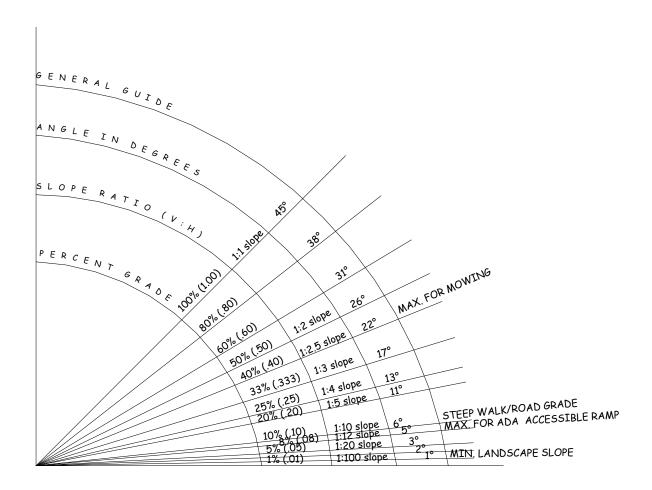
Landscape Architects

- Roadside Restoration Plans
- Wetland Mitigation Plans
- Contour Grading Plans
- Planting Plans
- Site Development Plans
- Irrigation Plans
- Co-signatory on Soil Bioengineering Plans, with Geotechnical Engineer or Engineering Geologist

Signature Authority Appendix A



Notes:

- Maximum slopes for cut and fill depend upon the materials involved. Refer to the Region Materials Engineer and the Standard Specifications for Road, Bridge and Municipal Construction 2-03.3(14) for guidance.
- The preferred slope for mowing is 1V:3H or flatter. Refer to the *Maintenance Manual* for more specific information.

Exhibit C-1 shows hourly sun angles for December 21 on a highway with a southwest—northeast road alignment, with a tree canopy height that might be typical for forested areas where shading is a concern. The drawing shows that for this road alignment, shading is caused by vegetation far outside the average right of way dimensions. For example, at 11:00 AM trees that shade the roadway are a minimum of 300 to 400 feet beyond the roadway centerline.

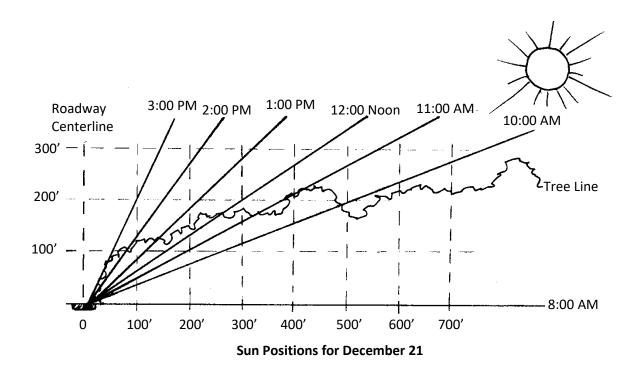


Exhibit C-1 Southwest to Northeast Road Alignment

Exhibit C-2 shows hourly sun angles for November 21 and January 21 on a road having an East–West alignment. It also depicts a tree canopy height that might be typical for forested areas where shading is a concern. The drawing shows that for this road alignment, shading is caused by vegetation far outside the average right of way dimensions. For example, at this time of year, for this road alignment, shading at 12:00 noon is caused by vegetation 500' to 600' beyond the roadway centerline. At no time during the day, for this example, does the sun reach an angle where it could reach the roadway.

