



Restoring the Watershed

A citizen's guide to riparian restoration
in Western Washington

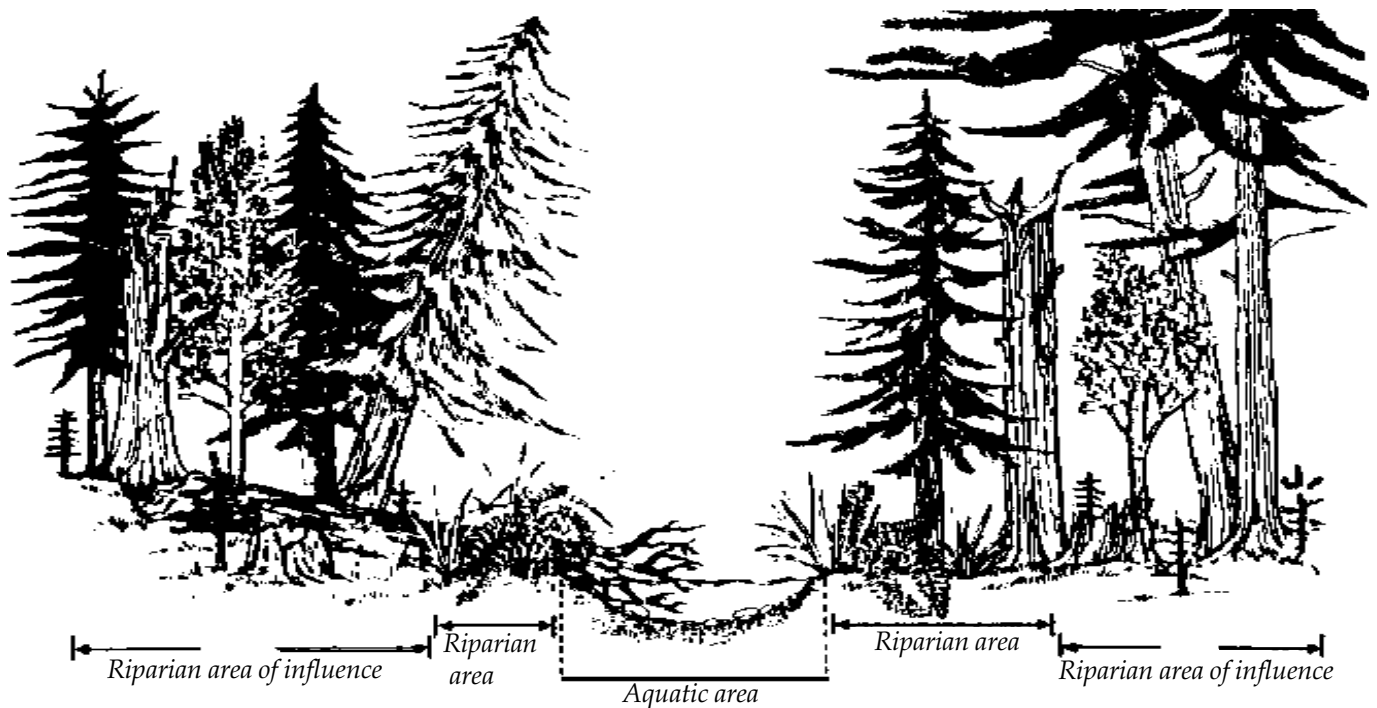


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Acknowledgments

Text and illustrations adapted with permission from:

Thurston Conservation District, "*A guide to stream corridor revegetation in Western Washington.*"

King County Surface Water Management, "*Northwest Native Plants: Identification and Propagation For Revegetation and Restoration Projects.*"

Thurston County Stormwater, "*Thurston County Guide to Pond Planting.*"

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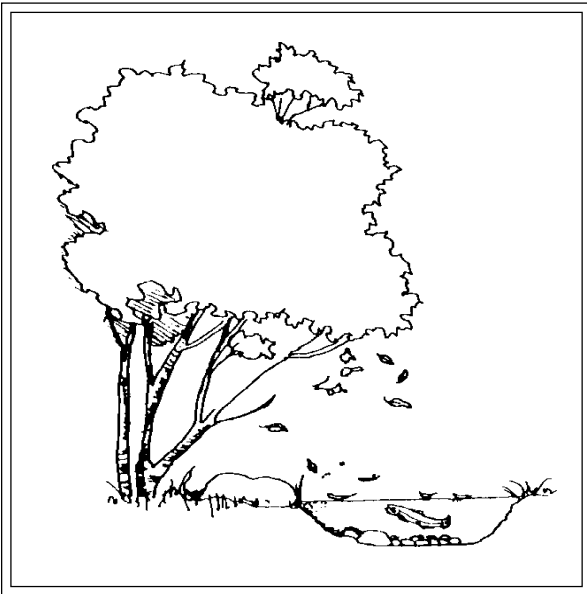
Riparian Zone

What is a riparian zone?

