must match desired wildlife with available habitat(s). The first step is to determine what sort of wildlife you desire.

What wildlife do you want?

Usually, if wildlife is to be managed, it most likely will be for you and your friends, with recreation and food as the chief values. Perhaps you wish to emphasize game. In most cases, leasing or selling hunting rights requires large acreages (600+ acres) to provide sufficient numbers of deer, rabbit, quail, and grouse. There is competition from federal lands (U.S. Forest Service and U.S. Bureau of Land Management), where anyone can hunt without charge and probably can find more variety and larger numbers of game animals than on a small, private ownership.

The required habitats for game animals are meadows and young forests (Table 1). This requires that you retain open grassy meadows with little emphasis on older and mature forests, which do not provide for optimum numbers of the primary game species. Note also that you will need fairly large acreages, especially for deer—an expected annual harvest of two to five deer from your land will require at least 100 acres.

If you want other uses of wildlife, such as birdwatching, you should increase habitat diversity. This means providing the full range of habitats, beginning with open meadows,

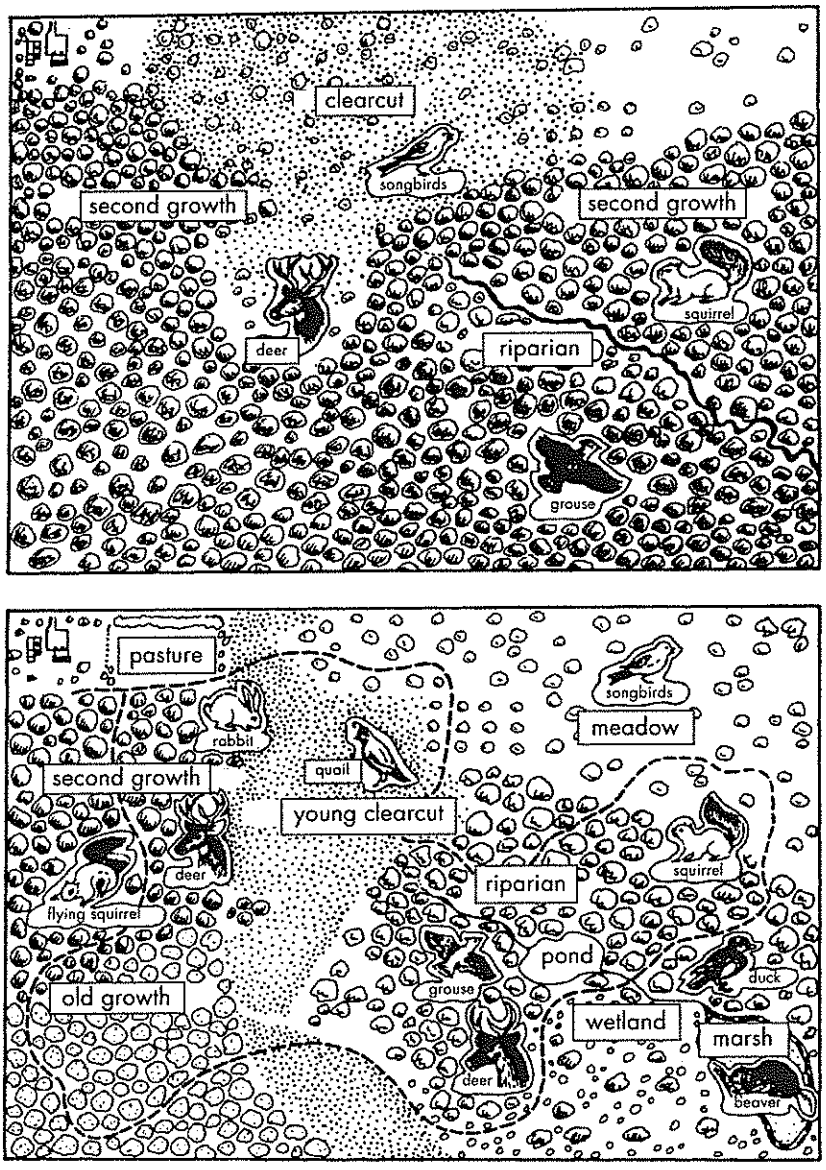


Figure 2.—(top) Wildlife–habitat associations on an undeveloped woodlot and (bottom) on a developed woodlot.

progressing through regeneration, and ending with mature forests.

As for a private game reserve, selling the privilege to observe wildlife on your land will not bring in much money—public lands are available for this.

The best approach is to design habitat improvements around silvicultural practices. The variety of species and numbers of individual species may be less than ideal, but small unused areas, riparian zones, steep slopes, and other areas where timber production cannot be maximized will provide many of the requirements you need for a diversified habitat.

