Section 4.0 – Revegetation Methods

4.1 Plant Selection

Riparian plant communities in Southwestern Oregon have willows, alders, cottonwoods and ash close to the stream bank, with conifers growing higher on the bank, and slightly back from the frequently flooded zone (CWS, 2004). Plants recommended for use in the riparian program were selected based on the geographic region, plant height and form, the native vegetation present in the region, and matching plant growing conditions with existing site conditions or reference conditions. Additionally, local plant lists developed by the Oregon Department of Fish and Wildlife, the Bureau of Land Management, the City of Medford, J. Herbert Stone Nursery, local ordinances, and Oregon Trout Riverkeepers were consulted in developing the RVCOG plant list (see page 25 for appropriate riparian plant species).

4.2 Plant and Seeds Sources

Native Plants

Species native to the local riparian site are most appropriate for planting in the riparian area. Local biotypes have better vigor and hardiness, are better able to compete with nonnative vegetation, and attract local native wildlife (Carey, 2003). As a result, nurseries specializing in locally grown natives or using cuttings from on site will result in better survival of species. A list of local nurseries with native plants is provided below. The list below is not meant to be an exhaustive list, it does cover a few of the larger nurseries that specialize in local natives for restoration scale projects. There are other nurseries in the State and the Pacific Northwest, along with Garden stores (e.g., the Grange), and landscaping nurseries that carry native species.

Althouse Nursery (541) 592-2395	5410 Dick George Road, Cave Junction, OR.	http://www.althousenursery.com/Welcome.html	althousenursery@frontiernet.net
Forest Farm (541) 846-7269	990 Tetherow Road, Williams, OR. 97544	http://www.forestfarm.com/	planst@forestfarms.com
Plant Oregon (541) 535-3531	8651 Wagner Road, Talent, OR 97540	www.plantoregon.com	dan@plantoregon.com
Siskiyou Rare Plant Nursery (541) 535-7103	2115 Talent Ave, Talent, OR. 97540	http://siskiyourareplantnursery.com/index.aspx	customerservice@srpn.net

Native Seeds

Silver Falls Seed Company (503) 874-8221	P.O. Box 8851 5648 Evans Valley Loop, Silverton, OR. 97381	www.silverfallsseed.com
Sunmark Seed Company 1-888-214-7333	2255 NE 194th Ave, Portland, OR. 97230	www.sunmarkseeds.com

4.3 Plant Size

Plants are available in many sizes from small plugs to several gallon containers. The plan recommends using one-gallon containers for trees and shrubs if possible. One-gallon container stock (18" container) with trees approximately 1cm caliper or larger are used to the extent feasible to attain the desired planting goals more rapidly. Larger containerized plant stock are more tolerant of existing local climate conditions because they are less vulnerable to transplant shock and are more capable of moisture retention during the transplanting process (National Tree Trust, 1997). However, larger stock may require augers and other equipment to plant. Additional plant stock can be harvested onsite using cuttings. Cuttings will be used with appropriate species including willows and cottonwoods. Where appropriate, sedge and juncus species will be directly seeded along gravel bars to help build soils for future plantings.

Figure 4-1(a.): Students planting a 1 gallon incense cedar (above).

Figure 4-2(b.): A big leaf maple planted from a one gallon container following approximately three years of growth (right).

4.4 Plant Spacing/Site Design

Plant layout reflects natural conditions to the greatest extent possible. Plants will be distributed to allow adequate spacing for root development.

