

Landowner Handbook

A Guide to Best Management Practices
in Skamania and Klickitat Counties



Underwood Conservation District

Acknowledgements

About the cover: Mt. Adams Country photo by © Darryl Lloyd/LongshadowPhoto.com

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Purpose of the Landowner Handbook

There is a lot to know about owning and managing land- after all, whether you inherited or bought your property, it didn't come with an instruction manual. The purpose of this handbook is to provide tools you can use to achieve your goals for your land and offer ideas on where to find more information. The concepts in this handbook have been adapted from best management practices developed by landowners and conservation professionals to enable individuals to meet their goals for their land while simultaneously protecting soil, water, air, plant, and animal resources. The best management practices and ideas provided here are tips of the iceberg. Please continue your research beyond this handbook or call Underwood Conservation District (UCD) for additional information.

Our Goal

Our goal is to provide information and resources that enable you, landowners or land managers, to achieve your goals for your land and conserve natural resources.

What Are Your Goals?

Identifying what you want in your land is a necessary first step for every landowner. Landowners and land managers can have many different goals, such as raising livestock, farming, timber production, providing wildlife habitat, or simply preserving an intact ecosystem. Each of these require some level of active management, whatever the acreage.

Some questions to ask yourself:

- How would you like your land to look?
- What uses can the land support?
- Where does your water come from? What is the quality of the water?
- What type of trees do you have? Are the trees healthy? Do you want more or fewer trees?
- Do you have or plan on doing any farming?
- Do you have or plan on having livestock?
- Do you have native plants? Invasive weeds?
- What is the quality of fish and/or wildlife habitat?
- Would you like to attract wildlife to your property?
- Do you need to designate your land use for tax purposes?
- Do you have a succession plan for your land in order to maintain your goals and vision when/if you want to sell or pass it down in the family?

The Conservation Plan

Defining your goals is the first and most difficult task in developing a Conservation Plan for your land. UCD encourages all landowners to develop some form of plan in order to help you achieve your goals. Some tax designations or funding programs will also require a land management plan. The Conservation Planning process is an exchange of ideas between the landowner and conservation professionals resulting in decisions by the landowner. These decisions often result in workable, affordable activities that protect and improve soil, water, and other natural resources in addition to working towards the landowner's goals for the property. The Conservation Plan is a dynamic operating structure that can be modified as landowner objectives or conservation needs change.

How to Start a Plan

If you are interested in creating a Conservation Plan for your property, or have general questions on how to be a good land manager, contact UCD. A Field Technician will be happy to talk to you and can arrange a site visit to your property. The Technician will work with you to define your short and long term goals for your property. Some example goals are: "create a screen to block view of road," "control Canada thistle infestation," or "manage timber for highest yield."

Once your goals have been defined, the next step in the Conservation Planning process is to inventory your natural resources. This includes mapping your soils, identifying plants or invasive weed infestations, evaluating wildlife habitat quality or streamside conditions. UCD can assist with this step of the planning process.

Finally, a list of recommended best management practices is developed with an associated timeline for implementation. In no way is the landowner obligated to the recommendations in the plan; the plan is designed to be an adaptable and dynamic tool.

A plan can be as simple as a single sheet of paper or as detailed as you want to make it. The basic components generally include: the landowner's goals, an inventory of natural resources, an aerial photo, map, or sketch of property, and a summary of recommended best management practices and planned schedule for implementation.

2 About Underwood Conservation District

What is Underwood Conservation District?

By now you're probably wondering why we want to help you achieve your goals for your land and natural resources. Because that is our mission: to enhance the level of natural resource stewardship for landowners, managers and resource users in the district.

What is UCD?

One of 47 districts within the state of Washington, Underwood Conservation District (UCD) covers Skamania County and the western portion of Klickitat County. UCD is a legal subdivision of state government that administers programs for the productive use and conservation of natural resources.

Within its boundaries, UCD provides both landowners and agencies with technical assistance to increase land productivity, enhance water quality and improve other features of our natural resources. UCD is non-regulatory and only works with volunteer landowners. Never will UCD report a problem or violation to a regulatory agency; instead we work with landowners to help them come into, or stay in, compliance with existing environmental laws.

What assistance does UCD Offer?

UCD can provide technical assistance and possibly financial assistance with on-the-ground projects, to assist with issues, such as:

- ☑ Farm and dairy planning
- ☑ Forest management and road maintenance
- ☑ Native tree & shrub establishment
- ☑ Streambank stabilization and enhancement
- ☑ Soil improvements and composting
- ☑ Stormwater run-off and erosion control
- ☑ Natural resource education in local schools
- ☑ Invasive weed management
- ☑ Farm and forestland preservation
- ☑ Environmental monitoring
- ☑ Clean-up events

Location

Since its beginnings, UCD has grown to encompass the western portion of Klickitat County, west of the Klickitat River, except for most of the City of Bingen, and all of Skamania County, except for the City of Stevenson. Our office is located in White Salmon.

History

On July 1st, 1940, concerned orchardists and farmers from the area around Underwood Mountain gathered to discuss irrigation needs, the decline of forest productivity, and the impact that settlement and development was having on their land - increasing soil erosion and degrading water quality. This meeting resulted in a partnership between the Soil Conservation Service (now called the Natural Resources Conservation Service) and private landowners. Underwood Conservation District was formed to find feasible solutions to the community's land-use concerns.

Addressing Local Needs

UCD is supervised by a five-member board. The Board of Supervisors is composed of local citizens, farmers, and forest landowners who volunteer their time to guide the efforts of the district. Each month the board meets to discuss current projects and issues, providing guidance and direction for the district staff. Board meetings are open to the public and held on the third Tuesday of each month beginning at 7 p.m. at the UCD office in the Park Center Building at 170 NW Lincoln, White Salmon.



Annual Events

On Washington State's Arbor Day (the 2nd Wednesday in April), UCD holds an informational Open House and Free Tree Giveaway. The purpose of this event is to inform local landowners of our services and get input about what kinds of programs we might provide for our district.

Outreach and Education

UCD works with several local schools and partnering agencies to assist and promote natural resource education to children. We have also hosted and helped with a variety of educational seminars for adults to teach about livestock management, invasive weed management, soil testing and improvements, forestry management, and much more. UCD frequently writes informational articles in local newspapers and publications to help provide resources and announce events.

Facilitation of Stakeholder Groups

UCD has facilitated numerous groups in the past to assist with the coordination of natural resource information and activities.

The White Salmon River Watershed Management Committee was formed in 1993 to help address concerns of the local community regarding the quality of water in the White Salmon River watershed. This group's participants represent the diversity of the local population including foresters, dairy farmers, and recreational providers. The group meets quarterly to discuss current projects in the watershed.

The Jewett Streamkeepers is a group which focuses on enhancing stewardship within the Jewett Creek watershed, which runs through the towns of White Salmon and Bingen. Monthly meetings are held the first Thursday of the month at 5pm at UCD's office.

The Wind River Watershed Council, formed in 1997 as a group of stakeholder representatives that provide information and coordinate project work within the Wind River Basin.



Students learn about water quality by collecting and identifying macroinvertebrate (water bug) samples, which can indicate levels of pollution.

How We Can Help You

Underwood Conservation District is interested in protecting soil, water and other natural resources by working with volunteer landowners in site planning and project implementation.

If the landowner would like assistance implementing any project that will benefit natural resources, contact Underwood Conservation District for further technical and financial assistance.



This stream has a well vegetated riparian zone that provides shade and reduces erosion

4 About the Region

Human History in the Area

The Klickitat and Chinook tribes have inhabited the Washington side of the Columbia Gorge for several thousand years. Learn more about the tribes by visiting the Yakama Cultural Heritage Center in Toppenish or yakamamuseum.com.

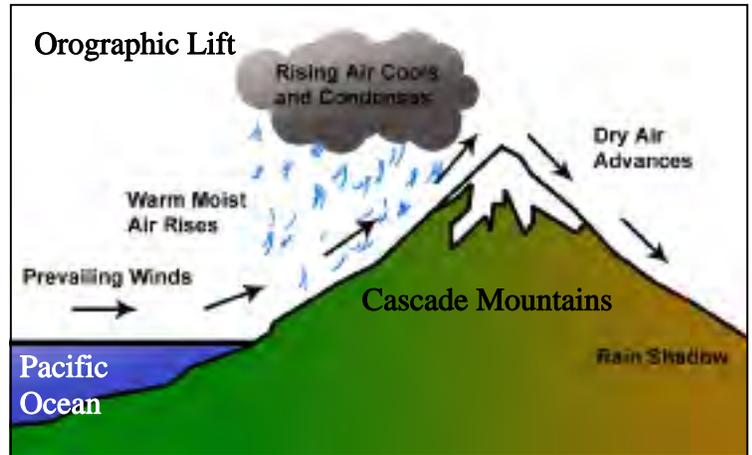
The first wave of settlers arrived in during the 1850's, encouraged by the donation land claims, and later by the Homestead Act. Early occupations for settlers included cutting wood to sell to the passing steamships, commercial fishing for salmon and sturgeon, farming, and logging. **Skamania County** was formed in March of 1854. The timber industry was the driving force for Skamania County's economy until the early 1990's, when concerns over habitat loss and logging practices slowed the industry. The county's population is ~11,000. The majority of residents live in the southern part of the county along the Columbia River. **Klickitat County** was formed in 1859. Timber, sheep and cattle grazing, and aluminum smelting have been important economic activities. Two rivers, the Klickitat and the White Salmon, are designated Wild & Scenic through parts of Klickitat County. The county's population is approximately 20,530. Growth rates for both counties average 1-1.5% per year.

Land use

Skamania County covers 1,656 square miles. The county is about 90% forested, and 80% of the land in the county is in the Gifford Pinchot National Forest and the Mount Saint Helens National Volcanic Monument. Major land uses include forestry and wood products, farming and orchard lands. **Klickitat County** covers 1,908 square miles. Timber, orchards, cattle range and wheat production are some of the major land uses. Most recreational and economic activities in the Columbia Gorge center around or depend on the rivers, mountains, and regional climate in some way or another.

Approximate Annual Precipitation

Skamania/Prindle	70"	Underwood	47"
Upper Washougal	56"	Trout Lake	50"
North Bonneville	70"	Glenwood	30"
Stevenson	90"	White Salmon	36"
Stabler	99"	Klickitat	20"



Climate

The Pacific Ocean and the topography created by the Cascade Mountain range dictate the weather and climate of our region. Mt. St. Helens and Mt. Adams are two major features in the Cascade Range in southern Washington. Clouds and moisture from the Pacific Ocean, propelled by winds, drop water in the form of rain or snow as they ascend over the Cascade Mountains. This contributes to the substantial amount of precipitation received in Skamania County. The majority of Klickitat County lies east of the Cascades and within the rain shadow created by the Cascade Mountains. Elevations range widely between 40 ft. above sea level on the shores of the Columbia River downstream of Bonneville Dam to 12,276 ft. at the top of Mt. Adams. Due to the variety of elevations and precipitation levels in the Columbia Gorge, many different micro-climates exist, influencing where plant and animal species occur. This creates great diversity in the ecosystems throughout the Columbia Gorge.

Watersheds

The land within Underwood Conservation District flows into the Columbia River, one of the largest watersheds in the U.S. Awareness and stewardship of all creeks and rivers will contribute to the health of downstream water bodies. The watersheds in Klickitat County within the UCD's boundary include: the White Salmon River, Catherine Creek, Major Creek, Klickitat River, Rattlesnake Creek, Trout Lake Creek and Jewett Creek. Major watersheds of Skamania County include the Washougal River, Wind River, Lewis River, Rock Creek, Little White Salmon River and the White Salmon River. See page 7 for more information on watersheds.

Rural Living

Country living demands self sufficiency and the hard work of being a responsible land steward. Services may not be the same as in urban areas and cooperation with neighbors can be necessary, especially during winter storms.

Agriculture: A Way of Life

Much of the rural land in Klickitat and Skamania Counties is actively used for growing crops, feeding livestock, and providing lumber and mineral resources. Agricultural operations common within the district include forestry and wood products, orchards and vineyards, cattle and range operations, dairies, goat and alpaca farms and organic fruit and vegetable farms. Agricultural businesses are an important aspect of Klickitat and Skamania County economies. If you choose to live in a rural area, be aware that day-to-day operations of agricultural-producing neighbors may be disruptive to notions of idealized rural living.

You may encounter the following in rural areas:

- Forested land next to yours may be logged.
- Farmers may burn fields or ditches to keep them clean of debris, weeds and other obstructions.
- Logging operations may burn slash piles.
- Farmers often work around the clock and may run machinery at night to avoid daytime winds or heat.
- Landowners are responsible for controlling noxious weeds on their property.
- Farmers may spray sulfur, oil, pesticides, manure, and herbicides throughout the year to protect crops.
- Frost control fans or bird control devices (cannons or distress calls) make loud noises and may run at night.
- Farmers can shoot dogs found harassing livestock.

