LANDSCAPE SCALE MANAGEMENT PLAN

For the Oak Forests, Woodlands, & Savannas of the

SOUTH WILLAMETTE VALLEY

A FOREST MANAGEMENT PLAN FOR THE

Insert Name Property

[Dates of plan – 10 years]

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INTRODUCTION

This document is a partially completed and fillable management plan template for properties wishing to participate in a coordinated landscape scale restoration effort for the oak forests, woodlands, and savannas of the south Willamette Valley. The information contained within is designed to provide landscape scale context and management guidance about Willamette Valley oak habitats, with tips for plan writers to aid in the creation of a property-specific management plan that meets the requirements of the Oregon Department of Forestry (ODF), Natural Resource Conservation Service (NRCS), and Oregon Department of Fish and Wildlife (ODFW).

This plan and associated appendices were developed by the Long Tom Watershed Council for the Oregon Department of Forestry with technical input from numerous community partners and professionals through a grant awarded to the Oregon Department of Forestry from the Western Forestry Leadership Coalition in 2019.

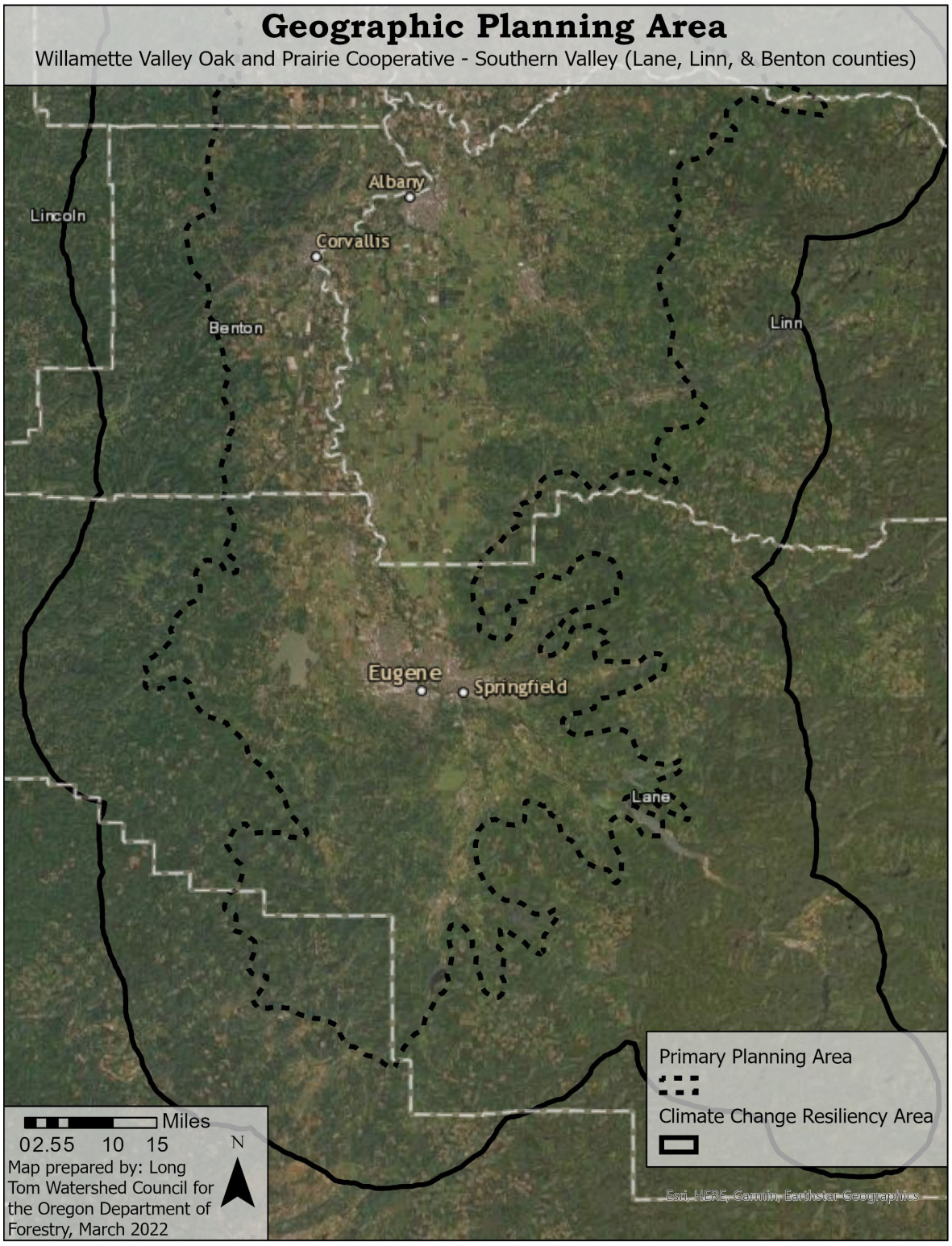
Goals of the project:

- Provide a reference for technical service providers, land managers, and landowners in the south Willamette Valley to assist with management planning for forested lands with an oak component
- Coordinate forest health improvement, fuels reduction, and wildfire risk mitigation efforts occurring in the south Willamette Valley with regional oak habitat restoration goals.
- Accelerate the pace and scale of restoration toward healthy, fire-permeable, and connected oak woodlands, forests, savannas, and adjacent ecosystems in the rural south Willamette Valley
- Provide streamlined access to funding to private landowners to support the above goals