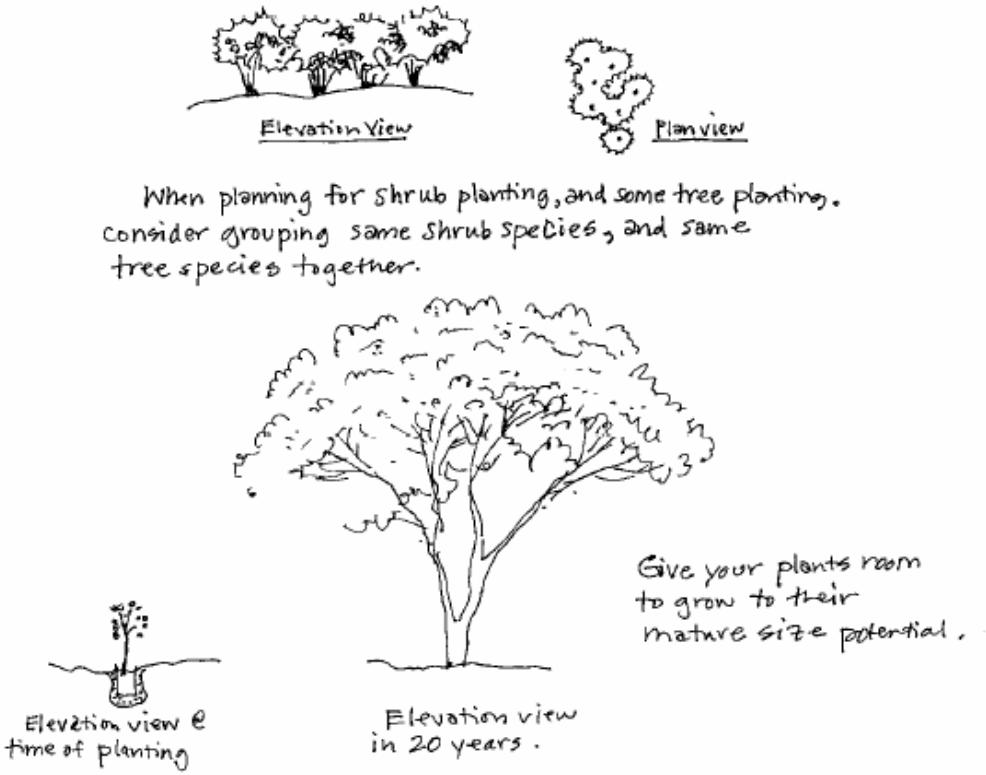


Figure 4-2: Planting design and spacing recommendations.
Drawing provided by Clean Water Services.

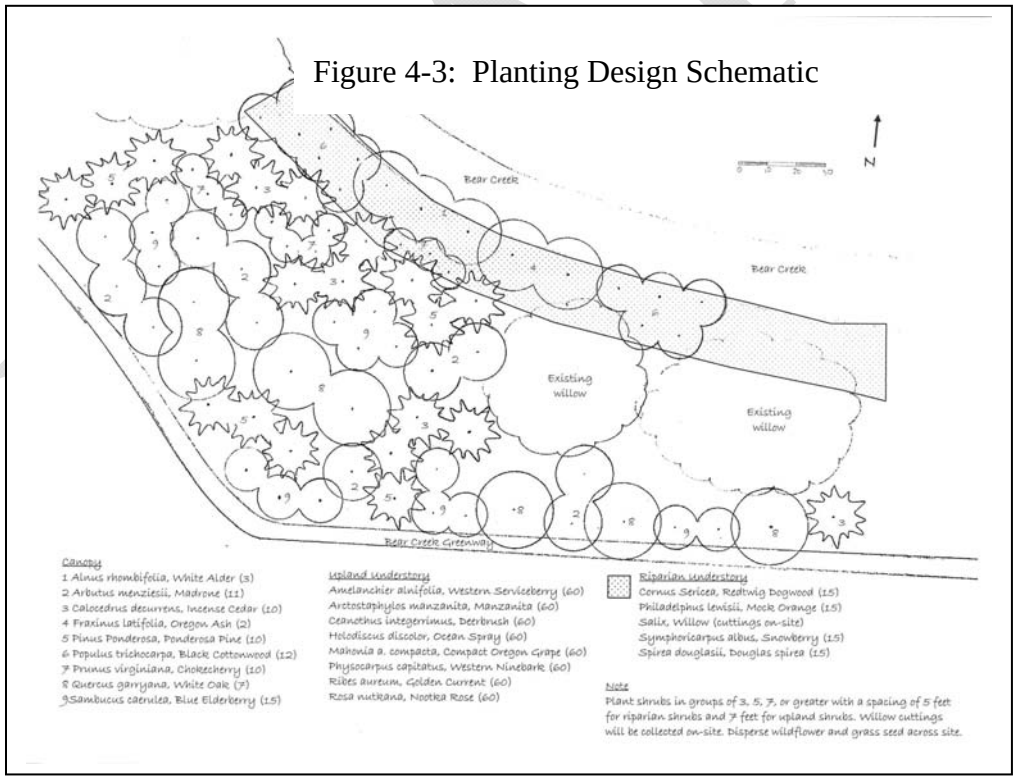
Additionally, attention to the natural landscape conditions and microsites help to locate appropriate locations for plants is recommended. In mature riparian forests, canopy tree stem density is roughly 150 stems per acre, indicating a tree spacing of 16 to 18 feet (USDA, 1998). The planting density for the Bear Creek and Rogue Basin Riparian Planting Program was determined by calculating the site size and then considering site conditions, water availability and the percent survival of the plant stock. As a general rule, plants will generally be spaced at 11 feet apart with shrubs interplanted within those spaces, resulting in approximately 360 stems per acre. Shrubs are interspersed at smaller intervals approximately 4 feet from the trees.