The term “riparian” refers to the border of moist soils and plants, next to a body of water, that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. If you have a stream or creek running through your land, then you have a riparian zone in your property.

Why is it so important?

Cover and Habitat



Graphics adapted from "Adopting a stream: A Northwest Guide."

Healthy riparian areas produce an abundance of cover and shade. The shade keeps water temperatures cool for fish and other wildlife. The various heights of vegetation along streams provide shelter, food, and temperature relief for many birds and other animals.

The moist soil found along the stream encourages the growth of a very diverse plant community. The seeds and fruits of these riparian plants provide a year-round food source for wildlife species. Aquatic insects feed on the leafy materials that fall into the stream and they, in turn, become food for fish, birds, small mammals and amphibians. These creatures attract larger predators like eagles, herons, coyotes and raccoons. Over three hundred species of Washington wildlife depend on riparian habitat for food and shelter.

Flood Reductions

The trees and other vegetation found in a healthy riparian area slow flood waters and allow some of the excess water to soak into the ground bordering the stream. This reduces the likelihood or magnitude of flooding in downstream communities.

Water Quality Improvements

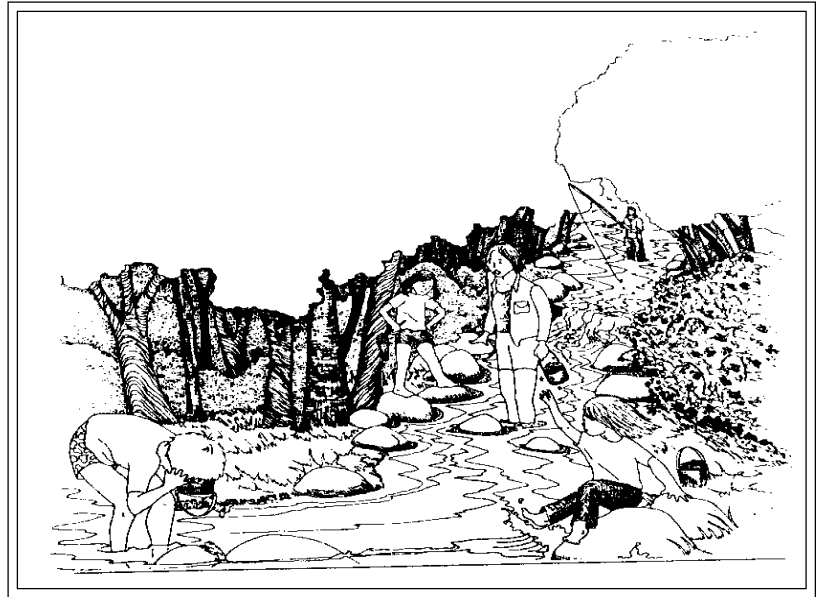
Riparian areas also filter runoff and sediments from slopes next to the stream. Riparian buffers clean water by filtering out pollutants, keeping surface water and ground water clean. When flood waters overflow the banks of streams or rivers, riparian vegetation slows the velocity of the water. Sediments are deposited along the stream banks. The vegetation quickly grows through this sediment, stabilizing its roots and covering it with plants that utilize the nutrients that could otherwise harm downstream water quality.

Why revegetate?

A healthy riparian area can support and sustain a diversity of species, from aquatic insects to fish, plants and wildlife. Animals, fish, plants and people all benefit from the water, food, shade and shelter offered in riparian areas.

Wildlife

Eighty-five percent of Washington's wildlife species spend at least a portion of their lives in a riparian area. They come for water, food, and shelter. River otters can be found resting on hollow trees and debris piles. Deer can be seen browsing on seedlings of willow trees, while birds find protection from predators for their nests high in the canopy of tall deciduous trees.



Graphics adapted from "Adopting a stream: A Northwest Guide."

Fish

Seventy-seven percent of the fish species in Washington inhabit freshwater. Within a riparian area fish find food, shade from the sun and gravel for spawning. Cutthroat trout can be seen leaping for mayflies, while schools of young coho salmon find shelter from predators beneath submerged logs.

Plants

Plants thrive on the readily available water and nutrients found in riparian areas. A healthy riparian system can support a diversity of plant species ranging from the tall, graceful western hemlock, to the favorite resting site of the bald eagles on the black cottonwood, and the familiar huckleberry shrubs.

People

A healthy riparian area helps to slow flood waters, reducing property damage caused by flooding and erosion. Healthy riparian zones also offer cool shade, soothing scenery, and opportunity for wildlife viewing. People also come to take part in recreational activities such as camping, picnicking and fishing.



