APPENDIX E: PLANT SPECIFICATIONS

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CRITERIA FOR CHOOSING PLANTS

Above all, plants should be chosen using the motto "Right Plant, Right Place". Plants in BMPs provide many ecological, hydraulic, and social functions, which must be considered. When choosing the best plants as stormwater managers, first consider water quality function of the facility. A diverse assembly of long-lived plants should be chosen according to the guidance provided throughout this appendix. Varying heights and rooting depths are also beneficial, if feasible.

Recommendations for Stormwater Management

Natives, non-natives, and invasives are not interchangeable terms. Their differences and the reasons for the following recommendations are provided in the "Background and Considerations" section below.

Suitable Plants Hierarchy. When choosing suitable plants, use the following hierarchy:

- Due to the availability of a variety of suitable species at nurseries[1], it is recommended to use native plants (groundcover, forbs (flowers), shrubs, and trees) wherever possible. In the case of street trees, if soils are highly degraded, avoid native trees.
- When selecting non-native plants, use the following research:
    - Avoid plants that reproduce readily. These are plants that spread by seeds (*e.g.* grasses), rhizomes (when a piece of broken off root will start a new plant, *e.g.* Yellow flag iris), or culms (when a piece of a stem is able to re-root, *e.g.* English Ivy), etc.
    - Avoid plants listed on the Native Plant Society's Emerald Chapter's website[2] for "Exotic Gardening and Landscaping Plants" that are emerging as problematic. Due to numerous similarities throughout Western Oregon, designated as a "bioregion", it's more likely that plants that are problematic could easily be problematic elsewhere in the bioregion. It's better to be cautious and avoid these plants in your region.
    - Avoid plants listed on the invasive plant lists of Washington[3] and California[4].
    - Consult with your local OSU Extension agent, watershed council, or soil and water conservation district.
- Avoid invasive plants listed on the Oregon Department of Agriculture "Oregon Noxious Weed List"[5].

Background and Considerations

Use Native Plants for Better Water Quality. Native plants are essential to healthy watersheds. They provide unique services and products in our region that other kinds of plants may not provide.
Native plants:

- Evolved over geologic time periods with other plants and animals in our watersheds. Native plants support the insects that feed the birds (Tallamey) that spread the seeds that grow the diverse landscapes that manage stormwater.
- Are generally easier to establish, which lessens maintenance, especially in the first two years of a BMP
- Often require less water and fertilizers.

[1] *Native Plant Society of Oregon (NPSO) website. Retrieved from: http://www.npsoregon.org/landscaping5.php*
[2] *NPSO. Exotic Gardening and Landscaping Plants Invasive in Native Habitats of the Southern Willamette Valley. Retrieved from: http://emerald.npsoregon.org/inv_ornmtls.html*
[3] *Washington State Noxious Weed Control Board. Retrieved from: http://www.nwcb.wa.gov/*
[4] *Invasive Species Council of California. The California Invasive Species List. retrieved from: http://www.iscc.ca.gov/species.html*
[5] *Oregon Department of Agriculture. Oregon Noxious Weed Profiles. Retrieved from: http://www.oregon.gov/ODA/programs/Weeds/OregonNoxiousWeeds/Pages/AboutOregonWeeds.aspx*

Avoid Invasive Plants. Invasives, or weeds, impact the watershed in many ways by:

- Overgrowing on trees and blocking solar access.
- Physically pulling limbs down.
- Filling niches in the watershed that would have been occupied by a variety of species and excluding them.
- Changing the composition of the soil organisms that provide our watershed's long-term permeability.
- Some invasives, like Himalayan Blackberry, increase erosion by shading out understory plants and exposing bare soils to rain.
- Reducing crop yield, which is why the Oregon Department of Agriculture maintains a list of invasive species, called the Oregon State Noxious Weed List[6].
- Impacting habitat. While many native insects and some amphibians find adequate habitat in any plant, many plants do not provide adequate habitat. Insects provide us with the long-term permeability of our watersheds and are the foundation of the food web for the wildlife that spreads the seeds that create forests. Just as humans are not adapted to eat a bowl of maple leaves, many native insects are adapted to eat only parts of native plants (see below for more information on native plants).

Figure E-1. Vinca minor, Himalayan Blackberry, and English Ivy are intermixed with natives along a popular hiking trail in the Columbia River Gorge, many miles from the nearest town. Seeds enter the forest on the wind, by birds and mammals, and are tracked in on shoes.