Right to Farm

Washington State protects farmers and ranchers from nuisance and liability lawsuits. Klickitat and Skamania Counties have enacted "Right to Farm" ordinances which enable the farms and ranches to continue producing food and fiber.

Farmland Preservation

People come to this area to live and play partly because of the rural character and agricultural productivity of the land. Many in the area want to maintain those values for future generations. Find out more about Farmland Preservation at farmland.org

What You Can Do

While there are many benefits to rural lifestyles, you may not enjoy every aspect. Contact UCD for information on planting windbreaks or hedgerows to create a living screen. Native plants can create privacy, reduce dust and pesticide drift, and provide habitat for pollinators and wildlife. As always, be considerate of what agriculturalists need in order to make a living and maintain open, working lands.



Before You Buy

Consider these issues:

Water - Learn how water is supplied to the property. Irrigation and water rights are complex and you may not have permission to use water that runs across your own land. Rivers, streams and wetlands may also require special management.

Winter Weather can be severe. Be prepared for power outages. Be prepared to shovel or plow snow out of your driveway or stay put for several days.

Meet your neighbors, and work to develop good relationships. You may need their help sooner than you think.

Land Maintenance - Maintaining your property can be hard work. Are you prepared to learn about irrigation pumps or spend countless hours maintaining fences, thinning brush or mowing?

Septic Maintenance Households that are not served by public sewer systems usually depend on septic tank systems to treat and dispose of wastewater. A well designed, installed and maintained septic system can provide years of reliable low-cost service. When these systems fail, property damage, ground and surface water pollution, and disease outbreaks can occur. Learn about your septic system. How is your system designed? Where are pipes routed from? Where is the outflow area? When was the system last pumped? Your County Health Department can help you inspect your septic system and give you information on maintenance.

6 Living Near Lakes and Streams

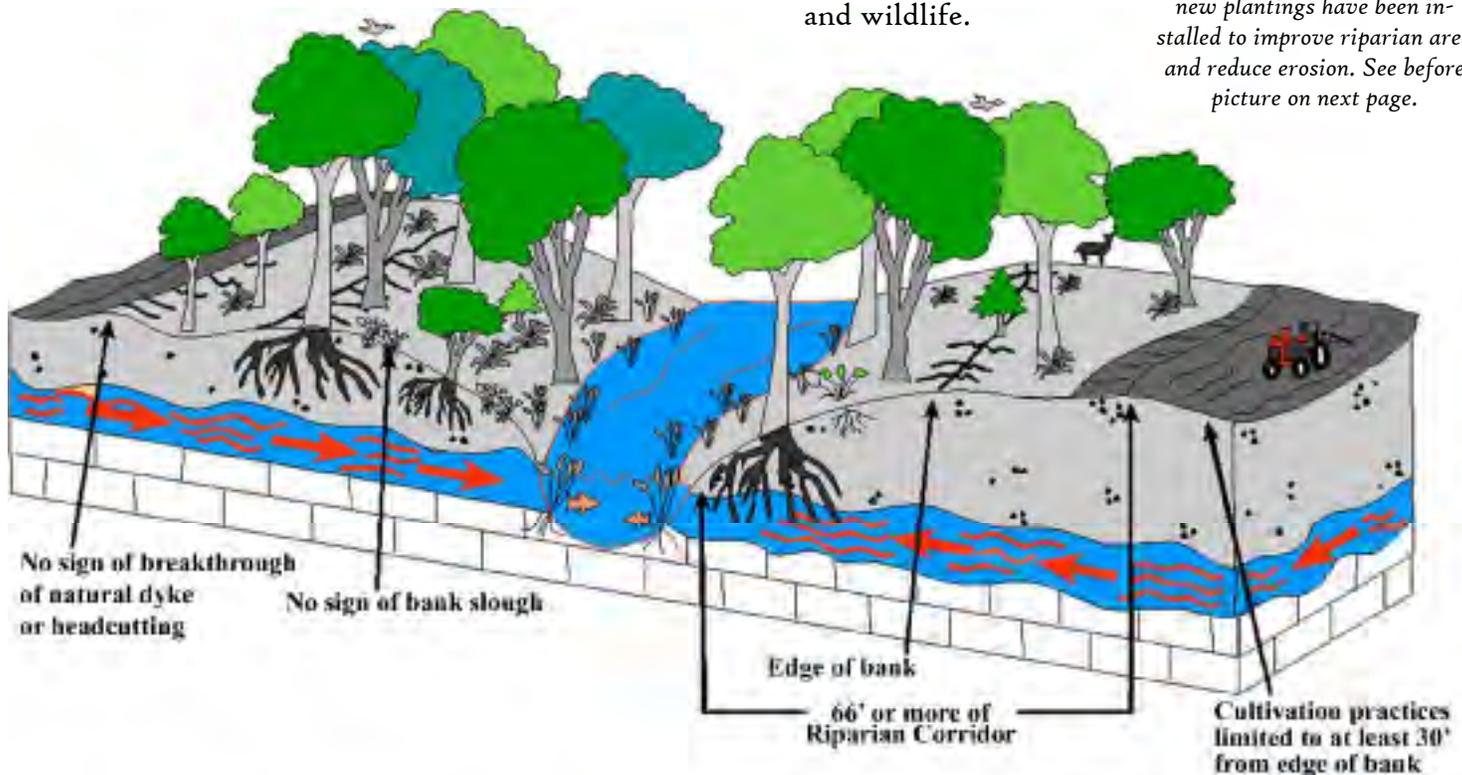
What Is a Riparian Zone?

A riparian zone is the vegetated transitional area between a waterway and the surrounding lands. It includes the stream banks, side channels, floodplains, and lake edges - anywhere vegetation grows along waterways .

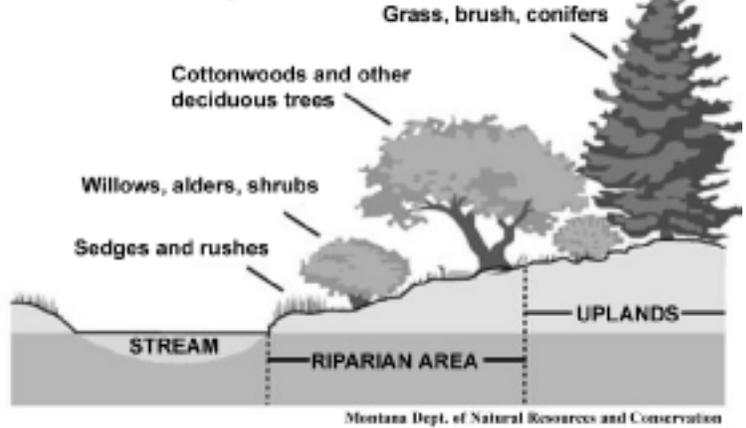
Why Do We Need Them?

Riparian zones are important natural bio-filters that protect and stabilize streambanks, reduce erosion, reduce polluted surface runoff, and flooding. Research shows riparian zones play a major role in maintaining clean water. Riparian areas provide shelter and food for many animals. Streamside trees, especially conifers, provide shade to keep stream temperatures cool. Riparian zones play an important role in supporting a wide variety of living organisms, including fish, amphibians, birds, mammals, and plants. Trees along streams reduce flooding and provide hiding places, pools and nutrients essential for aquatic habitats and fish. Riparian areas mimicking natural processes can be engineered using large wood and rootwads for habitat restoration and bank stabilization objectives. Waterways are often protected from certain clearing or development activities. Contact your County Planning Department for specific information.

Diagram of a Healthy Riparian Zone



What is a Riparian Area?



Healthy Riparian Zones Can Help:

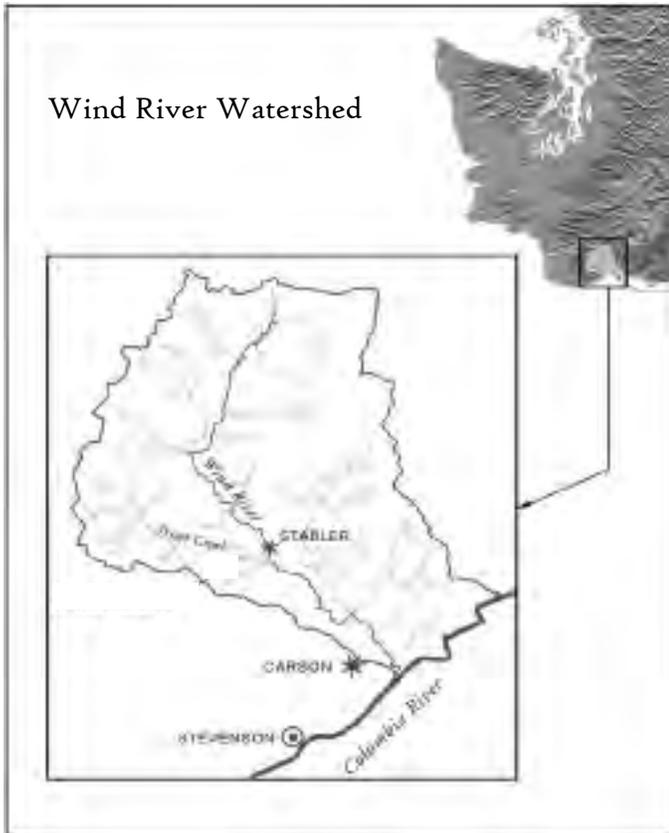
- Reduce flooding by absorbing excess moisture
- Reduce streambank erosion.
- Filter stormwater to prevent it from running directly into streams.
- Improve water quality by keeping streams shaded and cool in the summer.
- Provide habitat for fish and wildlife.



Bank stabilization rootwads and new plantings have been installed to improve riparian area and reduce erosion. See before picture on next page.

What is a Watershed?

A watershed is the land area that drains to a river or lake. Defined by ridge tops and high points, all the water that falls within our area will eventually drain to the Columbia River. The Columbia River Watershed begins in British Columbia and encompasses 258,000 square miles. You may also be living in another sub-watershed, such as the Wind River or White Salmon River watersheds.



Columbia River Watershed



Protect Riparian Areas:

- Plant native trees and shrubs to trap pollutants, runoff and to shade streams.
- Control livestock/animal access to streams, ponds and wetlands from overgrazing and trampling. Fence pastures appropriately.
- Avoid construction in Riparian areas. This may cause chemicals or waste to flush into the stream.
- Keep all trash, and debris, including lawn wastes, away from surface waters.
- Don't pour soapy water, oil, paint, household chemicals or pesticides down storm drains. Drains often feed directly into streams.
- Keep pet waste away from streams, riparian areas and paved areas.
- Use less or non-toxic household cleaners, try baking soda, lemon juice and vinegar
- Don't divert water to build a pond or irrigate without proper permits.

Use Plants to Stabilize Banks

Healthy riparian zones contain a variety of plants including trees, shrubs, grasses and other ground covers. Native plants are adapted to local rainfall, climate, insects and soil types, and tend to be easier to care for because they need less water and other inputs, such as pesticides.



This is an eroding streambank and an unhealthy riparian zone, see end result of bank stabilization project on the previous page.

Common Riparian Plants of the Pacific Northwest

Western Red Cedar	Vine Maple
Black Cottonwood	Blue Elderberry
Willows	Pacific Ninebark
Red Osier Dogwood	Oceanspray
Bigleaf Maple	Rosa Rugosa
Red Alder	Beaked Hazelnut
Douglas Spirea	Quaking Aspen

8 Water Conservation

Tips for Water Conservation

Anyone who lives in the area and who uses water has a role to play in conserving water. Water is the gold of our future, and the next ten years will require creative, proactive water conservation measures by all residents. How will you do things differently? Residents can conserve water to keep our water tables up and wells recharging. We can conserve water to maintain water levels in the streams for fish, wildlife and recreation. If everyone makes small changes, they will compound to make great differences in our communities' total water use.



Indoor Water Conservation Tips

Find dripping faucets and running toilets and fix the leaks. According to EPA, 10% of the water a typical homeowner pays for is never used because it leaks down the drain. A leaky faucet that drips at a rate of 1 drop per second can waste up to 2700 gallons of water a year. A leaky toilet can waste as much as 200 gallons per day. To check for leaks in the toilet, add food coloring to the tank; if the toilet is leaking, color will appear in the bowl within 15 minutes. Replacing worn out parts in the leaky toilet is easy and inexpensive (flush as soon as the test is done, since food coloring may stain the tank).

Fill part of the toilet's tank with a filled 2-liter jug. This will reduce the amount of water that is used for each flush. Low flow toilets (1.6 gpf or less) are available at most home improvement stores.