What habitat(s) do you have?

When you decide what kinds of wildlife you want, identify the habitats required and check them against what is available. Assess the diversity of habitats and acreage of each as well as the habitats of neighboring parcels of land. If the species you want match the type and amount of habitat available, the situation is ideal. If the matchup is not good, you must decide whether to manipulate the habitat to increase species diversity or to increase the number of animals—or perhaps both.

To do this properly, an inventory of your property is essential. Make a sketch of your land with the various habitats roughed out, including acreages. Then list the wildlife species that each type of habitat favors. Draw habitats that would result from vegetation enhancement and list the wildlife that these modified habitats would favor (Figure 2).

Make a plan

If you intend to enhance vegetation to provide a greater variety of habitats for wildlife, you must make a plan for the desired changes. The plan should include the location and acreage of habitat you desire to manipulate, the expected cost of the enhancement, and provisions for special habitat requirements not provided by typical vegetation manipulation. Table 2 gives an example of such a plan.

Where to go for help

A number of public agencies and private groups in Oregon can provide assistance. The Oregon State University Extension Service has publications that describe how to provide special habitat needs such as nest boxes. The Oregon Department of Fish and Wildlife has information on preferred habitats of wildlife, and the USDA Natural Resources Conservation Service provides help with habitat manipulation. The Audubon Society is an excellent source of information on providing for special needs of songbirds; most large towns have an Audubon Society chapter.

Table 2.—Sample habitat enhancement plan.

Wildlife species	Habitat enhancement and acreages	Provision for special requirements
Deer, elk	Provide openings in forest (20 to 50 acres each); harvest standing timber; suppress tree and shrub regeneration.	Seed 5- to 10-acre patches in meadows with grass–legume mix.
Rabbits, quail	Provide permanent openings (15 acres) and one to two brush piles per acre.	
Songbirds	Maintain a good mixture of meadows, second growth, and old growth (5 to 10 acres for each habitat).	Establish nest boxes; establish a system of trails through all habitats for bird watching.

For more information

OSU Extension publications are available from:

Publication Orders
Extension & Station Communications
Oregon State University
422 Kerr Administration
Corvallis, OR 97331-2119
Fax: 541-737-0817

We offer discounts on orders of 100 or more copies of a single title. Please call 541-737-2513 for price quotes.

You can view our Publications & Videos catalog and many of our publications on the Web at **http://eesc.oregonstate.edu**

Bennett, M. *Ecosystem Management: Opportunities and Implications for Woodland Owners*, EC 1469 (Corvallis: Oregon State University, 1996). $1.25

DeYoe, D., D. deCalesta, and W. Schaap. *Understanding and Controlling Deer Damage in Young Plantations,* EC 1201 (Corvallis: Oregon State University, reprinted 1999). $2.00

deCalesta, D. and K. Asman. *Controlling Pocket Gopher Damage to Conifer Seedlings,* EC 1255 (Corvallis: Oregon State University, revised 2002). $2.00

Edge, W.D. *Managing Wildlife Habitats in Forested Ecosystems*, EC 1470 (Corvallis: Oregon State University, reprinted 1998). $2.00

Other publications

The "Peterson Field Guide" series for birds, mammals, animal tracks, trees and shrubs, reptiles and amphibians, insects, and bird nests (Boston: Houghton Mifflin).

deCalesta, D. and M.S. Deusen. *Woodland Fish and Wildlife.* 1988. This series includes a number of separate publications. Order from Washington State University, 1-800-723-1763 or via the Web at **http://pubs.wsu.edu,** then "forestry," then "wildlife and fish."

The Woodland Workbook is a collection of publications prepared by the Oregon State University Extension Service for owners and managers of private, nonindustrial woodlands. Information has long-range and day-to-day value for anyone interested in wise management, conservation, and use of woodland properties. The Workbook is organized in sections in a 3-ring binder with tabbed dividers for each section. To order, and to get a current list of titles and prices, inquire at the OSU Extension Service office that serves your county.