Designing the planting

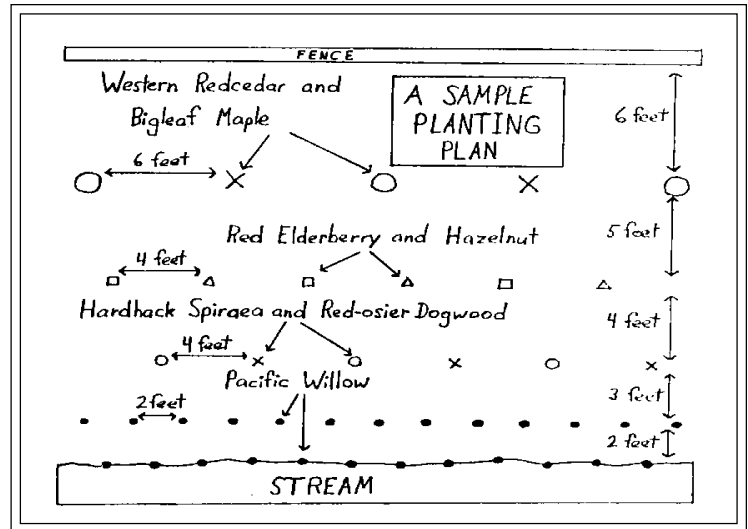
When designing your planting site, site evaluation is the most important step to ensure successful planting. The following questions should be answered:

- What is the soil like?
- How much sun does the site receive?
- How wet is the site?
- How steep are the banks?
- What kinds of natural vegetation already exist on the site?
- What activities take place around the site?

When designing a revegetation plan and choosing trees and shrubs to plant, the soil types, drainage, and size of existing vegetation in various areas of the stream corridor should be considered. For instance, one area along a stream may be marshy with loamy soil, while a nearby section may be drier and rocky. Different types of plants would thrive in each of these areas. Note that the direction the bank is facing will also influence the conditions for the plants; south-facing banks are typically more sunny and dry than others.

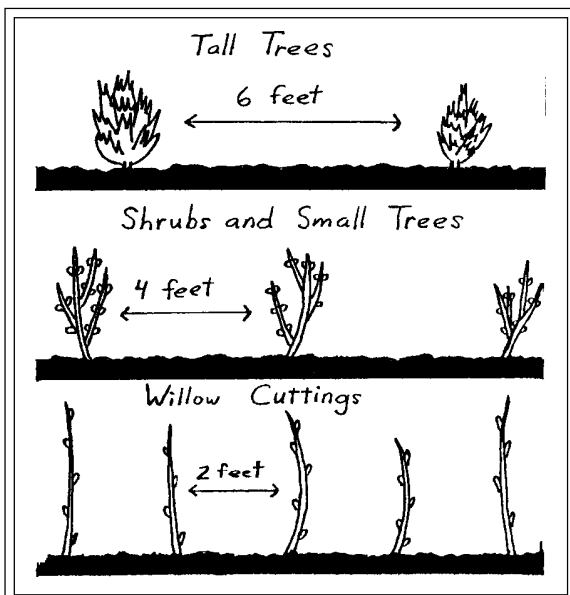
Establishing a variety of plants is desirable, both for wildlife use and for effectiveness in anchoring the soil. An ideal plan would include both conifers and deciduous trees and shrubs, of varying heights, and with different individual characteristics. The diversity of flowers, fruits or berries is important for attracting a variety of wildlife.

If woody plants such as willow or dogwood are present near the revegetation site or on a nearby stream, it may be desirable to use cuttings from those native plants for revegetation planting.



Graphics adapted from "A guide to stream corridor revegetation in western Washington."

Where to plant



Graphics adapted from "A guide to stream corridor revegetation in western Washington."

Vegetated corridors typically range in width from 50 to 350 feet, depending on the characteristics of the sites and the property owner's preferences. Even a small corridor has value for wildlife and water quality; large corridors are even more effective.

Helpful tips: Use graph paper to map out your project. This will help in determining how much plant material is required for the area of your project.

In very rocky soil, cuttings instead of rooted seedlings should be planted, since the seedlings have roots which could be broken off during planting.

Ideal spacing between plants is 2 feet for willow cuttings, 4 feet for seedlings of shrubs and small trees, and 6 feet for seedlings of larger trees.