Thank you to the following contributors and reviewers: Abby Colehour, Katie MacKendrick, Alex Rahmlow, Lauren Grand, Miranda Hawkes, Sara Evans-Peters, Andrew Owen, Tim Moss, Ed Alverson, Nathan Agalzoff, Tom Snyder, Al De Vos, Chris Yee, Bruce Newhouse, Matt Blakeley-Smith, Nicole Maness, Jana Peterson, Dan Menk, Bart Johnson, Ben Zuemling, Amy Kaiser, Lauren Bennett

Geographic Scope

This plan covers the geographic area included in the Willamette Valley Oak and Prairie Cooperative Strategic Action Plan (2020) that occurs within Lane, Linn, and Benton Counties. See Figure 1 below.



I. PROPERTY INFORMATION

*This section of the plan contains **property-specific** information.*

Landowner Name(s): Click here to enter text.

Property Address: Click here to enter text.
Mailing Address: Click here to enter text.
Landowner Phone: Click here to enter text.
Landowner Email: Click here to enter text.

Property acres: Click here to enter text.
Township, Section, Range: Click here to enter text.
Latitude & Longitude: Click here to enter text.
Maplot(s):Click here to enter text.
Within UGB? ☐ City: Click here to enter text.
County: Click here to enter text.
Zoning: Click here to enter text.
Watershed - Sub Basin (HUC 12): Click here to enter text.
Fire District: Click here to enter text.
Elevation: Click here to enter text.

Current tax deferral program, if any: Click here to enter text.
Desired tax deferral program, if different: Click here to enter text.

Plan Information

Plan writer name: Click here to enter text.
Plan writer company: Click here to enter text.
Plan writer email: Click here to enter text.
Technical Service Provider (TSP) number (if applicable): Click here to enter text.

General Description

Describe the property and landscape in general terms. Include information like acres, general habitat type(s), notable features, etc. Save details for management unit descriptions.
Click here to enter text.

Management Goals

For example, wildfire resilience, conservation of wildlife habitat, connectivity with broader landscape, maintain a livelihood through sustainable timber/forest products harvest, provide recreation opportunities for family and friends, preservation of scenic beauty, adapt and respond to climate change, support access to the land by Tribal members, prepare the landscape for prescribed burning…
Click here to enter text.

Background and History

What do you know about the history of the property? Include such items as past owners, timber harvests, tree planting projects, conservation activities, road building, farming practices, and major disturbances

such as wildfires, storms or insect attacks. Indicate when the property was acquired by the current owner and describe what has happened to it since then.
Click here to enter text.

Current Uses

How is the property currently being used? Does someone live or work there? Is someone generating livelihood or business there?
Click here to enter text.

Property Features

Visit the following digital tool called LandMapper, developed by EcoTrust, to generate maps for the following sections of the management plan: https://landmapper.ecotrust.org/. *The maps are generated as PDFs. Attach them and reference them here. Add additional information here.*
Click here to enter text.

Roads

Describe roads on the property, including their grade (pavement, gravel, dirt), how to access the property (i.e. directions), and fire access routes. Click here to enter text.

Terrain & Topography

Describe the property's terrain in terms of slope, aspect and elevation. Describe landforms that the property is part of (e.g., coastal headlands, valley floor, foothills, or mountains). Click here to enter text.

Soil

Include a map of the soil types across the property, and descriptions of those soil types in terms of origin, composition, productivity, moisture, etc. What are the limitations of the soil type?
Click here to enter text.

Water Features

Describe water features on your property, including ponds, year-round streams, seasonal drainages, and wetlands. Include any related restrictions or regulations that will affect management.
Click here to enter text.

Fuel type

Describe the dominant fire-carrying fuel type. See Appendix [X] for general descriptions of fuel types. See the following fuel model publication for more details: Click here to enter text.

See **Appendix A: Property Inventory Maps - LandMapper** for maps of the property's location, topography, soils, and water features.

II. LANDSCAPE CONTEXT

*This section provides **landscape-scale** information applicable across the South Willamette Valley in any oak-dominant forested property in Lane, Linton, or Benton Counties. Additional information may be added to this section if needed or desired.*

The following sections contain excerpts from the Willamette Valley Oak and Prairie Cooperative Strategic Action Plan (2020) and the Oregon Conservation Strategy (2016).

Biophysical Context

The Willamette Valley ecoregion (Level III ecoregion of the conterminous United States) is bound by the West Cascade and Coast Range ecoregions and contains terraces and floodplains of the Willamette River system along with scattered hills, buttes, and adjacent lower-elevation foothills. Elevations within the Willamette Valley ecoregion are generally below 1,000 feet in elevation with the exception of some higher elevation foothill areas and isolated buttes. Twenty to 40 miles wide and 120 miles long, the Willamette Valley is a long, level alluvial plain with scattered groups of low basalt hills. The climate is characterized by mild, wet winters and warm, dry summers. Fertile soil and abundant rainfall make the valley the most important agricultural region in the state.

