Protecting Water Resources: Planting and Caring for Trees and Shrubs in Home Wetlands

WASHINGTON STATE UNIVERSITY EXTENSION FACT SHEET • FS091E

What's a wetland?

Wetlands are areas whose soils and plant species are controlled by temporary or permanent flooding. We used to call these areas "swamps," but this negative-sounding term hides the benefits of a healthy wetland. For the purposes of this fact sheet, we will consider wetlands to include all property next to streams, rivers, ponds, and lakes.

How do wetlands (and wetland plants) benefit my property?

- Improve water quality by filtering out fertilizers, pesticides, and other soil and water pollutants.
- Reduce flooding of adjacent land by retaining stormwater like a sponge, then slowly releasing it over time.
- Prevent stream bank erosion and sedimentation.
- Provide food, shelter and breeding habitat for aquatic, terrestrial, and amphibious organisms.
- Create habitat for terrestrial wildlife.

How can I create a healthy wetland?

In general, your wetland will benefit from a diverse planting of native trees, shrubs, grasses, and herbaceous plants. Before you make any plans, you'll need to check your county and state regulations, as permits and monitoring may be required. These agencies can also help you get started in designing your planting site and choosing the best native plant species for your location. (See the "Useful Websites" section at the end of this publication.)

Once you have an approved plan in hand, use the following guidelines for creating a healthy, sustainable wetland landscape.

I. Choosing appropriate trees and shrubs

- Choose species that will tolerate the relative wetness of your soil. See the "Useful Websites" section at the end of this publication for help.
- Consider the mature size of different species, so that you don't block views or create overgrown conditions.
- Purchase sun-loving species first, and then buy shade lovers in a year or two when canopies start to form.
- Select bare-root plants (Fig. 1), as they are the cheapest to buy, the easiest to plant, and over time most likely to establish and survive. But they are smaller than container (Fig. 2) or balled-and-burlapped (B&B) plants (Fig. 3). If you must have larger trees or

Fig. 1. Bare-root tree

Fig. 2. Container shrub

Fig. 3. B&B tree, covered and uncovered

shrubs, you'll need to buy containerized or B&B specimens and plant them correctly (see below).

- Wait to plant until fall, when moist, cool conditions will reduce transplant stress. Avoid planting later than February, as summer heat and drought will hurt transplant success.

II. Preparing the roots (for bare root plants, skip to next section)

- Keep roots shaded and moist at all times.
- Remove all containers and other foreign materials from the roots.
- Remove all media from the roots (Fig. 4), using a hose or a water bath. If root mass is too dense, use cut-and-spread method (Fig 5). Current research supports this new method.

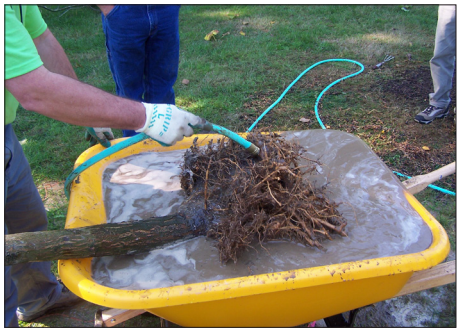

Fig. 4. Root washing B&B tree

Fig. 5. Cut and spread root system

- Let root balls soak for several hours if they are too dry to work.
- Prune excessively long fine and fibrous roots.
- Prune away girdling, circling, or kinked woody roots (Fig. 6).

Fig. 6. Poor root structure, before and after correcting

III. Preparing the soil

- Dig the hole to mirror the root system—twice as wide and just as deep.
- Avoid adding any soil amendments. Wetlands naturally have a high level of organic material (OM). It's very unusual for riparian soils to need compost or other sources of OM before planting. A soil test will reveal OM content, and as long as it's greater than 5%, no more OM needs to be added. The wetland will generate its own OM. Excessive use of organic amendment will:
  - Interrupt water and air flow within soil.
    - Roots may not establish (Fig. 7).

Fig. 7. Planting failure due to improper soil amendment

    - Soil becomes saturated during wet season.
    - Less soil water available during dry season.
  - Generate nutrient overload
    - Excessive use of organic material increases runoff of nutrients, such as phosphorus and nitrogen.
  - Cause subsidence over time
    - Excessive OM in soil profile can't be replaced after planting.
    - Soil and rootball will settle below grade when OM decomposes (Fig. 8).

Fig. 8. Soil subsidence

IV. Planting your plants

- Plant at grade—the root crown should be at or slightly above the soil surface.
- Create a mound of soil at the bottom of the hole to support the root crown.

- Arrange the roots in a starburst pattern over the mound (Fig. 9) and backfill with unamended native soil. Do not use commercial topsoil.

Fig. 9. Spreading the root system in a shallow hole

- Water well, adding native soil as holes develop (Fig. 10). Do not step on or press soil.

Fig. 10. Watered-in tree

- Stake trees low and loose, if necessary, for no longer than a year.