Use Non-Native Plants Carefully. Non-native plants are generally used by gardeners as ornamentals or edibles such as fruits, vegetables, and herbs. In many cases, non-natives are not harmful and are preferred as street trees, due to the many constraints of putting the right plant in the right place. On the other hand, non-native species may become invasive, and there's often no way to know which path a plant will take until it has been introduced into a watershed. Some non-natives have taken up to 80 years to become invasive after overplanting (*e.g.* kudzu planted on the East coast for erosion control); some spread quickly from just a few specimens (*e.g.* scotch broom dominates the Pacific NW landscape and originated from three plants introduced in the late 1800's). Follow the research guidelines provided above to ascertain whether a non-native is likely to become invasive.

[6] *Oregon Department of Agriculture. Oregon Noxious Weed Profiles. Retrieved from: http://www.oregon.gov/ODA/programs/Weeds/OregonNoxiousWeeds/Pages/Law.aspx*

There are additional reasons to avoid non-native, edible plants:

- Fertilizers, pesticides, and herbicides used to maximize yield could be easily exported to become pollutants from any BMP.
- In rain gardens, stormwater planters, swales, and vegetated filter strips, polluted runoff is directed to the plants for treatment. Plants may treat pollutants in a variety of ways. Microbes on the roots or other internal processes may break pollutants down into harmless materials or the pollutants may be absorbed and stored in the plant structure, including leaves, flowers, or fruits. While research is underway, there is very little science currently on which plants uptake which pollutants and where each plant stores those pollutants. It's possible that pollutants can become concentrated in an edible part of a plant, so regardless of whether they are native or non-native edible plants, they should be avoided in these facilities.

Native Cultivars ("Nativars"). "Nativar" is a relatively new term has been coined to describe cultivars of native plants. These are readily available and popular, because they offer a variety of sizes, shapes, and colors. Sometimes these plants offer the same benefits (see list above in "Use Native Plants for Better Water Quality") as their native relatives, which have not been crossbred; sometimes they do not. For this reason, as with non-native plants, there is currently no way to know whether "nativars" would be impacting the watershed in ways similar to invasive plants in that they are filling niches that could be occupied by non-crossbred native plants, changing the microbial soil composition, or not providing wildlife benefit. Use native cultivars carefully, researching information using guidance provided above for "Suitable Plants Hierarchy".

Soil Depth Influences Plant Choice

Generally, the more soil, the better it will be for the plant. Choose plants that, at maturity, will still have enough soil to be low maintenance. Too little soil can stunt the size of the plant or, in the case of trees, cause it to be unhealthy and drop limbs. For plants to reach their full size at maturity and be low maintenance, soil depth requirements vary with the plant type. Generally, soil depth minimums are as follows:

- Sedums: 2"
- Grasses: 12". Generally, the roots of grasses and grass-like plants will be as deep as the plant is tall so some species may benefit from deeper soil.
- Shrubs: 18", but 24" is preferable.
- Trees: 36", but depending on the species, trees also need a minimum volume of soil, 400 to 1,000 cubic feet. Since tree roots often don't extend much deeper than 3 feet, the minimum area needed is 133 to 333 square feet (see **Chapter 4** "*Tree Planting BMP*").

Lined Vegetated Stormwater Facilities. Lined vegetated stormwater facilities designed per this guidance require 30" of soil to provide water quality treatment before runoff flows out of the facility. This soil depth is enough for sedum, grasses, and shrubs. Trees are not suitable for lined facilities unless additional cost is incurred to incorporate adequate soil depths.

PLANT SPACING, DENSITY & CONTAINER SIZE

Applicability. The information in this section applies to the following BMPs:

- Restored Soils BMP
- Vegetated Roofs (Green Roofs) BMP
- Dispersion BMP
- Rain Garden BMP
- Stormwater Planter BMP
- LID Swale BMP

- Water Quality Conveyance Swale BMP

The BMPs above rely on good vegetative cover to optimize water quality treatment and reduce maintenance needs, such as weeding.

Plant spacing and pot size needed to achieve the coverage goals -- provided in the detailed guidance for each BMP in **Chapter 4** – vary based on the type of plant, as follows. This section does not apply to street tree planting. See Grants Pass, OR, Development Code 23 for spacing, container size and other requirements for street tree plantings.

Suggested Plant Tables for Combining Plant Types. Plant densities that exceed the following tables may be desired for initial aesthetic reasons. For a cost- and environmentally-effective facility, minimum plant quantities are as follows:

Table E-1. Primarily herbaceous plants, such as flowers, groundcover, grasses, sedges, rushes.