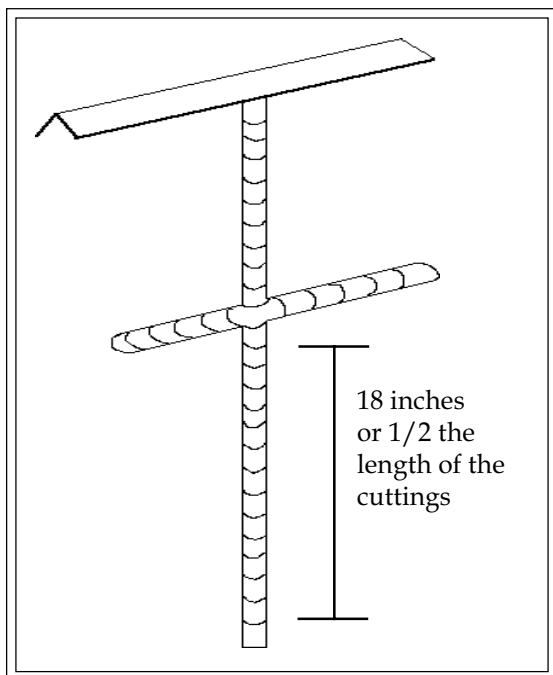
How to Plant

Prepare the tree planting site by scraping away weeds in a 2 foot wide circle where the trees are to be planted. During preparation and planting, avoid stepping in the stream or throwing soil into it; silt in the stream can suffocate fish and invertebrates.

Helpful tips: *The plants should be arranged along the stream so that each is in its preferred condition. For instance, plants which need lots of water should be planted near the water line. Plants which require full sunlight should NOT be planted next to growing plants which will shade them out.*

How to plant live cuttings or whips: cottonwood, willow, dogwood

Certain species root easily from cuttings of live stems or roots. Planting live cuttings is simple, but they must be placed in the right location or they will not root. Willows, cottonwood, and dogwood cuttings all require saturated soil to root. If you are planting them on a steep stream bank, be sure to place them close enough to the stream so the bottoms of the cuttings reach the water table.



Graphics adapted from "A guide to stream corridor revegetation in western Washington."

When to Plant

Woody vegetation in the form of seedlings or cuttings should be planted from mid-March to mid-April; the last two weeks of March is the ideal time. In this part of the year, the trees are still dormant, so they will be less shocked by transplanting. Also, planting after the coldest weather avoids the possibility of the cold stressing the plants.

Willow cuttings are hardy enough that they can be planted any time from September through March.

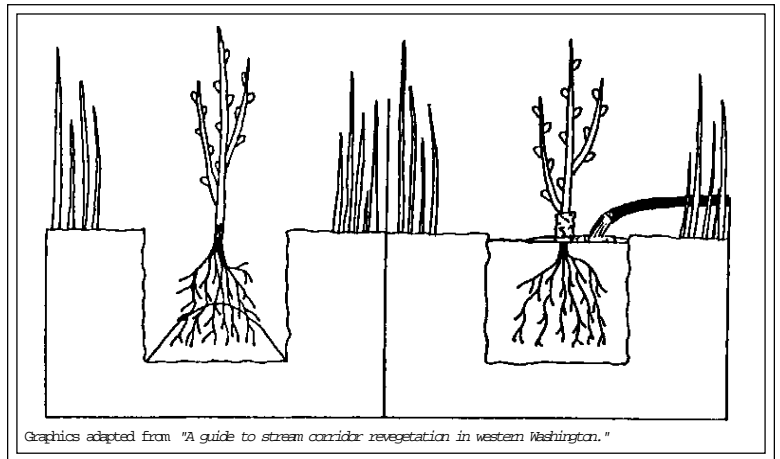
1. Punch a planting hole into the bank using a piece of rebar or length of metal rod (*see drawing at left*). The rebar should be shoved or hammered into the ground perpendicular to the slope surface, and deep enough to reach permanently saturated soil. Rebar hammered into hard soil can be difficult to pull out, so be sure to use a long piece and leave enough sticking out to get a good grip on. Smooth metal rods are easier to remove.
2. Place a cutting or whip into the hole, making sure that the bottom (angled cut) points down into the ground. Leave at least 6" of the whip or cutting protruding above ground.
3. Stomp down hard on the ground around the cutting, or push a shovel or planting tool into the ground next to the cutting and wiggle it back and forth, to help close up the soil around each stem.

How to Plant.....(continued)

How to plant bare-root plants:

Bare root plants require more careful handling than container-grown plants, because the fragile roots are more easily damaged. They should be planted during the dormant season (approximately October to April, depending on the weather and the plant species), and they should be irrigated if a prolonged dry spell follows planting.

1. Place the plants with roots submerged in a bucket of water until you need them. Adding a mild fertilizer such as fish fertilizer, or a rooting agent such as "Roots" or Vitamin B-12 to the water can help the plants recover quickly from transplant shock.
2. Dig a hole one-half times as deep and wide as the roots. If the soil conditions prevent you from digging the hole deep enough, prune off the bottom of the roots so they can hang down without curling on the bottom.
3. Remove one plant from the bucket and place it in the hole by holding it so the section of stem just above the roots (called the "root collar") is even with the ground surface, and the roots dangle in the hole. Use your other hand, trowel, shovel, or an assistant to gently refill the hole with soil. Break up the soil clumps by crumpling them as you refill the hole, and don't use clumps of sod and roots in the planting hole. Keep the roots spread or fanned out as you refill the hole, and take care not to damage the roots.
4. Poke your fingers down into the soil around the roots as you refill the hole, in order to tamp it down and eliminate air holes that can damage the roots. Refill the hole so that all the roots are completely covered, but the stem is not buried above the root collar. Mound up any extra soil around the plant to form a berm for catching and retaining water. It's better to place the plant a little too deep, rather than placing too shallow so that mounded soil can wash away and expose the roots.
5. Always water every plant thoroughly after planting.