Climate

The climate in this region is characterized by cool and wet winters and warm and dry summers. The average January temperature is 39 degrees F and the average July temperature is 67 degrees F. The average annual temperature is 50 to 55 degrees F. The frost-free season is 160 to 235 days. The average annual precipitation is about 45 inches and the average annual temperature is about 53 degrees F.

Climate change[1] [2]

Climate studies by Oregon State's Oregon Climate Change Research Institute (OCCRI) and Oregon Health Authority outline the likely changes that can be expected in the Eugene and Willamette Valley area. Though no one can predict exactly what the future climate will bring, scientists predict that dry months will be hotter and drier with increased wildfires, and wet months will have higher intensity but shorter duration rain events, with less snowpack. Overall, weather will be more extreme, and as the climate and environment changes, populations are projected to increase as people move north and inland to milder conditions. Already, forests in the south Willamette Valley region are experiencing increases in tree mortality from insects, drought, and fires, especially Douglas fir and Ponderosa pines. The climate has warmed 2 degrees since 1900, with the hottest year on record occurring in 2015. Research into climate change impacts is ongoing. Focusing on biodiversity, adaptability, and resilience on the landscape are appropriate strategies in the face of an unknown future.

Cultural Context

Humans have lived in the Willamette Valley for over 10,000 years and are known to have had significant influence on the Valley's vegetation patterns. Prior to Euro-American habitation, most native inhabitants in the Willamette Valley belonged to the Kalapuya Tribe, made up of numerous bands. The Kalapuyan people are known to have regularly set fires throughout the Willamette Valley, likely in an effort to manage the land to improve hunting, forage, and travel. These fires helped maintain the Valley's mosaic of open prairies and oak savannas that the early Euro-American explorers and settlers encountered.

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[1] Oregon Climate Change Research Institute

[2] City of Eugene Climate Action Plan 2.0

The Kalapuyans were known to have used grasslands (prairie and savanna) and oak dominated areas intensively for food production and utilized at least 50 species of plants. Important food plants included bulbs of camas (*Camassia spp.*), brodiaea (*Brodiaea spp.*), and checker lily (*Fritillaria affinis*); acorns from Oregon white oak (*Quercus garryana*) and California black oak (*Quercus kelloggi*); roots of biscuitroot (*Lomatium spp*.) and yampah (*Perideridia spp*.); and seeds of tarweed (*Madia spp*.) and balsamroot (*Balsamorhiza spp.*).

With increased pressure from settlers to control fire and the devastating decline of the Kalapuyans due to introduced diseases and forced removal from their traditional lands, the practice of large-scale burning had largely ended by the late 1840s. In the wake of this cultural suppression, these traditional ways of knowing and the habitats supported by them continue to be threatened by a variety of prevailing societal, political, and environmental limitations. These include human impacts, varying land stewardship and control patterns, intergenerational poverty, historical trauma, public misconceptions regarding Tribal Sovereignty, dismissive attitudes toward treaty rights, legal challenges, and changing climate patterns.

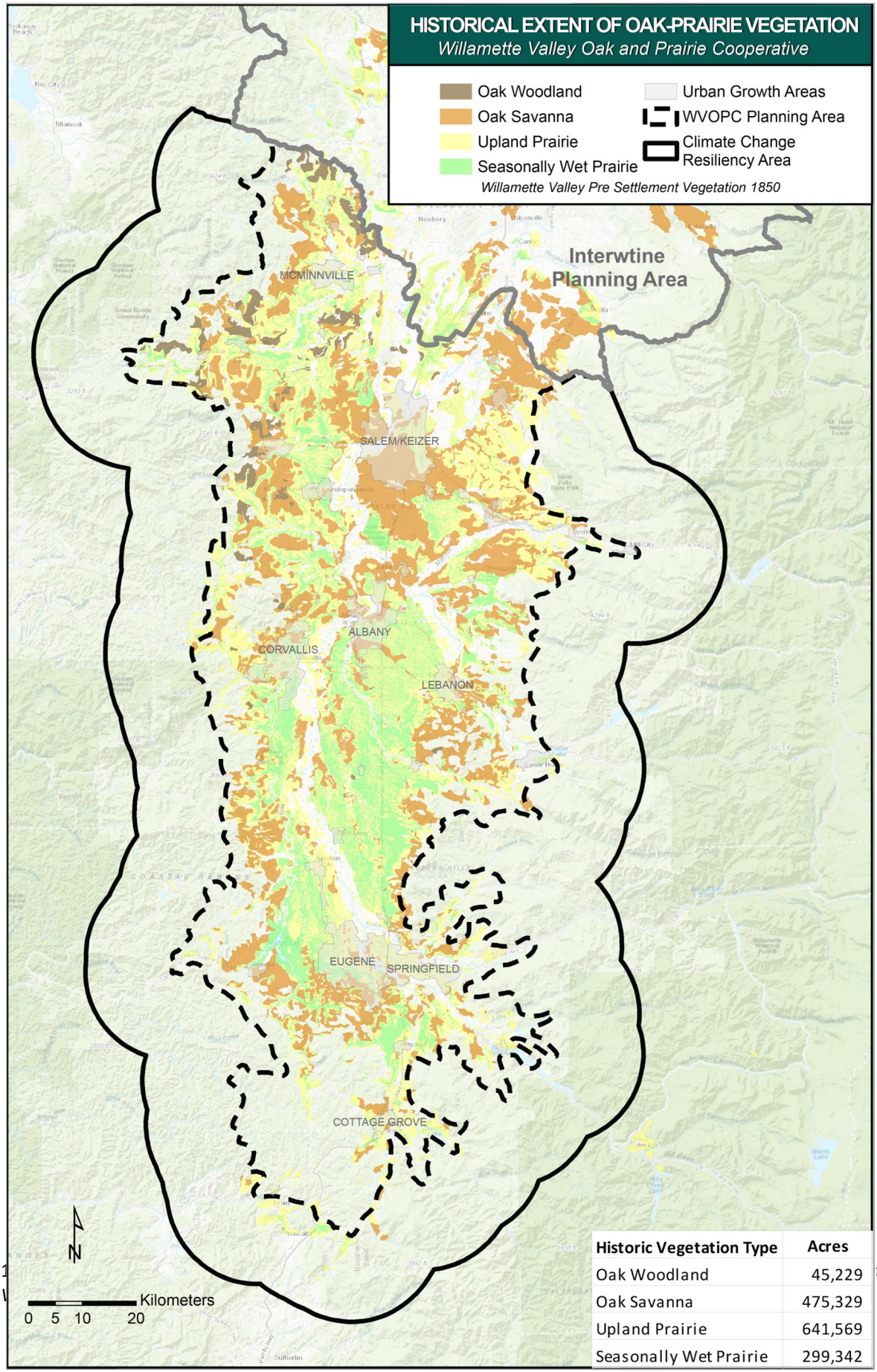
Modern descendants of the Kalapuya nations and neighboring indigenous groups are enrolled in the Confederated Tribes of Siletz Indians and Confederated Tribes of Grand Ronde. They continue to practice traditional lifeways and are making valuable contributions to their communities and stewardship of the Willamette Valley landscape.