Turn the water off while you brush your teeth. This can save up to 4 gallons per minute.

Take a quick shower (under 5 minutes) and save up to 1,000 gallons of water each month. In the hot months especially, turn the shower off until you're ready to rinse.

Designate a drinking glass for an entire day to cut down on dish loads.

Install low-flow aerators on your faucets and showerheads (available at local hardware stores).

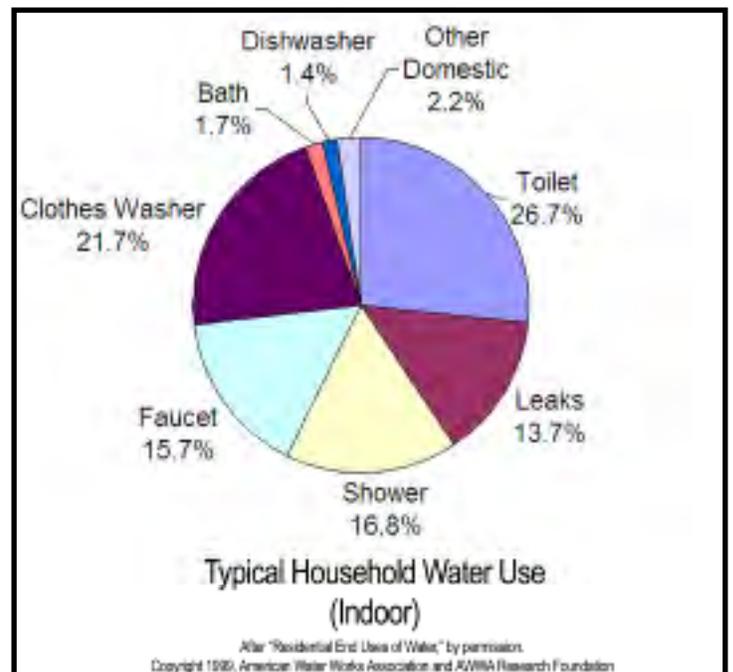
In the kitchen, scrape dirty dishes rather than rinsing them before placing them in the dishwasher.

Instead of using a garbage disposal, start a compost pile with food scraps and help reduce water use as well as solid waste. Garbage disposals require a lot of water to operate, and can add up to 50% of the solid waste in our sewer lines. See the Composting page in this booklet. Klickitat County also has some excellent information about composting on their website (www.klickitatcounty.org/SolidWaste).

Only run full dishwasher loads.

Keep drinking water in the refrigerator instead of letting the water run until it's cool.

The graph below shows typical household water use. Think how much you could save just by fixing leaks!



Outdoor Water Conservation Tips

Make sure your plants or lawn really need the water you apply. On a rainy day, turn your watering system off.

Avoid watering at windy times when the water is more likely to drift away from your target plants or evaporate faster.

Don't water plants from overhead. Water on leaves can burn them in the sun, and water is wasted due to drift and evaporation. Drip irrigation is a great option for the average vegetable garden or flower bed.

Water grass and garden beds in the morning or evening to reduce loss of water due to evaporation. This may help reduce the occurrence of slugs and other critters that like moisture.

Water deeply and infrequently to encourage deeper root growth. Slow irrigation allows for better absorption into the soil and less water runoff. If your plants develop deeper roots they will be more capable of finding the water they need on their own.

Use a hose with a shut off nozzle. This can save as much as 150 gallons per car wash.

Minimize bare ground. Planting plants closer together so the leaves will cover and shade the ground conserves water. Leaving less bare ground exposed will allow water to soak into the ground rather than evaporate or runoff. If your plants don't cover every inch of space, use mulch. Mulch keeps water in the ground and prevents weeds from germinating. A layer of cardboard or paper, leaves, grass clippings, wood chips, nut hulls, and many other various materials can be used as mulch. Mulching also adds nutrients to the soil and reduces the need for fertilizer.

Plant drought tolerant or native plants that require less water (and maintenance). Many of these plants are great for landscaping, with showy flowers and edible fruits. Because the native plants are adapted to local rainfall, extra water is only necessary when the plants are first getting established.

Reduce the amount of turf grass you have in your yard, or allow your lawn to go dormant this summer by watering it only once every three weeks. If you love having a green lawn, there are turf grass varieties that require minimal watering. Call Underwood Conservation District for information on these varieties.

When mowing your lawn, set the blade at 2-3 inches. Longer grass will shade the soil and allow for better water absorption and stronger root growth. Either leave the grass clippings on the lawn to add nutrients to soil, or use them as mulch elsewhere.

Turn gutters and downspouts towards trees and shrubs so that rainwater can help do your watering for you.



Use a broom to sweep sidewalks and driveways instead of using a hose. A hose uses approximately 50 gallons of water every 5 minutes!

Wash your car on the lawn to prevent soapy water from running into storm drains and streams. The lawn can filter and use the water. Using a commercial carwash will ensure proper treatment of wastewater.

Remember our stormwater flows into streams and rivers where we fish and recreate and where our children play

10 Native Plants

What is a Native Plant?

Native plants are plants that occur naturally in the local area and are adapted to the seasons and growing conditions here. There are many benefits to using native plants in your landscaping. See below for ideas.

Why Landscape with Native Plants?

REDUCE INVASIVE WEEDS

• Invasive weeds are a big problem across much of the country. Many of these invasives were first planted as garden ornamentals, which then escaped into the natural landscape, wreaking havoc on native plant populations.

SAVE MONEY AND RESOURCES

• In the west, 60% of water used outdoors is consumed by lawns. Consider digging up portions of your lawn that you tend to have the most trouble with, and plant with drought-tolerant native plants.

• Because native plants are already adapted to the pests and soils of the area, they require little, if any, pesticides or fertilizers.

• Underwood Conservation District or your local native plant nursery can help you choose the right plants for your landscaping needs.

SAVE TIME

• Native plant landscapes tend to take care of themselves. Replanting a lawn with native plants reduces time spent mowing, raking, and watering.

ATTRACT WILDLIFE

• Use native plants to attract native wildlife like birds and butterflies into your yard.

NATIVE PLANTS ARE BEAUTIFUL!

• There are lots of beautiful and unique native flowers, trees, and shrubs to choose from.

GOOD FOR THE ENVIRONMENT

Native plants help control erosion and reduce run-off, keeping sediments and pollutants out of waterways.

Getting Started

Observe what kinds of growing conditions exist on your site. Note the soil type, amount of sunlight through the days and seasons, drainage and moisture. Also consider visiting a nearby natural area and observe what plants are growing there, what kinds of conditions they're growing in, as well as how the plants arrange themselves with other plant species. Mamie and Francis Gaddis Park off Spring Street in White Salmon has native plants identified along the trails.



Bitter Cherry is a native tree valued by wildlife

Select Plants for Your Site

Decide what plants will work for your site based on soil, moisture, and light conditions. Visit your local plant nursery for more information about what plants would work well at your site.

Planting and Maintenance Tips

Make sure you dig a big enough hole so roots are not bent upwards and are well-spaced. Plant in the fall or in early spring so plants get enough moisture to establish healthy root growth, and water your trees and shrubs for 1-2 summers after planting to ensure they are established enough to grow on their own.

Local Sources of Native Plants:

Milestone Nursery, Lyle, WA 509-365-5222

Gator Creek Gardens, Carson, WA 509-427-0010

Humble Roots, Mosier, OR humbleroots@gorge.net

Also try www.plantnative.org

Some Native Plants for Hedgerows or

Willows	Red Alder
Blue Elderberry	Salmon Berry
Black Hawthorn	Salal
Snow Berry	Ninebark
Serviceberry	Vine Maple
Mock Orange	Red Osier Dogwood
Wild Rose	Red Currant
Ocean Spray	Douglas Spirea
Golden Currant	Columbine
Thimbleberry	Black Cottonwood
Oregon Grape	Western Red Cedar
Beaked Hazelnut	



Douglas Spirea
Spirea douglasii



Oregon Grape
Mahonia aquifolium



Goldenrod
Solidago canadensis



Sword Fern
Polystichum munitum



Western Columbine
Aquilegia formosa

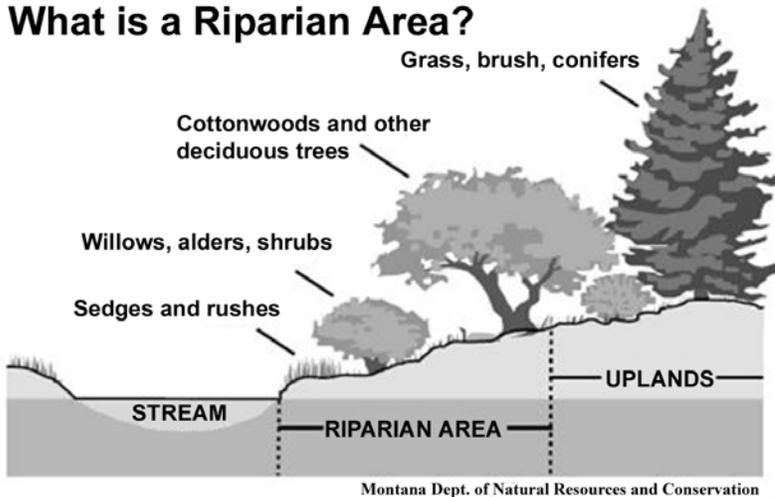
Hedgerows

Plant native plants along ditches or streams to create hedgerows. Hedgerows can filter runoff, decrease flooding, protect streams, provide shelter and food for wildlife and attract pollinators to a garden or orchard. Hedgerows can act as wind barriers and provide attractive visual and physical boundaries. When installing a new hedgerow: keep existing native plants; plant more of the plants you find growing already, as these plants are likely adapted to conditions in your area; add different native plants that are adapted to your conditions to increase structure, diversity and shape. Call UCD for ideas on native hedgerow plants adapted to your location.

Stream Buffers or Buffer Strips

Plant strips of grass or other vegetation down slope of animal paddocks or confinement areas or workshops where small spills may occur to prevent runoff from entering streams or groundwater. For advice on buffer size and species suitable for planting, call UCD.

What is a Riparian Area?



Garden Wise

The invasive species listed on the left below are commonly planted as ornamentals but they reduce food and habitat that wildlife depend on and may spread aggressively. The plants on the right are beautiful, provide habitat for wildlife, and attract pollinators.

Avoid these Invasive Ornamentals	Opt for these Non-Invasive Alternatives
Butterfly Bush	Pacific Ninebark, Chaste Tree, California Lilac
English Holly	Tall Oregon Grape, Osmanthus or False Holly
Knotweeds	Goats Beard, Robusta Clumping Bamboo, Fothergilla
Tall or Purple Verbena	Russian Sage, Larkspur Delphinium, Pincushion Flower, Homestead Purple Verbena

From "Garden Wise" Non-Invasive Plants for Your Garden from the Invasive Species Coalition, www.invasivespeciescoalition.org

Resources

- Plant Native www.plantnative.org
- Contact your local Master Gardener
- WSU Master Gardener Native Plant Guide: gardening.wsu.edu/nwnative
- WSU Klickitat County Extension
- www.klickitat.wsu.edu/masterg.html
- WSU Skamania County Extension
- skamania.wsu.edu/Hort.htm
- Washington Native Plant Society: www.wnps.org
- Native Plant Database: www.wildflower.org/plants

Adapted from Washington County SWCD Stream Buffers Fact Sheet

12 Common Tree Species

Douglas Fir (*Pseudotsuga menziesii*) Douglas Fir is one of the most important and prolific tree in the Pacific Northwest. It is also the most used lumber species in the US and is commonly used as plywood, fuel and Christmas trees.



Leaves: Needles are positioned singly on the branch often covering it all the way around. They are $\frac{3}{4}$ to $1\frac{1}{4}$ in long, dark yellow-green to blue green and highly variable.

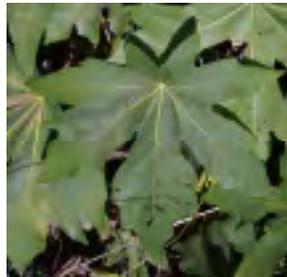
Bark: Smooth and dark gray-brown when young, corky and deeply furrowed as it ages. All but the outer layer has wavy light and dark bands on it.

Cone: 3 to 4 in long egg shaped cones, bracts with three points poking out of each scale.

Size: Truly a giant in the forest, the Douglas Fir can attain heights of over 225 ft. and sometimes is found more than 8 ft. across

Bigleaf Maple (*Acer macrophyllum*)

A common large leaved tree used for furniture and wood fuel. It grows rapidly in mixed stands on rich bottomland soils. It is shade tolerant.