4.5 Planting Techniques and Tools

4.5.1 Site Layout/Site Map

As part of the planting plan development or the planting prescription, the arrangement and layout of species need to be mapped. General spacing for trees and shrubs is defined in section 4.4. The arrangement and layout can be general and defined by area and species using this spacing. This approach can be used if the crew and/or contractors are experienced in restoration (see example plan in Appendix D). An alternative method is to provide the layout to the contractor/volunteer group as a detailed design schematic (map) see (Figure 4-3). For larger sites with similar characteristics, example schematics can be detailed for sections of the creek. For example, if the planting plan is the same for 1,000 feet along a creek in a 20 foot wide section. A detailed design can be done for a 100 foot section and then repeated for the 1,000 foot area. Local ordinances should be reviewed for determining the width of the riparian zone. In lieu of an established ordinance, it is recommended that the planting plans be designed to meet a minimum of the Safe Harbor (Goal 5) requirements which is a minimum of a 75 foot setback from streams with an annual average flow of > 1,000 cfs and 50 for streams with an average annual flow of < 1,000 cfs.

Figure 4-3: Planting Design Schematic



In addition to the maps, the site can be flagged prior to the planting. The flags are color coded for plant species, to assure plants are located according to the site prescription.

Figure 4-4: Site flagged prior to a planting event.

4.5.2 Tools

Tools such as shovels, pulaskis, hoe-dads, and mattocks are used for hand planting. There are several groups in the region that have tools that may be available for group plantings. They include the Rogue Valley Council of Governments, the Bear Creek Watershed Education Partners, the Medford office of the Bureau of Land Management, the United States Forest Service, and the Jefferson Nature Center. In addition, local parks and recreation departments often have tools, equipment, and staff that can be tied into planting projects. In addition, several groups including the job council, Lomakatsi, and the County Community Justice provide their own tools.

In areas where the soil is compact or ground is rocky, or larger stock is used, an auger or stinger can be used. In addition, some sites may require the use of heavier equipment to dig planting bowls and backfill with soils that promote plant growth. This technique has been used effectively in the Rogue Basin (see Figure 4-5).

Figure 4-5: Example of an excavated area for planting backfilled with soil to promote plant growth.

4.5.3 Planting

Hole Depth

Typical hole depth is typically the length of plant container plus 4", and approximately twice as large as the diameter of the plant container. The additional prepared soil encourages root growth beyond and results in a healthier tree (see Figure 4-6).