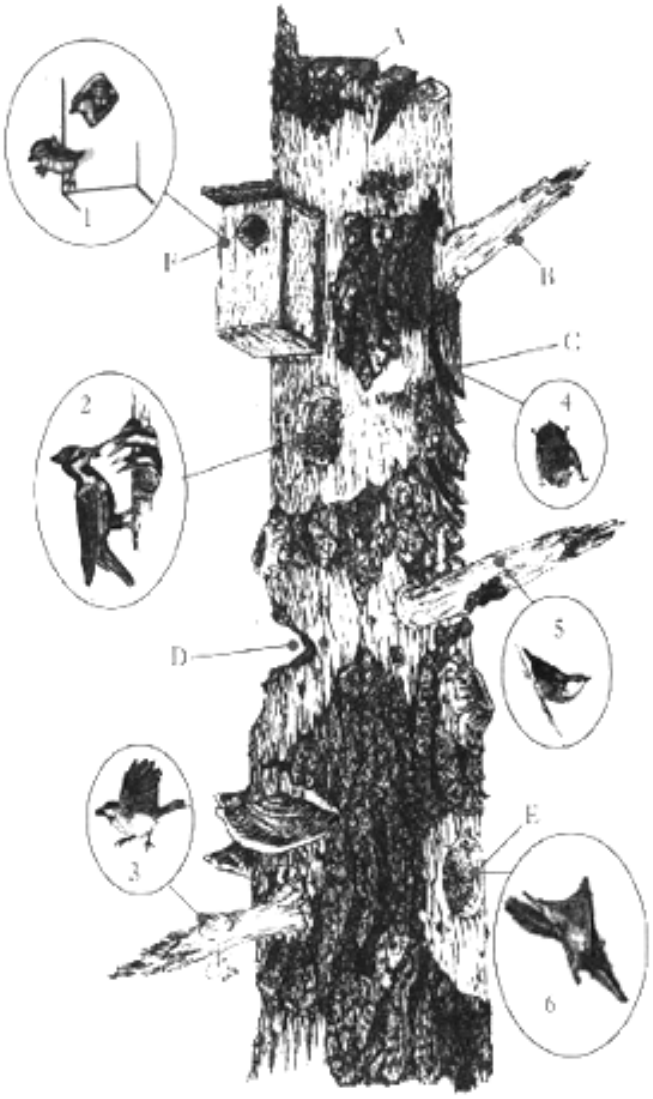
This publication was produced and distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914. Extension work is a cooperative program of Oregon State University, the U.S. Department of Agriculture, and Oregon counties.

Published 1983. Reprinted June 2002.

TIPS FOR CREATING 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 period of time. Poor quality or deformed trees, such as those with broken tops or large branches, make excellent snags.

- **Snags can be dangerous.** Locate them well away from trails, roads, buildings, and other structures.
- **Select conifers for snag creation** as they normally last longer than deciduous trees. Snag trees should be at least 14" in diameter.
- **Top or girdle trees at or above the first whorl of branches**, but at least 14 feet high (ideally, much higher). Smaller trees may be useful for some cavity nesters, as are stumps which are at least 3 feet high.
- **A jagged top (A) will decay faster** and supply more habitat than a smooth-topped tree.
- **Large branches (B)**, 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.
- **Roosting slits (C) and cavity starts (D)**may be added to created snags at the time of topping or girdling. However, do not put these features, or bird boxes, on existing snags.
- **Roosting slits may be used by most bats (4) and some birds**, such as brown creepers. The slits should be at least 8" deep and 2" wide, and angled sharply upward into the cambium layer.
- **Cavity starts allow decay** causing fungus to enter the tree wound. These cavities may be used by flying squirrels, swallows, kestrels and smaller owls. They should be at least 6" deep and 4" high. In time, as rot progresses, these cavities may be used by a large variety of cavity nesters, such as pileated woodpeckers (2), nuthatches (5), chickadees (3) and flying squirrels (6). Over 66 varieties of birds and animals in the pacific northwest use snag tree cavities (E) for nesting or foraging.
- **Bird boxes (F)** of varying sizes will host many species, such as wood ducks (1) and swallows. They can be erected in most forest stands depending on target species and stand characteristics. Bird boxes, however, do not replace the need for snags.



Dead or dying trees, called snags, provide habitat for many forest species. This illustration shows how some practices can be used on live trees to create snags. Not all practices or wildlife shown here should be on the same tree. They are shown together for demonstration purposes only.

King County
Department of Natural Resources and Parks
Water and Land Resources Division
Noxious Weed Control Program
206-296-0290 TTY Relay: 711

BEST MANAGEMENT PRACTICES
Evergreen blackberry (*Rubus laciniatus*) and Himalayan blackberry (*Rubus discolor syn. Rubus armeniacus*)

Legal Status in King County: Not listed, no legal requirement for controlling obnoxious weeds. The County Weed Board recognizes these plants are invasive and is collecting information and providing education on control. The Board encourages and recommends control and containment of existing populations and discourages new plantings.

BACKGROUND INFORMATION

Impacts and History

- Highly invasive and can be found throughout King County.
- Can be very difficult to control.
- Out competes native understory vegetation and prevents the establishment of desirable native shade intolerant trees such as Pacific Madrone, Douglas Fir and Western White Pine.
- Can limit movement of large animals when forming large impenetrable thickets.