(c) 2002 Steve Baskauf
bioimages.vanderbilt.edu

Leaves: Opposite, five lobed, long stem 8-12 inches

Bark: Brown to gray, dark and furrowed on older trees

Fruit: Double samara, two 'wings' 1-2 inches, hairy

Size: Medium, 60-80 feet max. A narrow crown is normal, and open crown becomes a much broader tree

Black Cottonwood (*Populus trichocarpa*)

This is the largest native hardwood in the state of Washington and is used as paper, fuel and plywood. Common in area with increased moisture such as wetland, ponds and stream banks

Leaves: Alternate, oval, serrated, 3-4 in.

Bark: grayish brown and furrowed on lower trunk

Fruit: three-valved hairy capsule

Size: Very large in the west over 120 feet with a narrow round topped crown.



Oregon White Oak (*Quercus garryana*)

This is the only oak in the state. This is a slow growing species that is commonly found in stands on dry rocky sites. It is cut locally for fuel and furniture.



Leaves: Alternate, simple with five to seven rounded lobes. 4 to 6 in long with hairy stems.

Bark: Grayish brown, scaly.

Smooth on younger stems broken up into narrow fissures.

Fruit: Acorn, 1 to $1\frac{1}{4}$ in enclosed at base by a cup.

Size: A medium sized tree, 60-70 feet tall with a broad round Crown. Small trees are know as Scrub Oak.

Ponderosa Pine (*Pinus ponderosa*)

This long needled pine is know by a variety of common names; Yellow, Bull and Blackjack Pine.

Leaves: Needles occur in clusters of 2 or 3 that are 5 to 11 in. long and green in color.

Bark: Brown to reddish brown with a flaky texture.

Cone: 3 to 6 in. long, egg shaped with prickly scales.

Size: The ponderosa Pine can easily reach 100 180 feet with up to a 4 foot diameter. This is a drought resistant tree that needs sunlight and space to grow.



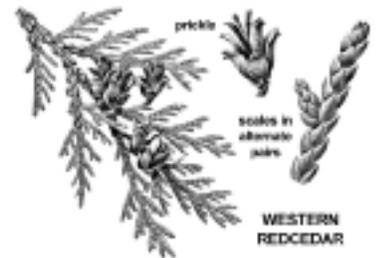
Western Red Cedar (*Thuja plicata*)

Leaves: Flattened, scale like, and closely pressed at right angles in alternate pairs, these yellow green leaves are easy to identify.

Bark: Bright reddish brown thin fibers that peel off.

Cones: These very small ($\frac{1}{2}$ in) cones cluster in groups upright on the branch.

Size: The western Red Cedar can reach 200+ ft. tall and 6 ft. in diameter. This shade loving cypress enjoys damp soil and doesn't do well in exposed, dry places. Great for the wetland or riparian areas, it has rot resistant wood.



Continued on the next page.

Grand Fir (*Abies grandis*)

Grand fir is widely distributed throughout the Northwest. It tolerates shade is common in the understory and forest edges in this area.



Leaves: Flattened needles 3/4 - 2 inches long, yellow green in color with two white bands on underside.

Bark: Gray-green and covered with resin blisters when young, Gray-brown with flattened ridges when mature.

Cone: 2-4 inches, greenish when mature, cylindrical, upright on branches, cones dry and fall apart when seed matures in fall.

Size: Can attain heights over 200' on good growing sites, but generally isn't as large as Douglas-fir and Ponderosa pine.

Soils

Many farmers and ranchers will tell you that their number one priority crop, year in and year out, is their soil. Soils are complex arrangements of inorganic (minerals), organic (dead plant, fungi, insect etc) and living materials (bacteria, fungi, insect, plant etc). The majority of soils are composed of some combination of the following physical properties: (a) sand/silt (b) clay (c) loam and (d) living and organic materials. Soils provide both physical structure as well as the chemical nutrition critical to plant life. The specific combination of materials as well as their specific arrangement all contributes to the unique soils of your property. There are numerous resources available to learn more about your soils. This includes, but is not limited to, research on existing soil classification data, simple field physical testing, soil drainage testing, as well as laboratory aided soil testing.

“Essentially, all life depends upon the soil ... There can be no life without soil and no soil without life; they have evolved together.” - Charles E. Kellogg, USDA Yearbook of Agriculture, 1938

Soil Classification Data: A large percentage of soils across the United States have been sampled, mapped and classified. This extraordinary wealth of information is made available by the Natural Resource Conservation Service (formerly the Soil Conservation Service) in both printed books and online through the Web Soil Survey (see Soil Resources, right). Underwood Conservation District staff are available to help you access this data.

Simple Physical Soil Tests: A simple test in the field will help you determine the relative proportions of physical materials in your soil. This basic test involves scooping up a small, handful size portion of damp soil at various depths, and performing basic tasks like squeezing, smelling and identifying the color of your soil. Squeezing the soil will tell you the relative proportion of clay in your soil. If the soil remains compacted in the shape of your clenched hand, the soil has a high proportion of clay. If it feels gritty and falls apart easily, it contains a high proportion of sand. If it feels kind of spongy and is dark brown or black in color, it contains a high proportion of loam.

Soil Drainage: The ability of a soil to drain water is an important feature to many landowners. To test your soils drainage capacity you can perform a simple test. Dig a hole in your soil 24 to 36 inches deep (width is not important). Fill the hole with water and let drain for several hours or over night. Refill the hole with water (avoid doing this on a sunny/hot day to minimize loss to evaporation) and monitor the depth of the water over time. A poorly drained soil will drain less than a half inch per hour. A moderately drained soil will drain between a half inch and one inch per hour. A well drained soil will drain more than one inch per hour.

Analytical Laboratory Soil Tests: To gain more insight into the properties of your soil that have a direct impact on plant life and crop production, a laboratory soil test may be advisable. There are numerous soil test laboratories across the country offering a wide array of services (see Soil Resources below) ranging from standard tests that might estimate pH, extractable nutrients, cation exchange capacity, organic matter and soluble salts to numerous other tests. Many soil testing laboratories will have specific procedures regarding correct field sampling techniques, sample labeling procedures, storage and shipping methods. Some laboratories will provide recommendations for nutrient and pH adjustment in addition to the analysis report.

Soil Resources

USDA Natural Resource Conservation Service Web Soil Survey: websoilsurvey.nrcs.usda.gov/app/HomePage.htm

Soil Testing Laboratories: University of Massachusetts www.umass.edu/plsoils/soiltest

Washington State University: www.puyallup.wsu.edu/soilmgmt/SoilTesting.htm

14 Invasive Species

What is an Invasive Species?

Invasive species can be plants, animals, or fungi that are not native to an ecosystem and were introduced by humans. Invasive species are a problem because they have no natural predators or parasites that control their numbers. As a result, invasive species can spread aggressively and crowd out desirable plants that provide food and habitat for wildlife. These species are expensive to control and can forever degrade our natural environment by reducing crop yields, damaging recreational opportunities, clogging waterways, lowering land values, creating erosion problems and fire hazards. Some are poisonous to humans and livestock. Do your best not to transport invasive species or seeds. Report new sightings with your county's Weed Control Department.

What If Invasives Are On My Land?

Remember, once invasive weeds are present they are virtually impossible to eradicate! You may be held responsible for the cost of invasive species removal on your land, so act early and often.

Prevention– Prevention is the first step and should be used in conjunction with other methods. Do not let disturbed soil stay bare for any length of time; invasive species thrive on disturbed soils. If you have bare soil, broadcast a native grass seed mix to establish some vegetation while you finish your project.

Mechanical Control– Options include pulling, lopping, clipping and cutting weeds on your land. This method requires hard work. Try to remove invasive weeds when they are young and before they go to seed.

Biological Control– This control relies on natural predators of the weed species including fungi and insects. Bio controls help to reduce, but not eradicate, weeds. Use them in conjunction with other methods. Contact your county weed board for information on specific biological controls.

Chemical Control– Chemical herbicides are an efficient way to control some invasive weeds. Be careful not to damage native plants or pollute waterways. Always follow manufacturer instructions as well as State and county regulations.

Skamania County Noxious Weed Department
(509) 427-3941 or www.skamaniacounty.org/weeds/noxious_weed_board.htm

Klickitat County Noxious Weed Control
(509) 773-5810 or noxiousweed@co.klickitat.wa.us

Himalayan Blackberry (*Rubus armeniacus*)

Blackberry is a common sight along roads, near streams, in fields and yards throughout the state. Although delicious, this blackberry tends to spread into large thickets and can choke out native plants, shrubs and even trees. Blackberry has spiny canes that may persist through the winter. We also have a native Trailing Blackberry in the area, but it stays low to the ground.



Other Noxious Weeds

Japanese Knotweed	False Brome
Yellow Star Thistle	Yellow Flag Iris
English Ivy	Shiny Geranium
Canada Thistle	False Brome
Herb Robert	St. Johnswort
Houndstounge	Tansy Ragwort
Rush Skeleton Weed	Poison Hemlock

Garlic Mustard (*Alliaria petiolata*)

This flowering mustard plant, native to Europe and Asia, was introduced as a culinary herb in the 1860s.

The insects and fungi that feed on it in its native habitat are not present in North America, increasing its seed productivity and allowing it to out-compete native plants.

Garlic Mustard blankets forests and displaces native plants and reduces forage for deer, who prefer the now rarer, native species. Browsing deer trample the soil and encourage seeds to spread and grow.

- Seeds stored in the soil can germinate up to five years after being produced.
- Small patches can be manually removed by hand pulling or spraying
- Plants that have been uprooted can still produce seed. Be sure to bag everything.
- Document the site and report any Garlic Mustard to your county's Weed Department.



Chris Evans, River to River CWMA, bugwood.org

Scotch Broom (*Cytisus scoparius*)

Scotch Broom is an aggressive weed that invades disturbed sites, roadsides, fields and construction or logging sites. It's found throughout the state and was introduced for erosion control along state highways. Some people are highly allergic to the pollen it produces. Scotch broom is a hardy evergreen and a member of the pea family. It produces bright yellow flowers followed by green pods that turn brown in late summer. Ripe pods burst open with a 'pop' and spread seed in all directions. Seed can stay viable for 30 years! Do not pull Scotch Broom because you will disturb the soil and encourage seeds in soil to germinate. Instead, cut stalks below the soil surface with loppers. Remove plants of seeding age first. Maintain a watchful eye in the spring for green shoots. After removing bigger plants, small plants can be maintained by mowing.



Knapweeds (*Centaurea*)

Knapweeds are aggressive, invasive weeds that inhabit pastures, fields road sides and other bare ground sites. There are many varieties in Washington state and flowers can be yellow, pink or white. Most varieties have spiny stalks. Knapweeds increase soil erosion, consume nutrients and crowd out native vegetation. They are also allelopathic, meaning they produce a natural herbicide that eliminates neighboring plants. This chemical toxin enables Knapweeds to effectively take over an area once they are introduced. Knapweed removal is a challenge. Early detection and fast action can stop the weeds from becoming established. Pulling Knapweed before it goes to seed can be an effective control method. Weeds pulled at the wrong time may drop seed and produce a huge crop the next season!



John Cardina, Ohio State University, bugwood.org

Learn more at: www.invasive.org

Never Leave Disturbed Ground Bare!

Invasive species thrive in disturbed areas. Broadcast non-invasive grass seed while you finish your project.

Aquatic Nuisance Species (ANS)

ANS are water-based invasive species that can take over lakes, streams and rivers. ANS can overwhelm native fish species, prevent recreation and pose health hazards. Keep a diligent watch for these invaders and clean your gear so you don't spread them!

Report Sightings to: 1800-Stop-ANS

Fisherman, Boaters, Science Crews & Kayakers:

Don't Spread Mud, Sand or Plant Materials to New Waters!

You could spread invasive species that threaten recreation!

1. When moving between water bodies, rinse & inspect gear to ensure you aren't transporting any materials.
2. Dry waders completely, rinse in hot water or freeze before moving to a new water body.

Learn more at: www.clr.pdx.edu/projects/ans

New Zealand Mudsnails

This tiny aquatic snail is in the Deschutes River! These snails can completely cover a streambed and wreak havoc on local ecosystems by eating the organisms that fish eat. These Mudsnails reproduce by cloning, so a single snail can start a new population. These snails can survive out of water for 72 hours and can pass through fish undigested.



Zebra and Quagga Mussels

These mussels can cause major problems. They can shut down public water supply pipes, industrial facilities, hydroelectric dams, boat docks and make sandy beaches as sharp as glass. By removing most of the food available to other organisms, Zebra and Quagga mussels can effectively starve the native populations of fish and shellfish. The estimated annual cost of controlling Zebra mussels in the Great Lakes area now ranges from **\$100 to \$400 million annually!**



Eurasian Milfoil

Milfoil forms very dense mats of vegetation that can interfere with recreational activities such as swimming, fishing, water skiing, and boating. Milfoil can quickly cover a lake & mosquitoes like to hide and breed in dense mats of Milfoil.