Number of plants	Vegetation type	Per square feet of BMP	Size	Spacing density (average on center)*
45	Herbaceous plants	100	1 gallon	1.5'***
OR				
37	Herbaceous plants	100	1 gallon	1.5'***
4	Small shrubs	100	1 gallon	3' to 4'**
OR				
100% Native seed coverage (follow supplier guidelines for density)				

* To reduce erosion and water flows from shortcutting in runoff reduction BMPs receiveing concentrated flows, plants should be randomly located per Standard Details BMP 1.07, 2.07, 3.09, and 9.05. The average on-center density is provided as general guidance.
** Depending on mature spread. Shrubs may be placed farther away than density indicated but not closer.
*** Usually ranges from 1 to 3 feet, depending on plant species.

Table E-2. If a mix of herbaceous, small and large shrubs is desired, the following minimum plant quanties may be used.

Number of plants	Vegetation type	Per square feet of BMP	Size	Spacing density (average on center)*
30	Herbaceous plants	100	1 gallon	1.5'***
4	Large shrubs	100	1 gallon	4' to 8'**
OR				
6	Medium to small shrubs	100	1 gallon	3' to 8'**
35	Small shrubs	100	1 gallon	3' to 4'**

* To reduce erosion, plants should be randomly located. The average on-center density is provided as general guidance.
** Depending on mature spread. Shrubs may be placed farther away than density indicated but not closer.

Table E-3. Trees may be added to any of the above planting configurations, if appropriate (per Chapter 4 "Tree Planting BMP" "Siting").The recommended minimum density for trees is as follows.

Number of plants	Vegetation type	Per square feet of BMP	Size	Additional Info
1	Evergreen tree	300	6' high minimum	See guidance in Chapter 4 "*Tree Planting BMP*"
OR				
1	Deciduous tree	300	1.5" minimum caliper**	See guidance in Chapter 4 "*Tree Planting BMP*"

* Measured at a height of 6 feet above the base

Plant Placement

Moisture is considered one of the most important factors in choosing successful plants for your BMPs. Consider the drying effects of sunlight and wind when determining the moisture available at your site. As a result of buildings and other shading infrastructure, even very small sites may have a combination of light and moisture availability. See Section, "*Recommended Plant List*", Figure E-3.

SOIL TEXTURE

Soil texture affects how quickly a soil drains and how much moisture is retained for the plant's use after a rain event. Sandy soils drain quickly and don't hold as much moisture as clayey soils. The facilities in this guidance are designed to empty within 30 hours and with their facility bottoms at least a few feet (see individual guidance) above the groundwater table. Regardless of the soil texture in your BMP location, any soil that won't cause plant roots to be in standing water for more than 30 hours can be considered to be in a "well-drained" condition.

Some plants are adapted to grow better with a particular soil texture. A qualified landscape architect, landscape designer, or horticulturist can assist with identifying suitable plants for your project site based on soil texture. You can also use the USDA PLANTS database (see tutorial below) to find plants adapted to certain soil textures.

For more information on field testing and interpretation, see Appendix C: Infiltration Testing.

AESTHETICS

Aesthetics, are a matter of opinion, but consideration of the following questions can help with public acceptance of stormwater management facilities and promote their wider use:

- What is the plant's height, width?
- Does the plant have attractive foliage, flowers or fruit?
- Does wildlife like it?
- Does it look good with its neighbors?
- Does it have seasonal interest?
- Is it fire resistant?

To achieve a traditional design aesthetic:

- Place short, small plants in the front (or sides) and big, tall plants in the back or middle
- Scale your plants for your site
- Mass color or foliage for effect
- Lacy, light foliage mixes well with course foliage
- Draw attention to features by placement with other plants or hard features
- Include natural elements such as rocks and logs

Aesthetics can greatly impact maintenance frequency and intensity. For instance, squared-off hedges are going to be more difficult and costly to maintain than a more natural look.

SAFETY & CRIME

Regardless of the land use, vegetation should not block ground floor views either to or from a property (sometimes referred to as "eyes on the street") or provide hiding places for unauthorized users. Shrubs that grow excessively dense and/or tall should be planted with care. Some questions to ask about chosen plants when they reach their mature height and spread are as follows.
Will this plant (or associated landscape elements such as rocks, benches, etc):

- Obstruct traffic or block road signs? Check for setbacks and height limitations in rights of ways.
- Create a hazard? Does the plant have weak branches or does it tend to create excessively slippery or otherwise hazardous debris?
- Block views of ground floor windows or doors?
- Provide a place for unauthorized users to hide?
- Provide unauthorized access to a roof?
- Redirect foot traffic away from access points with the use of short, impenetrable hedges or thorny shrubs?