Description

- **Himalayan blackberry** is a robust, sprawling perennial with stems having large stiff thorns.
- Main canes up to 10 feet long with trailing canes reaching up to 40 feet.
- Trailing canes typically take root at the tips.
- Leaves are large, round to oblong and toothed typically come in sets of three (trailing canes) or five (main stems).
- Individual canes can reach a density of 520 canes per square meter.
- Flowers are white to pink about one inch in diameter and borne in clusters of about 5 to 20.
- Develops edible black fruit that clings to the center core when picked.


Himalayan blackberry

- **Evergreen blackberry** is a robust trailing evergreen shrub that grows into impenetrable thickets.
- Ribbed reddish stems up to 10 feet in length with large curved thorns.
- Young canes arch as they grow longer that eventually reach the ground rooting at the nodes.
- Palmately compound leaves with 3 to 5 deeply lacerated leaflets.
- Flowers are white to pink about one inch in diameter borne in clusters.
- Develops edible black fruit that clings to the center core when picked.

Evergreen blackberry

Habitat

- Blackberry can be found in a myriad of habitats such as vacant lands, pastures, forest plantations, roadsides, creek gullies, river flats, riparian areas, fence lines, and right-of-way corridors.
- Does not grow well in wetland areas, will grow if cane tip roots.

Reproduction and Spread

- Reproduces vegetatively by root and stem fragments, and by seed.
- Plants begin flowering in spring with fruit ripening in midsummer to early august.
- Daughter plants can form where canes touch the ground.
- Seeds can remain viable in the soil for several years.

Local Distribution

Found throughout King County.

CONTROL INFORMATION

Integrated Pest Management

- The preferred approach for weed control is Integrated Pest Management (IPM). IPM involves selecting from a range of possible control methods to match the management requirements of each specific site. The goal is to maximize effective control and to minimize negative environmental, economic and social impacts.
- Use a multifaceted and adaptive approach. Select control methods which reflect the available time, funding, and labor of the participants, the land use goals, and the values of the community and landowners. Management will require dedication over a number of years, and should allow for flexibility in method as appropriate.

Planning Considerations

- Plan your control effort including: 1) surveying of the area thoroughly for blackberry, 2) setting priorities for control, 3) selecting the best control method(s) for the site conditions and regulatory compliance issues and 4) monitoring the success of control and implementing follow up control as necessary.
- In unincorporated King County outside of wetlands, aquatic areas, wildlife network areas and their buffers, a Clearing and Grading permit is not required to clear areas of blackberry if: 1) the annual area to be cleared is less than 7000 square feet or 2) if the clearing is conducted in accordance with an approved Forest Management Plan, Farm Management Plan or Rural Stewardship Plan. Within wetlands, aquatic areas, wildlife network areas and their buffers, Clearing and Grading permits are not required if the area to be cleared is less than 7000 square feet and clearing is conducted in accordance with one of the stewardship plans mentioned above or is removed by hand labor. Clearing in excess of these limits will

require a permit, however there will be no cost for this permit provided control practices defined in this BMP and the King County Noxious Weed Regulatory Guidelines are followed.

- Control practices in critical areas should be selected to minimize soil disturbance. Any disturbed areas need to be stabilized to control erosion and sediment deposition. Refer to the King County Surface Design Manual for further information about sediment and erosion control practices. Minimizing disturbance also avoids creating more opportunities for germination of blackberry and other weeds.
- Generally work first in least infested areas, moving towards more heavily infested areas.
- Ensure habitat protection by targeting only blackberry and preserving all native and beneficial vegetation.

Early Detection and Prevention

- Blackberry is easily identifiable throughout the year.
- Manually control new infestations as early as possible .
- Monitor the control site and remove any plants returning from root fragments

Manual

- Hand pull the stem close to the ground and uproot the root ball. This method is most effective with first year plants.
- Manual control works best after rain or in loose soils where the canes are suppressed because the blackberries are growing in a forest understory.
- Digging up root crowns and major side roots is slow but will control blackberry and is effective on small infestations.
- Using a claw mattock or pulaski/mattock is also effective.
- Recheck work area because large root fragments left can re-sprout.
- If removing dense patches, area should be replanted with native plants and mulched, or reseeded with a suitable grass.
- Hand pulling and the use of hand mechanical tools of up to seven thousand square feet annually is allowable without a permit in unincorporated King County, including all critical areas and buffers.