16 Wildlife and Habitat

A Wildlife Mindset

To attract wildlife to your land, think about how your land will provide for needs of all wildlife:

Food - Seeds, berries, nuts, nectar, insects, arthropods

Water - Streams, wetlands or marsh areas, birdbaths, dripping faucets, ponds, or water features

Shelter - Trees, shrubs, brush piles, rock walls, rock piles, hollow logs, snags, perches, tree cavities, shade

Space - Migration or passage corridors, edge areas, open space, nesting, resting, and rearing young

What Are the Benefits of Wildlife?

- Bats and birds are natural pest control! Birds devour mosquitoes, caterpillars, gnats, flies and other insects.
- Bats can eat up to 500 insects per hour and are important pollinators.
- Hawks and owls eat rodents and prevent rodent populations from getting out of control.
- Recreational Opportunities: A thriving wildlife population provides ample opportunities for activities including bird watching, photography, hunting& fishing.
- Wildlife is Free. Wild animals do not need to be walked, fed or cleaned up after. Few house pets are as low-maintenance.

Inviting Wildlife To Your Property: Getting Started!

- Draw a map of your property
- Take an inventory of places that provide shelter on your property; include stumps, snags, & rocky areas.
- Integrate native plants in your landscaping. Wildlife are adapted to and depend on native shrubs, trees and groundcovers for food, shelter and nest material.
- Protect buffer areas along streams, rivers, wetlands and ponds. These areas are great habitat for amphibians, numerous species of waterfowl and bugs that fish feed on. Riparian areas provide food and shelter for larger mammals as well.
- Leave habitat connections between your land and the next natural area, wildlife or fish easement. These connections help maintain passage corridors for moving or migrating wildlife.



2008 Cold Springs Fire

Weekend Projects

- Eliminate Invasive Species from you landscape. They can grow aggressively and exclude the native plants that wildlife depend on. Japanese Knotweed in riparian areas is deadly to habitat diversity and requires early intervention. Blackberry requires a long-term management strategy (mowing annually).
- Feeder, roost and nest boxes can be added to your property to increase the population of certain species. Be sure the boxes you buy are designed for the bird you wish to attract. Call UCD or search online for bird & bat box plans.

Get Outside

Visit public lands with habitats similar to your own. Include visits to restored areas and active restoration projects. Identify similarities between natural areas and your own property and species that may visit.

Conboy Lake Wildlife Refuge, Glenwood
Balfour-Klickitat Park, Lyle
Catherine Creek, near Lyle
Columbia Hills State Park, Dallesport
Mamie & Francis Gaddis Park, White Salmon
Trapper Creek Wilderness Area, Stabler
Trout Lake NAP

Get involved in Annual & Christmas Day Bird Counts



Western Gray Squirrels are year-round inhabitants of the Columbia River Gorge and spend their lives in oak or mixed Ponderosa Pine , Douglas Fir woodlands.

Resources:

- Borrow these books through the White Salmon Library: Living with Wildlife by Russell Link and Don't Run From Bears and Other Advice on Living with Wildlife in the Columbia River Gorge, by Bill Weiler
- Washington Department of Fish and Wildlife Backyard Sanctuary Program wdfw.wa.gov/wlm/backyard
- National Wildlife Federation Garden for Wildlife Program: www.nwf.org/outside
- Cornell's All About Birds Site: www.birds.cornell.edu
- The Wildlife Habitat Incentive Program (WHIP) is a voluntary program for conservation-minded landowners who want to develop and improve wildlife habitat on private land. See: www.nrcs.usda.gov/programs/whip

Retain Native Hardwoods such as Oregon White Oak

Did you know spring bird migrations are timed with caterpillar emergence? Birds eat Bugs!



Coho salmon (l)
White-breasted Nuthatch (r)

Tips for Land Managers

Have you identified goals for your property or agricultural operation? Do your goals include promoting wildlife habitat? If you want to reduce costs and realize benefits of natural pest control, consider these tips:

- Time maintenance activities to minimize potential impacts on wildlife and their life functions: breeding, caring for young, and migration. Time **hay**ing activities to have minimal impact on ground nesting birds (most are done by mid-July, some are much earlier like Western Meadowlark and Long-billed Curlew). Time your tree thinning activities to be aware of canopy and cavity nesters (most are done nesting by mid-July).
- Promote water sources on your property like vernal pools (seasonal swales that hold snow on water & dry out by spring or summer). Plant pond edges with native plants (vs. lawn grass) to increase wildlife diversity. Promote vegetation near water for shade and habitat and plant diversity.

Wildlife Love Tree Defects

Consider leaving the following defects for wildlife: cavities, loose bark, split or broken leaders, & dead tops on live trees.

- Birds feed on bug pests! Resident and migratory bird species eat destructive forest defoliating insects that threaten forests and increase wildfire risk. Birds need habitat, so plan your thinning or harvesting activities with birds in mind by keeping some nesting and forage areas. Manage your land for diversity by keeping a variety of tree species of different ages, including shrubs, standing snags and downed logs.
- Many wildlife species serve as good indicators of habitat diversity and quality (examples: White-breasted Nuthatch breeding = healthy presence of older Oregon White Oaks; Tailed frogs = need cold water temps; Sage Sparrow breeding = healthy community of Big Sagebrush in large enough area).

Integrated Pest Management

Integrated Pest Management (IPM) enables managers to limit the use of pesticides, herbicides and fertilizers while controlling pest populations. IPM meets pest management objectives and uses economically & environmentally sound pest control methods. IPM often includes the use of natural predators such as birds and bats. IPM helps managers learn when to time activities so they have fewest negative impacts on wildlife. Forest managers, orchardists, viticulturists and gardeners can implement IPM on a small or large scale to limit damaging pests and attract beneficial insects. Be aware of the species you may impact by spraying or applying chemicals. You may be working against your own goals.

Resources

- OSU Integrated Plant Protection Center: ipcwweb.science.oregonstate.edu
- WSU Extension IPM research: ipm.wsu.edu
- Xerces Society for Invertebrate Conservation www.xerces.org Find bat and bird box plans here.
- Northwest IPM: www.nwipm.info/industlinks.asp

The Deer are Invading! Managing for Wildlife Pests

Many people have problems protecting tree and shrub seedlings from deer or elk browse. Deer and elk like to rub their antler velvet on Ponderosa Pine and snack on Western Red Cedar. Deer may browse any young seedling depending on forage availability. While there are no perfect solutions, UCD does have 2 types of mesh tree protectors for sale. A more experimental method we have used with some success is to tie half of a dryer sheet to an upper branch of each seedling. We believe the strong odor deters browse for a limited time. See Russell Link's book for managing wildlife pests.

Two Osprey nest in an old piece of dock equipment near Stevenson, WA. Mated pair such as these are becoming a more frequent sight along the Columbia River.



Fire: Part of the Landscape

Fire is a natural part our environment. Long before human occupation, frequent fires ensured only the strongest, healthiest trees survived on the east side of the Cascades. On the west side, and in heavily forested areas, infrequent but catastrophic fires burned forests completely and forest succession restarted with seedlings. Fire suppression over the recent past has allowed a build-up of potential fuel sources and an increased likelihood of intense fires throughout the region. Fires are likely to have major impacts on private and public lands. Steep terrain combined with dry, hot, windy summers create the perfect storm for fires in our area.



Fire Awareness

- **Defensible Space** is the single most important step you can take to increase the likelihood of your home surviving a fire. Defensible Space also provides a safe area for fire fighters to work in.
- Living in rural areas means that fire departments may have **longer response times**, may have to carry their own water, and may have to traverse difficult terrain to reach your property.
- If your property is **hard to access**, doesn't have adequate turn-around space or could trap fire fighters, they are unlikely to enter or protect your property.
- **Be Fire Safe!** Be aware of weather and wind! **Encourage fire awareness** among friends and relatives.

Additional Resources

Defensible Space Step by Step:

pnwfireprevention.com

FirewiseUSA: www.firewise.org

US FEMA Fire: www.usfa.dhs.gov

See WA DNR Fire Prevention web page

FireWise Construction Materials

Your house could be vulnerable to a fire because of its design, construction, and/or its location.

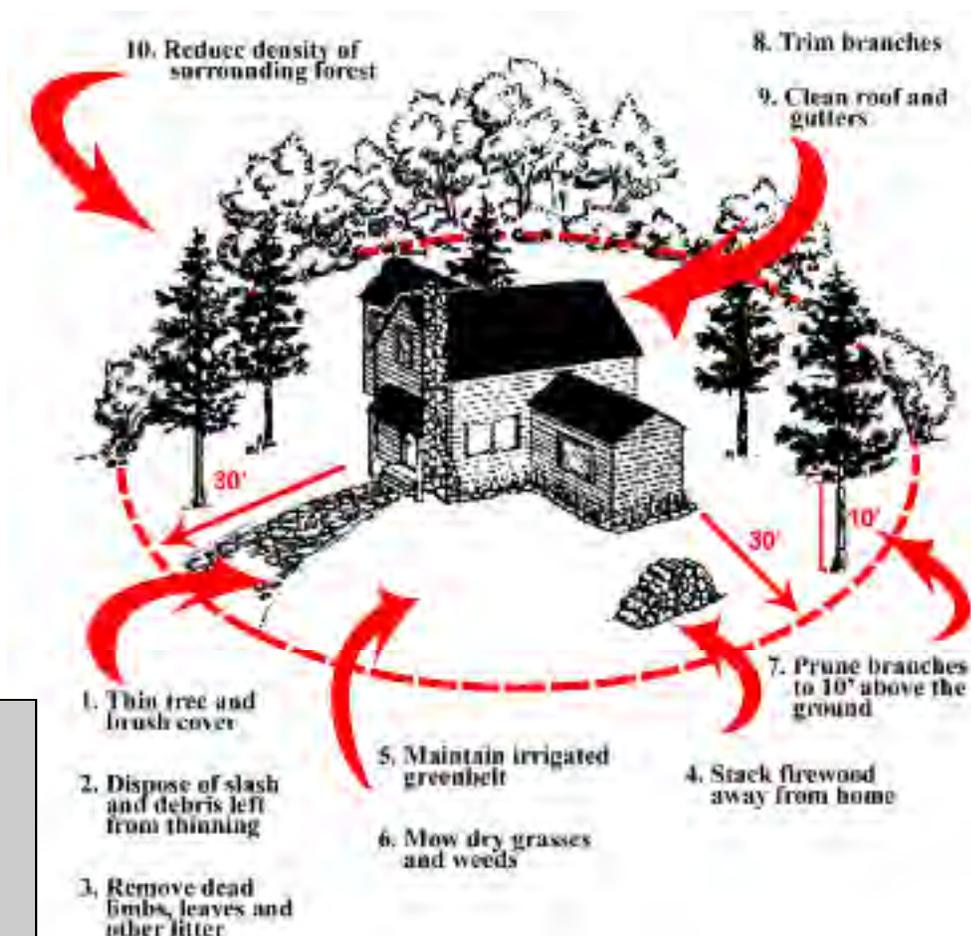
Roof. Your roof is the most vulnerable part of your house because it can easily catch fire from wind-blown sparks. After creating Defensible Space, the single most important step you can take to reduce your fire risk is to build or re-roof with fire-resistant or noncombustible materials when it is time to replace your roof. Cedar shake is highly flammable, choose metal or Class C asphalt shingles.

Siding. Choose fire resistant siding if building new and keep vegetation next to siding to a minimum if your siding is wood.

Decks. Keep vegetation to a minimum under decks, and use gravel footing. Do not store firewood under decks and consider enclosing areas under the deck with 1/2" wire mesh or non-wood lattice. If building new, consider a non-wood decking material.

SAVE YOUR HOME! CREATE

Defensible Space





Defensible Space Works!

What is Defensible Space?

Defensible space is an area you create around your home to reduce chances your home will be ignited by a wildfire. Fire can ignite homes in three ways: direct flames, indirect heat and if flying embers land on your roof, on a deck or near wood siding. By creating Defensible Space and reducing the vegetation around your home, you can reduce the chances of your home burning in a wildfire even if you are away.

Create Defensible Space

The area immediately adjacent to your house is particularly important for an effective Defensible Space. This area is called the Home Ignition Zone. Focus your efforts in this area.

- Within 30' of your home keep vegetation to a minimum and keep it well spaced from other vegetation. Think of vegetation as fuel and keep your landscaping lean, clean and green.
- Remove branches that overhang roofs, garages or decks. Limb up and remove tree branches that hang low, near vegetation or structures. UCD has a pole saw for rent.
- Choose drought resistant, native plants for landscaping and select plants (see right) with fire resistant characteristics.
- Remove any dead vegetation within the defensible space area. Remove dead branches lying on the ground or still attached to a tree, dried grass or shrubs, dropped leaves, needles, and firewood debris including bark.