Ecological Context

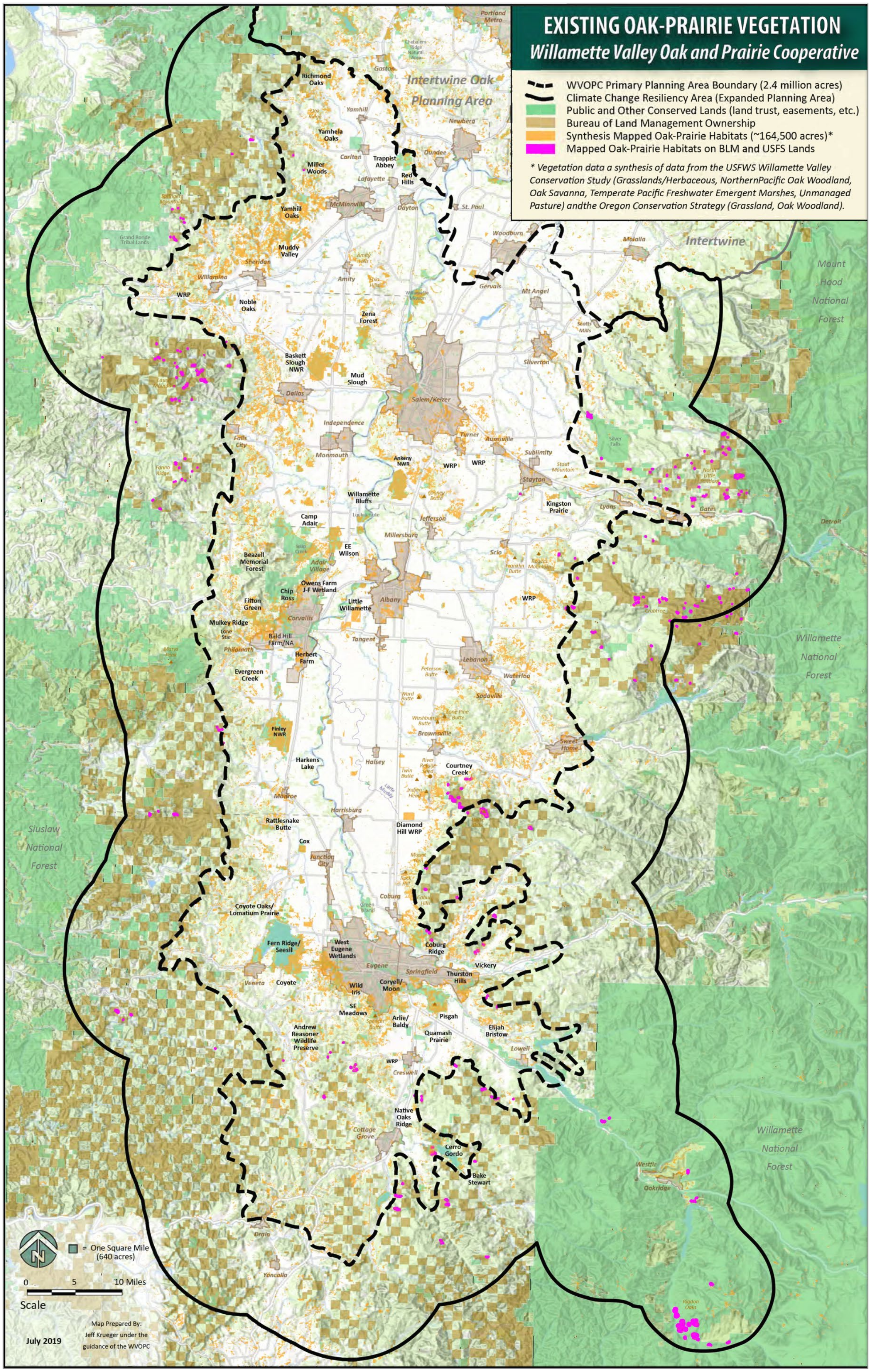
Accounts from early explorers and settlers to the Willamette Valley indicate that, prior to Euro-American settlement in the mid-1800s, large expanses of grassland and oak dominated habitats covered the valley floor, forming a complex mosaic of upland and wet prairie, oak savanna, and oak woodland mixed with broad bands of riparian forest lining major waterways (see “Historical Extents of Oak-Prairie Vegetation” map on following page). In general, open prairie occupied a central position within the valley bottom surrounded by bands of savanna and woodland, transitioning to conifer forest on the valley fringes and on some north facing hillslopes. Based on information derived from the General Land Office (GLO) survey notes from the 1850s, it is estimated that 61 percent (1,461,469 acres) of the Willamette Valley and foothills was occupied by oak or prairie habitat at the time.