Mechanical

- Mowing, including the use of riding mowers and tractor mounted mowers, can be very effective in controlling blackberries but also may harm desirable plants present.
- Mowing should not be used where soils are highly susceptible to compaction or erosion, or where soils are very wet.
- Several cuttings a year over several years are necessary to exhaust the roots of their reserve food supply.
- If only one cutting is done per year, cut when the plants begin to flower. If no follow-up is done, the blackberry may re-sprout from the root crown at a greater density, and could overgrow any vegetation planted.

- Cultivation in agricultural areas utilizing cultivation machinery can be effective in controlling blackberry either alone or in conjunction with mowing but is not selective and may require specific sediment and erosion control measures (see Control of Large Infestations/Monocultures).

Biological

Biological control is the deliberate introduction of insects, mammals or other organisms which adversely affect the target weed species. Biological control is generally most effective when used in conjunction with other control techniques. Biological control methods that may assist in blackberry control include the use of goats and chickens as follows:

- Goats and pigs may be effective on clearing or controlling blackberry re-growth from a year to four years old. On mature stands, goats tend to only strip leaves off of the canes. Animals may prefer alternative forage available, so reduce opportunities for selective browsing. Grazing must be continuous or else regrowth will occur. Care needs to be taken to fence off or protect any native or other valuable vegetation. The King Conservation District can provide further information of the use and management of goats for weed control.
- Chickens can potentially decrease the seed bank in blackberry cleared areas by grazing on the seeds.

Chemical

- Herbicides should only be applied at the rates and for the site conditions and/or land usage specified on the label. **Follow all label directions.**
- Herbicide specified in these guidelines may be used in accordance with Federal and State Law in critical areas and their buffers with certain restrictions. Refer to the **King County Noxious Weed Regulatory Guidelines** for a summary of current Federal, State and local restrictions and regulatory compliance issues.
- For control of large infestations, herbicide use may be effective, either alone or in combination with mowing. Infested areas should not be mowed until after the herbicide has had a chance to work and weeds are brown and dead.
- For several years following treatment, monitor areas for new plants germinating from the seed bank, or any missed plants.

Specific Herbicide Information

Herbicides are generally described here by the active ingredient. Many commercial formulations are available containing a specific active ingredient. References to product names are as an example only, and other equally, or more effective commercial products may be available.

Glyphosate: can effectively control blackberry. Treatment with glyphosate needs to be combined with effective re-vegetation of the site to prevent re-invasion by undesirable vegetation and to control erosion. Glyphosate is most effective on blackberry in September to October when canes are actively growing and after berries have formed. Fall treatments should be conducted before the first frost.

Selective Broadleaf Herbicides (such as triclopyr, 2,4-D and metsulfuron): most effective when blackberry is growing in a grassy area. Read the label of the product you are using to determine the optimal time to spray. Re-treatment the following year may be necessary to control any returning plants. Continue to monitor for new plants for several years after the initial treatment and following any disturbance to the soil such as tilling or construction. **NOTE: Certain additional restrictions apply for products containing 2,4-D and Triclopyr BEE (e. g. Garlon 4, Crossbow). Refer to the King County Noxious Weed Regulatory Guideliness for more details.**

Selective herbicides that are effective on blackberry include metsulfuron (e.g. Escort, Cimarron, Ally), triclopyr ester (e.g. Garlon 4) or triclopyr amine (e.g. Garlon 3A) and a combination treatment of triclopyr and 2,4-D (e.g. Crossbow).

Metsulfuron should be applied to fully leafed-out blackberry before fall leaf coloration. Good coverage is essential to achieve control.

Triclopyr (amine and ester) and triclopyr + 2,4-D should be applied when actively growing. Foliage must be thoroughly wetted with herbicide.

2,4-D can harm certain grasses, alfalfa, clover and other legumes. The addition of a suitable surfactant may improve the control results.

The mention of a specific product brand name in this document is not, and should not be construed as an endorsement or as a recommendation for the use of that product. Chemical control options may differ for private, commercial and government agency users. **For questions about herbicide use, contact the King County Noxious Weed Control Program at 206-296-0290.**

SUMMARY OF BEST MANAGEMENT PRACTICES

Small Infestations in Native and/or Desirable Vegetation

- Properly identify targeted blackberries
- Mark all desirable vegetation around control area, ensuring that no native plants are removed.
- Small infestations of less that 200 square feet can be effectively and relatively easily hand-pulled or dug up. Isolated plants should be removed in order to prevent them from infesting a larger area.

- Cut above ground portion of blackberry with loppers or pruners. Dig up or pull the remaining root ball.
- Pull or dig up the plants when the soil is wet.
- Replace any divots created when removing the plants to lessen the amount of disturbed soil.
- Apply appropriate herbicide with wick wiper or by spot spray to the cut stumps to minimize off target injury.
- Monitor site throughout growing season and remove any new plants.
- If using an herbicide in a grassy area, use a selective herbicide to avoid injury to the grass.