Fire Behavior

Fire behavior depends on **Topography, Weather and Fuel**. Fire moves uphill. The steeper the slope, the faster it can move. Think about prevailing winds around your property. Which direction is wind likely to be blowing in summer and early fall? Modify vegetation based on your conclusions.

Defensible Space and Slope

How big is a defensible space? It depends on the slope of your property. You need 70-200 feet of Defensible Space if your home is on a slope, or 30' if the topography is flat. Break up continuous, dense stands of trees or shrubs. More widely spaced plants are less susceptible to wildfire threat.

Ladder Fuels

Vegetation grows at different heights and fire can quickly move from a grass fire up to igniting shrubs, and finally into tree crowns. Within the defensible space area, create a separation between low growing vegetation and tree branches. Space shrubs.

Fire Resistance: Any Plant will Burn

Using fire resistant native plants in your landscape rather than highly flammable



vegetation can help protect your home from flames and heat. **Characteristics of fire resistant plants:**

- Don't have aromatic sap (juniper, arborvitae, cedar, pine) or strong odors when leaves are crushed.
- Don't accumulate dry, dead material through the year (lilacs, blackberries, junipers) or have papery bark.

Some fire resistant plant suggestions:

Shrubs: Rhododendron, Azalea, Flowering Currant, Mock Orange, Serviceberry, Ore. Grape, Salal

Groundcovers: Kinnikinnick, Pinks, Ice plant, sedum

Perennials: Yarrow, Coreopsis, Penstemon, Echinacea, Flax, Lupine, Blanket Flower, Daylily, Iris,

Trees: Ponderosa Pine, Western Larch and Ore White Oak are adapted to survive fire. In your Defensible space, opt for limbed up Big Leaf Maple, Quaking Aspen, Walnut, Dogwood, Alder, Oak & Crabapple.

20 Forest Management

Managing Forest Lands

Washington's forests provide tremendous benefits. Forests help to limit erosion and act as filters, purifying our water and air. In addition to producing timber and wood products that fuel our economy and warm our homes, our forests provide fish, game and wildlife habitat, opportunities for outdoor recreation and great natural beauty. Yet forests require active management to be healthy and grow vigorously. To be a good forest manager, learn about the species that make up your forest. Jot down a few goals for what you want your forest to provide in the next 5, 10, and 30 years. Do you want to manage your land to attract wildlife? Different wildlife species have different needs. Do you want to grow big healthy trees and reduce wildfire risks, or plan to harvest to pay for retirement or a child's education? Each of these goals requires active management. Consider writing a management plan for your land to help you define and achieve your goals.

Forest Succession

Forests are in a constant state of change. The stage of development your forest is in depends on how long it has been since the forest's last major disturbance, or any event that drastically altered the composition or structure of the forest. Common disturbances here include: wildfire, logging or even a severe winter where many trees blow down. Determine what stage of succession your forest is in to help you determine management options for reaching your goals.

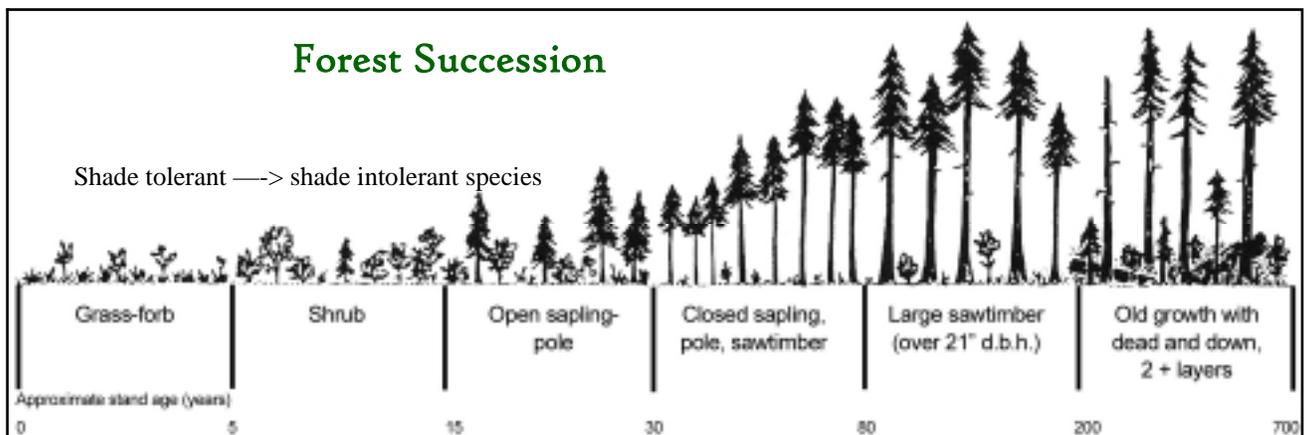
Write a Plan to Meet Your Goals

Forest Management Plans are changeable as your needs change and they reflect your goals. Writing your own plan can be as simple or complex as you want. See the Resources list for helpful publications. Be sure to include a map, property location, acres, conditions, & your 10 year plan for management activities.

Practices for Healthy Forests

Consult with your local DNR Stewardship Forester, UCD, or a private consultant forester for specifics.

- If you have root diseases on the site, make sure you are not planting species susceptible to the disease. Consult an expert for advice.
- Use seedlings that came from local seed sources. Most nurseries can provide trees grown from local sources.
- Remove trees infected with diseases and insects, to reduce loss in nearby healthy trees. If you need to replant, ensure that you don't use species susceptible to the same insect or disease.
- Thin forests to maintain individual tree growth and health, and to reduce wildfire hazard.
- Plant areas devoid of trees with locally adapted, native species. Use light-loving species such as Douglas-fir and ponderosa pine, that occur in your area.
- Plant multiple species for diversity. If you have root diseases, make sure not to plant susceptible species.



Tree Stocking

Tree density is important for forest health. Trees without enough room will compete with one another for sunlight, water and soil nutrients and your forest will not grow at potential rates. In our area, forest lands may be overstocked due to past management and may need thinning to ensure healthy trees, vigorous growth rates and fire safety. One way to tell if trees are crowded is to see if there are multiple tree within the drip line of each desirable tree.

Tree Distribution

Zone	Elevation	Species
Westside Cascades (Skamania Co.)	0-2000 feet	Douglas-fir, Western Hemlock, Western Redcedar, Bigleaf Maple, Red Alder, Pacific Dogwood
	2000-5000 feet	Douglas-fir, Mountain hemlock, Noble fir, Pacific Silver fir, Subalpine fir, Western White Pine, lodgepole pine
Eastside Cascades (Eastern Skamania Co., Western Klickitat Co.)	0-2000 feet	Douglas-fir, Ponderosa pine, Grand fir, Oregon White Oak, Bigleaf Maple, Black Cottonwood, Willows, Pacific Dogwood, Pacific Yew, Quaking Aspen, Black Hawthorne
	2000-5000 feet	Douglas-fir, Ponderosa pine, Grand fir, Pacific Silver Fir, Western Larch, Western White Pine, Noble fir, Subalpine fir, Western hemlock, Mountain hemlock, Black Cottonwood, Western Redcedar, lodgepole pine



Ponderosa Pine and East Gorge from Catherine Creek. Photo: Jim White

Sustainable Forest Actions

- Keep buffers strips of trees and shrubs along streams to shade them, protect water quality, prevent erosion and reduce chances of flooding.
- Understand the roles that fire, disease and fungi play in tree growth, health and populations.
- Leave travel corridors for wildlife.
- Plant planning on tree growth. Thin trees when necessary.
- Plant a variety of locally adapted species. Plant mostly shade-intolerant (sun-loving) tree species in open areas. Use a diversity of species when you can.
- Find and identify and diseases, blights or parasitic fungi that may be present on your land.
- Use seedlings that came from local seed sources. Most nurseries can provide trees grown from local sources.
- Build temporary roads that can be covered and replanted after harvesting and keep roads away from streams. Contact the DNR.
- If you need to install a culvert, contact the DNR to ensure you aren't blocking fish passage.
- When logging, avoid damage to the stems and root systems of trees that you leave. Cont'd at right
- Dispose of heavy concentrations of dead, down wood – “slash”- that constitute a fire hazard.
- Leave some standing dead trees – “snags” – and large down logs. They are extremely valuable as wildlife habitat.
- Consider secondary products that your land may produce in the under story while trees grow. Look into alternative forest products, agroforestry, and alley cropping.

Resources

- Contact the Department of Natural Resources for a copy WA's Forest Practices Rules or find it online at: www.dnr.wa.gov See also Forest Practices, Small Forest Landowners Office, Fire and Burning Info.
- Silviculture in Washington Family Forests, free from WSU publications: pubs.wsu.edu
- WSU Extention: ext.wsu.edu/forestry

UCD sells native trees and shrubs during our annual tree sale. Place Orders Starting Dec. 1st.

22 Forest Management, cont'd

Learn about Forest Practices

The Washington Department of Natural Resources (DNR) manages Forest Practices. If you're interested in harvesting timber, building or repairing forest roads, installing culverts, thinning your forest, or other forest practices, check with DNR to be sure you comply. Call 360-577-2025 for questions about land in Skamania County or 509-925-8510 for Klickitat County.

What are Forest Practices Rules (FPAs)?

FPAs are rules that protect soils, water, fish, wildlife and improvements (power lines, roads) from impacts related to forest practices on private, county and state forest land. Forest lands that have been managed poorly or logged without care can be sources of erosion and pollute our streams and rivers.

Do I need to file a Forest Practices Application (FPA)?

Forest practices that may require a FPA include: harvesting timber, salvaging downed and standing wood, constructing forest roads, installing and replacing stream crossings on forest roads and applying forest chemicals. If you cut or remove less than 5000 board feet of timber for personal use during any 12 month period you are not required to fill out an FPA. Consult with your local DNR Office (see above).

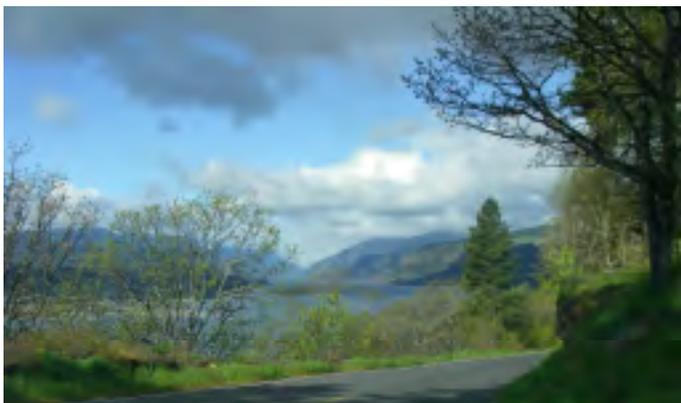
Programs for Forest Landowners

- Environmental Quality Incentives Program, NRCS
- Riparian Easement Program, DNR
- Family Forest Fish Passage Program, DNR
- Long Term Forest Practices Application, DNR
- Conservation Reserve Enhancement Program

Cultural Resources

See the back of this handbook to find out how to determine if there are cultural resources on your property.

From Dock Grade Photo: Adrienne Zuckerman



Non-Timber Forest Products

Firewood	Flowers, Herbs &
Beargrass	Medicinal Plants
Ferns	Pinecones
Hazelnuts	Huckleberries
Mushrooms:	Thimbleberries
Chanterelle	Salmonberries
Morel	Serviceberries
Boletus	Elderberries
Chicken of the woods	Blueberries
Lobster	Fronds and Boughs
Matsutake	Christmas Trees
Puffball	Lichens
Acorns	Mosses
Salal	Biomass

Alternative Forest Products

You may be able to find a local market for small diameter timber or woody biomass from thinning activities. Mount Adams Resource Stewards recently opened a log yard in Glenwood to add value to multiple wood products generated at the same facility. This project uses forest products previously viewed as waste to stimulate rural economies and reduce the amount of woody materials burned annually in slash piles. To learn more about this and other projects, contact: Mt. Adams Resource Stewards: 509-364-4110 www.mtadamsstewards.org

Planning Resources

WSU Extension publications: pubs.wsu.edu
EB2016 Forest Stewardship Planning workbook
OSU Extension pubs:
extension.oregonstate.edu/catalog
EC 1125 Management Planning for Woodland Owners: Why and How (OSU)
EC 1126 Management Planning for Woodland Owners: An Example Timber Management Plan (OSU)
EC 1128 Estimating Site Productivity on Your Woodland and EC 1129 Tools for Measuring Your Forest

Gardens and Landscaping

Like the majority of the Pacific Northwest, most of the moisture received annually falls between autumn and spring. Ensure the site you select for your garden will meet the needs of plants you want to grow. Plant hardiness zones can vary depending on elevation and microclimates, but zones in the District are generally 6-8b. A rule of thumb for the area is not to plant your garden until snow has melted off Mt. Defiance.

