

Seattle Permits

Part of a multi-departmental City of Seattle series on getting a permit

Environmentally Critical Areas: Vegetation Restoration

February 28, 2007

Environmentally critical areas (ECAs) such as streams, wetlands, shorelines and steep slopes represent the most environmentally sensitive and productive habitat in the city of Seattle. Vegetation restoration projects in these areas can play a critical role in improving the health and function of these areas. This Tip will guide you in conducting vegetation restoration on your property. It provides step-by-step instructions to design and implement a vegetation restoration project as well as links to additional information. While a simple backyard restoration project can be accomplished by any homeowner, technical assistance is also available if additional support is desired (see Additional Resources, pg. 5).

Individuals undertaking restoration that is required for mitigation of development within ECAs and surrounding buffer areas or is in response to a code violation should use this document for guidance. However, additional standards such as specific plant ratios or additional submittal requirements may be imposed by the Seattle Department of Construction and Inspections (SDCI) where restoration is mandatory.

This Tip is not intended for in-water restoration of aquatic habitat such as stream beds or wetlands. Applicants wishing to undertake in-water restoration should contact SDCI to understand additional permits and standards that will be required.

What is Vegetation Restoration?

Vegetation restoration is the establishment of native vegetation, including the removal of non-native or invasive plants, with the intention "to promote maintenance or creation of a naturally functioning

condition that prevents erosion, protects water quality, or provides diverse habitat" (SMC 25.09.320). Restoration should result in a densely vegetated area with a significant diversity of native trees, shrubs and groundcover.

Examples of allowed restoration include:

- re-establishment of a native ecosystem in human impacted areas such as paved surfaces, lawns or landscaped areas
- replacing non-native, noxious and/or invasive species such as English ivy, Himalayan blackberry, or reed canary grass, with native plantings
- replacing previously topped trees with healthy native trees
- replacing monocultural stands of deciduous trees like big leaf maples and red alder with native conifers

In assessing the effectiveness of restoration in these cases, it is important to consider the ecological function of existing mature trees and avoid removing existing tree canopy cover when possible.

Vegetation Restoration Plans that are required as mitigation of new development as part of a building or grading permit or in response to a violation will be required to address restoration of highly-impacted areas, where possible and appropriate, before replacing existing trees and vegetation.

Why Undertake Vegetation Restoration?

Vegetation restoration can recreate critical habitat and provide a natural buffer between human development and existing habitat in order to screen noise, light and activity that may impact nesting, and other critical activities. Vegetation along waterways also absorbs and filters urban runoff, resulting in improved water quality. Restoration of a dense native plant community is a simple and effective way of protecting sensitive areas with numerous potential benefits to the homeowner, local habitat and local community.

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Benefits to homeowners:

- reduces need for lawn maintenance and pesticides
- creates a scenic landscape
- attracts wildlife
- improves privacy

Benefits to natural habitat:

- provides shelter, food, cover and nesting habitat for wildlife
- buffers wildlife from noise and disruptions of urban areas

Benefits to waterways and wetlands:

- provides a critical source of nutrients in the form of insects and plant material such as leaves and woody debris
- shades aquatic habitat which helps regulate water temperature
- protects water quality by filtering and absorbing runoff from lawns, streets and structures
- prevents stream bank erosion and reduces flooding by slowing and absorbing water as well as stabilizing banks with a complex root structure

Is a Permit Required?

Restoration activities undertaken as part of an issued building or grading permit or in response to a code violation do not require a separate vegetation removal permit. Approval of a restoration plan will, however, be required and other conditions may be imposed by SDCI.

Applicants undertaking voluntary restoration activities not associated with a building or grading permit or violation will be required, at a minimum, to submit a planting plan when undertaking restoration work within a wetland, riparian corridor, shoreline, landslide-prone area or their buffers. Applicants should consult Tip 331, Environmentally Critical Areas: Tree and Vegetation Overview, to determine what SDCI requires.

Is Funding Available?

Grants may be available for voluntary projects on private property along creek, marine and lake shorelines that have been impacted by the City of Seattle's drainage system operations. They require a 1:1 match and must

meet the program criteria. Applications are accepted once a year. Large community projects may be eligible for a Community Salmon Fund Grant. See [Washington State Recreation and Conservation](#) site for more information.

Step 1: Surveying Your Site

Look over your site to determine conditions that will affect planting.