Large Infestations/Monocultures

- Properly identify invasive blackberries.
- Mark all native vegetation in and around the control area, ensuring that no native plants are removed.
- Mow down the blackberry with weed-eaters, brush mowers or machetes.
- Following mowing, either dig up the root-ball if labor is available or treat re-sprouting blackberry regrowth with an appropriate herbicide (See the Chemical section of this BMP).
- Mechanical cultivation is also an option for controlling invasive blackberries in agricultural areas. After initially mowing down the above ground vegetation, deep cultivation of the land can control root balls if done multiple times. Yearly spot control of returning seedlings or re-growth will likely be necessary.
- For large areas, it may be more cost-effective to apply herbicide to the mature blackberry plants and then mow the dead canes.
- When large dense areas of blackberry are removed, the bare areas created need to be stabilized and re-vegetated with native or non-invasive vegetation to prevent erosion and re-invasion of blackberries and other weeds (refer to the King County Surface Water Design Manual or equivalent for incorporated areas). Ensure that a high standard of blackberry control has been achieved prior to revegetating the site.
- If a non-selective herbicide is used in grassy areas, the area needs to be re-seeded to prevent reinvasion by weeds.
- Infested areas will require follow-up management lasting for several years to control plants re-growing from the seed bank and rhizomes.

Riparian and Aquatic Area Control Issues

- Focus on manual removal for small infestations if possible. Follow procedures listed above.
- For larger areas where herbicide use is warranted, apply with a wick wiper or spot spray using low pressure and large droplet size.
- Blackberry shrubs can be found growing along wetland margins but are typically daughter plants off of a main cane. Control can be achieved by cutting the canes down to the ground. The roots can not withstand the anaerobic soil conditions without the supporting canes.
- Pay particular attention to regulatory compliance issues for aquatic areas described in the King County Noxious Weed Regulatory Guidelines.

Road Rights-of-Way Control Issues

- Manually remove infestations if possible.
- If plants are in grassy areas, use a selective broadleaf herbicide; if controlled with a non-selective herbicide, re-seed after control is completed.
- An effective mowing program can control blackberries along a Right of Way. Any blackberries remaining outside the mowed area will quickly re-invade the cleared areas.
- Spot spray blackberries with glyphosate in areas with no desirable vegetation.

References

Blackberry (Rubus fruticosus aggregate.) Retrieved February 1, 2005
http://www.dpiwe.tas.gov.au/inter.nsf/WebPages/RPIO-4ZW2MF?open#IntegratedManagement

Controlling Himalayan Blackberry(*Rubus armeniacus* [*R. discolor, R. procerus*]) in the Pacific Northwest. The Nature Conservancy. February, 2002
<www.tncweeds.ucdavis.edu/moredocs/rubdis01.pdf>

Rees, N.E., P. Quimby Jr., G. Piper, E. Coombs, C. Turner, N. Spencer and L.Knutson, editors. 1996. Biological Control of Weeds in the West. Western Society of Weed Science.

VT Forestry I.D. Cards - evergreen blackberry Retrieved January 31, 2005
http://www.cnr.vt.edu/dendro/dendrology/carddetail.cfm?Genus=Rubus&Species=laciniatus

English ivy - *Hedera helix*

English ivy (*Hedera helix)* and Irish ivy (*H. hibernica or H. helix hibernica*) are very similar plants in the Ginseng family (*Araliaceae*), and both are referred to as English ivy in this bulletin.

THE IMPACTS

When English ivy escapes from landscaped plantings it often establishes and spreads in shaded forested lands or natural areas. There it can impact all three zones of a deciduous or conifer plant community – the forest floor, the shrub layer and the canopy.

English ivy climbing a mature tree

- English ivy reaches the tree canopy and shades out deciduous foliage during summer months, suppressing the host tree.
- Dense ivy cover deprives the bark of normal contact with air and microorganisms.
- English ivy adds substantial weight to a tree. The estimated weight of ivy removed from a tree in Olympic National Park was 2100 lbs.
- Mature trees covered with ivy are top-heavy and more likely to blow down.
- Thick ivy mats can accelerate rot and deteriorate structures.

Thick ivy mats smother understory plants and tree seedlings

- English ivy changes the natural succession patterns of forests.
- Ivy limits understory regeneration by blocking sunlight and shading out plants.
- The fast-growing ivy competes for water and nutrients.
- The shallow mat-like root system make it a poor choice for erosion control, and contributes to erosion in some cases.
- Provides hiding areas for rats and other vermin.