Resources

- NOAA Frost/Freeze Maps: www.ncdc.noaa.gov/oa/climate/freezefrost/frostfreemaps.html
- Hardiness Zone Maps: www.usna.usda.gov/Hardzone/ushzmap.html
 - Office of the Washington State Climatologist www.climate.washington.edu/climate.html
 - WSU Ag Weather Net: weather.wsu.edu
 - Oregon Climate Service www.ocs.orst.edu/page_links/climate_data_zones/climate_data.html

Native Pollinators

Pollinators play an important role by moving pollen and ensuring plants are able to produce seeds and fruit. Native bees are North America's most important group of pollinators. If you want to attract bees to your garden or orchard, consider installing nests for native bees on your property. Learn more about pollinators and find nest designs and instructions from the Xerces Society for Invertebrate Conservation at www.xerces.org/pollinator-conservation

Bats are other important pollinators and they consume thousands of pest insects every day. Learn more about bats and find bat house plants at: www.batcon.org

Irrigation Water

Water is an extremely valuable resource. Irrigation water rights attached to a property should be disclosed with the sale of a property. Read your water right permit carefully to ensure you are within the use allotted by your permit. Don't over water, you'll waste soil and fertilizer as well as water. See more tips for outdoor water conservation on page 9 & water permits on page 26.

Soils

Contact UCD for a paper copy of the Skamania County Web Soil Survey. The Klickitat County Survey is online. See page 13 for information on soils, how to have a soil test done, where to find soil survey information online.



*Mt. Adams from Oregon Peach Orchard
Photo: Adrianne Zuckerman*

Creating Microclimates and WindBreaks

Protect garden plants from wind, reduce home heating costs, decrease erosion and pesticide drift and increase productivity of crop or rangeland by planting wind barriers. Using native trees and shrubs in your windbreak will decrease maintenance and water needs and provide habitat for wildlife. Contact UCD for more information wind break design and installation.

Resources

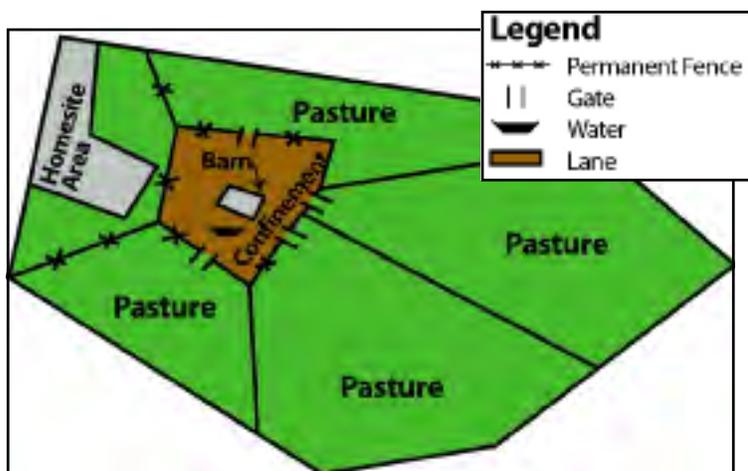
- Gorge Grown Food Network: www.gorgegrown.com
- WSU Small Farm and Sustainable Agriculture: agsyst.wsu.edu/altagr.htm
- WSU Small Farms Connection: smallfarms.wsu.edu/index.html
- OSU Small Farms: smallfarms.oregonstate.edu/
- Contact your local Master Gardener
- WSU Klickitat County Extension www.klickitat.wsu.edu/masterg.html
- WSU Skamania County Extension skamania.wsu.edu/Hort.htm
- OSU Extension Mater Gardner Program
541-386-3343

24 Livestock and Pasture Management

Increase Pasture Productivity with Rotational Grazing

Good pastures provide forage for your animals, absorb rainfall, filter runoff, and reduce erosion, all of which protect streams. Close grazing can result in bare ground and mud leading to poor animal health, erosion, and nutrient runoff into ditches and streams.

By managing your pastures, you can protect clean water and raise healthy animals. To prevent overgrazing and force animals to graze more evenly, try creating a rotational grazing scheme. Divide larger pastures into several, smaller pastures and rotate animals through these fields when grass is 3-4". Temporary fencing (often electrified) works best to set up smaller fields and leaves flexibility to rearrange as necessary.



Adapted from WSU Publication on Pasture Management

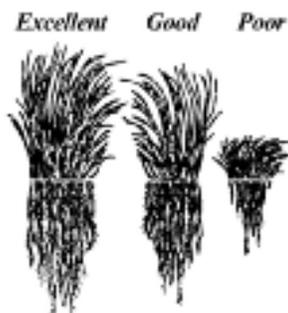
Additional Resources

- Horses for Clean Water: www.horsesforcleanwater.com
- Reduce Mud and Keep Water Clean: Sacrifice Areas: clark.wsu.edu/horticulture/smallAcreageProgram/sacrifice-areas.pdf
- Managing Mud and Manure: www.or.nrcs.usda.gov/news/factsheets/fs11.pdf

Overgrazing Damages Grass

Overgrazing will damage root systems and lead to unproductive pastures. Don't graze when grass is <3".

Adapted from: Pasture Management: Tips for Small Acreages in Oregon. Fact Sheet No. 6, 1999.



Mud Matters

Mud can make chore time unpleasant, increase fly breeding areas, transmit diseases, create unsafe footing, and increase polluted runoff. Often the best protection against mud is prevention. Reduce the amount of water that runs through your animal yard and you will reduce mud and polluted runoff. Tips to reduce runoff include:

Install roof gutters.

Install roof gutters and downspouts or French drains to divert clean water from the animal yard. A 1-inch rain on a 20-foot by 50-foot roof will produce 620 gallons! Design gutters to handle the amount of rainfall in your area.

Use sacrifice areas.

Move animals into a corral, run, or pen when pastures are wet in the winter or when grass is less than 3 inches high in the summer. By using a small enclosure such as a paddock or sacrifice area, you can protect the remaining pasture from damage when animals graze on wet ground. Locate a new sacrifice area on high ground and at least 100 feet away from wells and open water. Maintain a 25' grass buffer around the sacrifice area to filter polluted runoff. Widen the buffer if the sacrifice area slopes or is located near wetlands, streams, or ditches.

Protect downspouts.

Protect gutter downspouts from animal and equipment damage by using heavy polyvinyl chloride (PVC) pipe, a hot wire, or a permanent barrier. Empty downspouts into a stock watering tank, rain barrel, dry well, tile line, French drain, road ditch, or creek before animal manure pollutes it.

Control runoff

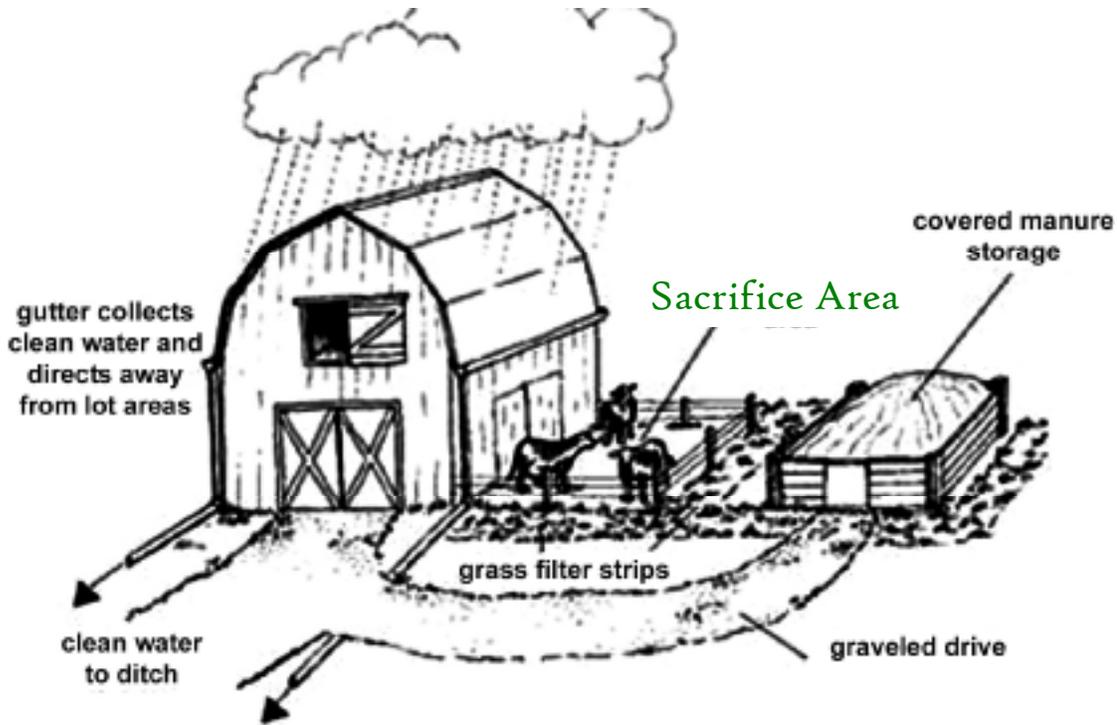
Locate new animal yards at least 100 feet from wetlands, ditches, and streams. Curb concrete animal yards or use an earthen berm around animal yards that are close to water. Divert animal yard runoff away from wetlands, ditches, and streams and into a vegetated area that can filter the flow. Divert clean water above animal yards to water to reduce mud. Close open ditches with a buried pipe to carry water past farm-scapes. You may not be able to eliminate mud, but you can reduce the amount of mud you deal with daily. Tips to reduce mud and pollution include:

Fence animals.

Fence animals away from wetlands, streams, or ditches. Rotate water tank areas to avoid mud and manure buildup.

Design drainage.

Slope the animal yard with a 4 to 6 percent grade and use a southern aspect for quick drying. Use tile drainage to reduce water in the animal yard and riding ring. Drain tile water into a buffer strip that can filter pollutants in runoff.



Manage Manure: Compost!

Collect raw manure at least every other day and add it to a covered compost pile. By covering and aerating your manure pile, you will turn it into rich compost, a valuable soil amendment for your pasture or garden. In addition, through composting your manure, you will reduce mud in your horse area, reduce parasites and bugs that bother you and your horse, reduce odors, reduce the volume of your manure pile by half, and

kill weed seeds. By spreading finished compost on your pastures, you'll grow stronger, healthier, more nutritious grass, reduce weeds, improve water retention and save money! For information on building your own low cost manure composting facility see below or call UCD. In contrast, improperly managed manure is a breeding ground for flies and other pests. Nutrients and bacteria from manure harm fish and wildlife if they wash into streams. Manure also presents a potential source of pollution to local drinking water sources, such as a wells.

Locate your compost bin where it will be easy to access daily. Cover it! Speed decomposition by aerating: drill holes into PVC pipes and pound them into the pile as shown.

From: www.manuremaiden.com



Install firm footing

Muddy areas are often found at barn entrances, lanes, gates, and loafing areas. You can install concrete in these areas. However, geotextile fabric and gravel will provide an all-weather surface at a third of the cost. Geotextile fabric allows water to drain down, but stops mud from working up through the gravel. Use a layer of geotextile fabric next to the soil, a 4- to 6-inch layer of 1.5-inch minus crushed rock in the middle, and a 2- to 3-inch layer of 5/8-inch minus crushed rock on top to provide a firm surface. In areas with less animal traffic, consider using up to 18 inches of hogfuel or bark chips for footing. Hogfuel decomposes and needs to be periodically replaced. Avoid using hogfuel near wetlands, streams, or ditches, as moisture will speed up decomposition.

Source: Washington County Soil and Water Conservation District (SWCD). Managing Mud and Manure: Tips for Small Acreages in Oregon. Fact Sheet No. 11, 1999. Online: www.or.nrcs.usda.gov/news/factsheets/fs11.pdf



Fencing

Use fencing to keep animals out of streams and to keep pastures from being overgrazed. See Rotational Grazing at left.