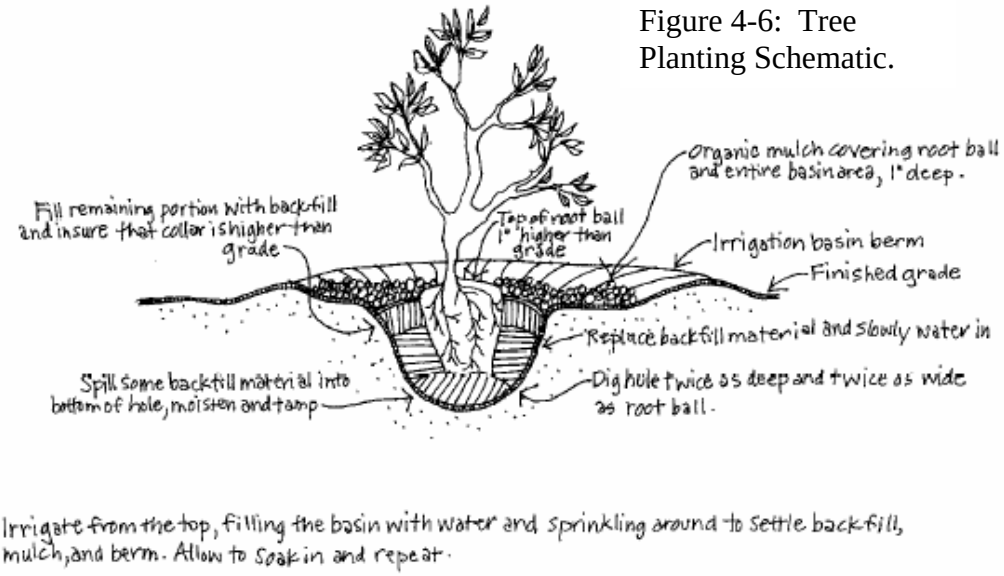


Figure 4-6: Tree Planting Schematic.

The following guidelines will help increase plant survival:

1. Plant materials should be kept in the shade prior to planting.
2. Vertical cut any roots that show tendencies to circle the root ball to prevent root girdling.
3. Carefully pack the soil firmly around the root mass while slightly pulling the plant up so the root collar is even with the surrounding terrain to avoid "j" rooting and air pockets (National Tree Trust, 1997).

Post-planting

Once planted, excess soil is placed around the plant to help collect and retain water. Mulch and/or geotextile fabric can be placed around the tree to inhibit weed growth, retain water and help protect against frost.

Figure 4-7: Ponderosa pine with vispor matting around base to suppress weed growth.

4.6 Education and Outreach

Workshops are an important component of the riparian planting program to reinforce the importance of healthy riparian areas, the role of native plants, and to promote long term stewardship goals and healthy watersheds. Workshops that have been conducted as part of the riparian planting program include seed collection and propagation, proper planting techniques, the role of native plants and healthy riparian areas, maintenance and monitoring techniques, and other topics. A brief summary of the seed collection and riparian technique workshop is provided below.

The native seed collection workshop focused on seed collection methods, what species to collect, when and where to collect seeds, and germination and viability of native seeds, with emphasis on the value and importance of native seed sources. Seeds collected were germinated and grown by BLM's Sprague Seed Orchard and used in future plantings.

The riparian planting technique workshop focused on planning and implementing riparian planting projects, including equipment use and supplies needed, site planning, selection of plant stock, seasonal considerations in planting, and planting methods.

Figure 4-8: Riparian Planting techniques workshop, March 2004.

Other educational materials used in the Riparian Planting Program include the *Stream and Wetland Enhancement Guide* brochure, the RVCOG website, local educational symposiums, and presentations to local groups.

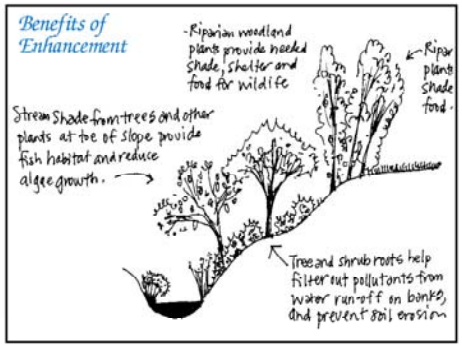
A healthy network of urban streams and wetlands protects water quality, provides fish and wildlife habitat and enhances the beauty and livability of our neighborhoods. You can help protect and enhance these important natural resources by learning the techniques outlined in this guide. These enhance-ment techniques will help you control erosion, manage invasive plants, and cultivate a healthy, native landscape.