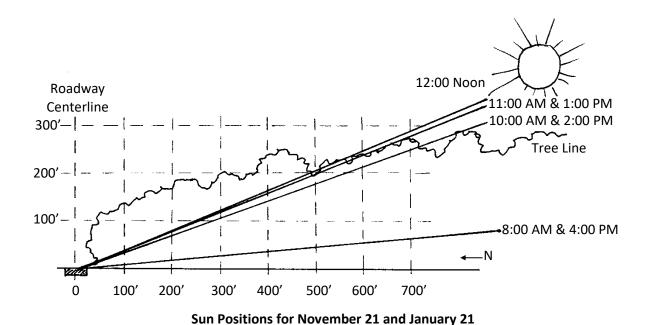
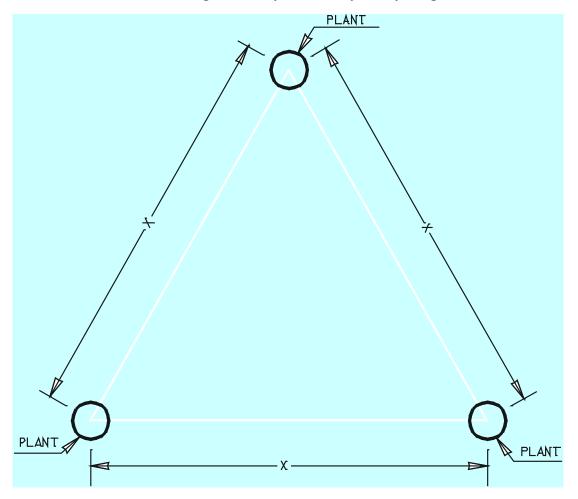


Exhibit C-1 East-West Road Alignment

Assumed geometric pattern for plant spacing



If this is the geometric shape in which plants will be spaced, the area of the equilateral triangle is:

Area =
$$2* X / 2 * \sqrt{(X^2 - X^2 / 4)} = X^2 / 2 * \sqrt{3}$$

There will be one plant for each equilateral triangle shaped area throughout the area to be planted, plus two extra plants.

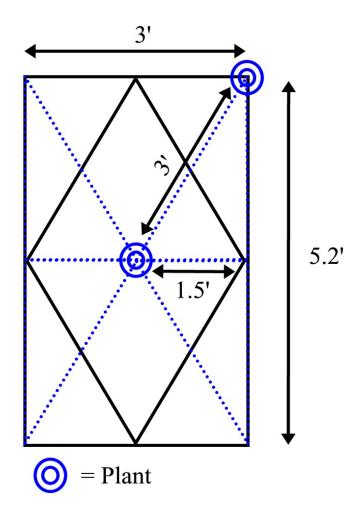
Therefore, the number of plants that will be needed for an area in acreage is:

No. of plants = acreage to be planted * 43560 sq. ft. per acre / X^2 / $2*\sqrt{3}$ (where X is the plant spacing in ft.) + 2 more plants

(Formula first developed by Julie Nelson, P.E. for the SCR WSDOT Environmental Office.)

Plant Spacing Appendix D

DRAFT Plant Spacing Formula for Vegetation Mitigation Projects



Assuming a 3' on-center planting requirement, the following applies:

- A. Total Area of Above: $3' \times 5.2' = 15.6 \text{ sq. ft.}$
- B. Two (2) plants per 15.6 sq. ft. or one plant per 7.8 sq. ft.
- C. If at first you don't think it will work, try stacking the rectangles side by side and top to bottom and you will start to see how it works.
- D. The only possible flaw would be around the edges of a large area to cover, where it may come up a little short.
- E. When used in the Selah project, the planting numbers came out just right.
- F. In the field, construction of the formula is not expected to be exactly 3' on-center for each plant. Some variation will occur.
- G. There may be room for improvement so if you have suggestions, please forward them to the SCR WSDOT Environmental Office (your comments are greatly appreciated).
- H. Formula easily changed for 2', 4', 5', 8', or 10' on-center calculations.

For more information and other region native plant lists, please refer to the Native Plant List website at: http://plantnative.org/rpl-imw.htm



NATIVE PLANT LIST Idaho, Eastern Oregon, and Eastern Washington







This is a "starter" list of native plants for Idaho, eastern Oregon and eastern Washington. It is intended for residential or commercial landscapers who want to create attractive and varied native landscapes.