Two species of oak are native to the Willamette Valley--Oregon white oak (*Quercus garryana*), whose range stretches up and down the west coast, and California black oak (*Quercus kelloggii*), which extends as far north as Monroe. Oak ecosystems support immense biodiversity, with many species dependent on oak habitats to survive. Oak habitats were historically maintained by indigenous people in the valley with regular, low-intensity burning that supported ecological and cultural vitality. These fires favored fire-tolerant and sun-loving mature oaks, prevented the establishment of Douglas firs and other conifers, and reduced the understory shrubs and small trees. These fire-maintained oak habitats resulted in widely spaced, large, open-branching oak trees with a clear understory dominated by fire-tolerant grasses and forbs and some scattered shrubs and small trees. In the absence of fire, fast-growing tall conifer trees like Douglas fir often encroach and overtop the oaks, which need space and sunlight to thrive. Since fire suppression and the exclusion of native people with European settlement starting in the 1850s, oak habitats and the species that depend on them have declined significantly, with less than 10% of oak habitats remaining (see “Existing Oak-Prairie Vegetation” figure on following page) and numerous bird and plant species listed as species of concern. What remains is generally found in

highly fragmented patches and in most cases is significantly impacted by invasive species and colonizing woody vegetation.



Historic Vegetation Type	Acres
Oak Woodland	45,229
Oak Savanna	475,329
Upland Prairie	641,569
Seasonally Wet Prairie	299,342


EXISTING OAK-PRAIRIE VEGETATION
Willamette Valley Oak and Prairie Cooperative
WVOPC Primary Planning Area Boundary (2.4 million acres)
Climate Change Resiliency Area (Expanded Planning Area)
Public and Other Conserved Lands (land trust, easements, etc.)
Bureau of Land Management Ownership
Synthesis Mapped Oak-Prairie Habitats (~164,500 acres)*
Mapped Oak-Prairie Habitats on BLM and USFS Lands
* Vegetation data a synthesis of data from the USFWS Willamette Valley Conservation Study (Grasslands/Herbaceous, NorthernPacific Oak Woodland, Oak Savanna, Temperate Pacific Freshwater Emergent Marshes, Unmanaged Pasture) andthe Oregon Conservation Strategy (Grassland, Oak Woodland).
Intertwine Oak Planning Area
Mount Hood National Forest
Willamette National Forest
Siuslaw National Forest
Salem/Keizer
Corvallis
Albany
Eugene
Springfield
= One Square Mile (640 acres)
0 5 10 Miles
Scale
July 2019
Map Prepared By: Jeff Krueger under the guidance of the WVOPC

Conservation Significance of Oak Habitats

The significance and ecological value of oak habitats is well documented in the Willamette Valley. See image below for some of these values, as well as "Desired Habitat Features" section of this plan.