This guide is arranged into sections to help you understand, design, plant and manage streamside vegetation. The sections are: 1. Rogue Basin Native Plants; 2. Planting and Managing Streamside Vegetation; 3. Invasive Non-Native Plants; 4. Suggestions for Planting Design; 5. Streamside Stabilization and Erosion Control Techniques; 6. Wetland Plant Community; 7. Riparian Woodland Plant Communities; 8. Resources

1. Rogue Basin Native Plants

Trees

Big Leaf Maple *(Acer macrophyllum)*
Vine Maple *(Acer circinatum)*
Red Alder *(Alnus rubra)*
Western Dogwood *(Cornus nuttallii)*
Black Hawthorne *(Crataegus douglasii)*
Oregon Ash *(Fraxinus latifolia)*
Black Cottonwood *(Populus balsamifera v. trichocarpa)*
Common Chokecherry *(Prunus virginiana)*
Western Crabapple *(Pyrus fusca)*
Pacific Willow *(Salix lasiandra)*
Scoulers Willow *(Salix scouleriana)*
Dusky Willow *(Salix exigua ssp. melanopsis)*
Incense Cedar *(Calocedrus decurrens)*



Riparian Woodland Understory Trees and Shrubs

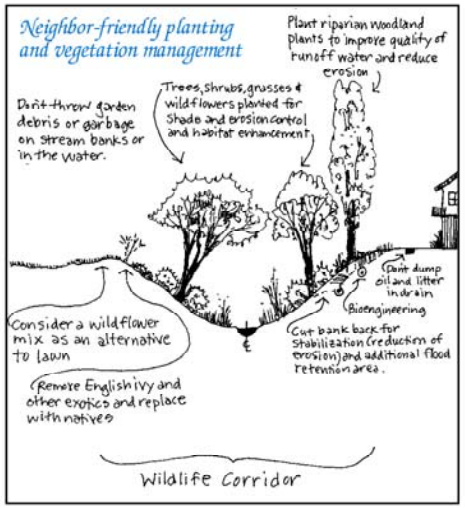
Serviceberry *(Amelanchier alnifolia)*
Red Osier Dogwood *(Cornus stolonifera)*
Ocean Spray *(Holodiscus discolor)*
Indian Plum *(Oemleria cerasiformis)*
Pacific Ninebark *(Physocarpus capitatus)*
Nootka Rose *(Rosa nutkana)*
Thimbleberry *(Rubus parviflorus)*
Golden Currant *(Ribes aureum)*
Blue Elderberry *(Sambucus cerulea)*
Red Huckleberry *(Vaccinium parvifolium)*
Oregon Grape *(Mahonia aquifolium)*
Sword Fern *(Polystichum munitum)*
Common Snowberry *(Symphoricarpos albus)*
Wild Mock Orange *(Philadelphus lewistii)*

Grasses

Orchardgrass *(Dactylis glomerata)*
Bluejoint Reedgrass *(Calamagrostis canadensis)*
Idaho Fescue *(Festuca Idahoensis)*
Meadow Barley *(Hordeum brachyantherum)*

Wildflowers

Columbine *(Aquilegia formosa)*
Asters *(Aster chilensis ssp. hallii, A. subspicatus)*
Wild Ginger *(Asarum caudatum)*
Fireweed *(Epilobium angustifolia)*
Corn Lily *(Veratrum californicum)*
Bear Grass *(Xerophyllum tenax)*
Wild Strawberry *(Fragaria chiloensis)*
Colt's Foot *(Petasites frigidus)*
Lupines *(Lupinus rivularis, L. polyphyllus)*
Western Bleeding Heart *(Dicentra formosa)*
Cliff Penstemon *(Penstemon rupicola)*
Common Camas *(Camassia quamash ssp. quamash)*
Insideout Flower *(Vancouveria hexandra)*



Riparian Wetland Plants

Scouring Rush *(Equisetum hyemale)*
Soft Rush *(Juncus effuses)*
Slough Sedge *(Carex obnupta)*
Creeping Spike-rush *(Eleocharis palustris)*
Manna Grass *(Glyceria occidentalis)*
Baltic Rush *(Juncus balticus)*
Hardstem Bulrush *(Scirpus accutus)*
Small-fruited Bulrush *(Scirpus microcarpus)*
American Brookline *(Veronica americana)*
Wapato *(Sagittaria latifolia)*