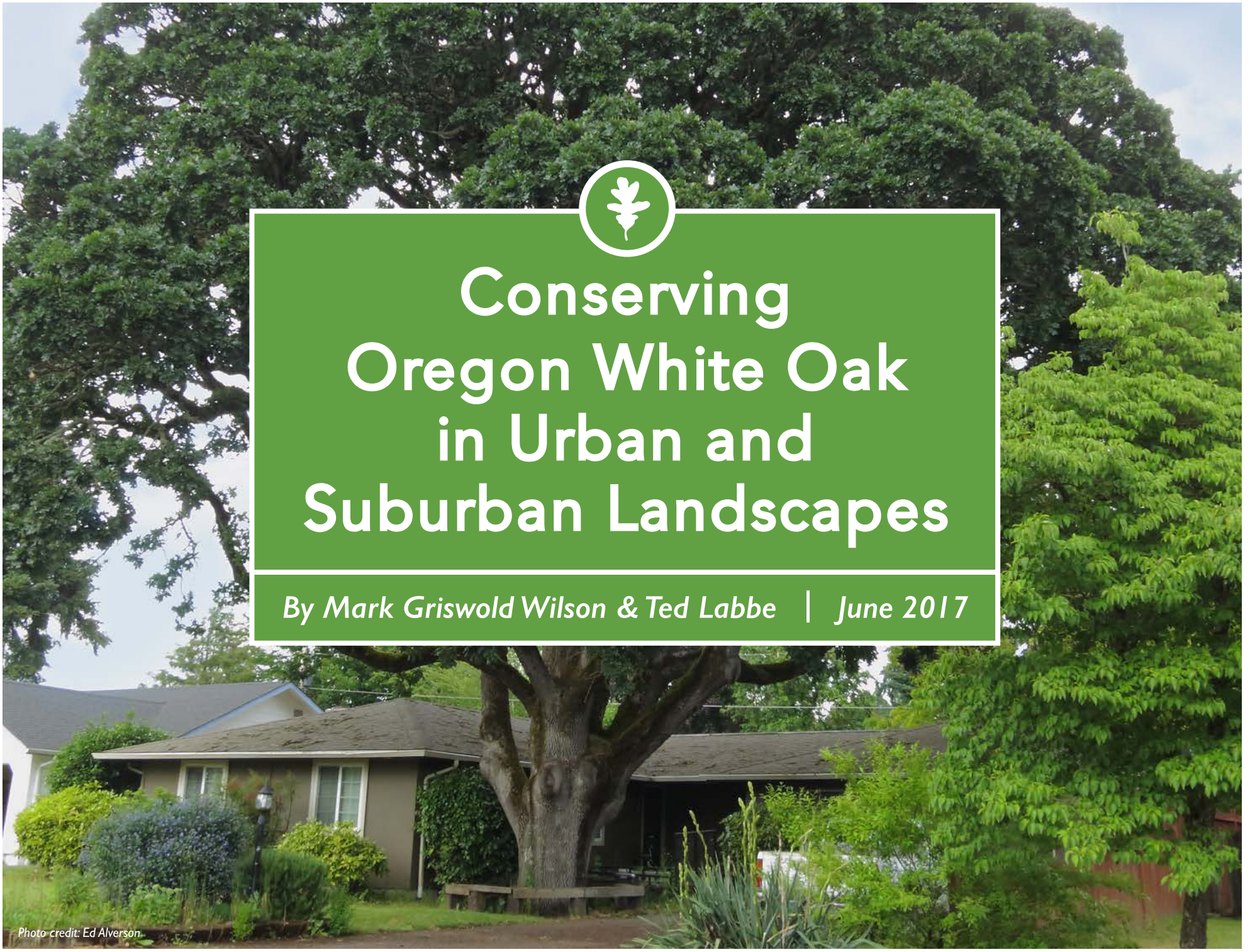

# Conserving Oregon White Oak in Urban and Suburban Landscapes

*By Mark Griswold Wilson & Ted Labbe* | *June 2017*

*Photo credit: Ed Alverson*

# This Guide is Made Possible by:

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# Preface

This 'Conserving Oregon White Oak in Urban and Suburban Landscapes' document is a compendium of instructional materials developed in 2016-17 by Mark Griswold Wilson and Ted Labbe for a workshop series *Landscaping with Oregon white oak* for residents of urbanizing north Clackamas County. The workshops focused on designed installations of native plants in urban and sub-urban settings of the Portland metro area, incorporating lessons from native oak and prairie ecosystems. This approach accommodates both human and plant needs by developing site-specific planting and maintenance plans rather than letting landscapes "go wild".

The Metro Nature in Neighborhoods grant program, as well as Clackamas, Tualatin, and West Multnomah Soil and Water Conservation Districts (SWCD) provided funding for the development of these materials. A steering committee of conservation agency staff provided valuable project input, feedback, and edits, which included: Kammy Kern-Korot (West Multnomah SWCD), Nicole Ahr (Clackamas SWCD), Lacey Townsend (Tualatin SWCD), Mary Bushman (City of Portland Bureau of Environmental Services), Janelle St. Pierre (City of Portland Parks and Recreation), Lori Hennings (Metro), and Kathy Pendergrass (NRCS). Mike Houck (Urban Greenspaces Institute) assisted with administering grant and contract materials. Elena Cronin's assistance with graphic design and document layout greatly enhanced the presentation and accessibility of the information. We are grateful for the assistance and support provided by these organizations and individuals.

This document is designed for landowners as well as SWCD staff and other agencies working with private parties to conserve or establish native oak and prairie habitats in an urban setting. SWCD staff may choose to utilize a subset of the handouts with particular landowners, depending on their situation. The handouts introduce Oregon white oak, prioritize habitat protection upfront, and then walk through the sequence of steps necessary to implement a small oak naturescaping project for an urban residential property. The appendices contain supplemental information as discrete handouts.

Although each chapter and section is a handout that can be used independently, we emphasize that chapters 3-7 describe a sequential process for implementing a successful oak naturescaping project in a yard. See section 3.1 for an overview of this process and a description of the timeframe necessary to complete a project. We stress that skipping steps in this process or speeding through necessary project planning or site preparation may not lead to a successful project.

The disclaimers included in the Introduction (for the private landowner) are worth repeating here for SWCD and other conservation agency staff: the handouts focus on native oak conservation steps that private residential landowners can take – they do not address other important native Pacific Northwest habitats, or large-scale oak conservation at parks, natural areas, or on rural lands.

This version 1.2 of the document represents a 'first edition,' and all errors and omissions are the responsibility of Mark Griswold Wilson and Ted Labbe. Feedback and suggestions are welcome and should be sent to markgriswoldwilson@gmail.com, ted.labbe@gmail.com, and info@conservationdistrict.org.

# 1 Introduction & Purpose

*Conserving Oregon White Oak in Urban and Suburban Landscapes*

# 1 // INTRODUCTION & PURPOSE

## 1.1 Ecological and cultural significance of Oregon white oak

Historically, Oregon white oak woodlands, savannas, and prairies dominated the Willamette Valley, supporting a rich biodiversity of plant and wildlife species. Indigenous people used fire to manage these habitats and promote food resources such as acorns and camas, as well as food for game animals such as deer and elk.

With settlement by Euro-Americans, fire suppression, land conversion to agriculture and urbanization, this rich ecosystem has dwindled, imperiling a host of associated plants and wildlife. Over 300 species of native wildlife and plants are found in association with these habitats, and many of these species are found nowhere else. Roads and other development impacts have fragmented remnant habitats and created avenues for the introduction and expansion of invasive weeds. Today less than 5% of oak and prairie habitats remain, with greater than 90% of them on private lands where they are threatened by ongoing development and the spread of invasive species.

The overlap between native oak habitats and human settled lands represents both a threat and an opportunity for conservation. Native Oregon white oak responds well to restoration, and the preservation of even a few oaks within a neighborhood can have far-reaching impacts benefiting humans as well as native wildlife and plant species. Through active conservation of oak in your yard and neighborhood, you can be an important partner working to ensure their long-term persistence and health[1].

## 1.2 Benefits of oak conservation and enhancement

There are numerous benefits to conserving and enhancing native oak and prairie in your yard and neighborhood. You will attract native birds, bees, butterflies, and other beneficial insects and wildlife. You will save water, since native oak and prairie ecosystems are drought-hardy after establishment and thrive without supplemental summer watering, unlike typical non-native landscaping (like lawns). You will also enjoy an ever-changing native plant garden scene with relatively low annual maintenance, as compared to the typical high-maintenance and high-input manicured garden.

There will also be benefits that accrue beyond your yard. Your oak-natures-caped yard will reflect the cultural heritage of the Willamette Valley and will support the wider integrity and connectivity of habitats within your neighborhood. Oak and prairie landscapes frequently include a palette of plants with deep cultural significance to Northwest native tribes, and can help homeowners connect with important traditions of stewardship for plants, such as camas and other bulbs. By protecting and restoring native oak habitats, you also become an active participant in the regional ecosystem and cultural conservation strategy to protect and enhance native oak ecosystems and the species that depend on them.

## 1.3 Purpose of the guide

This document provides guidance to landowners and others interested in conserving and planting Oregon white oak and associated prairies where

1 *Tallamy, Douglas W. Bringing Nature Home: How you can sustain wildlife with native plants. Timber Press. Portland, OR. 2007.*

they live. We begin with simple steps that all residents can do to protect and enhance native Oregon white oak habitats in their yards and neighborhoods (Section 2). For those with sufficient time and resources, the sections following provide a basic guide on how to implement an oak naturescaping project to restore associated understory vegetation (Sections 3-7).

This guide focuses on conservation steps that residents of oak-rich neighborhoods can implement to preserve the rich legacy of Oregon white oak and associated flora and fauna. It can complement other guides for gardening with Pacific Northwest oak-prairie habitats[2], but emphasizes plant associations common to the north Willamette Valley. It does not address other important native Northwest habitats, such as riparian areas, wetlands, and upland conifer forests. There are other more general Northwest naturescaping books and resources available if you have these other habitats in your yard and are seeking information on enhancement ideas you can implement[3].

## 1.4 Definitions

Throughout the guide we use the terms landowner and resident interchangeably. All residents of oak-rich neighborhoods can contribute to their conservation, whether they are landowners or not. However, if you are altering the vegetation or landscaping on a property, you will obviously need the permission of the landowner. There are numerous ways that residents of oak-rich neighborhoods can contribute to oak conservation, even if they lack access to land to implement an oak naturescaping project (see Section 2, below).

*Photo credit: OakQuest volunteer*

"Oak" means Oregon white oak, unless specified otherwise. Oregon white oak (*Quercus garryana*) is our only native oak in the north Willamette Valley and is the signature species for a variety of habitats that include oak woodlands, oak savanna, and prairie.

"Oak naturescaping" is landscaping in support of native Oregon white oak. It involves planning, designing, implementing, and maintaining a landscape in and around native Oregon white oak trees with native plants in a way that supports ecological functions and benefits. This includes the planting or enhancement of existing native tree, shrub and groundcover species; the removal and control of invasive vegetation; minimizing the use of fertilizer and irrigation under remnant oaks; and more. You do not need to have native Oregon white oak in your yard to implement an oak naturescaping project that benefits the wider ecosystem.

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*2 GOERT. 2009. Garry Oak Gardeners Handbook. Garry Oak Ecosystems Recovery Team, Victoria, BC Canada. 2nd Edition. http://www.goert.ca/documents/GOERT_Gardeners_Handbook.pdf*
*Logalbo, Mary and M.G. Wilson. 2016. The Meadowscaping Handbook: Designing, planting and managing an urban meadow. West Multnomah Soil & Water Conservation District, Portland, OR. https://wmswcd.org/projects/the-meadowscaping-handbook/*

*3 Stark, Eileen M. 2014. Real Gardens Grow Natives: Design, plant, and enjoy a healthy Northwest garden. Mountaineer Books, Seattle. 320 pages.*
*Kruckeberg, Arthur. 1996. Gardening with Native Plants of the Pacific Northwest. University of Washington Press, Seattle. 288 pages.*
*Link, Russell. 1999. Landscaping for Wildlife in the Pacific Northwest. Washington Department of Fish and Wildlife. University of Washington Press, Seattle, WA.*
*Weston, et al. 2011. Naturescaping: A landscaping partnership with nature. Oregon Department of Fish and Wildlife, Salem, OR.*

2

# First Steps: Safeguarding Oak

*Conserving Oregon White Oak in Urban and Suburban Landscapes*

# 2 // FIRST STEPS: SAFEGUARDING OAK

## 2.1 Protect remnant oaks


Photo credit: Ed Alverson

For all landowners and residents with remnant native Oregon white oak habitats in their yard or neighborhood, a crucial first step is: Do no harm.

Some landowners with oak may lack the time and resources to implement oak naturescaping projects, but these individuals can still be key partners in regional oak habitat conservation by preserving remnant oaks and managing their land to support the long-term persistence of this ecosystem and the wildlife species that depend on them.

For all landowners with native Oregon white oak in their yard or neighborhood, our recommendations are:

- Avoid or minimize oak tree removal and pruning. When you must remove trees, favor retention of Oregon white oak over Douglas-fir or other species. Use only light pruning when necessary and seek the advice of a licensed professional arborist when needed.
- Leave the leaves beneath oak trees to support soil health.
- Consider transplanting oak seedlings that are naturally regenerating in your yard during the late fall, to promote their establishment in sunny areas beyond existing tree canopies.
- Do not irrigate and fertilize beneath the canopy of a mature oak. Under and around oaks, maintain a 'summer-dry' meadow or lawn with occasional high-mowing to keep vegetation heights low.
- Talk with your neighbors about the ecological and cultural heritage that Oregon white oak represents, to foster greater awareness and stewardship of this imperiled habitat.
- Observe and record wildlife species using the Oregon white oak in your yard and/or neighborhood.

## 2.2 Further steps

Not everyone is lucky enough to have a mature native oak in their yard or neighborhood, but you can still be an ambassador for the oaks by talking with your neighbors to encourage oak conservation in their yards, supporting and promoting oak conservation efforts at nearby parks and natural areas, and planting an oak tree in your yard.