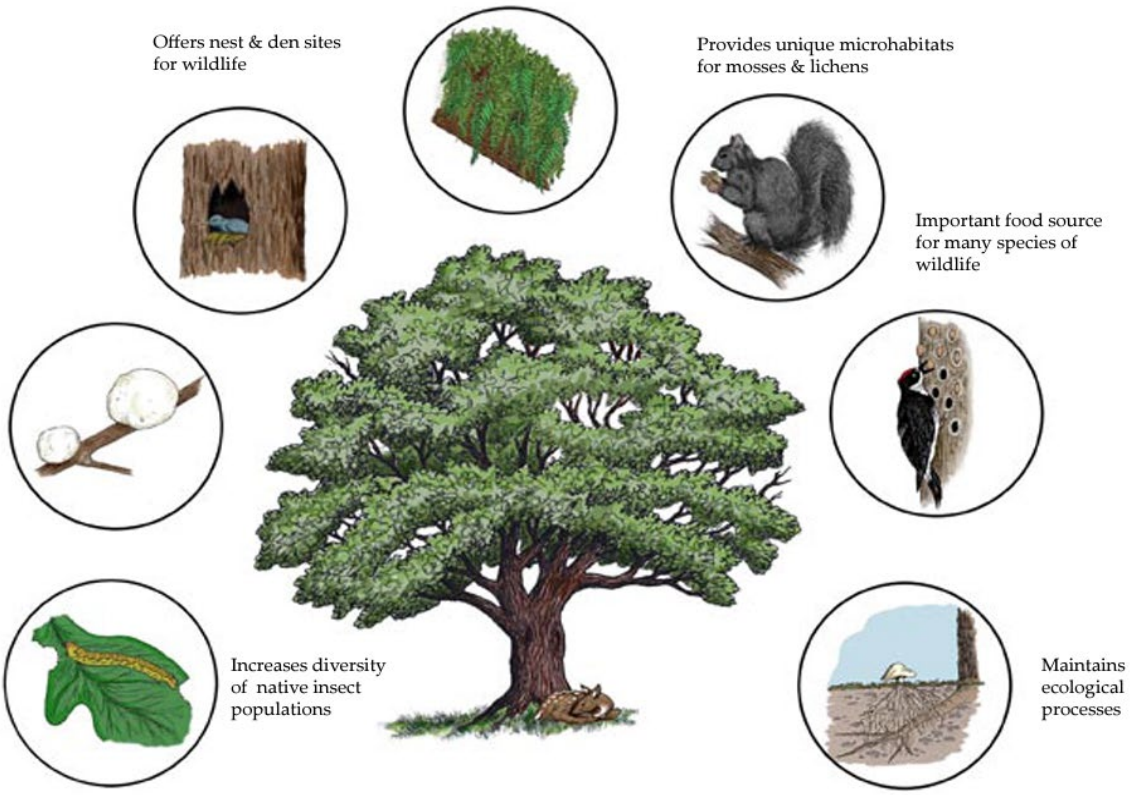
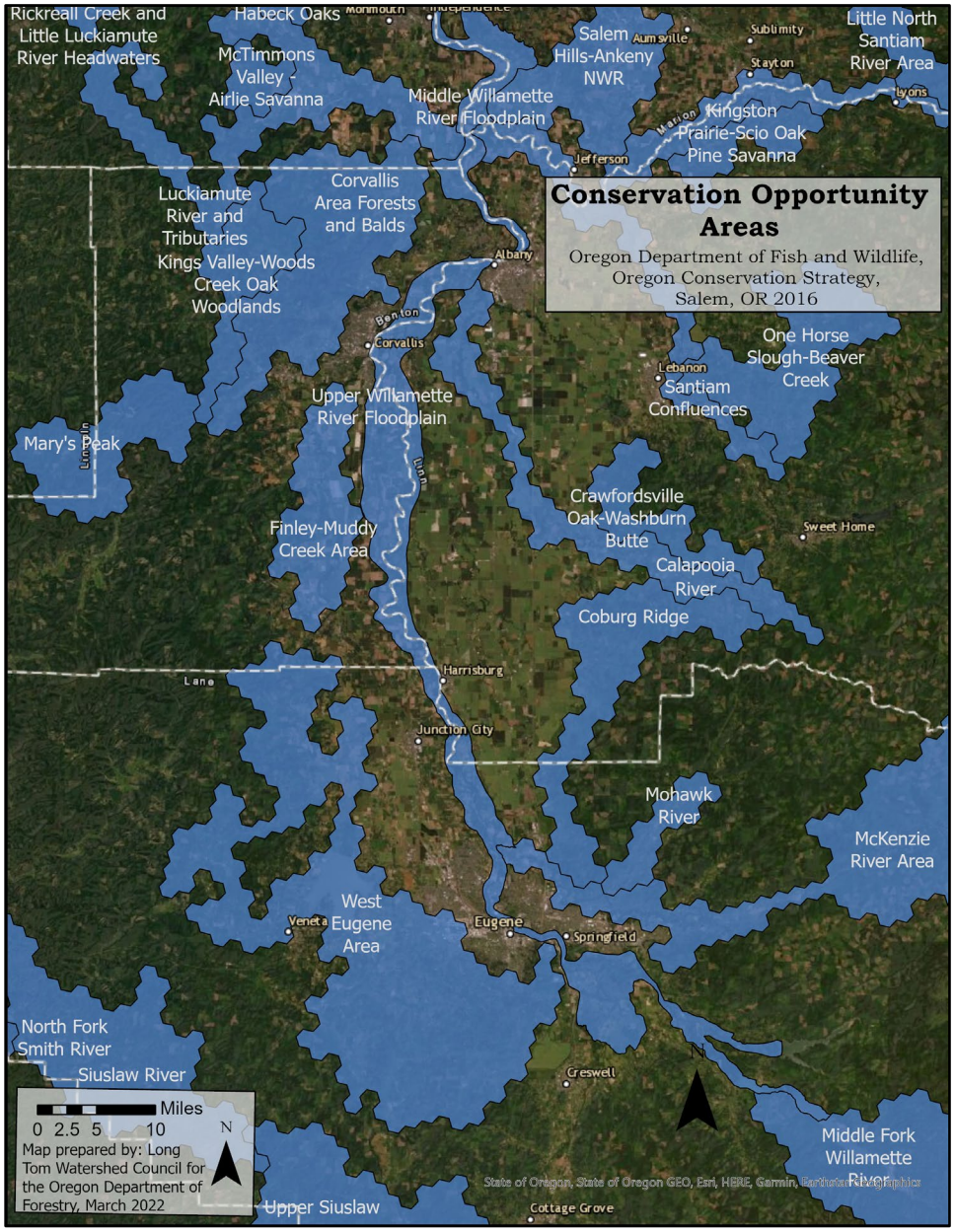


Image: Diagram of some of the many offerings of an oak tree to biodiversity. From *Landowner's Guide to Restoring and Managing Oregon White Oak Habitats* (Vesely and Tucker 2004).