PLANTING TECHNIQUES

Plants from nurseries can often be root-bound in their pots. If the roots aren't loosened and unwound, the roots will continue to twist around in the planting hole instead of growing downwards and outwards, causing poor plant establishment and high maintenance. Another key to low maintenance plants is to ensure that the roots have good contact with the soil.
To plant a tree, see **Chapter 4** "*Tree Planting BMP*" "*Construction*".

Planting in Containers

To properly install plants in Contained Planters:

1. Fill your container with soil to within 4 to 5 inches of the top of the container.
2. Dig a hole twice the size of the pot the plant comes in. Keep the soil pile nearby and clear of leaves and other surface debris.
3. Take note of where the potting soil from the nursery level is compared to the stem of the plant. Many plants have a different color and texture on the section that sits below the soil than on the sections that sit above ground.
4. Gently shake the potting soil off as much of the roots as possible. The nutrition from the potting soil is likely to be exhausted.
5. For balled and burlapped trees, the soil may be left in. However, ensure that burlap or any other confining material will not impede root growth by removing at least the bottom half of the material.
6. Loosen the roots. For 4" root-bound plugs, use hand clippers to cut an X into the bottom of the root wad, then pull it apart to loosen the roots.
7. Taking some of the soil you dug out, create a mound at the bottom of the hole and lightly tamp it down.
8. Drape the plant roots around the mound so that they're touching the mound on the bottom and pointing downwards. There are two kinds of roots, larger structural roots and tiny feeder roots, which is where the plant "drinks" and "eats". In pot-bound plants, some roots may be really long and will just continue winding around the other plant roots. If they're very small feeder roots, shorten them by pulling them off to be a similar length as the other roots. A few of the bigger structural roots can be cut, but it's better to dig a deeper hole and get them pointed downward.

9. As you backfill the hole by pushing soil in around the tops of the roots, hold the plant so that the point at which the plant came out of the soil in its original pot will be the level where the final grade of soil in the contained planter will be (level of soil on the stem is the same). Plants that are planted too deep may drown or the stem may rot. Plants that are too high may not have enough feeder roots in the soil to survive.
10. When finished, tamp down the soil. If the container is very large, step around the stem of the plant. This, combined with previous steps, will ensure good root contact with the soil.
11. Place an organic mulch that meets the specifications in Appendix D, Compost Specifications to a depth of 2 to 3 inches. For woody stems on shrubs or trees, push the mulch a few inches away or the stems could rot.

Planting in the Ground

To properly install plants in a Restored Soils BMP area, or in a Rain Garden BMP, Stormwater Planter BMP, LID Swale, Dispersion BMP, or Conveyance Swale, follow steps 2-11 for installing plants in a Contained Planter BMP described above.

ESTABLISHMENT PERIOD MAINTENANCE

Native plants should be allowed to reseed before cutting the plant. When reseeding will occur depends on the chosen plant palette. As a general rule, most spring and summer blooming plants have seeded by August, and fall and winter blooming plants will have set their seed by January. Generally, most plants don't respond well when cut down to less than 6 inches high.

Timing of pruning is important. While common and correct horticultural practices might prune a shrub in the fall, when this is done to a shrub used for stormwater management, the shrub no longer has leaves to evapotranspire stormwater. This reduces the effectiveness of the BMP in reducing runoff.

Irrigation

Watering and weeding may be needed frequently within the first 1 to 3 years during Oregon's very dry summers, but this should taper off dramatically if you choose native perennial plants. The goal during the establishment period is to make plants as "drought proof" as possible by watering deeply and infrequently. Shallow, frequent watering will only make plants dependent on continued watering.

To establish perennial plants, you'll need to irrigate more in the first year and less to much less in subsequent years. In addition, plants benefit from varying irrigation seasonally. At the beginning of summer, after the rains stop, water a little. Increase irrigation volume as the summer/dry season continues. Taper off irrigation as the rains start to come back. Depending on your area and rainfall patterns, irrigation may be needed from May to October.

The volume of water and frequency of watering varies with the type of plant:

- Trees: 5-10 gallons, once/week
- Shrubs: 3-5 gallons once/week
- Groundcover: 1-2 gallons, once or twice/week
- Perennial herbs: ½ gallon, twice/week.

After the 2 – 3-year establishment period, irrigation would theoretically not be needed; however plantings surrounded by impervious pavement or hot roofs will probably require occasional irrigation beyond the establishment period, indefinitely.