Helpful tips: When planting shrubs and trees, wrap stem. Use foil or a plant protector (commercial) to avoid damage by mice and deer.

Helping the trees survive

Plants typically experience transplant shock for a brief period following planting, especially in the late spring and early summer. Transplant shock makes leaves wilt, but they should perk up again within a few days. The plants must be well-watered, especially during the first few weeks after planting. If prolonged dry, summer weather follows the planting day, be sure to water the plants. The plants should be well-established in six months to one year. Once established, appropriate native plants should not require watering. However, the plants will probably need some watering if the first year is a dry year. Supplemental watering should mimic natural rainfall patterns: water most frequently in spring and early summer, and decrease watering throughout summer. By August, you should be watering infrequently; perhaps once every two weeks. After the first year, stop watering most plants (trees may require additional watering if they show signs of stress during drought years).

Weeding grassy plants such as reed canary grass can improve survival rates of new plants. Removing too much grass, however, could increase erosion by leaving unprotected soil. Fertilizing the plants is not necessarily recommended, since native plants should not require additional nutrients. Fertilizer might also burn the tree roots, encourage the growth of grasses, and pollute the stream. **Helpful tips:** *If you use a weed whacker, you need to be careful not to damage the bark.*

Helpful tips: *If the plant survival rate is very low, you may want to check your planting plan and watering schedule. Replanting in future years may be necessary. If the survival rate is very high, thinning may be desirable.*

Where to get the plants

Typically plants for stream revegetation are purchased from a nursery in the form of bare-rooted seedlings or cuttings of branches. Conservation-grade plants, which are slightly irregular plants sold inexpensively in large quantities, are usually available. Some people may choose to grow their own plants for stream revegetation; there are many different techniques for reproducing plants from seeds or parts of live plants.

Native plant salvaging

An alternative to purchasing native plants is to salvage or collect them from construction sites or other sources. This can be an excellent way to provide large inexpensive plants for any restoration project. However, native plants should be salvaged or collected with the following provisions:

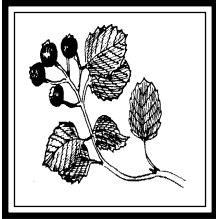
1. Permission from property owners should be received before salvaging.
2. Only salvage or collect in areas that are actually being bulldozed and developed.
3. All permits should be obtained for any salvaging and collecting projects in national forests or other sites.
4. DO NOT collect endangered plant species.

Plant salvaging is most successful on wet, cloudy days and when plants are dormant (November through March).

Native Plants

Native plants are usually the best choice for streamside revegetation because they are able to survive and flourish in the local environment without extensive added care. For successful growth, moisture and sunlight requirements should be taken into consideration before planting. The following plants are most likely to grow in a riparian situation, provide cover and food for fish and wildlife, and stabilize the streambank.

* The term *moisture tolerance* refers to the level of soil moisture appropriate for each plant.



Grows 12 to 40 feet.
Medium-dry moisture tolerance.
Shade tolerant.
Forms extensive thickets.
Berries are eaten by birds and mammals.
Twigs are browsed by deer and elk.

Serviceberry
Amelanchier florida



Grows 6 to 10 feet.
Medium-dry moisture tolerance.
Shade tolerant.
Excellent control of soil erosion.
Provides food and cover for wildlife.
Berries are edible to humans.

Tall Oregon-grape
Mahonia aquifolium



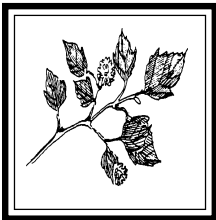
Grows 15 to 16 feet.
Moist-medium moisture tolerance.
Shade tolerant.
Excellent soil-binding roots.
Food for wildlife.
Easily started from cuttings.

Red-osier dogwood
Cornus stolonifera



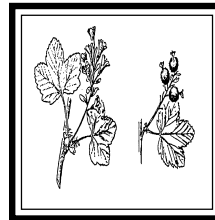
Grows 4 to 12 feet.
Medium-dry moisture tolerance.
Shade tolerant.
Good soil-binding characteristics.
Attractive flowers when blooming.
Food for wildlife.

Oceanspray
Holodiscus discolor



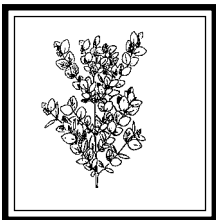
Grows 12 to 15 feet.
Moist-medium moisture tolerance.
Shade tolerant.
Berries are eaten by bears.
Dense foliage provides cover for wildlife.
Excellent soil-binding roots for stabilizing streambanks.
Easily propagated from cuttings.