Photo courtesy of USDA/NRCS

Additional Resources

- Strategies for Managing Manure: clark.wsu.edu/horticulture/smallAcreageProgram/PastureGrazingMgmt.pdf
- Manure Maiden: www.manuremaiden.com
- How to Compost and Use Horse Manure: see www.kingcounty.gov under livestock-programs
- Keeping Water Clean: Management Practices for Small Acreages: clark.wsu.edu/horticulture/smallAcreageProgram/BMP-List.pdf

26 Recycling, Solid Waste & Outdoor Burning

Recycling and Solid Waste

Recyclable materials are accepted for free at Transfer Stations

Klickitat County Recycling and Solid Waste Disposal Locations:

Transfer station locations: BZ Corners, Dallesport, Goldendale, at the Roosevelt Regional Landfill
Call 509 773-4448 or see web page for current operating schedule, list of recyclables and composting info
www.klickitatcounty.org/SolidWaste

Skamania County Recycling and Solid Waste Disposal Locations:

Transfer stations in Skamania County accept recyclables and solid waste. Transfer Station Locations: Stevenson, Underwood, and Mt. Pleasant.
Call 509-427-3926 or see the web page for current operating schedule www.skamaniacounty.org/PublicWorks/Solid%20Waste/solid_waste_division.htm

Annual Solid Waste Events:

White Salmon Community Pride
Skamania County Earth Day
Contact your county for details.



Don't Trash Usable Items!

Organize a garage sale, donate to WGAP or Second Hand Rose in Bingen or use these sites to give away items you no longer need:

Second Hand Rose, Bingen Thrift Store: 509-493-4231
portland.craigslist.org/grg/zip - this is the Gorge subsection
classifieds.gorge.net - anyone with internet service through Gorge.Net can list items
www.freecycle.org - search for the Columbia River Gorge community
zwaggle.com/ - list kid and baby items here



Burning and Burn Permits

- In Washington, it is illegal to burn garbage at any time. The use of burn barrels is prohibited.
- It is illegal to burn construction and demolition debris. Only natural vegetation from your property and firewood are legal to burn. Burning may require a permit. Check with your local fire department. For recreational fires in excess of 4'x4'x3' a small fire permit is required. Call Skamania County Public Works at (509) 427-3920. In Klickitat County call (509) 575-2490.
- Know and abide by burning regulations in your area. County and National Forest laws may differ.
- Burn only when winds are light and do not exceed 7-10 miles per hours.
- For larger burns, such as slash piles from a logging operation, contact your local DNR office.
- Do not burn more than one fire at a time.
- Keep sufficient tools and water on hand.
- If you see someone you think is burning illegally, or if the smoke from someone's fire is bothering you, call Ecology's toll-free complaint line at 1-866-211-6284.



Electronic Waste Disposal

Through the Oregon StRUT (Students Recycling Used Technology) program, students take donated computers and computer components and upgrade them for the use in schools. Students evaluate, repair and refurbish donated computers and in turn donate those computers to local schools. Students gain valuable skills and schools get free computers. See: www.oregonstrut.org or call (541) 296-2630 for more information and locations.
See earth911.com/ [in recycling locations](#) for other electronic waste

Household Hazardous Waste

Identifying common household hazardous wastes: Look for DANGER, WARNING, CAUTION on the container's label. Do not mix, apply, or dispose of weed control chemicals, used motor oil or other toxic substances where they can leach into groundwater. Free disposal may be available. Contact your County solid waste disposal provider (see above left).

Reduce Waste & Enrich Soil: Compost!

Composting is easy and cheap, you can cut down your garbage by hundreds of pounds each year, and create a mixture that can be used to improve the soil. If you have kitchen scraps, leaves or grass clippings you already have what you need to compost.

Getting Started

Get your own compost bin started in three simple steps: Make a compost bin or buy one, throw in your kitchen scraps and yard waste, and mix it up with a shovel or pitchfork once in a while.

1. Begin with the bin:

Location, location, location. Pick a spot in your yard that's at least partially shaded and at least 2 feet from a structure like your house or a fence.

Other considerations:

- Location: easy to monitor & add to
- Access to water
- Good drainage

Containers: You can compost in a simple pile, but using a container or bin helps your compost pile retain heat and moisture and look neat. To get started, it's easy to go with a single bin system. As materials are added and mixed together, the finished compost settles to the bottom of the bin.

Materials: You can build bins from scrap lumber, old pallets, chicken wire, or concrete blocks. Search online for plans to build your own or visit Rheingarten Park in White Salmon to see some examples.

Size. A pile that is 1 cubic yard (3 feet high, 3 feet wide, 3 feet long) is big enough to retain heat and moisture, but small enough to be easily turned. Home compost piles shouldn't be larger than 5' x 5' x 5'.

2. Add the first materials:

An equal mixture of brown autumn leaves and fresh grass clippings will give you an good composting combination. New composters shouldn't worry about the precise mixture though; as you gain experience, you can fine-tune your compost's composition.

A. Lay a base. Start with a layer of browns. First lay down 4-6 inches of twigs or other coarse carbons on the bottom of the pile for good air circulation.

B. Alternate greens and browns. Add layers of nitrogen (green) and carbon (brown) materials. Make layers 4-6 inches thick. When you turn the pile the first time, these materials will get mixed together and compost more efficiently.

C. Size does matter. Materials will decompose faster if they are broken or chopped into smaller pieces.

Water as you go. Your compost pile should be as moist as a wrung-out sponge, but not soaking wet. Your pile will get water from rain, as well as the moisture in the greens — fresh grass clippings are nearly 80% water by weight. If the pile gets too wet, you can turn it more frequently to dry it, or add dry brown materials to soak up the excess moisture.

3. Mix the pile:

Once you build your pile, the real composters get to work — bacteria, fungi and insects help break down the materials in your compost bin. As the organic materials decompose, your pile will get warm on the inside and you might see some steam. In about a week, your compost will be ready for turning.

Use a pitchfork or shovel to mix up the layers of green and brown and move materials toward the center of the pile. You can empty your bin and re-layer, or just work materials around inside the bin. Break up clumps of material and wet the pile as needed.

4. Cover your bin in winter:

Too much rain will make your pile too wet and nutrients from the pile may pollute run-off water.

5. Repeat until it's complete:

The composting process goes more quickly in the summer months. Your compost pile may no longer heat up after just a few weeks. Look in your pile for finished compost — material that is dark and crumbly, fresh-smelling, and no longer looks like what you originally put into your bin. Turn your pile if nothing is happening.

Adapted from www.reduce.org



Inexpensive materials like pallets or chicken wire can be used to make simple compost enclosures.



Resources

• www.klickitatcounty.org/solidwaste

• www.stopwaste.org

• www.compostwashington.org

• Search for "Backyard Magic" Composting Handbook, online at the New Brunswick Canada Department of the Environment

28 Regulatory Considerations and Resources

Water Rights

A Water Use Permit is required before diverting, impounding (creating a pond) or withdrawing surface or ground water. Contact: **Washington Department of Ecology, Water Review Program SW Region: 360-407-6058, www.ecy.wa.gov**. Access Water Right records through Dept. of Ecology's **Public Records Coordinator: (509) 454-7658**. **Washington Rivers Conservancy** is also available to assist with water right issues or investigations: **(509) 881-7689, www.warivers.org**

Water Quality Protection

It is illegal to pollute surface or ground water. The landowner is responsible for preventing manure, pesticides, sediment and other pollutants from reaching wetlands, waterways and groundwater. Use this booklet and the following resources to protect the quality of your water. A Construction Stormwater Permit from **WA Dept. of Ecology** is required for any construction project disturbing 1 acre or more: **www.ecy.wa.gov**
In Skamania County, call: (360) 407-6300
In Klickitat County, call: (509) 575-2490
WA State Department of Agriculture is responsible for regulating livestock operations to prevent water pollution: **www.agr.wa.gov**

Stocking Fish in Your Pond or Stream

A permit is required to transport or stock any species of fish in and lake, pond, river or stream.
Washington Department of Fish and Wildlife:
(360) 696-6211, wdfw.wa.gov

Fish Screens

Fish screens are required for all irrigation and surface water diversions in order to keep fish from getting caught in ditches and pipes. **WDFW** can assist with fish screen specifications and design. Another local resource for state-of-the-art fish screen technology is the **Farmers Conservation Alliance** in Hood River, OR: **(541) 716-6085, www.fcasolutions.org**

State Environmental Policy Act (SEPA)

SEPA is a process to ensure that environmental impacts are being evaluated when projects are proposed. A SEPA application may be required prior to the issuing of permits contact:
WA Dept. of Ecology's Environmental Review Section, SEPA Board: (360) 407-7448.



The Western Gray Squirrels are the largest native tree squirrels in Washington. Photo: WDFW

Protection of Streams and Wetlands

Permits must be obtained to dredge, drain, fill, remove vegetation, or otherwise alter waters in the U.S. including wetlands. Below is a list of some permits that apply to projects in or near streams and wetlands. In WA, one permit application is needed to apply to these multiple permit agencies, the Joint Aquatic Resources Permit Application (JARPA). Contact UCD or the **Office of Regulatory Assistance** for more information: **(800) 917-0043, www.ora.wa.gov**

Hydraulics Permit: Work, development or construction that will use, divert or in any way change the natural flow of any water body may require a Hydraulics Project Approval Permit. Also required if discharging water into streams and/or wetlands.

Washington Department of Fish and Wildlife:
(360) 696-6211, wdfw.wa.gov

Shoreline Permit: Land use or development within the 100-year flood plain or within 200 feet of certain water bodies, wetlands and deltas may require a Shoreline Development Permit.

Skamania County Planning Department: (509) 427-3900
www.skamaniacounty.org/Departments.htm
Klickitat County Planning Department: (800) 765-7239
www.klickitatcounty.org/Planning

Septic Systems

A Sewage Disposal Permit is required before disposing of any sewage through septic tanks and drain fields.

Septic systems also need regular inspection and maintenance. Call your local county health department for assistance with septic system installation, inspection or maintenance:

Skamania County Health Department: (509) 427-3881
[www.skamaniacounty.org/EnvirHealth/](http://www.skamaniacounty.org/EnvirHealth/EnvirHealth.htm)

[EnvirHealth.htm](http://www.skamaniacounty.org/EnvirHealth/EnvirHealth.htm)

Klickitat County Health Department: (509) 773-4565
www.klickitatcounty.org/Health

Building and Construction

Permits are required by counties and cities to construct permanent buildings or additions.

Skamania County Planning Department: (509) 427-3900
www.skamaniacounty.org/Departments.htm

Klickitat County Planning Department: (800) 765-7239
www.klickitatcounty.org/Planning

Forest Practices

Forest Practices including re-forestation, harvesting, fertilizing, road building, insect and disease control, salvaging trees and applying chemicals may require a Forest Practices Permit. UCD has additional resources to help you determine whether you need a Forest Practices Permit, and WA DNR is responsible for enforcing these permits.

Washington State Department of Natural Resources:

SW Region: (360) 902-1400, www.dnr.wa.gov

Small Forest Landowners Office: 360-767-7002 ,

[www.dnr.wa.gov/BusinessPermits/Topics/](http://www.dnr.wa.gov/BusinessPermits/Topics/SmallForestLandownerOffice)

[SmallForestLandownerOffice](http://www.dnr.wa.gov/BusinessPermits/Topics/SmallForestLandownerOffice)

Columbia Gorge National Scenic Area

Much of the Columbia River Corridor in Skamania and Klickitat Counties is part of the Columbia Gorge National Scenic Area, authorized in 1986 to protect and enhance the scenic, natural, cultural, and recreational resources of the gorge. New land uses and ground disturbing activities need to be in compliance with Scenic Area ordinances. Policies guiding activities in the Scenic Area are determined by the Columbia River Gorge Commission. If you own land in the Scenic Area, contact your county planning department or the **Columbia River Gorge Commission: (509) 493-**

Noxious Weeds

The landowner is responsible for controlling many noxious weed species, according to WA law. Discover which weeds are noxious in your area and how to best control them.

Skamania County Noxious Weed Control Board: (509) 427-3940

www.skamaniacounty.org/weeds/noxious_weed_board.htm

Klickitat County Noxious Weed Control Board: (509) 773-5810, www.klickitatcounty.org/WeedControl

Underwood Conservation District can also help identify weeds and recommend management practices.

Cultural Resources

In Washington, excavation or removal of archaeological materials, including Native American artifacts, may require a permit from the WA State Department of Archeology and Historic Preservation. The presence of other types of historic sites may also limit certain development or disturbance. Consider having an archeological survey done, or consult with Yakama Nation, before ground disturbing activities take place. Contact the **Dept. of Archeology and Historic Preservation** for more information: **(360)586-3065, www.dahp.wa.gov**

Air Quality Protection

Authority over air quality may be regulated by local, state or federal agencies, and is generally based on location and activity causing air quality problem. Check with your local clean air agency for burn bans or other restriction throughout the year.

Southwest Clean Air Agency: 1-800-633-0709,

www.swcleanair.org



Goals or Notes

Underwood Conservation District

170 NW Lincoln St
P.O. Box 96
White Salmon, WA 98672

509-493-1936
<http://w3.gorge.net/ucd>