Take the time to visit a nearby natural area during the spring and at other times of the year, and note the species that thrive there and in your neighborhood. What are the dominant tree and shrub species? Are invasive plants present? What is the local park manager or natural area stewardship group doing to enhance and restore the native habitats? Are there opportunities for you to get involved or support this work?

*Photo credit: OakQuest volunteer*

Take the time to learn what your local community does to promote tree and vegetation conservation on private lands generally, and for native oaks in particular. For a start, see Appendix 8.4 below on vegetation conservation requirements in north Clackamas communities. Many communities have basic tree preservation rules but do not have policies that favor or promote Oregon white oak (for example, as a choice for street trees in appropriate settings). What trees are recommended in your community? If you are so inclined, what opportunities are there for you to get involved in improving these policies?

For residents of oak-rich neighborhoods with sufficient time, resources and devotion to native oak conservation, a potential next step is implementing a native oak naturescaping project, as described in the following sections. An oak naturescaping project involves planting oaks and restoring the native oak understory plant communities of shrubs and/or prairie. Naturescaping with oak takes time and resources, which not all landowners have, but it may appeal to those who enjoy gardening.

Before deciding to undertake such a project, read on and consider your available resources in relation to the various recipes for success. Remember that protecting even one Oregon white oak tree in your yard or neighborhood can support the greater native oak ecosystem including many oak-associated wildlife species.

3

# Planning
## Your Native Oak-Prairie Naturescaping Project

*Conserving Oregon White Oak in Urban and Suburban Landscapes*

# 3 // PLANNING YOUR NATIVE OAK-PRAIRIE NATURESCAPING PROJECT

## 3.1 Introduction

A successful oak naturescaping project involves a specific sequence of five project phases. Each phase sets up and prepares you for subsequent phases. A successful project, running from planning through planting and first-year monitoring post plant-installation, may take 2-3 years. Most successful oak naturescaping projects do not rush the scoping, planning, and site preparation phases. By comparison, the planting, seeding, and installation phases are relatively short in duration.

The sequence of oak naturescaping project phases and their approximate duration are:

- ***Planning:*** 2-6 months
- ***Design:*** 1-2 months
- ***Site preparation:*** 1-2 years
- ***Planting, seeding, & installation:*** 1-3 weeks during Sept. and Oct.
- ***Maintenance and monitoring:*** 1-3 days/year

The timing of these project phases across a year is also important. While nurseries, garden shows and books often promote spring planting, the best time of year to establish your oak-prairie plantings is in the early fall from mid-September through October, after the onset of fall rains. This means your site preparation will typically begin during the preceding fall or spring (***Figure A***).

The cost of a small-scale oak naturescaping project of 1,000 square feet or less may range from $200-$2,000, depending on whether you hire a landscape professional to assist with site preparation and design, your mix of planting stock (larger plants cost more), and the type and volume of mulch. If you have less money or time to implement and maintain an oak naturescaping project, select a smaller area and/or a planting plan that integrates more shrubs and fewer wildflowers and grasses (since the latter generally require more maintenance. For those with financial resources and less time, you may wish to hire a professional to assist with some/all of the project design, site preparation, and installation.

We encourage you to start with a small oak naturescaping project of 1,000 square feet or less, learn what techniques and plants work well for you, and then expand your project as your time and budget allows. Before you begin your project use the information in this guide to craft a realistic project scope, schedule and budget to make sure it is feasible. See Appendix 8.1 for a checklist of key steps in the project process.

The planning phase will involve a visit to a nearby natural area for inspiration, scoping out the best location(s) in your yard, completing a questionnaire to guide your planning, investigating your soil and local community codes related to vegetation management, and gathering other information to prepare for the design of your project.

## 3.2 Seek inspiration

The natural vegetation in many of our residential neighborhoods has been greatly altered and degraded over time. Before beginning your project, we encourage you to visit nearby certified habitat gardens, greenspaces and natural areas with thriving native oak and prairie habitats to draw inspiration for your design work. See the list of nearby areas below in Appendix 8.2. Try and visit at least one of these sites, during the months of April or May – at the height of the spring wildflower bloom.

During your visit, note the native species that occur together in settings that are like your yard. Reference a field guide, inquire with the natural area manager or contact your local SWCD for any unknown species that you are particularly

*Figure A. Timing and duration of project phases for a typical oak naturescaping project. In this example, the site preparation phase begins one year in advance of the fall plant installation during year 2. The actual timing and duration of each phase depends on the specific needs of a given site and project.*

| PROJECT PHASE | KEY STEPS | YEAR 1 Fall | YEAR 1 Winter | YEAR 1 Spring | YEAR 1 Summer | YEAR 2 Fall | YEAR 2 Winter | YEAR 2 Spring | YEAR 2 Summer | YR 3+ Fall |
|---|---|---|---|---|---|---|---|---|---|---|
| PLANNING | Questionnaire and conceptual design | | | | | | | | | |
| | Native garden and natural area visit | | | | | | | | | |
| DESIGN | Refine layout | | | | | | | | | |
| | Final design | | | | | | | | | |
| | Order plants | | | | | | | | | |
| SITE PREPARATION | Site preparation treatments | | | | | | | | | |
| PLANTING & SEEDING | Installation | | | | | | | | | |
| MAINTENANCE & MONITORING | Photopoints | | | | | | | | | |
| | Replant, reseed and cut back plants | | | | | | | | | |

interested in but cannot identify. What native trees, shrubs, and groundcovers occur at the natural area versus in your neighborhood or yard?

Most of Clackamas and Washington counties, as well as select portions of Multnomah, Columbia and Clark counties historically supported Oregon white oak habitats[4]. Native oak tends to occupy drier, thin-soiled ridgetops as well as south/southwest facing slopes. However, in Washington County oak may also be found growing in wet areas with Oregon ash.

## 3.3 Complete the planning questionnaire

Planning a successful oak naturescaping project requires that you consider various project details simultaneously. Appendix 8.3 contains a project planning questionnaire that is designed to focus your thinking and consideration of these details before designing your project.

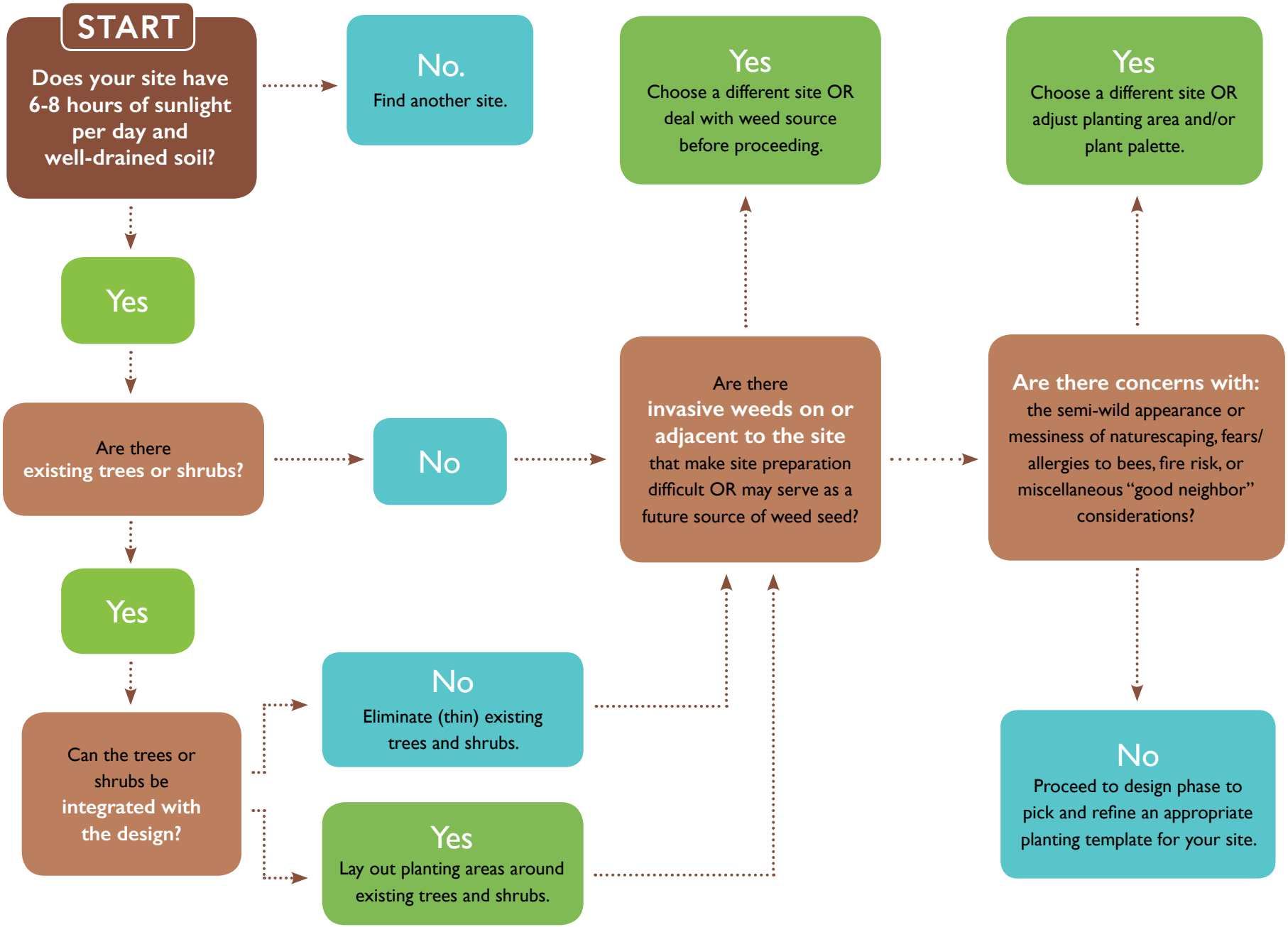
Take some time to complete this questionnaire, and from it you will derive ideas to assist with outlining your project goals and a conceptual site plan. As you step through the questionnaire you may identify certain details needing resolution before you can proceed. For example, certain limitations like homeowners association rules on vegetation heights, or vegetation clearance around rights-of-way or utility corridors need attention before you implement your project (see Appendix 8.4 on regulatory considerations). The questionnaire will also help match your project goals and preferences with the suitability of your site for oak naturescaping.

## 3.4 Refine your project scope and prepare a conceptual site plan

Use your questionnaire responses and the flow chart in ***Figure B*** (following page) to select a suitable portion of your yard for the oak naturescaping project. After selecting the project area, conduct a soil test and observe the distribution of sunlight across the day to better guide your selection of native plants and site preparation treatments. Gather any needed additional information on the location of property lines, utilities, and vegetation height or setback requirements.

4 *Christy, J.A. And E.R. Alverson. 2011. Historical vegetation of the Willamette Valley, Oregon, circa 1850. Northwest Science 85(2): 93-107. http://www.bioone.org/doi/pdf/10.3955/046.085.0202*
*For the distribution of remnant native oak in the Portland-Vancouver metropolitan region see https://databasin.org/groups/28468f0818724d1090bda7cb507ba633*

## *Figure B.* Selecting a suitable site for oak naturescaping



After you complete these steps, you should re-evaluate your project scope, goals, schedule and budget, and adjust as necessary. Then sketch a conceptual site plan following the guidance below (***Figure C***). Do not fuss over the artistic quality or precise dimensions of your initial site plan layout. However, be sure to complete several different interpretations as you walk around your site and view it from different angles. Your goal is not to locate individual plants during this exercise, but to create a simple bubble drawing of where the low-growing wildflowers will go versus taller shrubs versus existing trees, etc. See ***Figure C*** below for an example.

Your conceptual site plan shows the general juxtaposition of the planting areas (e.g. low wildflower bed versus shrub patches). It does not need to have precise distances or areas, but you certainly can measure the length and area of your house and planting areas if that is helpful. For our purposes a hand-drawn site plan with approximate locations and area estimates are sufficient. Start by drawing in your house, the street, and other buildings as references. Add a north arrow and highlight large landscape features like driveways, patios, large trees or shrubs.

Walk around your yard with your site plan and mark any prominent slopes, grade changes, large rocks, wet areas, or shallow soils. Finally, create an outline of the oak naturescaping planting area and delineate different patches of

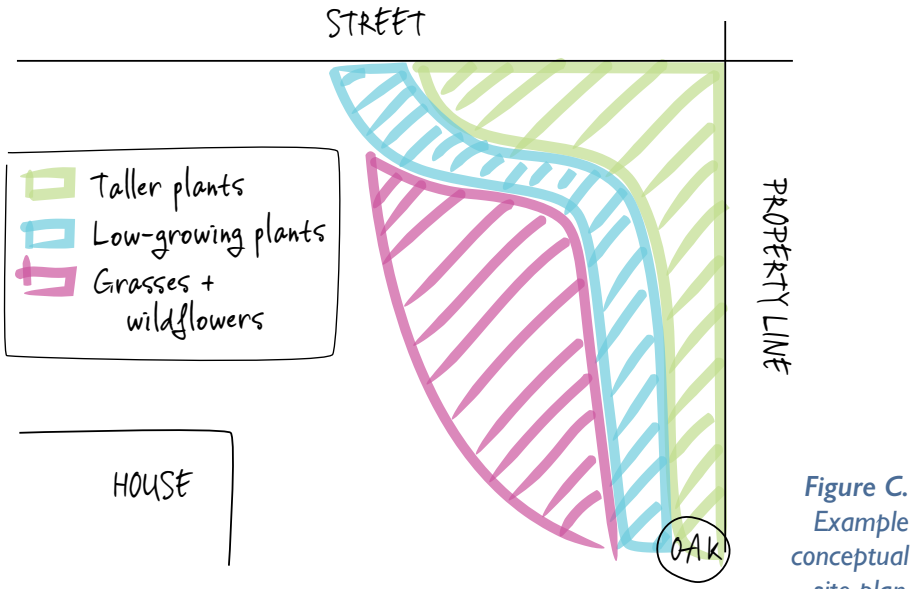



*Figure C. Example conceptual site plan.*

vegetation types (e.g. native grass/wildflower ground layer, shrub layer, tree layer) with your estimate of their approximate area(s) in square feet. You can use color if this helps, but it is not required.

Before you begin the design phase, seek out design advice or guides to expand your access to fresh ideas[5]. There are a variety of resources available in books online for guiding you in development of a site plan for your project.