Ninebark
Physocarpus capitatus



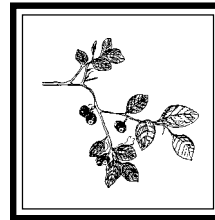
Grows 3 to 6 feet.
Medium moisture tolerance.
Shade tolerant.
Berries are eaten by wildlife.
Ideal for home landscape as well as upland buffers near streams or wetlands.

Red-flowering currant
Ribes sanguineum



Grows 3 feet.
Medium-dry moisture tolerance.
Shade tolerant.
Good soil-binding characteristics.
Provides food for wildlife throughout winter.

Snowberry
Symphoricarpos albus



Grows 6 to 8 feet.
Medium-dry moisture tolerance.
Shade tolerant.
Berries are popular with wildlife and humans.
Forms thickets to provide cover for wildlife.

Evergreen huckleberry
Vaccinium ovatum

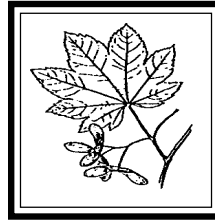
Native Plants.....(continued)

* The term *moisture tolerance* refers to the level of soil moisture appropriate for each plant.



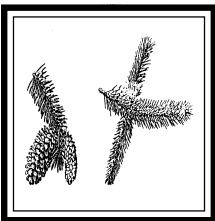
Salmonberry
Rubus spectabilis

Grows 4 to 10 feet.
Moist moisture tolerance.
Shade tolerant.
Fruits in late summer.
Often found growing under red alder trees.
Good soil-binding roots.
Well adapted to eroded or disturbed sites.
Fruit is edible and has high value for wildlife.



Vine maple
Acer circinatum

Grows 15 to 30 feet.
Moist-medium moisture tolerance.
Shade tolerant.
Often found in the understory of coniferous forests.
Excellent soil-binding roots and is very tolerant of shade.
Provide excellent forage for wildlife.



Sitka spruce
Picea sitchensis

Grows 60 to 200 feet.
Moist-medium moisture tolerance.
Shade tolerant.
More common on the coast but is well-adapted to streamside conditions.
Often a victim of bud-eating insects.
Excellent soil-binding roots that are resistant to washout or erosion.
Food and cover for wildlife year-round.



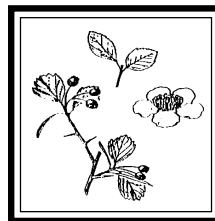
Nootka Rose
Rosa nutkana

Grows 6 to 8 feet.
Medium-dry moisture tolerance.
Shade tolerant.
Excellent soil-binding roots.
Great as streamside buffer.
Forms thickets for wildlife cover.
Provides food for wildlife.



Hazelnut
Corylus cornuta

Grows 15 to 20 feet.
Medium-dry moisture tolerance.
Not shade tolerant.
Heavy foliage for cover.
Excellent soil-binding roots.
Important source of food for small mammals and some birds.



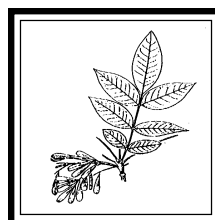
Black hawthorn
Crataegus douglasii

Grows 20 to 30 feet.
Medium-dry moisture tolerance.
Not shade tolerant.
Excellent soil-binding roots to keep soil stable.
Well adapted to disturbed sites.
Provides food and cover for wildlife, especially birds.
Tree creates a good barrier for birds because of thorns on branches.



Red Alder
Alnus rubra

Grows 40 to 80 feet.
Moist-medium moisture tolerance.
Not shade tolerant.
Great for regenerating disturbed sites.
Provides cover for young birds.
Provides food for wildlife.
Has very shallow root system which often causes tree to topple into stream, tearing out the banks.



Oregon ash
Fraxinus latifolia

Grows 60 to 80 feet.
Moist-medium moisture tolerance.
Not shade tolerant.
The only native ash in the Northwest.
According to legends, one is safe from snakes under the Oregon ash.
Seeds and twigs are browsed by various mammals and birds.

Native Plants.....(continued)

* The term *moisture tolerance* refers to the level of soil moisture appropriate for each plant.



Hardhack
Spirea douglasii

Grows 8 to 12 feet.
Moist-medium moisture tolerance.
Not shade tolerant.
Provides food for birds in the winter.
Forms thickets providing cover for wildlife.
Easily survives competition from grasses, but is sometimes too aggressive and can out-compete other planting.



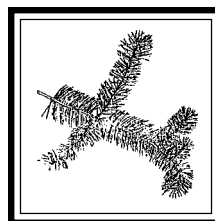
Pacific willow
Salix lasiantha

Grows 35 to 50 feet.
Medium-dry moisture tolerance.
Not shade tolerant.
Excellent soil-binding roots that control erosion along streambanks and in wetlands.
Rapid growth makes it ideal for regenerating disturbed sites.
Branches hang over water providing aquatic insects for fish food chain as well as shade for streams.