- What parts of the yard are sunny, shady or a mix of each?
- How wet are the soils?
- Does standing water exist during any part of the year?
- Are the soils especially sandy; are they clay?
- Are there power lines, views or uses of the yard that need to be preserved?
- It is often helpful to draw a simple map of the yard in order to keep notes and measure the areas you might want to plant.

You will also want to survey existing vegetation to identify plants that should be preserved as well as noxious or invasive plants that should be removed. Noxious and invasive plants such as Himalayan blackberry, English ivy, morning glory or Japanese knotweed are non-native plants characterized by aggressive growth with the ability to invade and disrupt an ecosystem. Vines choking other plants or large areas of a single plant are often signs of their presence. Controlling these plants is critical as they can often out-compete native plants. The King County Noxious Weed Board provides resources on identifying and controlling these weeds. You can also seek additional help from Washington State University's Master Gardener program (see Additional Resources).

Step 2: Preparing a Plan

A successful backyard restoration project will create a dense buffer between development and critical habitat that will filter water, noise and other disturbances from these areas while providing a diverse habitat for wildlife. The goal of plant placement is to create a thick, continuous layer of vegetation in this area. Conditions should mimic natural habitat by planting in layers with tall overstory trees, small understory trees, shrubs and groundcover as shown in the diagram on the next page. Since grass lawns are effectively dead space to wildlife,



Example of Vegetation Layering

consider restoring as much of these areas as possible

Other factors to consider include:

- Trees should be planted near streams, lakes, or other waterbodies where they can provide shade and organic matter such as leaves for the aquatic environment.
- Consider how the plants will look when full grown. What will be shaded? Will the plants interfere with each other?
- For considerations in attracting specific types of wildlife, see the Additional Resources section.
- Slopes may be prone to erosion during and after planting. Ensure adequate protection of these areas by identifying or avoiding areas that pose a significant risk, choosing appropriate plants, and following the site preparation standards in Step 3.

Choosing Your Plants

When choosing plants, select a variety of plant species. This will ensure success if some species do poorly and will help create a variety of habitat for wildlife. Native plants should be used because they are well adapted to our local climate, habitats and wildlife. They will require less work and be less expensive in the long term as they require less water and no fertilizer once they are established. Moreover, they resist native pests and diseases while providing shelter, food and pollination opportunities for native wildlife. Using native plants also helps to preserve local culture and overall plant diversity. Evergreen trees such as Douglas

Fir, Western Hemlock and Western Red Cedar are especially recommended as they provide substantial habitat and water retention benefits year round.

Selected plants should be appropriate for the soil and light conditions of your site. A list of recommended native plants is provided at the end of this document. The number of plants needed can be determined through the creation of a detailed planting plan as described in the next section and pictured in Sample Plan 1. This is highly recommended to ensure that the planting is successful; however, if you would rather do a general planting plan such as Sample Plan 2, the following ratios can work as well: for every 1000 square feet of unvegetated area, plant 12 trees, 28 shrubs and 60 groundcover plants.

Contact a local plant nursery to determine if the plants you want are currently available. Salvage of native plants from other sites may also be an option. When shopping for plants, use the Latin names to avoid selecting non-native varieties of common plants.

If your property abuts a saltwater shoreline, salt spray and high winds may be an issue for plant survival and additional help should be sought.

Drawing a Planting Plan

Creation and submittal of a planting plan is required by the City of Seattle when working within a wetland, riparian corridor, shoreline, landslide-prone area or their buffers. [Tip 331, Environmentally Critical Areas: Tree and Vegetation Overview](#), outlines the requirements for these plans. Applicants should consult this document before drawing a planting plan to ensure that their final product will be in an appropriate format.

Unless your project qualifies for filing with the SDCI Public Resource Center (see Tip 331) you must use the Standard Vegetation Restoration Plan form or an alternative format prepared by a qualified professional for your planting plan.