*5 Bornstein, Carol, David Fross, and Bart O'Brien. 2011. Reimagining the California Lawn: Water conserving plants, practices and designs. Cachuma Press, Los Olivos, CA.*
*Brooks, John. 1995. Garden Design Workbook: A practical step by step course. Dorling Kindersley Publishing. NYC, NY. (Sections 1 Design Principles and 2 Practical Skills).*
*Diekelmann, John and Robert Schuster. 2002. Natural Landscaping: Designing with native plant communities. University of Wisconsin Press. Madison, WI. (Parts 1 Introduction and 3 Planning and Establishing the Landscape).*
*Greenlee, John. The American Meadow Garden: Creating a natural alternative to the traditional lawn. Timber Press, Portland, OR. 2009*
*Keator, Glenn and Alrie Middlebrook. 2007. Designing California Native Gardens: A plant community approach to artful ecological gardens. University of California Press. Berkeley, CA.*
*Rainier, Tom, and Claudia West. 2015. Planting in a Post-Wild World: Designing plant communities for resilient landscapes. Timber Press. Portland OR.*
*Tallamy, Douglas W. And Rick Darke. 2014. The Living Landscape: Designing for beauty and biodiversity in the home garden. Timber Press, Portland, OR. (See Chapters 1 Layers in Wild landscapes and 5 Applying Layers to the Home Garden).*

4

# Designing Your Native Oak-Prairie Naturescaping Project

*Conserving Oregon White Oak in Urban and Suburban Landscapes*

# 4 // DESIGNING YOUR NATIVE OAK-PRAIRIE LANDSCAPE

## 4.1 Introduction

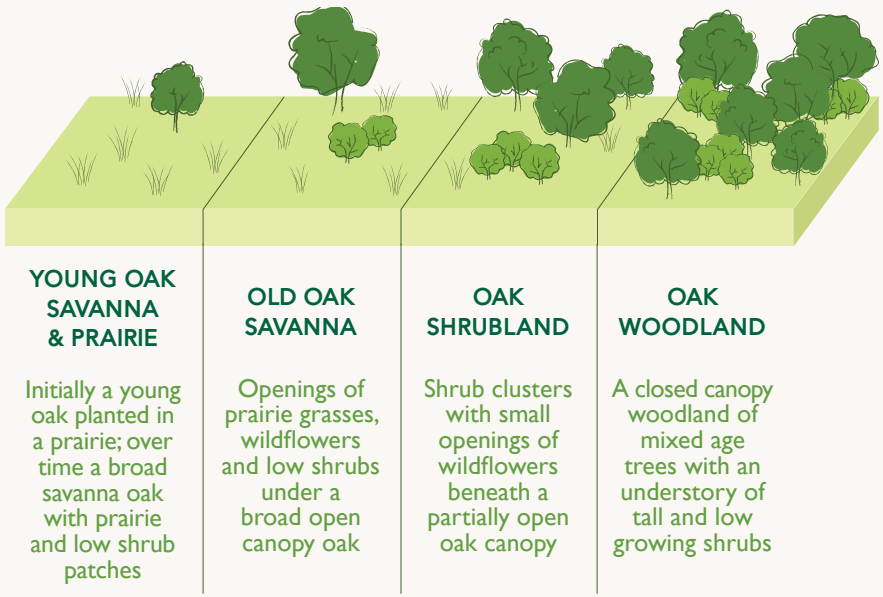
With your completed planning questionnaire, identified goals, and a conceptual site plan for a portion of your yard (see Section 3 and Appendix 8.1), you are now ready to begin designing an oak naturescaping project. During the design phase, you will refine your conceptual site plan, select a planting template, determine your plant layout, and produce a final site plan. The last step is to research available sources of plant materials.

## 4.2 Select a Landscaping with Oregon oak planting template

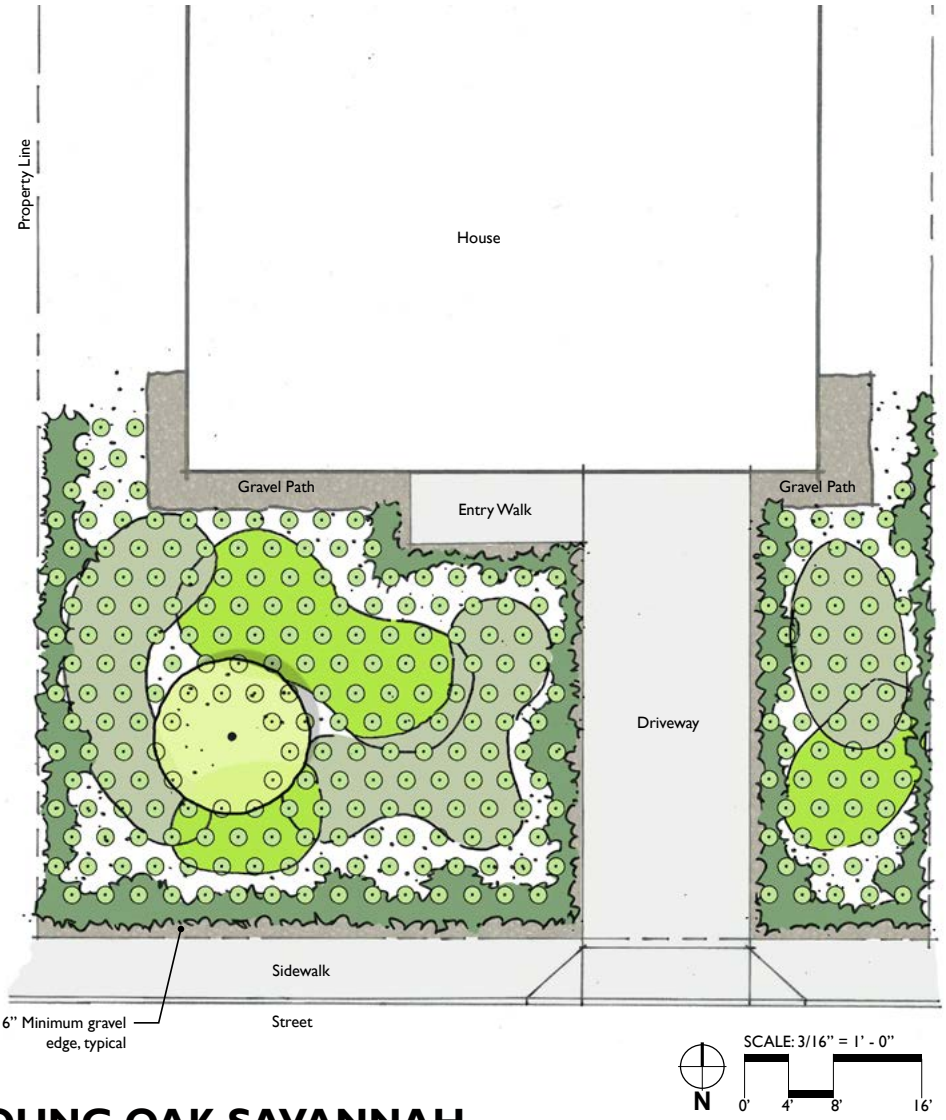
Once you have completed the previous planning exercises in Section 3, you should have an idea of whether you want your oak naturescaping project to have a more prominent shrub component (to provide a visual screen, etc.), or to support more low-growing wildflowers (for more open views, pollinator habitat, etc.). With this information, use the tool in ***Figure D*** to select one of the four planting templates and review plant information on the appropriate planting plan (See ***Figures F.1-F.4***, following). See Appendix 8.5 for more information on the individual planting plans.

If you have or desire a range of vegetation conditions at your site, pick one plan as a starting point and borrow plant selections from the others as appropriate. You may also find other plant guides and tables listed in the appendices of the Meadowscaping Handbook[6] or Portland Plant List helpful for identifying appropriate substitute Pacific Northwest species if you have difficulty locating a source of plant materials identified on these Oregon oak planting plans.

*Figure D. Selecting an oak naturescaping planting template.*




6 *Logalbo, M. And M.G. Wilson. 2016. The Meadowscaping Handbook. West Multnomah Soil & Water Conservation District, Portland OR. 86 pages.*




## LEGEND

Young Oak Savannah

Initially a young oak planted in a prairie; over time, a broad (open grown) savannah oak with prairie + low shrub patches beneath. (See Old Oak Savannah design).

| Species | Plant Size/Type | Spacing/Seed Rate |
|---|---|---|
| **Tree** | | |
| *Quercus garryana (Oregon White Oak)* | 2" Cal. - B&B or Cont. | |
| **Perennial Grass/Rush/Sedge Matrix -** | | |
| (33%) *Carex tumulicola (Foothill Sedge)* | | |
| (34%) *Festuca roemeri (Roemer's Fescue)* | Plug (All) | 3' O.C. (All) |
| (33%) *Juncus tenuis or J. Patens (Rushes)* | | |
| **Wildflower Edge** | | |
| *Achillea millefolium (Western Yarrow)* | | 30' O.C. |
| *Fragaria virginiana ssp. platypetala (Field Strawberry)* | Plug (All) | 20' O.C. - groups 3+ |
| *Eriophyllum lanatum (Oregon Sunshine)* | | 20' O.C. - groups 1-3 |
| **Wildflower Patch 1** | | |
| *Asclepias speciosa or A. fasicularis (Milkweeds)* | 4" Pot | 20' O.C. - groups 1-3 |
| *Camassia leitchlinii (Great Camas Lily)* | Bulb | 12 bulbs/100 sq. ft. - groups 3+ |
| *Ranunculus occidentalis (Western Buttercup)* | Plug | 10' O.C. - groups 1-3 |
| *Grindelia integrifolia (Gum Weed)* | 4" Pot | 20' O.C. |
| **Wildflower Patch 2** | | |
| *Aquilegia formosa (Western Columbine)* | 4" Pot | 10' O.C |
| *Potentilla gracilis (Slender Cinquefoil)* | 4" Pot | 20' O.C. |
| *Sidalcea virgata (Rose Checkermallow)* | 4" Pot | 20' O.C. |
| *Symphyotrichum hallii (Hall's Aster)* | 4" Pot | 20' O.C. |
| **Annual Grass & Wildflower Matrix** | | |
| *Deschampsia danthonioides +* *Deschampsia elongata (Hairgrass)* | Seed (All) | < .01 oz./100 sq. ft. (All) |
| *Clarkia amoena (Farewell to Spring)* | | |
| *Collomia grandiflora (Large-leaf Collomia)* | | |
| *Gilia capitata (Blue Field Gilia)* | | |

Note:

1. Seed all areas with Annual Grass & Wildflower Matrix except Wildflower Patches and Edge. Seed mix provides short term weed suppression and erosion control.
2. Distribute Perennial Grass/Rush/Sedge Matrix species evenly throughout the entire planting area.
3. Wildflower Patch outlines are shown overlapping to indicate that where patches edges meet, plants within each zone can be combined and feathered into one another to create a natural transition.

Mark Griswold Wilson, M.Sc. URBAN ECOLOGY

GREENWORKS

# YOUNG OAK SAVANNAH

## LANDSCAPING WITH OREGON OAK

Mark Griswold Wilson, M.Sc.
URBAN ECOLOGY

GREENWORKS


## LEGEND

Old Oak Savannah

Openings of prairie grasses, wildflowers and low shrubs under a broad open canopy oak.

| Species | Plant Size/Type | Spacing/Seed Rate |
|---|---|---|
| **Tall Shrubs** | | |
| *Lonicera hispidula (Hairy Honeysuckle Vine)* | 1 Gal. Cont. | 50' O.C. - groups 1-3 |
| *Mahonia aquifolium (Tall Oregon Grape)* | 1 Gal. Cont. | 20' O.C. - groups 1-3 |
| *Symphoricarpos albus (Common Snowberry)* | 1 Gal. Cont. | 20' O.C. - groups 1-3 |
| *Philadelphus lewisii (Mockorange)* | 1 Gal. Cont. | 30' O.C. - groups 1-3 |
| *Ribes sanguineum (Red Currant)* | 3-5 Gal. Cont. | 50' O.C. |
| *Rosa gymnocarpa (Baldhip Rose)* | 1 Gal. Cont. | 30' O.C. |
| *Rubus parviflorus (Thimbleberry)* | 1 Gal. Cont. | 20' O.C. - groups1-3 |
| **Perennial Grass/Rush/Sedge Matrix & Wildflower Patches** | | |
| Perennial Grass/Rush/Sedge Matrix: | | |
| *(33%) Carex tumulicola (Foothill Sedge)* | Plug (All) | 3' O.C. (All) |
| *(34%) Festuca roemeri (Roemer's Fescue)* | | |
| *(33%) Juncus tenuis or J. patens (Rushes)* | | |
| Wildflower Patches: | | |
| Sun Mix | | |
| *Aquilegia formosa (Western Columbine)* | 4" Pot | 20' O.C. |
| *Asclepias speciosa or A. fasicularis (Milkweeds)* | 4" Pot | 20' O.C. |
| *Camassia leitchlinii (Great Camas Lily)* | Bulb | 12/100 Sq. Ft. - groups 3+ |
| *Grindelia integrifolia (Gum Weed)* | 4" Pot | 20' O.C. |
| *Potentilla gracilis (Slender Cinquefoil)* | 4" Pot | 20' O.C. |
| *Ranunculus occidentalis (Western Buttercup)* | Plug | 10' O.C. - groups 1-3 |
| *Sidalcea virgata (Rose Checerkmallow)* | 4" Pot | 20' O.C. |
| *Symphyotrichum hallii (Hall's Aster)* | 4" Pot | 20' O.C. |
| Shade Mix | | |
| *Camassia leitchlinii (Great Camas Lily)* | Bulb | 12/100 Sq. Ft. - groups 3+ |
| *Ranunculus occidentalis (Western Buttercup)* | 4" Pot | 10' O.C. - groups 1-3 |
| *Tellima grandiflora (Fringe Cup)* | 4" Pot | 10' O.C. |
| **Low Shrubs** | | |
| *Arctostaphylos uva-ursi (Kinnickinick)* | 1 Gal. Cont. | 4' O.C. - groups 1-3 |
| *Mahonia nervosa (Leatherleaf Oregon Grape)* | 1 Gal. Cont. | 4' O.C. - groups 1-3 |
| *Mahonia repens (Cascade Oregon Grape)* | 1 Gal. Cont. | 4' O.C. - groups 1-3 |
| *Polystichum munitum (Swordfern)* | 1 Gal. Cont. | 4' O.C. - groups 1-3 |
| *Spiraea lucida (Shiny Leaf Spirea)* | 1 Gal. Cont. | 4' O.C. - groups 1-3 |
| *Symphoricarpos hesperius or S. mollis (Creeping Snowberry)* | 1 Gal. Cont. | 4' O.C. - groups 1-3 |
| **Annual Grass & Wildflower Matrix** | | |
| *Deschampsia danthonioides + Deschampsia elongata (Hairgrasses)* | | |
| *Clarkia amoena (Farewell to Spring)* | Seed (All) | < .01 oz./100 Sq. Ft. (All) |
| *Collomia grandiflora (Large-leaf Collomia)* | | |
| *Gilia capitata (Blue Fleld Gilia)* | | |

Note:
1. Seed all areas with Annual Grass & Wildflower Matrix except Low Shrubs and Wildflower Patches. Seed mix provides short term weed suppression and erosion control.
2. Distribute Perennial Grass/Sedge/Rush Matrix species evenly throughout the entire planting area.