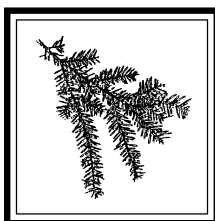
Black cottonwood
Populus trichocarpa

Grows 150 to 200 feet.
Moist-medium moisture tolerance.
Not shade tolerant.
Fast growing tree and thrives best in wet conditions.
Great for restoring flooded lands and other wet habitats.
Ideal sites for nesting birds especially the bald eagle and blue heron in spring.



Douglas-fir
Pseudotsuga menziesii

Grows 200 to 250 feet.
Dry moisture tolerance.
Not shade tolerant.
Common tree in Western Washington.
Fast growing conifer and often found in company of hemlock and cedar.
Seeds provide food for wildlife.



Western hemlock
Tsuga heterophylla

Grows 60 to 225 feet.
Medium-dry moisture tolerance.
Shade tolerant.
Provides winter cover for mammals and small birds.
Seeds are eaten by most rodents.



Black twinberry
Lonicera involucrata

Grows 10 to 15 feet.
Medium moisture tolerance.
Shade tolerant.
Good soil-binding roots.
Provides food for wildlife, especially birds.
Dense foliage for browsing and cover for wildlife.
Tolerant of air pollution.

For more information

Most Conservation Districts hold a plant sale every winter and have access to the Natural Resources Conservation Service listings of native plant nurseries in the Pacific Northwest. Call your local Conservation District or the following organizations for more information.

Washington Native Plant Society
Central Puget Sound Chapter
Post Office Box 576
Woodinville, WA 98072-0576

Center for Urban Horticulture
University of Washington
Mail Stop GF15
Seattle, WA 98195

Hortus Northwest
(A guide to native plant nurseries of the PNW)
PO Box 955
Canby, OR 97013

Adopt A Stream Foundation
P.O. Box 5558
Everett, WA 98206

Cascadia Quest
4649 Sunnyside Ave N. Suite 305
Seattle, WA 98103

King County Surface Water Management
700 Fifth Ave Suite 2200
Seattle, WA 98104

Permits for working in or near Washington streams

Any and all development activities, including flood damage restoration or prevention work, construction, land use or any other types of projects undertaken in, on or near any lake, river, stream, marsh, or other waterbody, may require one or more permits. In order to avoid unnecessary delays, added costs, or other inconveniences, we strongly recommend you contact the permitting offices of your local county, state or federal agencies before the planning stages of your project.

The following permits are examples of what may be needed:

Local Permit

Shoreline permit (RCW 90.58): Land use, work, construction, development or other activities and projects within the 100-year floodplain or within 200 feet of the shoreline of certain lakes, rivers, streams, marshes, bogs, swamps, wetlands, floodways, and river deltas may require a Shoreline Substantial Development Permit. *Contact your local planning department.*

Floodplain development permit (CFR, Part 60): A Floodplain Development Permit is required for all activity within the 100-year floodplain, including buildings, mining, filling, dredging, grading, paving, excavations, drilling operations, and storage of equipment or materials. *Contact your local Planning, Building or Public Works Department.*

What permit do you need?

Is the project near water?

- Hydraulic Permit (HPA)
- Aquatic Lands Authorization

Will it effect water quality?

- Water Quality Certification

Will trees be removed?

- Forest Practice Approval

Will wetlands be involved?

- Army Corps Permit

Is it in the 100-year floodplain?

- Floodplain Development Permit

Does the project cost over \$2,500?

- Shoreline Permit

State Permit

Hydraulic permit (RCW 75.20.100, .103, .106): Work, construction, development or other activities that will use, divert, obstruct or change the natural flow or bed of any fresh or salt water may require a written Hydraulic Project Approval. Verbal permission will be granted in emergencies. *Contact: Department of Fish and Wildlife, (360) 902-2534 or the hotline, (360) 753-6618.*

Water quality standard modification and/or certification (RCW 90.48): Work, construction, or other activities, including chemical applications either in or around any waters, may need a Temporary Modification of Water Quality and/or a Water Quality Certification. *Contact the Department of Ecology, (360) 459-6000.*

Who to call for permits

In an emergency:

Department of Fish and Wildlife
hotline (360)753-6618

Local Contacts:

Planning Department
Building Department
Public Works Department

State contacts:

Department of Fish and Wildlife (360) 902-2534
Department of Ecology (360) 459-6000
Department of Natural Resources
(360) 902-1100, Aquatic Lands
(360) 902-1400, Forest Practices

Federal contact:

Army Corps of Engineers
(360) 754-3495

State Permit

SEPA Review (RCW 43.21C): Some projects near waterbodies will have to go through SEPA. SEPA stands for State Environmental Policy Act, and is a process (rather than a permit) geared to mesh with already existing permits, approvals, and/or licenses. SEPA provides a way to analyze the environmental impacts of any proposed project. Whether your project must go through the SEPA process will be determined by the scope of your project and/or through your local or state permitting jurisdiction. Contact the Department of Ecology's Environmental Review Section, (360) 459-6025 or 459-6020.