IVY CULTIVARS

More than 400 different English ivy cultivars vary in leaf shape, size, color and growth form. While many cultivars are sold as ornamental plants, recent research indicates that several cultivars are invasive and should be avoided as landscape plants in the Pacific Northwest.

Four cultivars of English ivy were added to the 2002 Washington State Noxious Weed List as Class C weeds.

They are: *Hedera helix* 'Baltica';
H. helix 'Pittsburgh';
H. helix 'Star' and
H. hibernica 'Hibernica'

WHAT IS A WEEDY CULTIVAR?

- English ivy is invasive when growing in areas where it was not planted.
- It is invasive when thick mats or vines inadvertently cover plants, trees or structures.
- It is invasive when producing flowers and seeds and rapidly spreading on its own.

King County
Department of Natural Resources and Parks
Water and Land Resources Division
Noxious Weed Control Program

WHAT IS ENGLISH IVY?

This woody, evergreen perennial grows as a vine (climbing or creeping) or as a shrub. English ivy can photosynthesize year-round, and is capable of growth for 9 to 10 months of the year. Older vines can grow over 90 feet long with stems reaching one foot in diameter. English ivy is long-lived with reports of one plant over 400 years old.

Adventitious roots are formed at the leaf nodes of immature plants, and they help ivy climb by adhering or anchoring to surfaces – they do not penetrate the surface. Ivy tolerates a wide range of light conditions but growth is stimulated by light.

The entire plant contains slightly toxic compounds. Berries and leaves are toxic to people or livestock if eaten in a large quantity. The sap can cause dermatitis and blistering.

Hedera is native to Europe and Asia, and was widely introduced into temperate parts of the world. It has a long history as a garden plant. Introductions to the Pacific Northwest date back to at least the 1890's.

There are two distinct forms and growth stages of English ivy – the juvenile and the mature form.

Leaves of juvenile plants

Juvenile form

- Leaves are deeply 3 to 5 lobed, light green and alternately arranged.
- Young shoots and leaves are hairy.
- Stems produce adventitious roots at the nodes.
- Immature plants do not produce flowers.
- This juvenile stage lasts for about 10 years.

Leaves of a mature plant

Mature form

- Leaves are unlobed, or slightly lobed, dark green and leathery and spirally arranged.
- English ivy matures to produce flowers when it begins to grow vertically.
- Mature plants do not produce adventitious roots.

REPRODUCTION AND DISPERSAL

During the juvenile stage ivy only spreads vegetatively. Any stem fragments in contact with the soil can regenerate growth. Mature plants continue with a slower vegetative spread, but they also produce flowers and spread by seed. Clusters of small greenish-white flowers are usually produced in the fall.

The dark colored drupes (berry-like fruits) mature in the spring.

The fruits are high in fat, and they are available in early spring when food is still scarce. Many birds, including blackbirds, European starlings and American robins, disperse the seeds.

CONTROL REQUIREMENTS

English ivy is a Class C Noxious Weed of Concern in King County - control is strongly encouraged although not currently required. The County Weed Board recommends control and containment of existing populations and discourages new plantings of invasive cultivars. For control requirements in other areas, please contact the county noxious weed control program.

Stop buying and stop planting invasive cultivars.

PREVENTION

When planting an area, consider alternative ground covers. The list includes, but is not limited to, the following native plants: wild strawberries, false lily-of-the-valley, bunchberry, fringe cup, wood sorrell, kinnikinnick, low Oregon grape, and sedges. Please contact local nurseries or native plant societies for more suggestions.

PRIORITIZE YOUR CONTROL PLAN

Consider the amount of ivy to be removed and the site you are working on. Also consider the on-site vegetation you want to keep, the time frame for removal and the labor force. Be persistent with your control plan and with follow-up.

- First remove the vertical growing plants to stop flower production and further spread by seed.
- When working in steep areas, the site needs to be considered for slope and any surface erosion.

MANUAL CONTROL

Even though it is labor intensive, the most effective control method is manual removal. Depending on the site, several other manual control options are also effective. NOTE: Remove all cut stems from soil contact.

Wear gloves and protective clothing. The sap can cause a reaction in some people.

- Remove flowers or seed heads you can reach.
- Hand pull or dig out accessible plants.
- Mowing is effective in areas that are mowed regularly. Clippings need to be removed.
- Mulching – apply an 8" thick mulch layer. The plants can be cut or removed and then mulched, or a mulch layer can be directly applied on top of plants. This is not an option in steep areas.

Cut the vines or pry them off of trees with the aid of a tool at a comfortable height. This will kill the upper vines, but the lower, rooted plant needs to be removed.