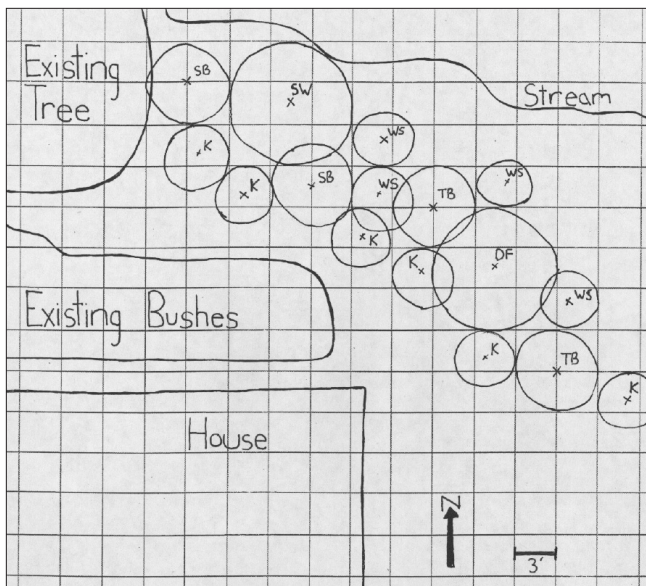
When drawing the planting plan, existing vegetation and structures should be clearly identified as well as the boundaries of parcels, ECAs and ECA buffers. Planting plans should conform to either of the following formats:

- Format 1 (see Sample Plan 1)
- Prepare a plan depicting the location of each plant. New plants can be drawn as circles of a diameter approximating their spacing requirement. Nurseries will provide exact spacing requirements for their plants; however, 10- to 15-foot diameter circles for trees, 5- to 10-foot diameter circles for shrubs and

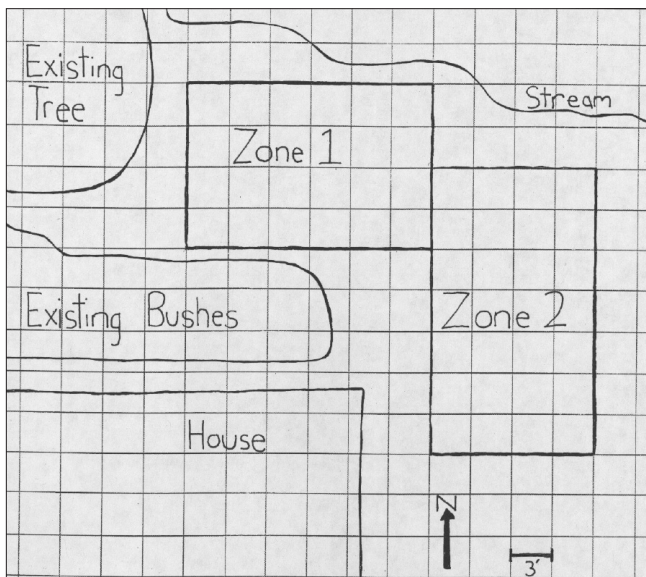
4-foot diameter circles for groundcover are good approximations. Significant overlap of these circles can occur and is encouraged to create a sufficiently dense planting. Make sure to label each plant on the plan for future planting ease.

- Format 2 (see Sample Plan 2)
- Prepare a plan depicting zones in which there will be consistent plant groups and spacings. The number of plants and basic arrangement of each zone must be described in an “additional notes” section.

Sample Plan 1



Sample Plan 2



Step 3: Preparation of the Site

Noxious and invasive vegetation must be removed prior to planting and properly disposed of off-site. Removing these weeds is crucial to the success of the restoration as even a small amount can out-compete native plants. The King County Noxious Weed Control Board provides excellent resources on weed control. Use of pesticides or machines to remove vegetation is prohibited unless authorized under a permit.

On steep slopes and stream banks, care should be taken to avoid exposure of bare soils for extended periods. Exposed soil is likely to erode quickly, harming aquatic habitat if it washes into a waterway. A layer of mulch 3" deep will provide basic erosion protection; however, on steeper slopes, the mulch should be covered with straw or jute matting and barriers such as silt fencing may also be necessary to prevent erosion and run-off.

Step 4: Planting

When possible, planting should be done between mid-October and mid-December as plants grow roots during cool weather, even when the top of the plant is dormant. In addition, less water is required. Planting between mid-December and mid-April is also appropriate but more attention to supplemental watering may be required. Make sure to read and follow any nursery instructions that come with the plants. Spacing requirements, in particular, may vary from the estimates used in your planting plan. Before planting, set out the plants where they will be planted to make sure the arrangement works well.