Tips for hand watering. If hand watering with a hose, it may be difficult to know how much time it will take to apply the amounts described above to each plant. In this case, find a one-gallon container and time how long it takes to fill up. Multiply this time by the number of gallons above and water each plant for this

amount of time. In some cases, water may begin to run off before the full time has been achieved, so water another plant for a little while and come back to the first plant after the original water has soaked in.
Plastic containers with a few holes in the bottom are one quick way to know how much water is being applied. The containers can fill up quickly (and repeatedly, as needed to achieve the above volumes) and water will drain out the holes without eroding soil or overloading the infiltration capacity. Clean the containers out very well and choose containers that contained something non-toxic like laundry detergent, but not something like bleach.

Reducing Water Demand & Improving Establishment

Watering techniques. Consider reducing your water demand by patient hand watering, using water efficient irrigation systems (i.e. drip), and harvesting rainwater. To make hand watering faster and more effective -- most people are not patient enough to water deeply enough to harden plants for drought -- find a gallon or two gallon container and poke a few small holes in the bottom and place it next to the stem of the plant. Commercially available watering bags are available for trees and large shrubs. This method allows you to deliver ideal water volumes to the plants quickly without causing erosion. Having a number of them already placed around the plants allows you to quickly move from one plant to another without having to wait for the water to soak in.

Mycorrhizae. Mycorrhizae are mushrooms that can interact in beneficial ways with plants to improve health and reduce water demand, through mycelium, or mushroom roots. These mycelia intertwine around plant roots and both mushroom and plant roots trade nutrients that the other cannot make. In addition, mycelium greatly expand the area for plants to access water and nutrition from the soil. Mushrooms will not necessarily sprout from the mycelium for the mycelium to work. Mycorrhizae treatments are very effective at reducing irrigation demand and supporting the long-term health of your plants through our tough summer droughts.
There are a number of commercial products available that can be surface applied or blended into the soil. See Appendix D for mycorrhizae specifications.

INTEGRATED PEST MANAGEMENT

Short and long-term maintenance of all landscape areas should be done using integrated pest management techniques.
According to the Oregon Department of Agriculture:
“Integrated pest management (IPM) refers to a coordinated decision-making and action process that uses the most appropriate pest control methods and strategies in an environmentally and economically sound manner to meet agency pest management objectives.
The elements of integrated pest management include the following:

- Preventing pest problems by focusing on developing healthy plant environments (fostering healthy soils, maintaining air flow and utilizing right plant right place techniques
- Monitoring for the presence of pests and pest damage
- Establishing the density of the pest population, which may be set at zero, that can be tolerated or correlated with a damage level sufficient to warrant treatment of the problem based on health, public safety, economic, or aesthetic thresholds
- Treating pest problems to reduce populations below those levels established by damage thresholds using strategies that may include biological, cultural, mechanical, and chemical control methods and that shall consider human health, ecological impact, feasibility, and cost effectiveness
- Evaluating the effects and efficacy of pest treatments

Pest refers to any vertebrate or invertebrate animal, pathogen, parasitic plant, weed, or similar organism that can cause disease or damage to crops, trees, shrubs, grasses or other plants, humans, animals, or property.[7]"

For additional resources including the PNW Insect Handbook, PNW Plant Disease Handbook, and the PNW Weed Handbook, visit the Oregon Department of Agriculture website: http://www.oregon.gov/ODA/programs/Pesticides/RegulatoryIssues/Pages/IPM.aspx.

Weeding. Invasive plants are invasive because they are more vigorous and grow faster than native and ornamental plants. While thoughtful irrigation, as described above, can reduce weeding effort, weeding is a continuous maintenance activity. During the establishment period, when desirable plants are still small, there will be many patches of open area where weeds will grow. Weeds and weed seed may also be brought in on the surface of plants grown in organic gardens where herbicides are not used.

Weeding frequency is generally recommended to be a minimum of twice a year in May and October, but should also be timed to pull whatever invasive plants are on-site before they go to seed. Hand pulling or other mechanical removal technique is preferred. In particular, pesticides, herbicides, and fertilizers should generally be avoided in maintaining any of the BMPs in this guidance, especially facilities that receive runoff and that infiltrate and/or have overflows. These are pollutants that are easily conveyed in stormwater runoff.

Figure E-2. Since weeds need water in the summer but the right natives won't, substantial irrigation beyond the establishment period will only increase maintenance.