Find another Native Plant List!
Select a Region ✓ Go

TREES SHRUBS FLOWERING PERENNIALS GRASSES

Trees

Co	ommon Name	Scientific Name	Sun	Soil Moist.	Height	Comments
Bi	g-tooth Maple	Acer grandidentatum	F-P	A-W	8-40'	Fall foliage varies from orange to yellow.
W	ater Birch	Betula occidentalis	F	A-W	15-25'	An excellent choice for Rocky Mtn. states.
Ne	etleaf Hackberry	Celtis reticulata	F	D	10-30'	Reddish orange berries in the fall.
W	estern Juniper	Juniperus occidentalis	F	D	20-30'	Blue-green cones appear in the spring.
W	estern Larch	Larix occidentalis	F	Α	150'	This deciduous conifer turns golden in fall.
Bl	ue Spruce	Picea pungens	F-P	Α	30'	Large evergreen with a silver-blue color.
Pii	nyon Pine	Pinus edulis	F	D	10-20'	Requires full sun and good drainage.
W	estern White Pine	Pinus monticola	F-P	Α	150'+	Grows best in sun with moist, well-drained soil.
Po	nderosa Pine	Pinus ponderosa	F	D	130'	Yellow brown, sweet-scented bark on old trees.
Qι	ıaking Aspen	Populus tremuloides	F	W	50'	Leaves turn gold in fall, shimmer in wind.
Bl	ack Cottonwood	Populus trichocarpa	F	W	100'	Oval leaves are glossy dark green.
Do	ouglas Fir	Pseudotsuga menziesii	F-P	Α	200'	Best in full sun with well-drained soil.
Ro	ocky Mountain Ash	Sorbus scopulina	F-P	W	13'	Bet in moist, well-drained acidic soil.





	Soil Moisture W = Wet
P = Part Sun	A = Average
S = Shade	D = Dry

Shrubs

Common Name	Scientific Name	Sun	Moist.	Height	Comments
Rocky Mountain Maple	Acer glabrum	F-P	A-W	8-25'	Showy fall foliage is red, orange, and yellow.
Saskatoon Serviceber.	Amerlanchier alnifolia	Р	Α	5-20'	White flowers April-May become purple fruit.
Kinnikinnick	Arctostaphylos uva-ursi	Р	Α	6"	Mat-forming shrub has pink flowers Mar-Apr.
Silver Sagebrush	Artemisia cana	F	D-A	3-5'	Semi-evergreen shrub with silver foliage.

Native Plant List - Eastern Appendix E

Fringed Sagebrush	Artemisia frigida	F	Α	8-18"	Foliage is metallic silver.
Louisiana Sage	Artemisia ludoviciana	F	Α	12-18"	Smells strongly of sagebrush.
Big Sagebrush	Artemisia tridentata	F	D-A	3-12'	Yellow inconspicuous flowers in the fall
Four-wing Saltbush	Atriplex canescens	F	D-A	4-5'	Yellow inconspicuous flowers mid-spring
Curl-leaf Mtn. Mahog.	Cercocarpus ledifolius	F	D-A	8-15'	Evergreen; dark green leaves, gray bark
Mountain Mahogany	Cercocarpus montanus	F-P	Α	5-10'	White flowers Apr-May, Plumes persist into fall
Fern Bush	Chamaeb. millefolium	F	Α	6-8'	White flowers in summer
Rubber Rabbitbrush	Chrysoth. nauseosus	F	D-A	2-7'	Dark yellow flowers late summer into fall
Green Rabbitbrush	Chrysoth. viscidiflorus	F	D-A	3'	Leaves green, shiny, and sticky
Red-osier Dogwood	Cornus stolonifera	F-S	Α	3-9'	White flowers May-Jun, berries attract birds
Douglas Hawthorn	Crataegus doulasii	F-P	Α	8-20'	Showy clusters of white flowers mid spring
Mormon Tea	Ephedra viridis	F	D	2-5'	Yellow flower-like cones and berry-like fruits.
Apache Plume	Fallugia paradoxa	F	D-A	4-6'	White to rose flowers late spring-early summer
Winterfat	Kraschen. lanata	F	D	1-3'	Tolerates highly alkaline soil, needs drainage
Creeping Oregon Grape	Mahonia repens	P-S	D-A	1'	Holly-like leaves; drought and shade tolerant
Mockorange, Syringa	Philadelphus lewisii	F-P	D-A	4-10'	Incredibly fragrant flowers begin late spring
Ninebark	Physocarp. malvaceus	F-S	Α	3-6'	White flowers (spring); red fall color
Shrubby Cinquefoil	Potentilla fruticosa	Р	Α	3'	Yellow flowers early summer- mid fall
Bitter Cherry	Prunus emarginata	F-P	Α	6-8'	Fragrant white flowers become red cherries
Chokecherry	Prunus virginiana	F-P	Α	10-20'	White flowers in spring become red-purple fruit
Antelope Bitterbush	Purshia tridentata	F	D	5-8'	Yellow highly fragrant flowers Apr-May.
Smooth Sumac	Rhus glabra	F-P	Α	4-20'	Compound, blue-green leaves turn red in fall.
Oakleaf Sumac	Rhus trilobata	F-P	D-A	3-6'	Leaves turn a bright red to orange color in fall.
Golden Currant	Ribes aureum	F-P	Α	3-6'	Bright yellow flowers in early spring.
Red-flowering Currant	Ribes sanguineum	Р	Α	3-5'	Pale to dark pink flower spikes in early spring.
Woods' Rose	Rosa woodsii	F-S	D-A	3-4'	Pale to dark pink flowers bloom in late May.
Blue Elderberry	Sambucus cerulea	F-P	W	8-12'	Small white flowers in late spring; attracts birds
Silver Buffaloberry	Sheperdia argentea	Р	W-A	10-15'	Dense form of silver foliage, good bird habitat
Russet Buffaloberry	Sheperdia canadensis	F-P	D-A	3-12'	Leaves are blue-green, often with rusty dots
Common Snowberry	Symphoricarpos albus	P-S	Α	4-6'	Pink to white flwoers bloom in May or June