# OLD OAK SAVANNAH

## LANDSCAPING WITH OREGON OAK

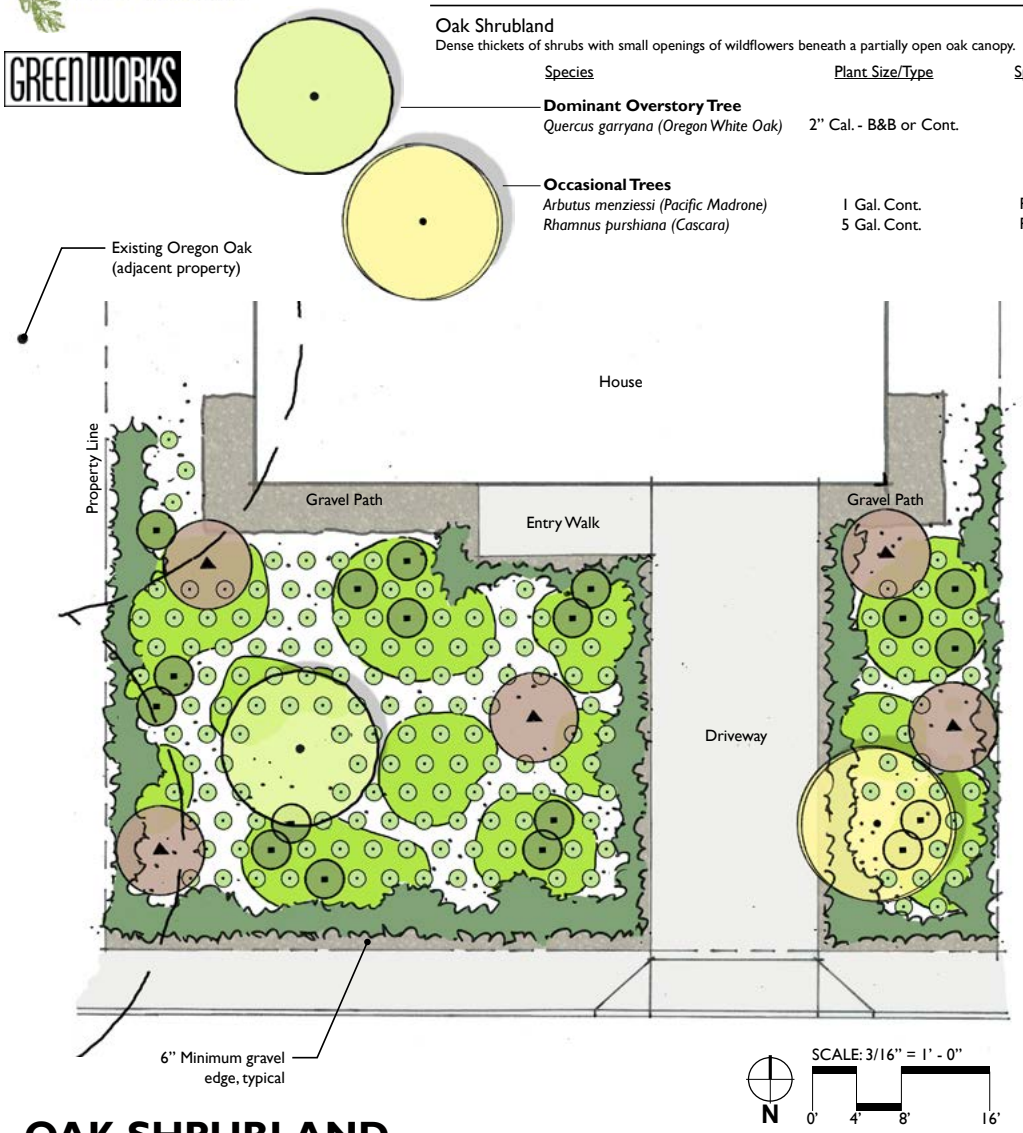
Mark Griswold Wilson, M.Sc.
URBAN ECOLOGY

GREENWORKS

## LEGEND

Oak Shrubland
Dense thickets of shrubs with small openings of wildflowers beneath a partially open oak canopy.

| Species | Plant Size/Type | Spacing/Seed Rate |
|---|---|---|
| **Dominant Overstory Tree** | | |
| *Quercus garryana (Oregon White Oak)* | 2" Cal. - B&B or Cont. | |
| **Occasional Trees** | | |
| *Arbutus menziessi (Pacific Madrone)* | 1 Gal. Cont. | Plant in openings |
| *Rhamnus purshiana (Cascara)* | 5 Gal. Cont. | Plant in openings |




| Species | Plant Size/Type | Spacing/Seed Rate |
|---|---|---|
| **Arborescent** | | |
| *Amelanchier alnifolia (Western Serviceberry)* | 1 Gal. Cont. | 30'-50' O.C. |
| *Ceanothus cuneatus or* | | 30'-50' O.C. |
| *C. Sanguineous (Wild Lilac)* | 5 Gal. Cont. | |
| *Holodiscus discolor (Oceanspray)* | 1 Gal. Cont. | 30'-50' O.C. |
| *Oemleria cerasiformis (Indian Plum)* | 1 Gal. Cont. | 30'-50' O.C. |
| *Prunus virginiana (Chokecherry)* | 1 Gal. Cont. | 30'-50' O.C. |
| *Ribes sanguineum (Red Currant)* | 3-5 Gal. Cont. | Plant in openings |
| *Sambucus cerulea (Blue Elderberry)* | 1 Gal. Cont. | 30'-50' O.C. |
| **Tall Shrubs & Wildflowers** | | |
| Tall Shrubs/Vine: | | |
| *Mahonia aquifolium (Tall Oregon Grape)* | 1 Gal. Cont. | 20' O.C. - groups 1-3 |
| *Symphoricarpos albus (Snowberry)* | 1 Gal. Cont. | 20' O.C. - groups 1-3 |
| *Rosa gymnocarpa (Baldhip Rose)* | 1 Gal. Cont. | 20' O.C. |
| *Rubus parviflorus (Timbleberry)* | 1 Gal. Cont. | 20' O.C. - groups 1-3 |
| *Rubus ursinus (Pacific Blackberry)* | 1 Gal. Cont. | 30' O.C. - groups 1-3 |
| Wildflower Patch: | | |
| *Achillea millefolium (Western Yarrow)* | Plug | 30' O.C. |
| *Chameron angustifolia (Fireweed)* | Tube or 1 Gal. Cont. | 30' O.C. |
| *Lupinus rivularis or* | 4" Pot | 30' O.C. - groups 1-3 |
| *native Lupine (Lupines)* | | |
| *Pteridium aquilinum (Bracken Fern)* | Tube or 1 Gal. Cont. | 30' O.C. - groups 1-3 |
| *Solidago canadensis (Goldenrod)* | Tube or 1 Gal. Cont. | 30' O.C. - groups 1-3 |
| *Symphyotrichum douglasii (Douglas Aster)* | Tube or 1 Gal. Cont. | 30' O.C. |
| **Perennial Grass/Rush/Sedge Matrix -** | | |
| (33%) *Carex tumulicola (Foothill Sedge)* | | |
| (34%) *Festuca roemeri (Roemer's Fescue)* | Plug (All) | 3' O.C. (All) |
| (33%) *Juncus tenuis or J. Patens (Rushes)* | | |
| **Low Shrubs** | | |
| *Arctostaphylos uva-ursi (Kinnickinick)* | 1 Gal. Cont. | 4' O.C. - groups 1-3 |
| *Mahonia repens (Cascade Oregon Grape)* | 1 Gal. Cont. | 4' O.C. - groups 1-3 |
| *Polystichum munitum (Sword Fern)* | 1 Gal. Cont. | 4' O.C. - groups 1-3 |
| *Spiraea lucida (Shiny Leaf Spirea)* | 1 Gal. Cont. | 4' O.C. - groups 1-3 |
| *Symphoricarpos hesperius or S.mollis* | 1 Gal. Cont. | 4' O.C. - groups 1-3 |
| *(Creeping Snowberry)* | | |
| **Annual Grass & Wildflower Matrix** | | |
| *Deschampsia danthonioides +* | | |
| *Deschampsia elongata (Hairgrass)* | Seed (All) | < .01 oz./100 Sq. Ft. (All) |
| *Clarkia amoena (Farewell to Spring)* | | |
| *Collomia grandiflora (Large-leaf Collomia)* | | |

Note:
1. Seed all areas with Annual Grass & Wildflower Matrix except Low Shrubs and Wildflower Patch. Seed mix provides short term weed suppression and erosion control.

# OAK SHRUBLAND

## LANDSCAPING WITH OREGON OAK

Mark Griswold Wilson, M.Sc.
URBAN ECOLOGY

GREENWORKS


## LEGEND

Oak Woodland
A closed canopy woodland of mixed age trees with an understory of tall (arborescent) and low growing shrubs.

| Species | Plant Size/Type | Spacing/Seed Rate |
|---|---|---|
| **Occasional Trees** | | |
| *Arbutus menziesii (Pacific Madrone)* | 1 Gal. Cont. | Plant in Openings |
| *Rhamnus purshiana (Cascara)* | 5 Gal. Cont. | Plant in Openings |
| **Arborescent** | | |
| *Amelanchier alnifolia (Western Serviceberry)* | 3 Gal. Cont. | 30' O.C. |
| *Ceanothus cuneatus or C. Sanguineous (Wild Lilac)* | 5 Gal. Cont. | 30' O.C. |
| *Holodiscus discolor (Oceanspray)* | 3 Gal. Cont. | 30' O.C. |
| *Oemleria cerasiformis (Indian Plum)* | 3 Gal. Cont. | 30' O.C. |
| *Prunus virginiana (Chokecherry)* | 3 Gal. Cont. | 30' O.C. |
| *Sambucus cerulea (Blue Elderberry)* | 3 Gal. Cont. | 30' O.C. |
| *Ribes sanguineum (Red Currant)* | 3-5 Gal. Cont. | 30' O.C. |
| **Tall Shrubs/Vine** | | |
| *Lonicera hispidula (Hairy Honeysuckle Vine)* | 1 Gal. Cont. | 50' O.C. - groups 1-3 |
| *Mahonia aquifolium (Tall Oregon Grape)* | 1 Gal. Cont. | 30' O.C. - groups 1-3 |
| *Symphoricarpos albus (Common Snowberry)* | 1 Gal. Cont. | 15' O.C. - groups 1-3 |
| *Philadelphus lewisii (Mockorange)* | 1 Gal. Cont. | 30' O.C. - groups 1-3 |
| *Rosa gymnocarpa (Baldhip Rose)* | 1 Gal. Cont. | 20' O.C. - groups 1-3 |
| *Rubus parviflorus (Thimbleberry)* | 1 Gal. Cont. | 15' O.C. - groups 1-3 |
| *Rubus ursinus (Pacific Blackberry)* | 1 Gal. Cont. | 20' O.C. - groups 1-3 |
| **Low Shrubs** | | |
| *Arctostaphylos uva-ursi (Kinnickinick)* | 1 Gal. Cont. | 4' O.C. - groups 1-3 |
| *Mahonia repens (Cascade Oregon Grape)* | 1 Gal. Cont. | 4' O.C. - groups 1-3 |
| *Mahonia nervosa (Letherleaf Oregon Grape)* | 1 Gal. Cont. | 4' O.C. - groups 1-3 |
| *Spiraea lucida (Shiny Leaf Spirea)* | 1 Gal. Cont. | 4' O.C. - groups 1-3 |
| *Symphoricarpos hesperius or S.mollis (Creeping Snowberry)* | 1 Gal. Cont. | 4' O.C. - groups 1-3 |
| **Perennial Grass/Rush/Sedge Matrix -** | | |
| (33%) *Carex tumulicola (Foothill Sedge)* | | |
| (34%) *Festuca roemeri (Roemer's Fescue)* | Plug (All) | 3' O.C. (All) |
| (33%) *Juncus tenuis or J. Patens (Rushes)* | | |
| **Annual Grass & Wildflower Matrix -** | | |
| *Deschampsia danthonioides + Deschampsia elongata (Hairgrasses)* | | |
| *Clarkia amoena (Farewell to Spring)* | Seed (All) | < .01 oz./100 Sq. Ft. (All) |
| *Collomia grandiflora (Large-leaf Collomia)* | | |
| *Gilia capitata (Blue Fleld Gilia)* | | |

Note:
1. Seed all areas with Annual Grass & Wildflower Matrix except Low Shrubs. Seed mix provides short term weed suppression and erosion control.

# OAK WOODLAND

## LANDSCAPING WITH OREGON OAK

## 4.3 Prepare your final site plan

Use the chosen planting template to refine the conceptual site plan you developed during the planning phase (see Section 3). First, adjust the location, relative size, and orientation of the different bubbles on your conceptual site plan drawing to better match the planting plans, as needed. Then go to your yard and play with the layout of individual plants within each planting bed. In your yard, use twine or string to lay out the various planting bed borders, and color-coded landscape flags (or other recycled, color-coded small objects) to represent the position of various plants. Within each defined planting area, place flags at the spacing specified in the planting template, and group plants in clusters of 3-7. Before you dismantle your layout, make sure you measure the planting bed dimensions and count the numbers of needed plants (see Section 4.4).