SOURCING PLANTS

Plants may be sourced from a variety of nurseries. Choosing healthy, appropriate specimens is key to high functioning facilities. Some tips for sourcing plants are as follows:

- A list of native plant nurseries can be found online: http://www.npsoregon.org/landscaping5.php
- Plants should be from seeds adapted to either clayey or sandy soil type, according to the on-site soils.
- Plants should be from seeds gathered as locally as possible. For instance, a native alder grown from seed collected in Tillamook County will not be as well adapted to the Willamette Valley.

RECOMMENDED PLANT LIST

The following plants list and planting guide was prepared by the Rogue Valley Council of Governments in their *Stream & Wetland Enhancement Guide*, prepared in May, 2004. This plant list is considered

[7] *Oregon Department of Agriculture. Integrated Pest Management. retrieved from: http://www.oregon.gov/ODA/programs/Pesticides/RegulatoryIssues/Pages/IPM.aspx*

appropriate for stormwater management applications as set forth in this manual due to the hydrophilic nature of the plants listed. The City of Grants Pass is adopting this list along with a list of recommended plants for ecoroofs from the City of Portland SWMM.

Vegetated Roof (green roofs) recommended plants

Ecoroof vegetation should be:

- Drought-tolerant, requiring little or no irrigation after establishment.
- Self-sustaining, without the need for fertilizers, pesticides, or herbicides.
- Able to withstand heat and cold.
- Very low-maintenance, needing little or no mowing or trimming.
- Perennial or self-sowing.
- Fire-resistant.

A mix of sedum/succulent plant communities is recommended because these plants possess many of the attributes listed above. Although herbs, forbs, grasses and other low groundcovers can provide stormwater and aesthetic benefits, plants that require irrigation beyond what is allowed in this section for survival are not permitted.

Table E-4. Ecoroof plant list.

	Scientific Name	Common Name	Potential Height	Full Sun	Partial Shade
Succulents	*Delosperma cooperi*	Ice Plant	4”	X	X
	Delosperma nubigenum	Ice Plant	2”	X	X
	Opuntia spp.	Prickly-Pear Cactus	5”	X	X
	Sedum acre	Biting Stonecrop	2”	X	X
	Sedum album	White Stonecrop	3”	X	X
	Sedum divergens	Pacific Stonecrop	3”	X	X
	Sedum hispanicum	Spanish Stonecrop	3”	X	X
	Sedum kamtschaticum	Kirin-so	6”	X	X
	Sedum lanceolatum	Lance-leaved Stonecrop	4”	X	X
	Sedum oreganum	Oregon Stonecrop	4”	X	X
	Sedum oregonense	Creamy Stonecrop	4”	X	X
	Sedum rupestre	Crooked Stonecrop	6”	X	X
	Sedum sexangulare	Tasteless Stonecrop	4”	X	X
	Sedum spathulifolium	Broad-leaved Stonecrop	4”	X	X
	Sedum spurium	Two-row Stonecrop	6”	X	X
	Sedum takesimense	Gold Carpet Stonecrop	9”	X	X
	Sedum telephium	Autumn Joy	24”	X	X
	Sempervivum tectorum	Hens and Chicks	6”	X	X
Herbaceous Plants	*Achillea millefolium*	Common Yarrow	36”	X	X
	Allium acuminatum	Hooker’s Onion	6”	X	X
	Allium cernuum	Nodding Onion	12”	X	X
	Antennaria neglecta	Field Pussytoes	4”	X	X
	Arenaria montana	Sandwort	4”	X	X
	Aurinia saxatilis	Basket-of-Gold	6”	X	X
	Campanula rotundifolia	Common Harebell	8”	X	X
	Dianthus spp.	Dianthus	12”	X	X
	Erigeron compositus	Fleabane	12”	X	X

Table E-5. Ecoroof plant list (continued).