V. Aftercare

Little care is needed for properly planted trees and shrubs. Don't prune any limbs, as this will hurt root establishment, and don't waste your money on expensive and unnecessary transplant supplements. Here are the recommended practices:

- Mulch
  - After planting, add 8-12" coarse organic mulch over all exposed soil up to but not touching trunks of trees and shrubs (Fig. 11). Organic mulch provides many documented benefits to any landscape, including:

Fig. 11. Mulching

    - Improvement of soil structure by reducing compaction and allowing aggregates (clusters) to form.
    - Enhanced establishment of trees and shrubs (Fig. 12).
    - Increased levels of beneficial microbes and other soil life.
    - Effective weed control for several months or, in some cases, years.

Fig. 12. Mulched and unmulched snowberries in experimental restoration sites

  - On slopes or in flood zones, secure mulch under a layer of coir cloth.
- Irrigation
  - Water your new plants well during the first year of establishment. Properly planted trees and shrubs should only need additional water for the first growing season, unless summers are unusually hot and dry.
- Fertilizer
  - Wetland soils are naturally rich in nutrients. Do not add fertilizer unless soil tests indicate a deficiency.
  - If fertilizer is needed, an organic mulch is better than liquid or granular forms, as it will provide a slow release of nutrients.
- Protection
  - Plastic planting tubes (Fig. 13) protect young trees from mower, rodent and grazer damage;

Fig. 13. Planting tube

remove before they interfere with tree growth.

- Chicken-wire fencing can be used to protect trunks from beaver, deer, and other browsers. If browsing animals become common in your wetland, plant new trees and shrubs that can grow back after being grazed.

VI. Protecting your riparian landscape

Many of the typical problems that cause wetland landscape plants to die can be avoided if you follow the guidelines listed above. Beyond that, there are other ways to protect your landscape and its inhabitants:

- Avoid the use of all pesticides and unnecessary fertilizer.
- Remove nearby paved or other hard surfaces that create runoff into your wetland. Use gravel, permeable pavers, or other easy-draining materials instead.
- Avoid storing machinery and other equipment near your wetland where leaking pollutants could contaminate your landscape.
- Avoid grazing any livestock near your wetland to prevent soil compaction, plant damage, and fecal contamination of water.

Additional resources

Buis, S. 2011. Stream Habitat Restoration Guidelines. Washington State Department of Fisheries and Wildlife http://wdfw.wa.gov/publications/01374/.

Cahill, A., L. Chalker-Scott, and K. Ewing. 2005. Wood-chip Mulch Improves Plant Survival and Establishment at No-maintenance Restoration Site (Washington). *Ecological Restoration* 23:212-213.

Chalker-Scott, L. (ed.). 2009. *Sustainable Landscapes and Gardens: Good Science, Practical Application.* Yakima, WA: GFG Publishing. Contains several relevant chapters, including those on site design, analysis and preparation; plant selection, installation, and management; and fertilizing, watering, pruning and propagating plants.

Daniels C.A. 2012. Analytical Laboratories and Consultants Serving Agriculture in the Pacific Northwest. http://www.puyallup.wsu.edu/analyticallabs/.

Useful websites

- The Mid-Columbia Fisheries Enhancement Group provides a guide to landscaping with native plants along streams and rivers: http://midcolumbiarfeg.com/what-we-do/backyard-riparian-buffers/.
- The University of Washington Burke Herbarium website has native species distribution information: http://biology.burke.washington.edu/herbarium/imagecollection.php.
- The Washington Native Plant Society maintains current lists of native plants for riparian planting: http://www.wnps.org/landscaping/herbarium/aquaticwetlandlist.html.
- Washington State Department of Ecology's Wetlands pages include information on regulation, mitigation, and stewardship of wetlands: http://www.ecy.wa.gov/programs/sea/wetlands/index.html.
- The Washington State Noxious Weed Control Board has current information about weed control and contact information for county weed control boards. http://www.nwcb.wa.gov/.

By **Linda Chalker-Scott**, Associate Professor/Extension Urban Horticulturist, WSU Puyallup Research and Extension Center, Puyallup, WA.

Copyright 2012 Washington State University

WSU Extension bulletins contain material written and produced for public distribution. Alternate formats of our educational materials are available upon request for persons with disabilities. Please contact Washington State University Extension for more information.

You may download copies of this and other publications from WSU Extension at http://pubs.wsu.edu.

Issued by Washington State University Extension and the U.S. Department of Agriculture in furtherance of the Acts of May 8 and June 30, 1914. Extension programs and policies are consistent with federal and state laws and regulations on nondiscrimination regarding race, sex, religion, age, color, creed, and national or ethnic origin; physical, mental, or sensory disability; marital status or sexual orientation; and status as a Vietnam-era or disabled veteran. Evidence of noncompliance may be reported through your local WSU Extension office. Trade names have been used to simplify information; no endorsement is intended. Published October 2012.

FS079E