Some notes on establishing Oak Woodlands in Portland

Benefits to planting Oregon White Oak

An important benefit of planting Oregon white oak on the Willamette Bluff Escarpments is the appropriateness of the site conditions present at that location.

Oregon white oak is typically a seral species that only maintains dominance over competing trees through the action of natural disturbance, usually fire. Several characteristics of white oaks (low amount of resin, thick bark, capability to withstand injuries) allow the species to survive on fire-prone landscapes where other species are unable to become established.

In the absence of fire, Oregon white oak woodlands will eventually become dominated by tree species that are faster growing or more shade tolerant such as Douglas-fir, grand fir, and bigleaf maple. Oregon white oak can occur as a climax species on droughty sites or where natural fire is frequent. (http://www.oregonoaks.org/ecology.shtml)

Over all restoration goals for Oregon White Oak habitats

1. Include wildlife needs in your choices
2. Choose plant materials that will thrive in the stressful environment of the Oregon white oak
3. Choose plant materials that have low volatility to reduce fuel in the event of wildfire
4. Take the long view. Oregon white oak is slow growing; develop a plant community of natives that can hold up under competition to invasive plants that are present in the area.
5. Choose a pallet of plants that are associated with Oregon white oak woodlands
6. Climate change. Oregon white oak woodlands and savannah are likely to persist and even thrive given the climate model predictions for the lower Willamette Valley.
7. Long term vision:

   Yr 1 – 20 Control invasive weeds and allow Oregon white oak and associated plant species to thrive (may include removal of native tree seedlings such as doug fir, big leaf maple, alder, etc..)

   Yr 10-20 Oregon White oak saplings beginning to overtop tall native shrubs

   Yr 20-50 young Oregon White oak woodlands established, maintenance continues to remove invasive plants (may include removal of native tree seedlings such as doug fir, big leaf maple, alder, etc..)

Yr 50 and beyond - As the canopy of the oak trees begins to close in the need forunderstory invasive vegetation management should subside. Maintenance goals should be developed depending on habitat needs of local wildlife.

Photo right: Oregon white oak woodlands at Oaks Bottom Natural Area in Portland (Photo Credit, Molly Hashimoto, 2009)

Soils and Topography:

Oregon white oak (Quercus garryana) grows on a wide range of soil series, but is outgrown by faster growing trees on good sites. The species can survive on seasonally-flooded clay soils, as well as xeric sites-conditions to which its competitors are poorly adapted. Oregon white oak typically occurs on flood plains, terraces, and slopes.

Recommendation for the establishment of Oregon white oak woodlands at University of Portland escarpment.

Recommended planting density and plant associations

Plant Communities: Oregon white oak occurs as scattered trees in savanna communities and in pure or mixed-species closed canopy woodlands. The Oregon Natural Heritage Information Center has identified five native plant associations that are commonly found in the Portland area of the Willamette Valley.

Trees and shrubs should be irrigated during drought season for up to 5 years from planting to ensure successful restoration.

Planting density for Oregon white oak should be - 200 trees per acre. To ensure that the trees thrive they should be irrigated for the first five years.

Other trees commonly associated with Oregon white oak woodlands can be included at recommended densities (below). These should also be irrigated for the first 5 years. Tree spacing should be irregular. Oak trees should not be shaded by other species so grouping non- oak associated trees is recommended.

Recommended Additional Trees

Tree Species	**Recommended density**
Pinus ponderosa (widely spaced)	Plant year 2 - 1 tree for every 25 Oregon white oak
Arbutus menzesii (scattered)	Plant year 2 - 1 tree for every 10 Oregon white oak
Rhamnus purshiana (scattered)	Plant year 2 - 1 tree for every 25 Oregon white oak
Fraxinus latifolia (plant only in chronically wet areas, and group in wettest locations)	Plant year 2 - 1 tree for every 25 Oregon white oak

Recommended Associated Shrubs and Forbs (plant bare root or potted starts, irrigation is recommended)

Shrub Species	**Recommended density**
Symphorocarpus albus (Snow berry)	Plant year 2 – Insert density here
Toxicodendron diverislobum (poison oak)	Planting not recommended, it is likely to establish itself. Allow to colonize as can be tolerated
Oemleria cerasiformis (Indian plum)	Plant year 2 – Insert density here
Holodiscus discolor (Ocean spray)	Plant year 2 – Insert density here
Corylus cornuta (hazel)	Plant year 2 – Insert density here
Polystichum munitum(Sword fern)	Plant year 2 – Insert density here
Amelanchier alnifolia (service berry)	Plant year 2 – Insert density here

Recommended Associated Forbs and Shrubs to plant from seed

The following list should make up the dominant species in the seed mix. All seeds in the seed mix should be native to the Willamette Valley. The seeds should be tolerant of full sun, and be fast growing vigorous colonizers. Preferably from the Portland Plant list (excerpt is provided as appendix).