The Willamette Valley Oak and Prairie Cooperative (WVOPC) is a central regional coordinating hub for regional oak and prairie conservation. Their website offers maps, descriptions of historical and ecological landscape patterns, and a strategic action plan. Oak habitats, alongside adjacent ecosystems including wet prairie, upland prairie, and riparian woodlands, are recognized as priorities for conservation by numerous agencies and collaboratives, including the Oregon Department of Fish and Wildlife, U.S. Fish and Wildlife Service, Rivers to Ridges Partnership, Cascadia Prairie and Oak Cooperative, and the Oak Accord.

Conservation Opportunity

[ODFW Conservation Opportunity Areas (COAs)] are a component of the Oregon Conservation Strategy, highlighting areas across the Oregon landscape where broad fish and wildlife conservation goals would best be met. COAs aim to increase the likelihood of long-term conservation success, maximize effectiveness over larger landscapes, improve funding efficiency, and promote cooperative efforts across ownership boundaries. COAs were developed to guide voluntary conservation actions in Oregon. Land use or other activities within these areas are not subject to any new regulations as a result of being designated a COA. [The Nature Conservancy] and [U.S. Fish and Wildlife Service] also designate conservation opportunity areas.



Navigate to the following websites to determine if the property is located within a conservation opportunity area. If so, find and add a description of that COA in this section.

[The Nature Conservancy's Willamette Valley Synthesis Conservation Opportunity Areas.]

[Oregon Department of Fish and Wildlife's Conservation Opportunity Areas]

Click here to enter text.

III. CURRENT & DESIRED FOREST, WOODLAND, AND SAVANNA CONDITIONS

Oak Habitat Types

The following habitat types occur in the south Willamette Valley. The descriptions have been slightly modified from their original publication in the Land Managers Guide to Bird Habitat and Populations in Oak Ecosystems of the Pacific Northwest (Altman & Stephens 2012).

1. Oak Savanna

Oak Savanna habitats are grasslands with scattered oak trees and an open canopy (<25% cover) with approximately 1-5 large trees or 1-10 younger trees per acre. Oak trees in savannas are "open-grown" (i.e. without nearby competition for resources), which at maturity results in large mushroom-shaped trees with well-developed limbs and canopies. Historically, the understory was typically dominated by a ground cover of grasses and forbs with < 10% shrub cover. Under current conditions of fire suppression and associated habitat degradation, the understory may include significantly more shrub and small tree cover depending on land use and management. Characteristic bird species include Lazuli Bunting and Western Bluebird.

2. Oak Woodland Open

Open Oak Woodland habitats are characterized by a relatively open canopy (25-50% cover) with approximately 5-10 large trees or 10-20 younger trees per acre. Oak trees in open oak woodlands are often a mixture of open-grown trees and columnar shaped trees with limited lower branch and foliage development. The understory was historically dominated by herbaceous ground cover with variable shrub cover <30% depending on site conditions. Under current conditions of fire suppression and associated habitat degradation, the understory may include significantly more shrub and small tree cover in the absence of management or disturbance. Alternatively, the understory may include limited or no shrub cover where management is occurring (e.g., grazing, mowing). Characteristic bird species include Chipping Sparrow in the understory and Western Wood-pewee in the canopy.

3. *Oak Woodland Closed*

Oak Woodland Closed habitats are characterized by a relatively closed canopy (50-75% cover) with approximately 10-30 large trees or 20-40 younger trees per acre. Oak trees in closed oak woodlands are mostly columnar shaped with limited lower branch and foliage development. The understory was historically dominated by herbaceous ground cover with variable shrub cover <30% depending on site conditions. Under current conditions of fire suppression and associated habitat degradation, the understory may include some patches of shrub and small tree cover in forest canopy openings. Characteristic bird species include Purple Finch and White-breasted Nuthatch (subspecies).

4. *Oak Forest*

Oak Forest habitats are characterized by a nearly closed canopy (greater than 75% cover) with typically >30 large trees or >40 younger trees per acre. Oak trees in a dense oak forest compete for resources and are almost exclusively columnar in shape with limited branching and crown foliage volume. The sub-canopy and understory can be devoid of woody vegetation where there is a lack of sunlight reaching the forest floor. Alternatively, in moist, productive soils, the sub-canopy and understory can be densely vegetated with shade tolerant shrub and tree species. Characteristic bird species include Nashville Warbler in the dense understory and Black-headed Grosbeak in the canopy and sub-canopy.