F = Full Sun P = Part Sun	Goil Moisture W = Wet A = Average D = Dry
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Flowering Perennials (Wildflowers)

(
Common Name	Scientific Name	Sun	Moist.	Height	Comments
Western Yarrow	Achillea millefolium	F	D	1-3.5'	White flowers fading to cream from spring-fall
Parry's Agave	Agave parryi	F	D	24"	Light gray to green foliage is broad and flat
Pearly Everlasting	Anaphalis margaritacea	F-P	Α	6-18"	White flowers bloom prolifically Jun-Sep
Rosy Pussytoes	Antennaria spp.	F-P	Α	4-8"	Pink and white flowers Jun-Jul; drought tolerant
CO Blue Columbine	Aquilegia caerulea	Р	Α	12-30"	Blue and white unique blooms Jun-Aug

Appendix E Native Plant List - Eastern

Western Columbine	Aquilegia formosa	Р	A-W	2-3'	Unique red and yellow flowers spring-summer
Wild Aster	Aster spp.	F	Α	12-36"	Purple, light blue to cream flowers
Arrowleaf Balsamroot	Balsamorhiza sagittata	F	Α	12-24"	Plants don't flower until they are five years old
Blue Camas	Camassia quamash	F	W	1-2'	Blue petals and yellow stamen blooms May-Jun
Purple Coneflower	Echinacea purpurea	F-P	Α	2-3'	Continuously blooms (purple) summer-fall
Cut-leaf Daisy	Erigeron compositus	F	D	6"	Numerous white to lavender flowers in spring
Wyeth Buckwheat	Eriogon. heracleoides	F	Α	6-16"	Creamy white flowers; drought tolerant
Snow Buckwheat	Eriogonum niveum	F	Α	6-18"	White flowers in the summer and fall
Sulfur Buckwheat	Eriogonum umbellatum	F	Α	1'	Yellow flowers with hints of reddish orange
Woolly Sunflower	Eriophyllum lanatum	F	Α	6-12"	Yellow flowers in the spring; drought tolerant
Blanket Flower	Gaillardia aristata	F-P	Α	24"	Flower rays a mix of red, yellow or orange
Sticky Geranium	Gerani. viscosissimum	F-P	Α	12-30"	Pink to lavender flowers with red veins May-Sep
Prairie Smoke	Geum triflorum	F-P	Α	18"	Reddish to purplish flowers
Texas Red Yucca	Hesperaloe parviflora	F	D	4'	Red blooms in summer reach 5'; slow-growing
Scarlet Gilia	Ipomopsis aggregata	F-P	Α	12-24"	Red flowers (Jun) attract hummingbirds
Wild Blue Flax	Linum perenne	F-P	Α	8-24"	Blue flowers all spring and summer; drought tol
Silver Lupine	Lupinus argenteus	F-P	Α	8-24"	Blue to white flowers; nitrogen fixing
MO Evening Primrose	Oenoth. missouriensis	F	D	6-12"	Yellow flowers Jun-Sep; slightly fragrant
Prickly Pear Cactus	Opuntia spp.	F	D	12"	Flowers of yellow, pink, or red bloom Jun-Jul
Pagoda Penstemon	Penstemon angustifolius	F	Α	1'	Comes in various shades of blue to lavender
Scarlet Bugler	Penstemon barbatus	F	Α	2-3'	Distinctly bright red corolla, flowers Jun-Sep
Dark Blue Penstemon	Penstemon cyaneus	F	Α	12-28"	Dark blue to violet flowers May-Aug
Hot Rock Penstemon	Penstemon deustus	F	Α	8-18"	Small creamy white flowers May-Jun