Achillea millefolium (common yarrow)	Plant year 1 - insert density here
Bromus carinatus (California Brome–grass)	Plant year 1 - insert density here
Clarkia amoena (Farewell to Spring)	Plant year 1 - insert density here
Collinsia grandiflora (large flowered blue eyed Mary)	Plant year 1 - insert density here
Elymus glaucus (Blue Wildrye)	Plant year 1 - insert density here
Festuca californica (California fescue)	Plant year 1 - insert density here
Festuca roemeri (roemers fescue)	Plant year 1 - insert density here
Geum macrophyllum (large leaf avens)	Plant year 1 - insert density here
Prunella vulgaris var. lanceolata (heal all)	Plant year 1 - insert density here

Year one – Site preparation

Winter, spring and summer – weed reduction (hand pulling, followed herbicide application)

Fall – winter planting - (seed) native grasses, sedges, rushes and wildflowers from recommended list above

Year 2 – Tree and shrub establishment

Spring and summer, spot treatments for undesired invasive plants(black berry, EDRR invasives, clematis, etc…). The treatments will need to be done by a person knowledgeable in native and invasive plants (I can provide a list of target species if needed).

Late Fall early winter – plant trees and shrub (bare root or potted starts). Second seeding of forbs and grasses as needed (use seed mix from previous year)

Year 3 – 5 Maintenance

Spring and summer, spot treatments for undesired invasive plants(black berry, EDRR invasives, clematis, etc…). The treatments will need to be done by a person knowledgeable in native and invasive plants. Replant potted, bare root seedlings as needed during late fall and winter planting season. Use seed mix to fill in gaps as needed (recommend fall and winter seeding). Continue to water woody plants.

Plant Associations for Oregon white oak restoration

TREES

Quercus garryana ..... Garry Oak
Arbutus menziesii ..... Pacific Madrone
Fraxinus latifolia……Oregon Ash
Prunus emarginata ..... Bitter Cherry
Rhamnus purshiana ..... Cascara
Crataegus suksdorfii ..... Black Hawthorn
Pinus ponderosa ..... Ponderosa Pine

SHRUBS

Amelanchier alnifolia ..... Western Serviceberry
Berberis aquifolium ..... Tall Oregongrape
Ceanothus cuneatus ..... Buckbrush
Holodiscus discolor ..... Ocean–spray
Symphoricarpos albus ..... Common Snowberry
Symphoricarpos mollis ..... Creeping Snowberry
Berberis nervosa ..... Dull Oregongrape
Oemleria cerasiformis ..... Indian Plum
Philadelphus lewisii ..... Mockorange
Prunus virginiana ..... Chokecherry
Ribes sanguineum ..... Red Currant
Ribes viscosissimum ..... Sticky Currant
Rosa gymnocarpa ..... Baldhip Rose
Rosa nutkana var. nutkana ..... Nootka Rose
Rubus parviflorus ..... Thimbleberry
Sambucus cerulea ..... Blue Elderberry
Ceanothus sanguineous ..... Oregon Tea–tree
Lonicera hispidula ..... Hairy Honeysuckle

GRASSES & FORBS

Bromus carinatus ..... California Brome–grass
Carex tumulicola ..... Foothill Sedge
Clarkia amoena ..... Farewell to Spring
Elymus glaucus ..... Blue Wildrye
Festuca californica..... California Fescue
Festuca occidentalis ..... Western Fescue–grass
Olsynium douglasii ..... Grass-widows
Polystichum munitum ..... Sword Fern
Pteridium aquilinum ..... Bracken Fern
Pyrola Picta ..... White-vein pyrola
Sanicula bipinnatafida..... Purple Sanicle
Tiarella trifoliata v. unifoliata ..... Trefoil Tiarella
Vicia americana..... American Vetch
Agoseris grandiflora ..... Large–flowered Agoseris
Apocynum androsaemifolium ..... Spreading Dogbane
Campanula scouleri ..... Scouler's Bellflower
Clematis ligusticifolia ..... Western Clematis

Collinsia grandiflora ..... Large Blue–eyed Mary
Collinsia parviflora ..... Small Blue–eyed Mary
Delphinium nuttallii ..... Nuttall's Larkspur
Epilobium angustifolium ..... Fireweed
Fragaria virginiana var. platypetala ..... Broadpetal Strawberry
Hieracium albiflorum ..... White Hawkweed
Ligusticum apiifolium ..... Parsley–leaved Lovage
Ligusticum grayii ..... Gray's Lovage
Melica subulata ..... Alaska Oniongrass
Osmorhiza chilensis ..... Mountain Sweet–root
Poa compressa..... Canada Bluegrass
Potentilla glandulosa ..... Sticky Cinquefoil
Rubus ursinus ..... Pacific Blackberry
Vicia gigantea ..... Giant Vetch
Bromus vulgaris ..... *Columbia Brome*
Cypripedium montanum ..... *Mountain Lady–slipper*
Cystopteris fragilis ..... *Brittle Bladder Fern*
Erythronium oregonum ..... *Giant Fawn-Lily*
Lupinus laxiflorus ..... *Spurred Lupine*
Pentagramma triangularis ..... *Gold–back Fern*
Sanicula crassicaulis ..... *Pacific Sanicle*
Viola adunca .....*Viola*

Bold = Common / Normal = Occasional / *Italic = infrequent*
adapted from the Portland Native Plant List