CHEMICAL CONTROL

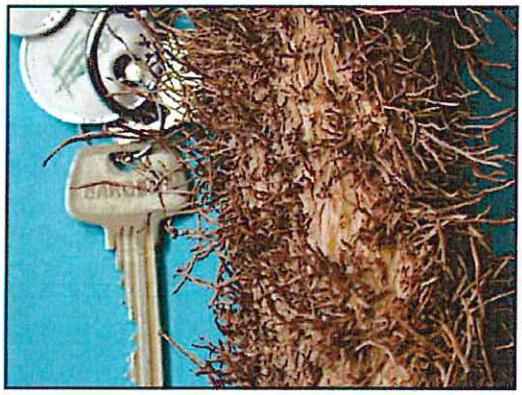
Controlling established English ivy with herbicides is not very successful because of the waxy leaves. There is also a risk to non-target plants from run-off of the waxy leaves. English ivy is considered tolerant of many commonly used herbicides. Some success has been achieved by carefully selecting herbicides and focusing applications on young, actively growing plants. If herbicides are used, make sure that their use is allowed at your site. Certain herbicides can not be used in aquatic areas or their buffers. When using an herbicide follow all label directions. Contact your local noxious weed control program for control guidelines in your area.

DISPOSAL - FOR SMALL AMOUNTS

Remove and dispose as yard waste. Backyard composting is only recommended when the rootlets and the cut stems are dead. Otherwise the ivy stems will root in the other material as it decomposes.

English ivy clippings will break down to 1/5 of its size when left to dry out and die.

- Expose the stems and rootlets to the air for 6 – 7 days until they desiccate.
- Pile the clippings under a covered area, then cover the clippings with a tarp.
- Pack the ivy in black plastic bags and leave in a sunny spot, rotating to heat all the plants.

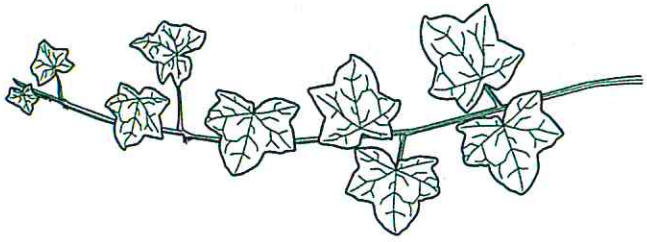


English ivy rootlets from a 4" diameter stem

DISPOSAL - FOR LARGER AMOUNTS

For large projects where the removed ivy can remain on site and out of sight, the cut stems can be balled or stacked on top of itself and left on site. Lift the ivy piles to keep the cut stems and rootlets from soil contact, or regularly turn the clippings to keep exposing the rootlets to the air.

- Pile the ivy and let it dry out or decompose. Cover the piles to speed the process.
- Wrap the pulled vines into medium sized bundles, leave them on site to dry up and die.



For more information please contact:

King County Noxious Weed Control Program
Department of Natural Resources
Water and Land Resources Division
201 S. Jackson St., Suite 600
Seattle, WA 98104
(206) 296-0290
email: noxious.weeds@metrokc.gov
http://dnr.metrokc.gov/weeds

Or contact your local county noxious weed program.

References are available from the King County Noxious Weed Control Program.

Murai, M. 1999. Understanding the invasion of Pacific Northwest forests by English ivy (*Hedera* spp., Araliaceae). Master's thesis. University of WA, College of Forest Resources, Seattle.

Reichard, S. 2000. *Hedera helix. In:* Bossard, C.C., J.M. Randall and M.C. Hoshovsky, eds. Invasive Plants of California's Wildlands, pp. 212-216. University of CA Press, Berkeley.

Turner, N.J and A.F. Szczawinski. 1991. Common Poisonous Plants and Mushrooms of North America, pp. 174-5. Timber Press, Portland, OR.

Written Findings. 2001. English ivy. Washington State Noxious Weed Control Board.

Websites:

King County Noxious Weed Control Program:
http://dnr.metrokc.gov/weeds
WA State Noxious Weed Program (with links to counties):
http://www.wa.gov/agr/weedboard
No Ivy League: http://www.noivyleague.com/
Ivy OUT: http://ivyout.org

Acknowledgments - For technical references and background information provided by the Native Plant Society, EarthCorps, Mark Mead, Ann Lovejoy, Laurel Shiner, Bill Wamsley and Jane Wentworth

This bulletin was produced by Bridget Simon, King County Noxious Weed Control Program. Photos were provided by staff.

Published February 2004

Information presented here is available in alternate formats upon request for individuals with disabilities. Call: 206-296-0290. TTY: 1-800-833-6388

file name: 0402ivyBULLETIN.p65 wgab