*Placing flags (Photo: Mark Griswold Wilson)*

Consider the various microclimates of each bed when laying out individual species, including shade, aspect, and soil conditions. Also think about focal points, plant heights, and managing edges. See ***Figures F.1-F.4*** and pages 14-18 in the Meadowscaping Handbook for more specific design guidance and advice on how to adapt a planting plan to your yard.

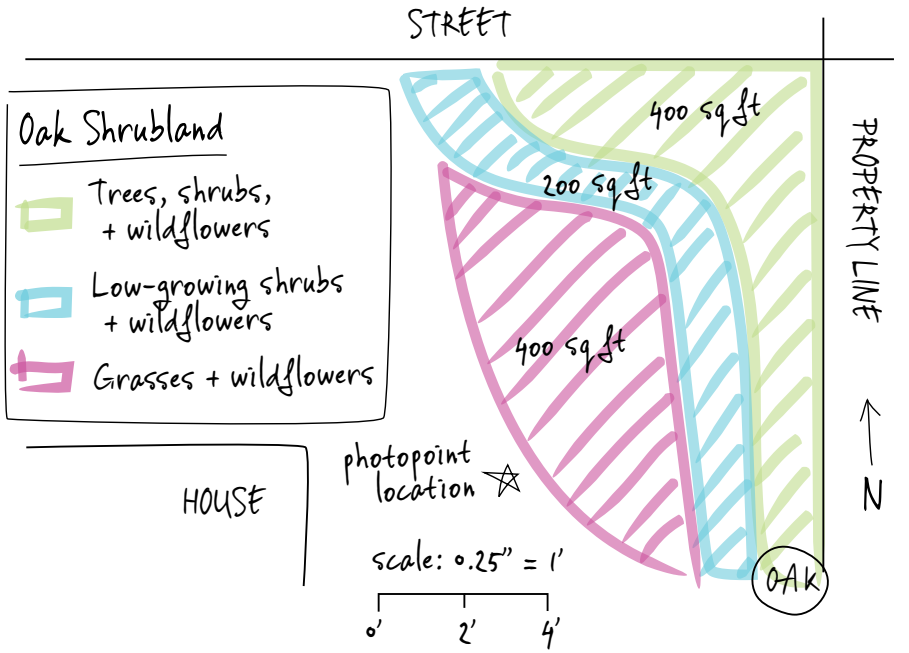
## 4.4 Estimate needed plant materials

With your planting beds delineated and plants located, you are ready to generate a final scaled site plan and estimate needed plant materials. See ***Figure E***, opposite, for an example of a final site plan. At the end of this exercise you should know the approximate area in square feet of your various vegetation patches and be ready to place your plant order. Remember: your final site plan does not have to be artistic – you only need it to estimate the quantity of plant materials to order and later to lay them out in your yard.

To measure the area of an oblong or odd-shaped planting bed, break it into a series of smaller rectangular subareas. Use a measuring tape to measure the length and width of each subarea, and then calculate their individual areas as length (feet) * width (feet) = subarea (square feet). Finally, add the individual subarea measurements together, to produce an overall area estimate in square feet.

Count the flags of various colors you laid out in the previous step to determine the number of potted plants or plugs of specific species you need to order. For bulbs and seeds, you can use the planting bed areas in square feet to estimate your needed quantities, based on the spacing/seed rate in the planting plan.

***Figure E.*** *Example final site plan.*



## 4.5 Research sources of plant materials and place orders

Use Appendix 8.6 to research the availability of plant materials and available container sizes from local nurseries and seed producers. Native plant and seed availability for each vendor changes seasonally and across years. Certain plants may be hard to find or become temporarily unavailable, and you may need to source your plant materials from more than one vendor. It is wise to check on the general availability of plants during the winter or spring prior to your fall planting to improve your chances of locating harder-to-find species.

Use a computer spreadsheet or a copy of your chosen planting template to track and calculate your plant sources, per unit cost, and total numbers by species. Be prepared to make substitutions for plants that are unavailable. Ideally, place your order during the spring prior to your fall planting to improve the chances you have access to your desired plant materials.

For any needed plant substitutions, refer to Appendix C and D of the Meadowscaping Handbook for an illustrative plant guide and list of other prairie species that may be used to supplement and adapt the four planting templates in Appendix 8.5. If suggested plant materials are not available from nurseries, this guidance can be used to substitute plant materials with similar light requirements, size at maturity, bloom time/color, and other characteristics. Another useful document is the Portland Plant List – in particular, cross-reference the plant lists from sections 2.3 (Mixed Deciduous Forest, Steep Dry Slope) and 2.7 (Prairie), with the species-specific information of sections 3.6 and 3.7 (for tall shrubs), 3.8 and 3.9 (low shrubs), 3.10 (forbs), 3.11 and 3.12 (grasses, sedges and rushes), as well as 3.13 (ferns).

*Spiraea betulifolia v. lucida and Ranunculus occidentalis (above); Iris tenax (below)*

*Photo credit (both): Mark Griswold Wilson*

5

# Site Preparation

*Conserving Oregon White Oak in Urban and Suburban Landscapes*

# 5 // SITE PREPARATION

## 5.1 Introduction

Appropriate site preparation is key to the success of your oak naturescaping project. Successful site preparation begins at least six to 24 months before your target planting date (depending on the composition of your site's vegetation), and combines two or more techniques discussed below. The combination of site preparation techniques you choose will depend on your site characteristics, including invasive weeds present, as well as the appropriate seasonality and sequencing of the individual techniques.

Generally, you will combine two site preparation techniques over at least a six-month period. At sites with weed-free turf that can be stripped, you may be able to begin your project during the summer before your fall planting. At challenging sites with persistent invasive vegetation (like Himalayan blackberry), as well as seedbeds or rootstalks of pernicious weeds, you will need to implement an adaptive approach over a longer timeframe. You may also need to consider the judicious use of herbicides, which this guidance does not currently cover. For more on herbicide use, please refer to Chapter 4 (p. 22 and 26) in the companion Meadowscaping Handbook.

Successful site preparation will result in a weed-free planting bed for you to establish your new plants and seeds in, enabling them to escape competition and establish strong growth during their first one to two years post-planting. With each of the techniques discussed below, you should refrain from any soil tillage, which can bring weed seeds to the surface where they will germinate and compete with your new plantings.

Before you begin your site preparation treatments you should set up and take your first set of photo points to document your project progress (see Appendix 8.7).

## 5.2 Site preparation decision tree and sequencing

To select an appropriate combination of site preparation techniques for your site, use the following decision tree in combination with ***Figures F.1 and F.2*** on the following pages, showing the seasonality and sequencing of site preparation techniques. In general, you should apply more and longer duration site preparation treatments in areas with more weeds, particularly those with persistent belowground roots.

Sod-stripping and temporary black plastic are used in advance of sheet composting, solarization, and flame-weeding. Certain techniques must be modified, used sparingly or not at all under oaks: sheet composting should be layered more thinly around tree trunks and roots, and flame-weeding may not be appropriate under trees in thinly-soiled settings. Solarization is only effective with good solar insolation so is not appropriate under trees.

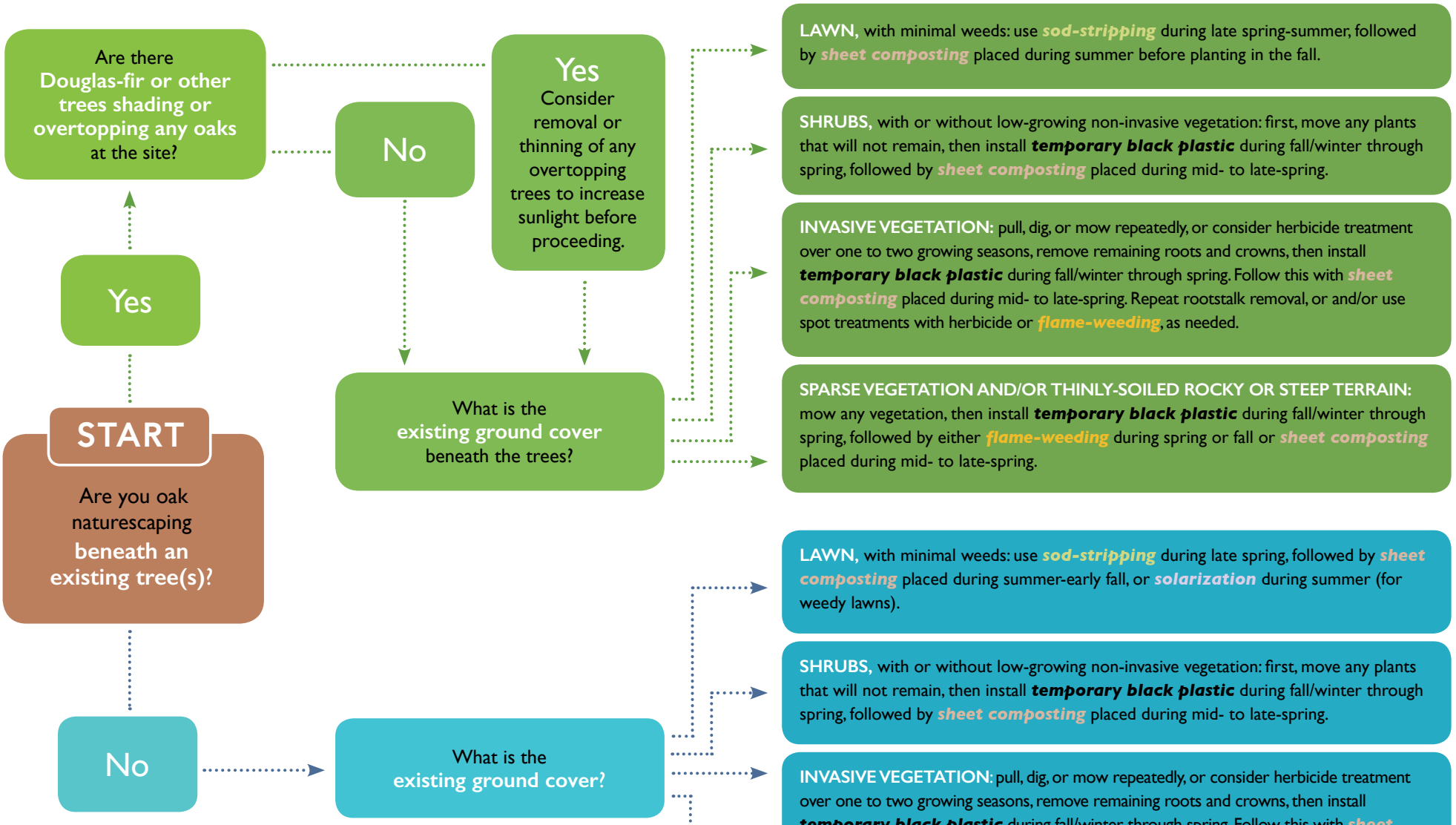



*Figure G.1.*

## Site Preparation Decision Tree

*Note: After completing weed control and/or removing undesirable vegetation, do not till or cultivate the soil and avoid any added ground disturbance that could bring new weed seeds to the surface.*

*Figure G.2. Seasonality and potential sequencing of site preparation treatments. (Note that not all potential combinations and sequences of site preparations are depicted, and that certain treatments are inappropriate for some sites.)*

| TREATMENT METHOD | SEPT. | OCT. | NOV. | DEC. | JAN. | FEB. | MAR. | APR. | MAY | JUNE | JULY | AUG. | PLANTING SEASON SEPT. | PLANTING SEASON OCT. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Temporary Black Plastic** | Install | | | | | | | Remove | | | | | | |
| **Sod-stripping (for weed-free lawn)** | | | | | | | | | | | | | | |
| **Sheet Composting** | | | | | | | | | | | | | | |
| **Solarization (do not use under trees)** | | | | | | | | | Install | | Remove | | | |
| **Flame-weeding (use with care under trees)** | | | | | | | | | | | | | | |


*Sheet mulching*


*Stripping sod by hand*

## 5.3 Site preparation do's and don'ts

**Do:**

- Consider your site and appropriate site preparation techniques at least a year in advance of your target fall planting window.
- Investigate your options for weed-free materials for sheet composting to ensure you are not importing material contaminated with weeds onto your site.
- Use the various techniques during their appropriate seasons.
- Consider how you combine your chosen site treatments at a site with more than one type of existing cover (e.g. lawn **and** large shrubs).
- In weedy areas with no woody vegetation, place up to 6 inches of sheet mulch on areas outside the drip line of mature trees and shrubs.
- Identify any weeds on site or in adjacent areas and adopt a suite of recommended site preparation techniques and/or herbicide to best address them (see Appendix 8.8).
- Take stock of any residual native oak-prairie associated shrubs and consider how you can integrate them into your design (see Appendix 8.9). It may be easier to preserve and maintain existing vegetation than it is to establish new plants if weeds are not too abundant or unmanageable.

**Don't:**

- Try and implement last-minute site preparation in the last few weeks or months before your fall planting.
- Use solarization under existing oaks or other trees, since it could jeopardize their long-term health. And the shade cast by these trees may render the technique ineffective.
- Place more than a 6" depth of sheet mulch under existing oaks or other mature trees and shrubs as it could jeopardize tree health.
- Lay down thick layers of sheet mulch under existing oaks or other trees (within their drip line). Keep mulch to less than six inches under trees.
- Expect to be able to effectively eliminate invasive blackberry and other invasive plants with residual underground root structures in one season. It will likely take at least two years of repeat treatments to adequately prepare sites like this and/or use of herbicide.
- Think you can strip away all residual vegetation at your site and not address belowground residual vegetation and/or the seedbed of weed seeds in the top layers of the soil.
- Think of flame-weeding as a panacea that replicates natural fire regimes. Flame-weeding is more like solarization (when applied properly), since it relies on residual soil moisture to draw heat into the top few inches of the soil and sterilize weed seeds.

## 5.4 Site preparation how-to instructions

The following section describes the various site preparation techniques in detail, explaining their appropriate use and timing, materials and procedures.

### 5.4.1 TEMPORARY BLACK PLASTIC SHEETING

**Use and Timing:**
Use this method in the fall/early winter through spring to smother unwanted vegetation. Place plastic directly on patches of mown non-woody weeds and nonnative grasses (e.g. crabgrass, dandelion, etc.).