Firecracker Penstemon	Penstemon eatonii	F	Α	3'	Flower stalks lined with bright red flowers
Shrubby Penstemon	Penstemon fruticosus	F	Α	18"	Blue/lavender to light purplish flowers May-Jun
Palmer Penstemon	Penstemon palmeri	F	D-A	2-4'	Large pink fragrant flowers attract hummingbird
Pine-Leaf Penstemon	Penstemon pinifolius	F	Α	6-18"	Red flowers attract hummingbirds
Rydberg's Penstemon	Penstemon rydbergii	F-P	Α	8-28"	Bluish-purple flowers in whirls around stem
Showy Penstemon	Penstemon speciosus	F-P	Α	2-6"	Bright purple to violet flowers May-Jun
Rocky Mtn. Penstemon	Penstemon strictus	F	Α	1-3'	Blue to violet blooms Jun-Jul
Lovely Penstemon	Penstemon venustus	F	Α	36"	Stunning flowers lavender-purple May-Jun
Whipple's Penstemon	Penstemon whippleanus	Р	Α	8-24"	Flowers usually creamy white-green Jul-Aug
Prairie Clover	Petalostem. purpureum	F	D	1-2.5'	Pinkish purple flowers May-Sep; fixes nitrogen
Goldenrod	Solidago spp.	F	Α	2-5'	Yellow flowers cover plant late summer-fall
Desert Globemallow	Sphaeralcea ambigua	F	Α	20-40"	Orange to brick red flowers Mar-Jun
Gooseberry-leaf Globe.	Sphaera. grossulariifolia	F	D-A	12-24"	Salmon colored flowers in the summer
Orange Globemallow	Sphairalcea munroana	F	D-A	12-24"	Apricot-pink to reddish-orange flowers
Prince's Plume	Stanleya pinnata	F	D	3-4'	Spikes of lacy yellow flowers spring-summer
Narrowleaf Yucca	Yucca glauca	F	Α	3-6'	Creamy white bell shaped flowers in July

For more info, enter a plant name

Find a Nursery in:	ID	OR	WA			
Find Community Services:	ID	OR	WA			
Check Neighboring States?						

Sun Exposure F = Full Sun P = Part Sun S = Shade	Soil Moisture W = Wet A = Average D = Dry
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Native Plant List - Eastern Appendix E

Grasses					
Common Name	Scientific Name	Sun	Moist.	Height	Comments
Indian Ricegrass	Achnather. hymenoides	F	D	12-16"	Beautiful inflorescence when it goes to seed
Little Bluestem	Andropogon scoparium	F	Α	12-36"	Blue-green warm season grass; reddish in fall
Blue Grama	Bouteloua gracilis	F	D	4-12"	Mat forming warm season grass
Buffalograss	Buchloe dactyloides	F	D	3-5"	Long blue-gray to green blades; reddish in fall
Bottlebrush Squirreltail	Elymus elymoides	F	D	13-24"	Unique tufted seed head in mid-spring
Idaho Fescue	Festuca idahoensis	F-P	Α	18"	Gray-blue blades in early summer
Sheep Fescue	Festuca ovina	F-P	D-A	18"	Does not do well in continuously wet sites
Great Basin Wildrye	Leymus cinereus	F	D	4-6'	Bluish tan blades with wheatlike seed heads
Bluebunch Wheatgrass	Pseudo. spicata	F	D	13-24"	Bluish cast, decorative inflorescence
Sand Dropseed	Sporobolus cryptandrus	F	D	8-16"	Stays green in heat of summer; resists fire if mowed anually