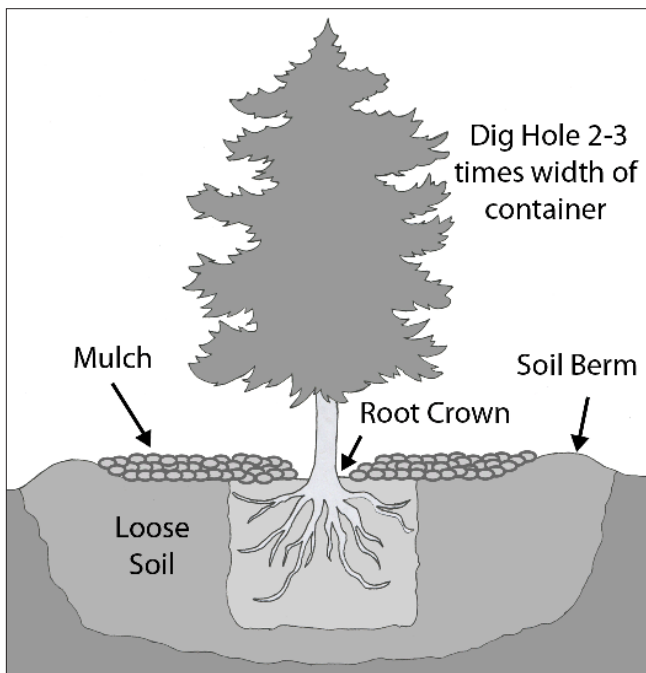
Instructions for Container Plants

1. Dig bowl-shaped planting holes at least twice the width and just slightly deeper than the potted plant's container. Remove any existing roots or loose materials such as leaves, rocks or branches from the hole.
2. Roughen the sides and bottom of the hole with a pick or shovel.
3. Remove the plant from its container and gently loosen bound roots on the outer inch of the soil and cut roots that encircle the root ball.
4. Set the plant in the hole so that the top of the soil remains level with the surrounding soil. Fill the surrounding space with loose native soil.
5. Cover any exposed roots, but do not pile dirt on the stem as it will kill most plants. For trees and shrubs,

the top of the root crown (where the plant flairs as the trunk ends and the roots begins) should be exposed.

6. Gently press the filled soil to collapse air pockets, but allow the soil to remain loose.
7. Form a temporary water basin around the base of the plant to encourage water penetration and water thoroughly (approximately 2" of water over the site).
8. Mulch should be added to a 3" thickness over the entire planting area. Wood chips, leaves, grass clippings, compost and manure are common mulches. Coarse wood chips are preferable in areas where noxious or invasive species may be a problem. Placing cardboard under the mulch may also help prevent weeds from growing up and will biodegrade over time.
9. Staking of trees or shrubs should not be necessary unless high winds exist or the tree is tall and has little roots. If it is necessary, use thick rope or padding around the tree to prevent damage to the bark and use the minimum amount of tension necessary to achieve balance.
10. If the area is heavily trafficked, it may also be necessary to add a barrier to protect the planting area.

For Bare Root Plants, follow instructions given by the nursery or plant salvage group.



Container Planting

Step 5: Monitoring & Maintenance

Plantings should be monitored for at least five years to ensure that the plants properly establish themselves. If more than half of the plants die in the first two years, additional planting should be undertaken to maintain a sufficiently dense buffer. Below are additional guidelines for maintenance of your restoration project.

During the first two years, it is critical to properly water, weed and monitor the site while the plants establish themselves. Plants should be watered when dry from May 1 to Oct. 15. Deep, infrequent watering is best. Weeding around the plants should be done at least twice a year particularly in the early and late spring. Hand pull noxious and invasive plants, removing the roots to prevent re-growth. Removal of noxious weeds may require additional weeding and monitoring. Maintaining a healthy cover of mulch will help reduce both weeding and watering.

In the long term, these areas should maintain themselves similar to any natural ecosystem. Leaves, woody debris, and dead trees provide food and habitat for wildlife on land and in the water and should remain undisturbed. Similarly, pruning can damage many plants and should be minimized.

Additional Resources

Information on Attracting Wildlife

- [DFW Habitat at Home](#)
- Landscaping for Wildlife in the Pacific Northwest. Russell Link. UW Press, Seattle 1999.

Native Plant Resources

- [Washington State University Native Plant Resource](#)
- [Washington Native Plant Society](#)
- Plants of the Pacific Northwest Coast. Jim Pojar and Andy MacKinnon. Lone Pine Publishing, Vancouver, BC 1994.

Native Plants Sources

- [King County Native Plant Nursery List](#)

Noxious Weeds Information

- [King County Noxious Weed Control Program](#)

Natural Lawn & Garden Care

- [Seattle Public Utilities Natural Lawn & Garden Care](#)
- Seattle Public Utilities Natural Lawn & Garden Care Hotline - (206) 633-0224
- Gardening with Native Plants of the Pacific Northwest. 2nd edition. Arthur R. Kruckeberg. UW Press, Seattle 1996.