**Materials:**
1 roll 6 mil black poly sheeting 24 ft X 50 ft.
Bark mulch or weed free compost

**Procedure:**

- Closely mow existing vegetation on area to be treated. Remove all sharp stones, sticks, or vegetation.
- **Do not cultivate.**
- Lay out sheeting on treatment area. Overlap plastic a minimum of 1' as necessary.
- Carefully ensure plastic contact with ground before weighting down all edges with bark mulch or **weed-free** compost.
- Place small plastic bags filled with soil (or comparable) to weight the center of each covered treatment unit to prevent wind billowing, if needed.
- Maintain in place for at least 4-5 months from November through April, then remove plastic.

### 5.4.2 SOD-STRIPPING

**Use and Timing:**
Use this method to remove weed-free lawn turf before implementing another site preparation technique. To minimize soil compaction, strip dry sod during the late spring through early fall (before the onset of fall rains).

**Materials:**
Imported weed-free compost or fine bark mulch
Hand tools + wheelbarrow

**Procedure:**

- Closely mow existing turf.
- Using a sod stripping machine or hand tools (mattock, hoedad, square point shovels, or similar) scalp sod from soil bed. Remove and dispose.
- **Do not cultivate the soil!**
- Cover area with 2 inches of **weed-free** soil mix or compost.

## 5.4.3 SHEET COMPOSTING

### Use and Timing:

Use this method during spring through fall to smother unwanted vegetation and create a weed-free planting area. Do not use manure or any other material that will enrich the soil (as you might do for vegetables), since it will stimulate the growth of weeds.

### Materials:

Cardboard

Imported **weed-free** soil mix or compost

### Procedure:

- Closely mow existing vegetation (this is not required following black plastic treatment).
- Hand dig green, deep rooted, perennial weeds (dandelion, plantain, etc.) from planting area.
- Thoroughly wet down native soil.
- Place overlapping layers of cardboard.
- Cover cardboard area with imported weed-free soil.
- Compact soil to 6-inch depth with lawn roller.
- Maintain in place for a minimum of four months, then plant into sheet composted area.

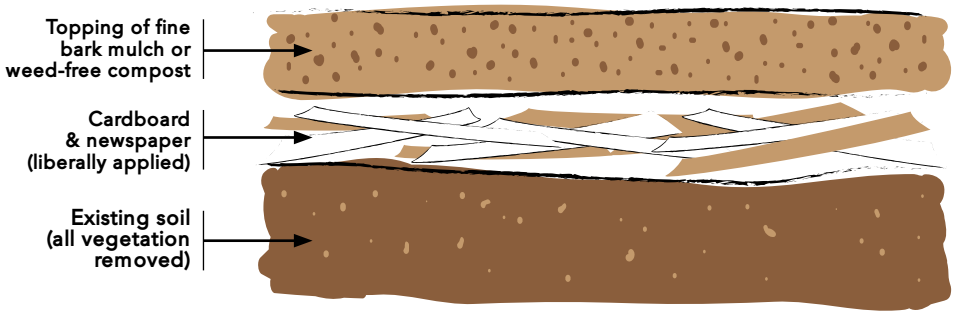



*Figure H. Sheet Composting*

## 5.4.4 SOLARIZATION WITH CLEAR PLASTIC SHEETING

### Use and Timing:

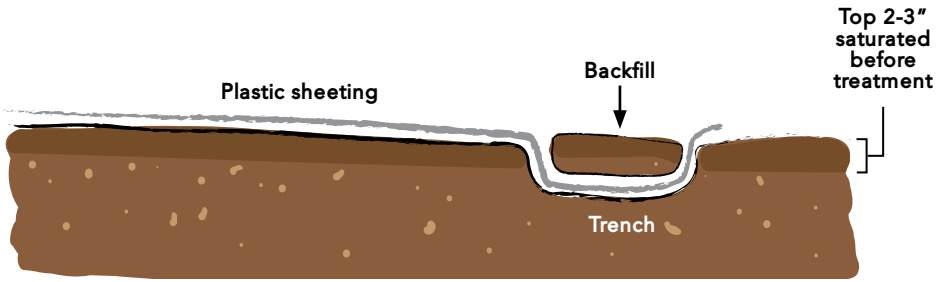
Use this method on bare soil **that has been thoroughly wetted down** in mid-spring through summer to sterilize the top few inches of soil with heat and eliminate weeds that will compete with your oak naturescaping plantings.

### Materials:

1 roll 6 mil **clear** poly 24 ft X 50 ft.

(with ultraviolet light protective coating - 1 year lifetime)

*Figure I. Solarization*




### Procedure:

- Remove black plastic or weed-free sod.
- **Do not cultivate.**
- Excavate a 1' wide by 4-6" deep trench around the inside perimeter of the treatment unit.

- If soil is dry, moisten the surface by hand watering.
- Lay out clear plastic sheeting carefully insuring plastic contact with ground before backfilling the free edges in the trenches. Overlap plastic a minimum of 1 foot as necessary.
- Tamp backfill to secure sheeting. Place small plastic "ziplock" sandwich bags filled with soil (or comparable) to weight the center of each covered treatment unit to prevent wind billowing.
- Check and repair any leaks observed from May through September.
- Maintain in place for a minimum of 2-3 months during summer, then remove plastic.

### 5.4.5 FLAME-WEEDING

**Use and Timing:**

Use this method on bare soil that has been thoroughly wetted down in spring or fall to sterilize the top few inches of soil and eliminate weeds that will compete with your oak naturescaping plantings. Flame-weeding functions like solarization to heat the top few inches of the soil horizon to 160 degrees F. At least 2-3 flame-weed treatments are required, spaced at two-week to one-month intervals.

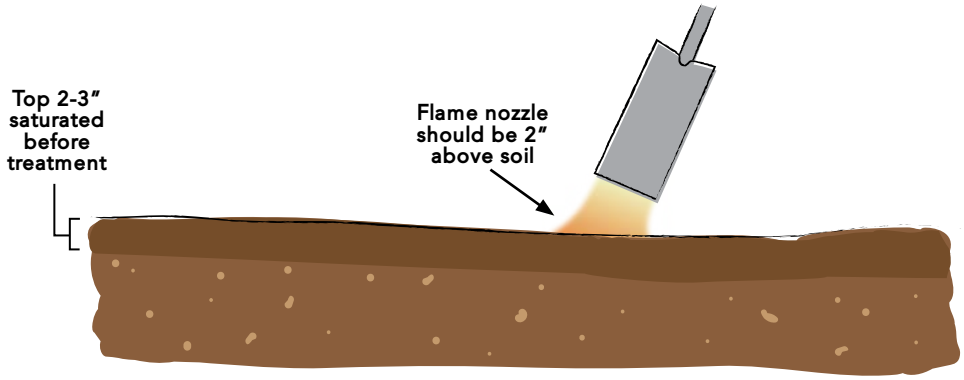
**Materials:**

Flame-weeder and propane fuel tank
Fire extinguisher
Imported **weed-free** soil mix or compost

**Procedure:**

- Remove all dead vegetation or other combustibles from the area to be treated.
- **Do not till the soil in advance.**
- Use a garden hose to thoroughly wet the soil to be flame-weeded to a depth of at least 2 inches (or time the treatment immediately after a spring rainstorm).
- Sweep the flame-weeder across the treatment area with the flaming tip at 2-4 inches above the ground. Take more time flaming the center of deep-rooted weeds like dandelions.
- After your second or third flame-weed treatments to the native soil on your site, you can spread imported soil and then flame-weed this material after it has settled and been wetted down. This will provide an additional depth of weed-free soil mulch.

*Figure J. Flame-weeding*



- Do not till or disturb the soil after flame-weeding, to preserve a layer of weed-free soil that will act as a mulch and prevent germination of weed seeds. You will plant directly into the flame-weeded soil, disturbing the soil as little as possible.

**Other flame-weeding tips:**

You can find good guidance on the use of flame-weeders online. Search YouTube for "flame-weeding" and see: http://www.garden.org/subchannels/landscaping/ground?q=show&id=77&page=1

Note that the treatment intensity to kill standing weeds is less than what you will need to sterilize the top 2-3 inches of soil of weed seeds. You will need to move more slowly and hold the flame tip closer to the ground surface than the guidance typically given online.


*Flame-weeding*

6

# Planting and Seeding How-to

*Conserving Oregon White Oak in Urban and Suburban Landscapes*

# 6 // PLANTING AND SEEDING HOW-TO

To establish an oak-prairie habitat plant a diverse combination of overstory and understory trees, shrubs, bunchgrasses, perennials and bulbs; then seed annual wildflowers and other grasses into the gaps between installed plants. Please refer to Appendix 8.6 for definitions of common plant container sizes (like plug, 3-gallon pot, etc.).

In the Willamette Valley fall planting and seeding produces the best results. Many native plant seeds require exposure to cold temperatures and damp conditions (cold stratification) before germination can occur and winter precipitation helps settle the soil and stimulates germination while helping newly installed plantings establish in a lower-stress, moisture-rich environment.

We emphasize again that after completing weed control and/or removing undesirable vegetation, do not till or cultivate the soil and avoid any added ground disturbance that could bring new weed seeds to the surface.


*Blue dicks/ookow* (Dichelostemma congesta)

To install and seed your oak naturescaping project follow these steps, in order:

## 6.1 Planting step-by-step

- Plan to pick up your plants from the nursery up to 1-2 weeks before your target planting date to minimize any required watering and care by you during the late summer drought period when container plants can be easily stressed by lack of water.
- After a good fall rain to moisten the soil, pick a dry day to plant and seed.
- Assemble all the plant materials and layout all the container plants and plugs at the planned spacing, adjusting as needed to cover the area.
- Before putting any plants in the ground, double-check species locations and spacing and adjust as necessary. Use your complete plant list and planting plan and check off each species as you go to ensure you have all your container plants laid out before installation.
- Plant container plants by opening a planting slot that matches the pot size with a small shovel, gently pushing the hole open rather than digging a large hole. Excavating a larger-than-necessary planting hole exposes more soil and weed seed to light. Leave the shovel in the slot while carefully removing plants from their containers and gently roughing-up the roots to ensure that they are not root-bound (i.e. winding around inside the container). Hold your plant in the planting slot ensuring the depth of the root collar is level with the soil surface as you slide the shovel out while ensuring all roots are pointed down. Installing "j-rooted" plants (with roots that bend back upwards) can kill them. Fill

all gaps in the excavated hole with soil, and make sure there are no air pockets by firmly tamping down the soil around the plant.

- Plant plugs by creating a small, right-sized hole with a shovel handle, crowbar or prybar. Ideally the hole should fit the width and depth of the plug you are installing. Push the plugs out of the tray from the bottom with your fingers. Drop the plug into the hole and firmly tamp down the soil around it with the root collar at the same elevation as the surrounding soil surface.
- Plant the bulbs, corms and/or rhizomes next and mark their location with small stakes. If installing any bare rooted materials, wait until the plants are fully dormant in late winter through early spring.
- Next, seed over the top of your installed plants to fill in the gaps.

## 6.2 Seeding and mulching step-by-step

- Before seeding annual grasses and wildflowers, spread an additional thin layer of fine bark mulch on the fine-graded bare soil between the plantings. When the soil is dry, smooth out soil clumps and lightly cover surfaces with a 1-2 inch-deep layer of fine bark mulch on the soil surface to control surface erosion and serve as a good seedbed.
- On small oak naturescaping sites broadcast seeding can be performed by hand, using a variety of tools such as tea strainers, kitchen sieves, coarse saltshakers, colanders, etc. for evenly distributing both large and very small seed. To ensure an even distribution over your planting bed, first experiment with the seed and adapted seeding implement over a cookie sheet, before seeding the planting bed. Try using different implements with a range of hole sizes or densities for different sized seeds.
- Sow large-seeded species first then rake lightly to cover with mulch. Then sow fine-seeded wildflowers and grasses on the surface of the mulch and do not cover or rake.
- Like-sized seed may be mixed together before sowing if they have similar soil, moisture and light requirements. Alternatively, you can do separate passes for different-sized seed and different seeding implements, if necessary.
- Finally, water in the newly installed plantings and seeding (or just let rainfall do this for you by seeding in the fall-winter-spring wet season)
- Erect temporary or permanent exclusion fencing (i.e. cats, dogs, and foot traffic) as needed.

7

# Maintenance and Monitoring

*Conserving Oregon White Oak in Urban and Suburban Landscapes*

# 7 // MAINTENANCE AND MONITORING

Making decisions about the desired type of oak prairie habitat will determine maintenance strategies. Understanding oak prairie habitat succession can help identify a desired future condition and the necessary maintenance. Regardless of your design and site preparation techniques, expect to be weeding and caring for your project, especially during the first few years.

In a wildland setting, native prairie and oak plant communities are not static groupings of plants but are instead dynamic and change over time. In an urban garden setting, maintenance and management activities can be guided by choices about function and design. For example, each of the four planting plan templates identify a native plant community that can be maintained as either a stable habitat or managed over time for succession (or change) to another habitat type. For example:

- A *Prairie landscape* can be maintained by tending the grasses and wildflowers and removing colonizing shrubs or trees or allowed to undergo succession (or change) by planting shrubs and trees in the prairie and managing the site in the future as an *Oak Shrubland* or *Oak Woodland.*
- The *Young Savanna* landscape will become the *Old Savanna* landscape as the tree matures **and** the *Prairie* plants beneath the young tree undergo succession (or change) as shade develops under the maturing oak.
- *Oak Shrubland* and *Old Savanna* habitats can be maintained by occasionally removing colonizing shrubs and maintaining prairie openings **or** managed to allow succession and eventually become an *Oak Woodland* habitat.

By making a choice about the type of habitat appropriate for the site conditions and the goals of the project, a *desired future condition* can be identified. After planting, site maintenance and monitoring activities can be used to fine tune the *desired future conditions* vision for the site.