TREES SHRUBS FLOWERING PERENNIALS GRASSES

IMPORTANT CONSIDERATION:

- 1. While the plants listed above are native to and appropriate for their indicated regions, please recognize that, in some instances, human development alters the characteristics of a site such that it may be advisable to use plants from a neighboring region. For example, plantings in urban and suburban areas may receive reflected heat from streets, sidewalks and/or walls or be in media that receives less moisture than normal (e.g., next to a paved area the pavement blocks rain from entering soil). Accordingly, using plants from a neighboring region that support higher temperatures and/or drier conditions may be more appropriate.
- While a plant is native to a region, that does not mean that it will grow everywhere in that region. The characteristics of any site will typically vary from place to place and some plants may do better than others at various places within a site. In other words, a little experimentation might be required.
- 3. The above list is a starter list. Though adequate for most residential and commercial landscapes, there are many more native plants and should you want to consider them, please inquire at a listed nursery, community service organization, reference book or other resources.

CREDITS:

1. Landscaping with Native Plants of the Intermountain Region

US Department of the Interior Bureau of Land Management in cooperation with Boise State University and the Pahove Chapter of the Idaho Native Plant Society www.id.blm.gov/publications/TR1730-3/cover_p7.pdf.

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2. Idaho Native Plant Society.

P.O. Box 9451, Boise, ID 83707 www.idahonativeplants.org/

3. PlantNative Staff.

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NATIVE PLANT LIST -Western Oregon and Western Washington







This is a "starter" list of native plants for western Oregon and western Washington. It is intended for residential or commercial landscapers who want to create attractive and varied native landscapes.

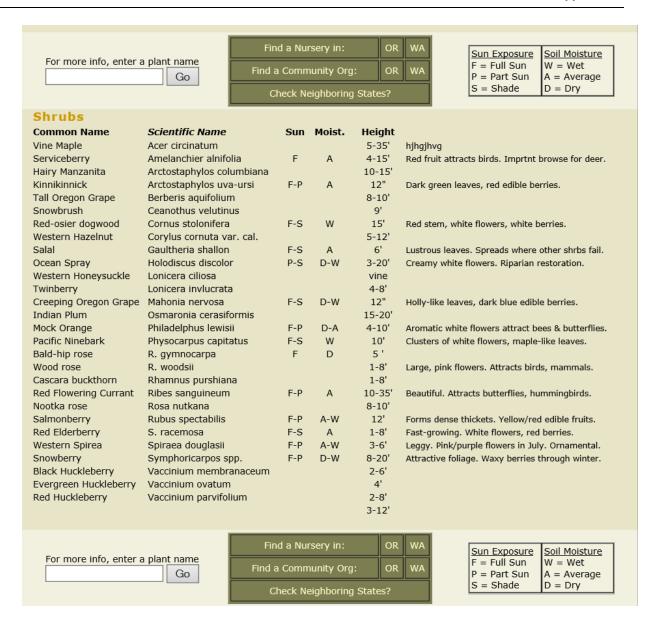
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Select a Region ✓ Go