Aquatic lands lease and/or authorization (RCW 79.90): Washington State owns most of the beds and shorelands of navigable waterbodies, including certain lakes, rivers, and streams. Any proposed uses or actions involving construction, filling, dredging, drilling, mining, road construction, utility installation, or other activities within the beds or shorelines of certain waters may need either an Aquatic Lands Lease and/or Authorization. Contact the Washington Department of Natural Resources, (360) 902-1100.

Forest practice approval (RCW 76.09): Forest activities relating to growing, harvesting or processing timber, road construction and maintenance, brush clearing, slash disposal, as well as forest chemical applications undertaken around waterbodies or other areas, may need a Forest Practice Approval. Contact the Washington Department of Natural Resources, (360) 902-1400.

Federal Permit

Corps permit (Section 10 and 405): Placement of dredged or fill material in waters and/or wetlands (including isolated wetlands), as well as the performance of any work in navigable waters of the United States, requires a Corps Permit. Contact: US Army corps of Engineers (360)764-3495.

We All Live Downstream

Individual actions, either positive or negative, may seem small. But multiplied by the millions of us who live in and visit Washington, these actions have a tremendous cumulative effect.

While some problems created by a growing human population are beyond an individual's ability to solve, there are many things each of us can do to lessen the impact on our environment, and consequently to fish and wildlife.

Here are some things you can do to leave a lighter footprint on your environment:

- Reduce water use in the kitchen, bathroom and yard.
- Reduce the size of your lawn. Do not water during times of water shortages.
- Use fertilizers and lawn care chemicals sparingly. Try organic alternatives to harsh pollutants. Contact your county extension agent for more information.
- Recycle paper, cardboard, glass, metals and plastics.
- Dispose of or recycle oil, antifreeze, paints and other household chemicals properly. Otherwise, they will eventually reach the stream, killing fish and wildlife.
- Start a compost pile to produce fertile soil from unwanted yard and kitchen waste.
- Carpool whenever possible. Exhaust emitted from cars introduces many pollutants to our watersheds.
- Never pour anything down a storm drain. Water and any contaminants from storm drains flow directly into the nearest stream, untreated.
- Revegetate stream sides with native woody plants.
- Build a fence to keep livestock out of streams, providing protection for the growing plants, and preventing trampling of the banks and deposition of manure into the stream. For more information, call your local Conservation District for assistance.
- Build bird houses, provide clean water and feeders for birds.
- Landscape with native vegetation that will attract wildlife. Wherever possible work with neighbors to create vegetated pathways (corridors) for wildlife to travel.
- Neuter your pets to reduce the number of strays or feral animals. Put bells on cats as a warning to birds and other wildlife.
- Take part in an organized volunteer program to work on improving riparian areas. Attend local government planning sessions.

Always ask yourself "What are the other unintended consequences of my actions?"

Resource List

For further information on native plants, the following books, handouts and brochures are available:

"Recognizing Wetlands and Wetland Indicator Plants on Forest Lands." *Richard Bigley and Sabra Hull.* Washington Department of Natural Resources.

"Northwest Native Plants: Identification and Propagation for Revegetation and Restoration Projects." *King County Department of Public Works and Surface Water Management Division.*

"Suggestion for Streambank Revegetation in Western Washington." Tom C. Juelson. Washington State Department of Game Applied Research Information Report No. 13. February 1980.

Gardening with Native Plants of the Pacific Northwest: An Illustrated Guide. *Arthur R. Kruckeberg.* The University of Washington Press. Seattle, Washington. 1982.

Handbook of Northwestern Plants. *Helen M. Gilkey and La Rea J. Dennis.* Oregon State University Bookstore, Inc. Corvallis, Oregon. 1980.

The Earth Manual. Malcolm Margolin. Hunt & Mifflin. 1982.

For more technical information on stream restoration projects, the following books are available:

Better Trout Habitat: A guide to stream restoration and management. *Christopher J. Hunter.* Island Press. Washington D.C. 1991.

Trout Stream Therapy. *Robert L. Hunt.* The University of Wisconsin Press. Madison, Wisconsin. 1993.

For more information on how to get started, the following departments or local county conservation districts can be contacted:

Washington Department of Fish and Wildlife
Habitat Division (360) 902-2534

Washington State Department of Ecology
Shorelands and Coastal Zones Management (360) 407-7250

OR call the Washington State County Conservation Commission
for a listing of your local conservation district office
(360) 407-6200

Washington Department of Fish & Wildlife

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