	Scientific Name	Common Name	Potential Height	Full Sun	Partial Shade
Herbaceous Plants	*Erigeron glaucus*	Beach Aster	6”	X	X
	Festuca idahoensis	Idaho Fescue	12”	X	X
	Fragaria virginiana	Wild Strawberry	6”	X	X
	Gaillardia aristata	Blanket Flower	20”	X	X
	Gazania linearis	Gazania	6”	X	X
	Koeleria macrantha	Junegrass	24”	X	X
	Lobularia maritima	Sweet Alyssum	12”	X	X
	Phlox douglasii	Tufted Phlox	4”	X	X
	Polypodium glycyrrhiza	Licorice Fern	12”	X	X
	Polystichum munitum	Sword Fern	24”	X	X
	Potentilla nepalensis	Nepal Cinquefoil	14”	X	X
	Potentilla neumanniana	Cinquefoil	14”	X	
	Prunella vulgaris	lanceolata Self-Heal	4”	X	X
	Silene acaulis	Moss Campion	3”	X	X
	Thymus serphyllum	Creeping Thyme	3”	X	
	Veronica liwanensis	Turkish speedwell	2”	X	X
Accent Plants	*Camassia quamash*	Common Camas	8”	X	X
	Clarkia amoena	Farewell-to-Spring	7”	X	X
	Gilia capitata	Globe Gilia	18”	X	X
	Linaria reticulata	Purplenet Toadflax	20”	X	X
	Linum perenne	Blue Flax	8”	X	X
	Lupinus bicolor	Two-Colored Lupine	5”	X	X
	Madia elegans	Elegant Tarweed	18”	X	X
	Nemophila menziesii	Baby Blue Eyes	5”	X	X
	Phacelia campanularia	Desert Bluebells	10”	X	X
	Plectritis congesta	Sea Blush	5”	X	X
	Triteleia ixoides	Golden Star	10”	X	X

Recommended plants for BMPs

Refer to earlier sections of Appendix E for planting specifications. Consult a landscape architect, arborist, and/or wetland scientist to properly place vegetation (Chapter 3, "*Steps to Planning an LID Site*"). Two facility planting zones are defined to guide the designer in placing plants within a BMP.

Zone A: Area of the facility defined as the bottom of the facility to the designed high water mark. This area has moist to wet soils and plants located here must be tolerant of mild inundation.

Zone B: Area of the facility defined as the side slopes from the designed high water line up to the edge of the facility. This area typically has dryer to moist soils, with the moist soils being located further down the side slopes. Plants here should be drought tolerant and help stabilize the slopes.