TREES SHRUBS PERENNIALS-SUN PERENNIALS-SHADE

Trees

Common Name	Scientific Name	Sun	Soil Moist.	Height	Comments
Deciduous:					
Vine Maple	Acer circinatum	F-S	A-W	25'	Attractive fall colors. Shade, ornmntl, undrstry.
Big Leaf Maple	Acer macrophyllum	F-P	Α	30-100'	Yellow fall color. Excellent shade.
Alder (Red)	Alnus rubra	F	W	40-100'	Good along streams for erosion control, shade.
Pacific Madrone	Arbutus menziesii	F	Α	40-80'	Reddish bark, shiny leaves, white flowers.
Paper Birch	Betula papyrifera	F-S	Α	80'	Peeling white bark. Yellow fall color.
Black Hawthorne	C. douglasii	F	W	20-30'	Low-growing. Berries for birds. Erosion control.
Pacific Dogwood	Cornus nuttallii	F-P	Α	30-50'	White flowers, pink-red berries.
Oregon Ash	Fraxinus latifolia	F	W	40-75'	Gray/brown bark, olive green leaves.
Crab Apple	Malus spp.	F-P	A-W	15-35'	Small green to red fruit, yellow/red fall color.
Indian Plum	Oemleria cerasiformis	F-P	D-A	16'	Blooms Jan, Feb. White flowers, purple plums.
Aspen (Quaking)	Populus tremuloides	F	A-W	40-80'	Food source for deer & other mammals.
Black Cottonwood	Populus trichocarpa	F	W	70-100'	Nesting for large birds. Fast-growing.
Bitter Cherry	Prunus emarginata	F-P	Α	20-60'	White flowers, conspicuous red seeds.
Oregon White Oak	Quercus garryana	F	D-A	30-100'	Only native OR oak. Wide spreading branches.
Cascara	Rhamnus purshiana	F-P	Α	30'	Silver grey bark. Berries attract birds.
Pacific Willow	Salix lasiandra	F	W	20'	Yellow bark, good along streams and ponds.
Evergreen:					
Grand Fir	A. grandis	F-P	D-A	100-200'	Tall, straight, stately, gray-brown bark.
Noble Fir	A. procera	F			Symmetrical, conical, smooth. Good Xmas tree.
Sitka Spruce	Picea sitchensis			100-150'	
Ponderosa Pine	Pinus ponderosa	F	D-W	60-130'	Scaled, colored bark. Vanilla fragrance.
Douglas Fir	Pseudotsuga menzies	F	D-W	75-200'	OR state tree. Can live over 1000 years.
Giant Sequoia	Sequoiadendron giganteum	F	Α	200	Gray-green foliage and reddish brown bark.
Western Redcedar	Thuga plicata	Р	A-W	100-175'	Great for wildlife cover, restoration, ornamental.
Western Hemlock	Tsuga hereophylla			125-200'	

Native Plant List - Western Appendix F

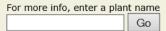


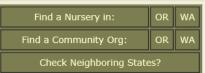
Appendix F Native Plant List - Western

Perennials - Sun

Common Name	Scientific Name	Sun	Moist.	Height	
Red Columbine	Aquilegia formosa	F-P	A-W	to 3'	Soft foliage, drooping r
Shooting Star	Dodecatheon hendersonii	F	A-W		Magenta to lavender flo
White Fawn Lily	Erythronioum oregonum	F-S	Α		Lance-shaped leaves, v
Tiger Lily	Lilium columbianum	F			Bright orange flowers v
Big Leaf Lupine	Lupinus polyphyllus	F	A-W	3-4'	Nitrogen fixer. Blue to
Oregon Stonecrop	Sedum oregonum	F-P	A-W		Yellow to pink flowers.
Yellow-Eyed Grass	Sysyrinchium californicum	F-P	W		Yellow flowers on short

Soft foliage, drooping red to yellow flowers.
Magenta to lavender flowers on singular stalk.
Lance-shaped leaves, white nodding flower.
Bright orange flowers with red or purple spots.
Nitrogen fixer. Blue to violet pea-like flowers.
Yellow to pink flowers. Good for rock gardens.
Yellow flowers on short stalks. Spreads easily.





	Soil Moisture W = Wet
P = Part Sun	A = Average
S = Shade	D = Dry

Perennials - Shade

Common Name	Scientific Name	Sun	Moist.	Height	Comments
Dwarf Dogwood	Cornus canadensis	S	W		Low, trailing. White flwrs, red berry-like drupes.
Bleeding Heart	Decentra formosa	S	W	1-2'	Fern-like. Pink/purple heart-shaped flowers.
Early Blue Violet	Viola adunca	S	W	to 4"	Heart-shaped leaves, yellow flwrs, purple lines.

TREES SHRUBS PERENNIALS-SUN PERENNIALS-SHADE

IMPORTANT CONSIDERATION:

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CREDITS:

1. East Multnomah SWCD 2006 Native Plant Descriptions

East Multnomah Soil and Water Conservation District 2701 NW Vaughn St. Suite 450, Portland, OR 97210

2. PlantNative Staff.

Native Plant List - Western Appendix F