Technical Assistance

- [Seattle Public Utilities Backyard Creek Stewardship](#)
- [Adopt-a-Stream](#) (in-stream restoration advice)
- [Washington State University Extension](#)
- [WSU Master Gardeners Program](#)

Funding

- [Aquatic Habitat Matching Grant program](#)
- [Community Salmon Fund](#)

Locate other people working on your watershed





- [Seattle Public Utilities Backyard Creek Stewardship](#)

Recommended Native Plant List










LIGHT NEEDS

- = Full Sun
- ◐ = Partial Sun / Partial Shade
- = Full Shade











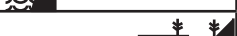


SITE PREFERENCE

-  Water's Edge = Edge of stream, wetland or freshwater shoreline
-  Wet = Soils that usually hold water or are very near water table
-  Standard = General condition of soil in Seattle (may hold water)
-  Steep = Also appropriate for Steep Slopes

Trees

Quantity	Common Name	Scientific Name	Average Ht.(ft.)	Light Needs	Site Preference	Comments
	Cascara	<i>Rhamnus purshiana</i>	25	◐ ●		Good for riparian
	Douglas fir	<i>Pseudotsuga menziesii</i>	200	○		Fast grower
	Oregon Ash	<i>Fraxinus latifolia</i>	70	○ ◐		
	Pacific willow	<i>Salix lasiandra</i>	40	○ ◐ ●		Prefers riparian
	Shore pine	<i>Pinus contorta</i>	40	○ ◐ ●		Tolerates poor soil
	Sitka willow	<i>Salix sitchensis</i>	25	○ ◐ ●		
	Vine maple	<i>Acer circinatum</i>	15	●		Slow grower
	Western Hemlock	<i>Tsuga heterophylla</i>	150	○ ◐ ●		Not drought-tolerant
	Western Red Cedar	<i>Thuja plicata</i>	150	◐ ●		

Shrubs

Quantity	Common Name	Scientific Name	Average Ht.(ft.)	Light Needs	Site Preference	Comments
	Black twinberry	<i>Lonicera involucrata</i>	10	○ ◐		
	Nootka rose	<i>Rosa nutkana</i>	6	◐		Rapid volunteer
	Ocean spray	<i>Holodiscus discolor</i>	10	○ ◐		Drought-tolerant
	Pacific ninebark	<i>Physocarpus capitatus</i>	15	○ ◐		Need good drainage
	Red osier dogwood	<i>Cornus sericea</i>	10	◐		Can be trimmed
	Salmonberry	<i>Rubus spectabilis</i>	8	○ ◐ ●		Not drought-tolerant
	Serviceberry	<i>Amelanchier alnifolia</i>	12	○		
	Slough sedge	<i>Carex obnupta</i>	3	◐		Extremely common
	Snowberry	<i>Symphoricarpos albus</i>	4	○		Common, tolerant
	Swamp rose	<i>Rosa pisocarpa</i>	6	○ ◐ ●		Forms thickets
	Sword fern	<i>Polystichum munitum</i>	3	●		
	Thimbleberry	<i>Rubus parviflorus</i>	4	○		Drought tolerant
	Western hazelnut	<i>Corylus cornuta</i>	15	○ ◐		





LEGAL DISCLAIMER: This Tip should not be used as a substitute for codes and regulations. The applicant is responsible for compliance with all code and rule requirements, whether or not described in this Tip.

Recommended Native Plant List (Continued)







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- ◐ = Partial Sun / Partial Shade
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Groundcover

Quantity	Common Name	Scientific Name	Average Ht.(ft.)	Light Needs	Site Preference	Comments
	Coast Strawberry	<i>Fragaria chiloensis</i>	<1	○		Rapid Spreader, Likes Sandy Soil
	Low Oregon Grape	<i>Mahonia nervosa</i>	2	◐		Slower to establish
	Salal	<i>Gaultheria shallon</i>	5	◐ ●		Slower to establish
	Red fescue	<i>Festuca rubra var. rubra</i>	2	○		Common, tolerant
	Tall mannagrass	<i>Glyceria elata</i>	4	●		Prefers streamside
	Woods strawberry	<i>Fragaria vesca herb</i>	<1	◐		Rapid spreader