## 7.1 Recommended maintenance and monitoring work for the first two years

### 1st Year Post-Establishment

***Late fall through winter***

- Prepare an as-built planting plan and plant list, or update the existing site plan (see Section 4.4).
- Research species planted/seeded with field guides and online searches for information on botanical descriptions, ecology and horticulture, as well as seasonal appearance, flowering time, and illustrations of seed, seedling and mature leaves, plant associations, propagation.
- Implement a photo point monitoring protocol to document results of planting and seeding (see Appendix 8.7).
- Start a project journal to record seasonal observations through subsequent years. Include photo point monitoring and the following information:
    - Seasonal features (sun/shade angle, presence of wildlife/birds/pollinators, vegetation bloom time, erosion, plant mortality, etc.)
    - Survey and identify all planted or colonizing vegetation, both native and non-native to create a record of changes through time.

- Research colonizing weeds and use the online resources listed under Appendix 8.8 to manage invasive vegetation as needed.

- Reseed native annual wildflowers and grasses as needed through late winter.

*Spring through summer*

- Continue to implement photo point monitoring to document plant growth; repeat every 3 months during growing season.
- Continue recording observations in project journal. See list of information to include above.
- Control invasive weeds.
- Irrigate woody trees and shrubs with drip or soaker hose twice monthly mid-June through mid-September. Do not water grasses and wildflowers.

*Early fall*

- Replant woody trees, shrubs and perennial wildflowers as needed to achieve 90% survival.
- Re-seed annual grasses and wildflowers in areas with less than 80% cover of herbaceous native vegetation.

## 2nd Year Post-Establishment

*Late fall through winter*

- Update as-built planting plan and plant list, as needed.
- Continue vegetation research, photo point monitoring, and field observations. Continue to log this information in your project journal.
- Reseed native annual wildflowers and grasses as needed through late winter.

*Spring through summer*

- Continue to implement a photo point monitoring to document plant growth.
- Continue recording observations in project journal. See list of information to include above.
- Control invasive weeds.
- Irrigate woody trees and shrubs with drip or soaker hose twice monthly mid-June through mid-September. Do not water grasses and wildflowers.

*Early fall*

- Replant woody trees, shrubs and perennial wildflowers as needed to achieve 90% survival.
- Re-seed annual grasses and wildflowers in areas with less than 80% cover of herbaceous native vegetation.
- Use species-specific information on native trees and shrubs from various sources listed in Section 4.2 or from online searches to learn about and implement maintenance pruning, cutting-back, or coppicing treatments to manage vegetation heights as needed.
    - Using Appendix 8.5 and your project *desired future condition* as a guide to develop a maintenance plan and schedule for the project.


*Before (top) and one year later (bottom)*

# 8

# Appendices

*Conserving Oregon White Oak in Urban and Suburban Landscapes*

# 8 // APPENDICES

## 8.1 Oak naturescaping project checklist

### 1. Planning

- ☐ Visit an oak-prairie natural area during April-May to get inspiration.
- ☐ Complete the planning questionnaire to refine your project goals and scope.
- ☐ Test your soil and observe the light distribution in your yard.
- ☐ Research vegetation management rules or requirements (e.g. city ordinances) that could affect your design.
- ☐ Use the flow diagram in *Figure B* to select a suitable portion of your yard.
- ☐ Created a conceptual site plan (*Figure C*) to guide your planning and design.
- ☐ Look at *Figure A* and think about how you might time the sequence of project steps to implement your vision.

### 2. Design

- ☐ Select and adapt a planting template for your landscape (*Figure D*).
- ☐ Refine your conceptual site plan based on the planting template selected and specific information from planting plans *(see Figures F.1-F.4)*.
- ☐ Use twine to delineate and measure your planting areas in square feet.
- ☐ Use color-coded landscape flags to assess the layout and space plants within the delineated planting areas.
- ☐ Prepare final site plan. (See *Figure E*)
- ☐ Estimate needed plant materials by counting the number of plants by color-coded flags, or estimate bulbs and seed quantities by the planting areas.
- ☐ Research availability of plant materials and place orders.

### 3. Site preparation

- ☐ Establish photopoints for your project to track changes through time, and document successes and challenges.
- ☐ Select a combination of two or more site preparation techniques depending on project circumstances, including season, presence of overstory trees, etc.
- ☐ Begin the site preparation at least one year in advance of your target planting date.
- ☐ For challenging sites with invasive vegetation, use an adaptive approach and be prepared for several seasons of site preparation.

### 4. Planting, seeding, and installation

- ☐ Integrate the scheduling of your plant order, site preparation, and project installation.
- ☐ Finalize design and order plants and seed well in advance of your target installation date (e.g. At least two seasons in advance).
- ☐ Pick a plant and seed installation date in October through early November, after the onset of fall rains.
- ☐ Lay out all your plants in advance of putting any in the ground to do a final spacing check.
- ☐ Install your largest plants first, then work on progressively smaller ones and finish with plugs.
- ☐ Minimize ground disturbance as much as possible to prevent bringing weed seeds to the soil surface.
- ☐ After you have installed all your plants, spread annual seed over the top of them to fill in the gaps.

### 5. Maintenance and monitoring

- ☐ Establish and collect photo points to track vegetation changes through time, and document successes and challenges.
- ☐ Check on your project at least once every 1-2 months: thin or cut back prolific species, remove weeds, and replace lost plants during the appropriate planting season.
- ☐ Develop a maintenance schedule to fit your project, referring to the outline provided in Section 7.1 above.
- ☐ Adjust your maintenance and plant upkeep schedule to fit your desired trajectory of change for your oak naturescaping project: will it remain a prairie/savanna or be allowed to develop or undergo succession into a shrubland/forest?

## 8.2 Gardens and natural areas within the Portland-Vancouver metropolitan area with native oak-prairie habitats

Before you implement an oak naturescaping project, try and visit at least one local natural area with native oak and prairie habitats to provide you with inspiration for your design. The ideal time to visit is during April through May – at the height of the spring bloom period.

*Camassia Natural Area, West Linn*
*Canemah Bluff Natural Area, Oregon City*
*Cooper Mountain Nature Park, Beaverton*
*Elk Rock Island, Portland*
*Lacamas Park Trail, Camas, WA*
*Mt Talbert Nature Park, Clackamas*
*Oaks Bottom Wildlife Refuge, Portland*
*Oaks Bottom Overlook, a SMILE neighborhood park, Portland*
*Ridgefield Wildlife Refuge, Ridgefield, WA*
*Tanner Springs Park, Portland*
*The White Oak Savanna, West Linn*
*Tualatin Hills Nature Park, Beaverton*
*Tualatin River National Wildlife Refuge, Sherwood*
*Willamette Park, Portland*

*Photo credit (both): Ted Labbe*

*Camassia Natural Area*

## 8.3 Planning questionnaire

This questionnaire is for landowners planning an oak naturescaping project, to help locate and guide the design of a successful project. You can use the completed questionnaire to refine your project goals and scope, and to make sure you have an appropriate area of your yard for the project. The ideal setting is set back from areas with human or pet disturbance, has sufficient sun exposure, and be located where invasive weeds will not jeopardize the establishment and success of plantings over the long-term.

The questionnaire is designed to provoke consideration of your yard in relation to neighbor concerns or those associated with an adjacent right-of-way (if applicable). It is also meant to make you consider your project in relation to the overall goals, perceptions and needs of your property and family. If there are parts of the questionnaire that are difficult, make sure you dwell there and use the exercise to consider all your options before you implement an oak naturescaping project. Hopefully, through your consideration of these issues now you can avoid costly errors or misjudgments later. If you have less money or time to implement and maintain an oak naturescaping project, select a smaller area and/or a planting template that integrates more shrubs and fewer wildflowers and grasses (since the latter generally require more maintenance). For those with financial resources and less time, you may wish to hire a professional to assist with some/all of the project design, site preparation, and installation.

### PROJECT GOALS

1. What uses do you currently make of your garden and landscape?

*Vegetable garden* *Recreation*
*Backyard habitat* *Other:*_____

2. What do you most like about your site?

3. What don't you like about the existing landscape?

4. How do you and other members of your family plan to use the landscape and its new spaces? What specific uses do you want to plan for?

### PERSONAL TIME AND BUDGET

5. How much money have you budgeted for improvements?

*$250 or less* *$500* *$1000*
*$2500 or more*

6. How much time will you have to work on the project?

*1 hour per month or less* *3 hours per month*
*1 day per month* *1 day per week or more*

7. How much time will you have to maintain it once it is installed?

*1 hour per month or less* *3 hours per month*
*1 day per month* *1 day per week or more*

8. Do you have the tools, patience, and skills to complete the project?

*Yes, I'm planning on taking it all on myself.*

*Yes, I'm planning on hiring a professional to help with parts of the project.*

*Yes, I'm planning on hiring it all out to a professional and giving them guidance.*

*I haven't figured out the specifics of how I am going to complete the project yet.*

## EXISTING CONDITIONS

9. Is your property adjacent to a large patch of native vegetation (near a park, natural area, stream or other sensitive or protected lands)?

10. What is the architectural style of your house, and what aspect of it do you want to carry through into the natural landscape?

11. Is your property adjacent to a street tree corridor or is there a tree or shrub canopy in your neighborhood?

*Oregon white oak* *Douglas-fir* *Bigleaf maple*
*Other Pacific Northwest natives* *Nonnative ornamental trees*
*Some trees, but I'm not sure of the species* *Not many trees*

12. Are there any materials or art that you want to integrate into the landscape to educate or create a special feeling?

13. Is there some particular landscape theme that you want to use?
*For example: naturescape? xeriscape? wildlife or pollinator habitat?*

## DESIGN LIMITATIONS AND OPPORTUNITIES

14. How shady or sunny is the project site? Is there a tall development project planned nearby that may impact solar access?

15. Are there invasive weeds on the project site that will require site preparation work?

*Thistle* *Ivy* *Clematis* *Blackberry*
*Scotch broom* *Morning glory*
*Other:*_____

16. Does your site require any special screening to block wind or sun or to ensure privacy? Are there good or bad views?

17. Are there any rare or unusual native plants or special heritage trees (protected by local tree ordinances) that you should take into consideration?

## DESIGN FOR PREFERENCES AND USES

18. If you have children, what specific uses will they be growing into and out of?

19. If you have pets, do they have any specific requirements that will influence your design? For example, do you want to shut them out or let them into specific areas?

20. If you were to think of various parts of your landscape as outdoor rooms or extensions of your indoor living spaces, what would you call them?

*Kitchen* *Dining room* *Living room*
*Storage* *Other:*_____

21. How do you feel about the look and feel of the entrance to your property and home?

## EXTERNAL DESIGN CONSTRAINTS

22. Are there any local building codes or other private or municipal zoning regulations that will influence what you do on your property?

23. Will easements, setbacks, and/or vegetation management apply to any of your work?

*Easement or setback on property edge abutting my neighbor*

*Easement or setback on property edge facing street*

*Local jurisdiction vegetation management requirement*

*I'm not sure*

*Other:*_____

24. Are there any underground or overhead utility lines or other hazards you should plan around? Can you identify their approximate location so a professional can determine their exact location?

*None that I know about*

*Underground utility lines, but I don't plan on doing any major excavation*

*Underground utility lines, and since my work could impact them I need to get their locations marked so I know where to avoid digging them up*

*Overhead utility lines, with tree height limitations and/or vegetation clearance requirements*

25. Do any of your potential plans influence your neighbors' interests? If so, have you discussed your plans with them?

26. Are there any other considerations that will influence what you can do in creating your native landscape?

## OTHER DESIGN CONSIDERATIONS

27. Most pollinators require three bloom cycles during the growing season to thrive. Are there any special native plants you want to use?

28. What seasonal colors of foliage and flowers do you want to use?

29. Are you or any member of your family allergic to any plants or insects? And does this impact your landscaping choices?

*Bees* *Wasps* *Pollen*
*N/A* *Other:*_____

30. Are native oak and prairie plants and other project materials easily available?

*I'm not sure.*

*My planting plan and needs have not progressed to that stage yet.*

*I can't find good sources for many/most of the plants I desire to have in my yard.*

*I'm aware of good sources for some of my desired native oak and prairie plants but not all of them.*

*I have all my plant sources and materials sourced or I know they are readily available.*

## 8.4 Regulatory considerations for planning and implementing an oak naturescaping project

Neighboring communities can have very different regulations governing tree preservation and removal, vegetation heights, etc. Take some time to research the requirements specified by your local municipality and homeowners association.

Your mailing address is not always a good indication of what political jurisdiction you are in. Take a moment to type your address into MetroMap (http://gis.oregonmetro.gov/metromap/). In the map pane, confirm that MetroMap found your home site correctly, then scroll down in the Info pane to "Political Jurisdication" to see what municipality you are in. It is not uncommon to have a city address, but to be within another political jurisdiction (like a neighboring city or unincorporated Clackamas County).

Once you identify the municipal government governing your neighborhood, use the internet to search for "[your city/county] municipal code" and/or contact a local planner with specific questions related to vegetation heights, setbacks from roads, etc. You may or may not have a homeowners association with their own rules on vegetation, in addition to what your city or county requires. Ask your homeowners association president about "covenants, codes, and restrictions" related to vegetation management.

The following table summarizes vegetation conservation requirements for example local jurisdictions, with an emphasis on tree preservation. This is based on information updated from the Portland Audubon Society/Portland State University Regional Urban Forestry Assessment and Evaluation for the Portland-Vancouver Metro Area[7].

| Jurisdiction | Has lists of nuisance and/or preferred plants? | Has heritage tree inventory? | Has tree preservation/ removal ordinance? | Require tree removal permit for development or land division? | Require tree removal permit without development? | Minimum size of regulated tree? (diameter at breast height) | Regulations consider tree species? |
|---|---|---|---|---|---|---|---|
| Lake Oswego | YES | YES | YES | YES | YES | 5" | YES |
| West Linn | YES | YES | YES | YES | YES | 6" | YES |
| Oregon City | YES | YES | YES | YES | SELECT CASES | 6" | YES |
| Milwaukie | YES | NO | YES | YES | SELECT CASES | 6" | YES |
| Unincorporated Clackamas Co. | YES | YES | YES | YES | SELECT CASES | 6" | NO |
| Gladstone | NO | NO | NO | NO | NO | 6" | N/A |
| Hillsboro | NO | NO | YES | SOMETIMES | NO | NONE | NO |
| Tigard | NO | YES | YES | YES | YES | 6" | NO |
| Unincorporated Washington Co. | NO | NO | YES | YES | SELECT CASES | STAFF DISCRETION | NO |

7 *Portland Audubon Society and Portland State University. 2009. Regional urban forestry assessment and evaluation for the Portland-Vancouver metro area. http://www.oregonmetro.gov/sites/default/files/06012010_regional_urban_forestry_assessment_evaluation_portland_vancouver.pdf*

## 8.5 Four Landscaping with Oregon Oak planting plans

This brief guide is designed to accompany the four *Landscaping with Oregon Oak* planting plans (*Figures F.1-F.4*).