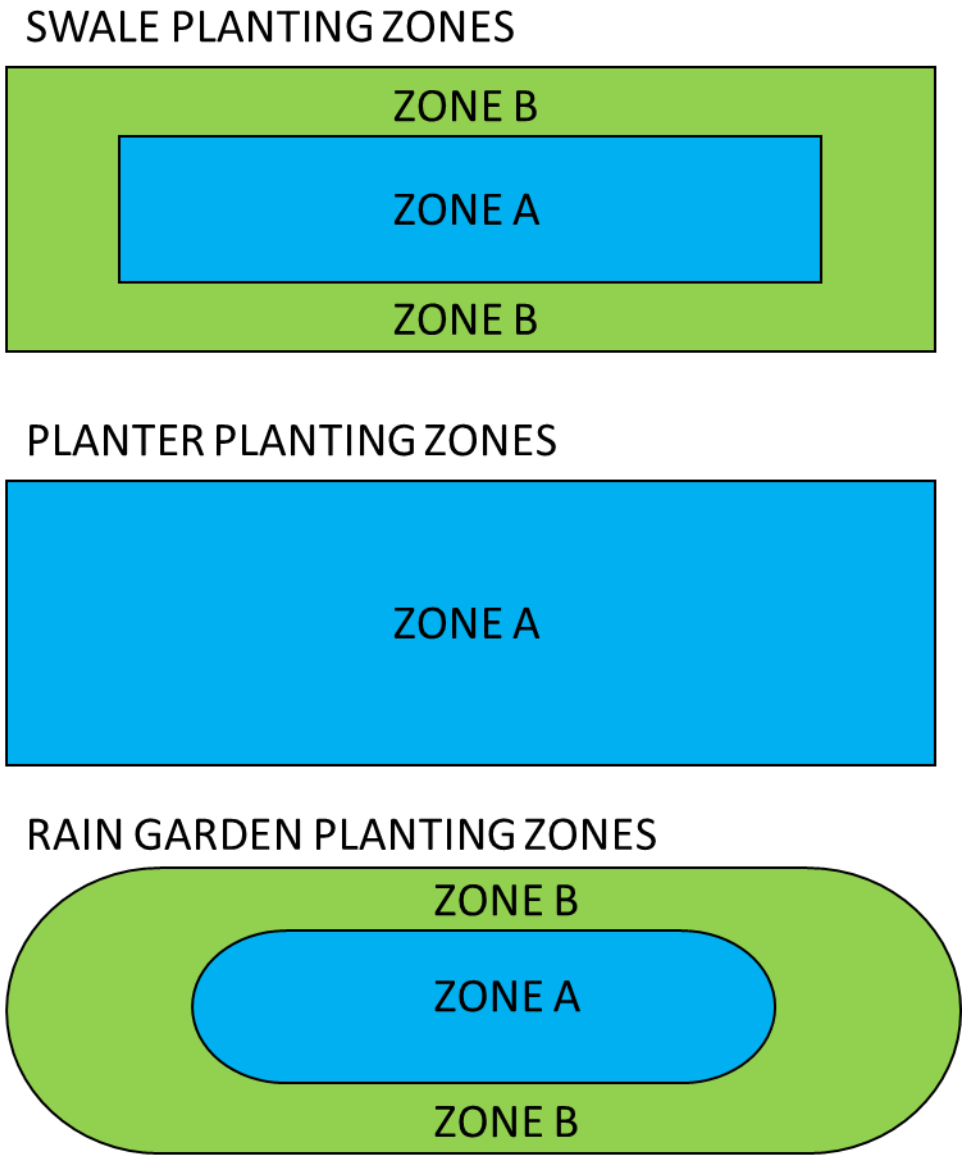

Figure E-3. Planting zones.

Table E-6. Recommended grasses and riparian woodland plants.

	Scientific Name	Common Name	Zone	Potential Height
Grasses	Dactylis glomerata	Orchardgrass	-	-
	Calamagrostis canadensis	Bluejoint Reedgrass	-	-
	Festuca idahoensis	Idaho Fescue	-	12”
	Hordeum brachyantherum	Meadow Barley	-	-
Riparian Woodland	Amelanchier alnifolia	Serviceberry	-	-
	Cornus stolonifera	Red Osier Dogwood	-	-
	Holodiscus discolor	Ocean Spray	-	-
	Oemleria cerasiformis	Indian Plum	-	-
	Physocarpus capitatus	Pacific Ninebark	-	-
	Rosa nutkana	Nootka Rose	-	-
	Rubus parviflorus	Thimbleberry	-	-
	Ribes aureum	Golden Currant	-	-
	Sambucus cerulea	Blue Elderberry	-	-
	Vaccinium parvifolium	Red Huckleberry	-	-
	Mahonia aquifolium	Oregon Grape	-	-
	Polystichum munitum	Sword Fern	-	-
	Symphoricarpos albus	Common Snowberry	-	-
	Philadelphus lewistii	Wild Mock Orange	-	-

Table E-7. Recommended trees, wildflowers, and riparian wetland plants.

	Scientific Name	Common Name	Zone	Potential Height
Trees	**Acer macrophyllum*	Big Leaf Maple	B	60'
	**Calocedrus decurrens*	Incense Cedar	A/B	100’
	**Fraxinus latifolia*	Oregon Ash	A/B	30'
	Alnus rubra	Red Alder	B	-
	Cornus nuttallii	Western Dogwood	-	-
	Crataegus douglasii	Black Hawthorne	-	-
	Populus balsamifera v. trichocarpa	Black Cottonwood	B	-
	Prunus virginiana	Common Chokecherry	-	-
	Pyrus fusca	Western Crabapple	-	-
	Salix lasiandra	Pacific Willow	A	-
	Salix scouleriana	Scoulers Willow	-	-
	Salix exigua ssp. melanopsis	Dusky Willow	-	-
Wildflowers	Aquilegia formosa	Columbine	-	-
	Aster chilensis ssp. hallii, A.	Asters	B	-
	Asarum caudatum	Wild Ginger	-	-
	Epilobium angustifolia	Fireweed	-	-
	Veratrum californicum	Corn Lily	-	-
	Xerophyllum tenax	Bear Grass	-	-
	Fragaria chiloensis	Wild Strawberry	-	-
	Petasites frigidus	Colt.s Foot	-	-
	Lupinus rivularis, L. polyphyllus	Lupines	-	-
	Dicentra formosa	Western Bleeding Heart	-	-
	Penstemon rupicola	Cliff Penstemon	-	-
	Camassia quamash ssp. Quamash	Common Camas	-	-
	Vancouveria hexandra	Insideout Flower	-	-
Riparian Wetland Plants	Equisetum hyemale	Scouring Rush	-	-
	Juncus effuses	Soft Rush	-	-
	Carex obnupta	Slough Sedge	A	4'
	Eleocharis palustris	Creeping Spike-rush	-	-
	Glyceria occidentalis	Western Manna Grass	A	18"
	Juncus balticus	Baltic Rush	A	20"
	Scirpus accutus	Hardstem Bulrush	-	-
	Scirpus microcarpus	Small-fruited Bulrush	-	-
	Veronica americana	American Brookline	-	-
	Sagittaria latifolia	Wapato	-	-