### 8.5.1 UNDERSTANDING AND USING THE PLANS

Four planting plans were developed for the *Landscaping with Oregon White Oak* landowner workshops and this 'Conserving Oregon White Oak in Urban and Suburban Landscapes' compendium of instructional materials. All plans are composed of a basic design, plant material lists, and specifications for planting and seeding.

After receiving advice from local ecologists, landscape architects, and native plant gardeners, plant survey data from several northern Willamette Valley oak and prairie remnants was compiled and analyzed. Thereafter, planting plans were prepared in accordance with accepted principles of environmental design using Willamette Valley native plant communities. Each planting plan provides practical information to guide prairie-oak habitat enhancement and/or restoration in the urban Portland metro area. The four planting plans are named and described as:

**Young Oak Savanna**
Vision of a desired future condition: Initially a young oak planted in a prairie; over time, a broad open-grown savanna oak with prairie and low shrub patches beneath.

**Oak Shrubland**
Vision of a desired future condition: Dense thickets of shrubs with small openings of wildflowers beneath a partially open oak canopy.

**Old Oak Savanna**
Vision of a desired future condition: Openings of prairie grasses, wildflowers and low shrubs under a broad open-grown oak.

**Oak Woodland**
Vision of a desired future condition: Closed canopy woodland of mixed age trees with an understory of tall and low growing shrubs.

### 8.5.2 A BRIEF DESCRIPTION OF PLANTING PLAN FEATURES

The plans are designed for the small scale of an urban backyard habitat but reflect characteristics commonly observed in the larger prairie oak landscape of the region. As observed in nature, the plans were designed to illustrate the mosaic of interconnected prairie oak habitats: openings of prairie grasses and wildflowers with scattered shrubs on the perimeter grading to dense oak woodlands of understory trees and shrubs. The individual planting plans illustrate only a model for achieving a natural looking prairie oak landscape. The exact composition of prairie oak plant species selected for a project is dependent on specific site conditions such as sun or shade, and soil moisture.

Individual planting plans illustrate the gradients of prairie oak plant communities observed in the northern Willamette Valley. If the plans are considered side-by-side, they illustrate the ecological concept of prairie oak *plant succession*. Gaining a rudimentary understanding of plant succession can help with landscape design, planting and maintenance of a project.

Plant succession is the natural progression of plant growth in each area, over time. A classic example of plant succession has occurred after the eruption of Mount St. Helens, which left behind a barren soil. Over time, plants began to re-colonize and re-emerge and the ecosystem changed and matured, from a few patches of small, annual plants to the forest that is beginning to form today.

Each planting plan is composed of a single or multiple number of overlapping prairie oak plant communities.

- **The *Prairie* plant community** – The initial (or pioneer) habitat composed of diverse annual and perennial wildflowers and grasses.
- **The *Young Oak Savanna* or *Old Oak Savanna* plant communities** – *Prairie* with (young or old) oak and occasional shrub patches
- **The *Oak Shrubland* plant community** – Composed of oak(s), shrubs, and *prairie* openings
- **The *Oak Woodland* plant community** – A *climax* (or stable end state) plant community of oaks, other understory trees, shrubs, and small openings of *prairie*.

If left unmanaged, in time, these plant communities will sort themselves as the plantings mature and site conditions change, allowing for plant succession and change in habitat.

The lists of native plant species in each of the four templates should be considered as an optional palette of choices. Individual plants should be selected to match specific site conditions such as; shade or sun, moist or dry soil conditions, etc. or to achieve an aesthetic goal or *desired future condition*.

A few of the listed native plant species are quite aggressive and spread through rhizomes or prolific seeding. However, many of these also have beneficial characteristics such as: important late-season nectar sources for pollinators, good erosion control, and more. Fall planting and no summer irrigation will limit their spread.

**Aggressive perennial plants:**

*Achillea millefolium* (western yarrow)
*Chamaenerion angustifolia* (fireweed)
*Lupinus rivularis (riverbank* lupine)
*Pteridium aquilinum* (bracken fern)
*Solidago canadensis* (Canada goldenrod)
*Symphyotrichum subspicatum* (Douglas aster)

**Self-sowing annual plants:**

*Clarkia amoena* (farewell to spring)
*Collomia grandiflora* (large-leaf collomia)
*Gilia capitata* (blue field gilia)

All native plant species listed on the plans are flammable and should not be planted near structures. See: www.firewise.org for additional information.

## 8.6 Native plant source materials and sizing

Appendix F of the Meadowscaping Handbook lists wholesale growers, retail nurseries, and producers specializing in Willamette Valley native plants. Please refer to this document for the most current and complete list of sources for local plant materials for oak prairie naturescaping. We emphasize that you should plan on reserving your plants at least six months in advance of your desired planting date to make sure you can secure the needed plants in the appropriate sizes and quantities.

In addition, seed for several of the native plants in the planting templates is available from Willamette Wildlings (willamettewildlings.com).

When researching available plant materials, you should be familiar with the common nursery container sizes so you understand the size of plants you will be installing and their proper spacing:

- 1- or 2-inch plugs are generally the smallest available, delivered in a plastic tray of one to two dozen plants or more with wells measuring 1-2 inches wide by 4 or more inches deep. Grasses, sedges, and small perennial forbs are often available in this container size.
- 3.5- or 4-inch pots or "band pots" are commonly used for small perennials. The measurement refers to the pot diameter or square edge width.
- Some perennials, shrubs, and trees can be obtained "bare-root", often in bulk at a discount during the winter/early spring, and must be planted as soon as possible. Bulbs or corms are also usually provided bare-root but are hardier than bare-root plants.
- Tree tubes are like narrow, very deep pots that are used for trees or any perennial with deep taproots.
- 1-, 2-, 3-, and 5-gallon containers are used for progressively larger size perennials, shrubs, and tree seedlings. The measurement refers to the pot volume.

Note that the planting templates of *Figures F.1-F.4* include plant spacing guidance for plants of a particular size. If you are unable to locate your plants at the specified size, you may need to adjust the number of plants and their spacing. If you must make substitutions, consider using fewer, larger plants for shrubs. For grasses and forbs, you can use more numerous and closely spaced smaller plants. However, in adjusting the mix of plant types and sizes, you also want to consider the layout. You may want smaller plants to go in less-visible corners of the installation, and to use larger plants in more prominent locations to create a more finished look.

## 8.7 Setting up photo points

To track changes in your yard, we will use perspective photos captured at specific locations over time. Below we outline the steps to setting up permanent photo points. At a minimum, you need your site plan, a camera, and a notebook to record notes. A stepladder may also be used to provide better perspective on your naturescaping project area.

### 1. Locate Your Photo Point(s):

With your site plan in hand, think about the best perspectives on your yard going forward in order to locate one or more permanent photo points. Don't put a photo point where you anticipate trees or other obscuring vegetation will make comparisons of the perspective photos through time difficult. Move your stepladder around until you have one or two good perspective views on each oak naturescaped area, then draw in their location in on the site plan. See example site plan drawing with photo point location, below.

### 2. Record Your Photo Point Location(s):

Measure or pace off the distance from your chosen photo point(s) to permanent landmarks in your yard (the building corner, a tree, spigot, etc.). Use distances from two or three permanent landmarks if the location is not clearly defined. Snap a photo of the stepladder at the location where you have established the photo point that you can refer to in the future. These photos are supplemental, to help relocate the photo point in the future but they can be very helpful. Make notes about the position of things visible in these photos relative to the stepladder in your notebook, so that you will have no problem relocating the photo point. See example location photo (photo A), below. Finally, mark the photo point location on your site plan.

### 3. Snap Your First Photo:

Climb the stepladder (or move into position to take your photo if not using a stepladder), compose the photo, and snap your first photo. Compose the photo with key landmarks in view for ease of comparison with subsequent photos over time. In your notebook, note the date, time, location, and height of your stepladder so that you can replicate the photo composition over time. See example photo point (photo B), below.

### 4. Collect Additional Photos:

At a minimum take at least one before and one after photo of the yard, taken at approximately the same time of year (ideally in April or May). Better still we would appreciate a time series of photos of your yard, taken from the same photo point collected at intervals every 2-3 months showing various project stages, such as:

- before site preparation,
- site preparation phase (showing installed plastic for solarization, stripped sod, or other),
- planting area layout (with plants still in pots, placed at their planting locations),
- newly-planted,
- 6-month, 1-year, and 3-year post-planting.

*(A) An example location photo for a photopoint. In this case, we paced the distance from a point on the pavement even with the tree on the right to the stepladder location, noted that the photographer stood on the second rung of the ladder at about 2 feet elevation above grade, and indicated that the direction of the photo was to the south-southeast.*

*(B) Example photopoint photo, showing the area to be landscaped in foreground under black plastic, with other landmarks like an oak tree and the house in the background.*

*Photo credit (both images): Ted Labbe*

## 8.8 Common Northwest weed species

There are a variety of online tools that are helpful to identify common weeds and guide you in determining effective treatment and control measures. For regional lists of common weed species with aids on their identification and treatment, see:

https://www.portlandoregon.gov/bes/article/471991

https://www.portlandoregon.gov/citycode/?c=34460&a=322280 p. 159-174

https://emswcd.org/wp-content/uploads/2013/12/EMSWCD-WEEDS-Wksp_11-13-15_for-sharing.pdf

https://4countycwma.org/aweeds/weed-id-links/

The following guides are more suited for agricultural areas of the Willamette Valley but may contain useful treatment suggestions for species common to northern Willamette Valley urban areas:

http://appliedeco.org/wp-content/uploads/WV-weed-guide.pdf

http://horticulture.oregonstate.edu/content/welcome-pnw-weed-identification-module

http://mint.ippc.orst.edu/weeds.htm

A number of local agencies are partners in the regional cooperative weed management area (https://4countycwma.org/) and may be able to assist you with identifying and selecting suitable treatment measures for weeds. Start with your local Soil and Water Conservation District staff for these counties:

**Clackamas**
http://weedwise.conservationdistrict.org/,

**Washington**
http://www.swcd.net/workshops-education/weed-watchers/,

**West Multnomah (west of Willamette River.)**
https://wmswcd.org/programs/common-weeds/,

**East Multnomah (east of Willamette River.)**
http://emswcd.org/on-your-land/weeds/,

**Columbia**
http://www.columbiaswcd.com/, **or**

**Clark (Washington State)**
http://www.clarkcd.org/.

Remember that controlling and eliminating aggressive, invasive weeds from your planting area may require multiple treatments over several years. However, adequate site preparation is essential to the success of these projects, and it will reduce the time and resources needed during the maintenance phase of your project. If you have the following aggressive weed species, you will need to spend additional time researching and implementing control measures as part of your site preparation project phase:

- **Himalayan blackberry**
- **English and Portuguese laurel**
- **English holly**
- **English hawthorn**
- **English ivy**
- **Clematis vitalba**
- **Bindweed**
- **Invasive geraniums (Geranium robertiana and G. lucidum)**
- **Lesser celandine**
- **Vinca**

## 8.9 Common oak-associated native tree and shrub species

Before implementing an Oregon white oak naturescaping project in your yard, look for common native trees and shrubs associated with oak and seek to integrate them into your plans. It is much easier to preserve existing vegetation than to establish new plant starts. This list includes common native trees and shrubs associated with oak in the Portland-Vancouver metropolitan region. Follow the links to photos and species descriptions.

- *Amelanchier alnifolia* (Pacific serviceberry)
  http://oregonstate.edu/dept/ldplants/amal1.htm
- *Arbutus menziesii* (Madrone)
  http://oregonstate.edu/dept/ldplants/armen1.htm
- *Arctostaphylos columbiana* (Hairy manzanita)
  http://oregonstate.edu/dept/ldplants/arco1.htm
- *Berberis aquifolium* (Tall oregongrape)
  http://oregonstate.edu/dept/ldplants/maaq6.htm
- *Ceanothus cuneatus* (Buckbrush)
  http://oregonstate.edu/dept/ldplants/cecun1.htm
- *Corylus cornuta var. californica* (California hazel)
  http://oregonstate.edu/dept/ldplants/cocorc4.htm
- *Crataegus douglasii* (Douglas hawthorn)
  http://oregonstate.edu/dept/ldplants/crdou12.htm
- *Fraxinus latifolia* (Oregon ash)
  http://oregonstate.edu/dept/ldplants/frla2.htm
- *Holodiscus discolor* (Oceanspray)
  http://oregonstate.edu/dept/ldplants/hodi6.htm
- *Philadelphus lewisii* (Mock orange)
  http://oregonstate.edu/dept/ldplants/phle1.htm
- *Pinus ponderosa* (Ponderosa pine)
  http://oregonstate.edu/dept/ldplants/pipo1.htm
- *Prunus emarginata var. mollis* (Bitter cherry)
  http://oregonstate.edu/dept/ldplants/prema4.htm
- *Prunus virginiana* (Chokecherry)
  http://oregonstate.edu/dept/ldplants/prvir11.htm
- *Rhamnus purshiana* (Cascara)
  http://oregonstate.edu/dept/ldplants/rhapu1.htm
- *Ribes sanguineum* (Red flowering currant)
  http://oregonstate.edu/dept/ldplants/risa13.htm
- *Ribes viscisissimum* (Sticky currant)
  http://www.malag.aes.oregonstate.edu/wildflowers/species.php/id-48
- *Rosa nutkana var. nutkana* (Nootka rose)
  http://oregonstate.edu/dept/ldplants/ronut4.htm
- *Sambucus caerulea* (Blue elderberry)
  http://oregonstate.edu/dept/ldplants/saca10.htm
- *Symphoricarpos albus* (Snowberry)
  http://oregonstate.edu/dept/ldplants/syal7.htm
- *Viburnum ellipticum* (Oval-leaved viburnum)
  http://oregonstate.edu/dept/ldplants/viel5.htm