5. *Oak/Fir Forest*

Oak/Fir habitats are typically closed woodland or forests where there is a relatively equal representation of oak and Douglas-fir in the canopy. This may be a natural community type which occurred primarily in the foothill elevational transition into Douglas-fir forests, or where site-specific conditions (e.g., north aspects, moister soil types) were present at the interface with oak habitats. However, the most common manifestation of this codominance today is the result of the encroachment of Douglas-fir as a result of fire suppression. There is often some representation of dying or dead oak trees in the canopy or sub-canopy as a result of the competition and over-topping of Douglas fir. The understory is typically limited because of the closed canopy, but shade-tolerant conifer tree species (e.g., Douglas-fir, grand fir) are often a component of the sub-canopy and shrub layers. Characteristic bird species include Black-throated Gray Warbler and Cassin's Vireo.

6. *Oak/Pine*

Oak/Pine habitats are typically woodlands or savannas characterized by the co-dominance of oak and ponderosa pine. These habitats predominantly occur in the east-slope Cascades ecoregion, to a lesser extent in the Klamath Mountains ecoregion, and only occasionally in the Willamette Valley at relatively drier sites, often on moderate to steep slopes in canyons and foothills. The understory may include pockets of shrubs, but is more typically dominated by grasses and forbs. Characteristic bird species include Lewis's Woodpecker in savanna habitats and Western Tanager in woodland and forest habitats.

7. *Oak/Hardwood Forest*

Oak/Hardwood habitats are typically closed woodland or forests characterized by the co-dominance of oak with other hardwood species such as madrone, big leaf maple, or Oregon ash. The former is characteristic of dry sites, and the latter two of wetter sites such as riparian. The understory is variable in extent - typically limited in both open-grown conditions where tree branching occupies much of the space, or in closed canopies where lack of sunlight limits development; but more robust in the wetter sites, which support shrub and sapling tree development. This habitat type occurs throughout the region, but is most prominent in the Klamath Mountains ecoregion. Characteristic bird species include Hutton's Vireo and Black-capped Chickadee.

8. *Riparian Oak*

Riparian Oak habitats are located adjacent to water bodies and can be further defined by any of the other habitat types. The main difference is that because of the higher productivity of riparian soils, Riparian Oak habitats tend to support denser shrub and sub-canopy cover, and often more tree diversity in the canopy, although pure oak in riparian sites is not uncommon. It occurs in all ecoregions, but is most prevalent in the Puget Lowlands and Willamette Valley. Bird species composition in riparian oak is similar to other oak-dominant or co-dominant types. However, because vegetation volume is high, there

may be a greater species diversity and/or higher densities of insectivores and foliage-gleaning birds than occur in non-riparian oak sites. Characteristic bird species include Black-headed Grosbeak, Bushtit, and Downy Woodpecker.

See **Appendix B: Oak Habitat Types of the South Willamette Valley** for a visual chart comparing differences between oak habitats.

Sensitive, Threatened, and Endangered Species

Oak ecosystems, as well as grasslands and riparian habitats, are associated with unique assemblages of plants, birds, and wildlife of all types. Since oak habitats have declined significantly in our region, many of these species are also in decline. Some have been put on federal, state, and regional conservation priority lists as sensitive, threatened, and endangered species with special protections. Management actions should be planned to enhance biodiversity overall and prevent the listing of any additional species.

See **Appendix C: Species of Conservation Concern in South Willamette Valley Oak and Adjacent Habitats** for a full list of sensitive, threatened, and endangered species including pictures and habitat details.

Also check out the Oregon Forest BioDiversity Explorer as an authoritative database to consult about threatened, endangered, sensitive, rare and other important forest species that could be located on or near your property.

List species of conservation concern known to occur on the site or nearby.
Click here to enter text.

Cultural Resources

If you find evidence of ancient artifacts or cultural landscape modifications, leave them in place. Most plants and animals serve important cultural roles for Indigenous people and deserve consideration as cultural resources as well. See the following posters as references for native plants that still have cultural value as food, fiber, and other uses for Indigenous people of our area.
Traditional Fiber Plants of the Confederated Tribes of Grande Ronde in the West Eugene Wetlands
Traditional Food Plants of the Confederated Tribes of Grand Ronde in the West Eugene Wetlands

If your site has significant patches of culturally valuable plants or other known cultural significance, consider being in touch with a local Tribe or Indigenous community group to see if they are interested in access to and/or co-management of the site. Learn about Tribal history and the impacts of colonization to Native people.
List and describe known cultural resources on the site.
Click here to enter text.

Forest Health Concerns (Insects and Disease)

The following information was originally published in Hardwoods of the Pacific Northwest, S.S. Niemiec, G.R. Ahrens, S. Willits, and D.E. Hibbs. 1995. Research Contribution 8. Oregon State University, Forest Research Laboratory. It can also be found on Oregon State University's Wood Innovation Lab's website.

Filbertworm (*Melissopus latiferreanus*) and filbert weevils (*Curculio occidentalis*) attack acorns of Oregon white oak. Hundreds of other insect species live on Oregon white oaks, although few cause significant damage. The most damaging insect is the western oak looper (*Lambdina fiscellaria somniaria*), which can defoliate trees over large areas; tent caterpillars also have a preference for oak. Gall wasps are common on Oregon white oak. Noticeable damage is often inflicted on oak by *Bassettia ligni*, which girdles and kills branches. Intentionally set fires and resulting smoke can help mitigate acorn pests.

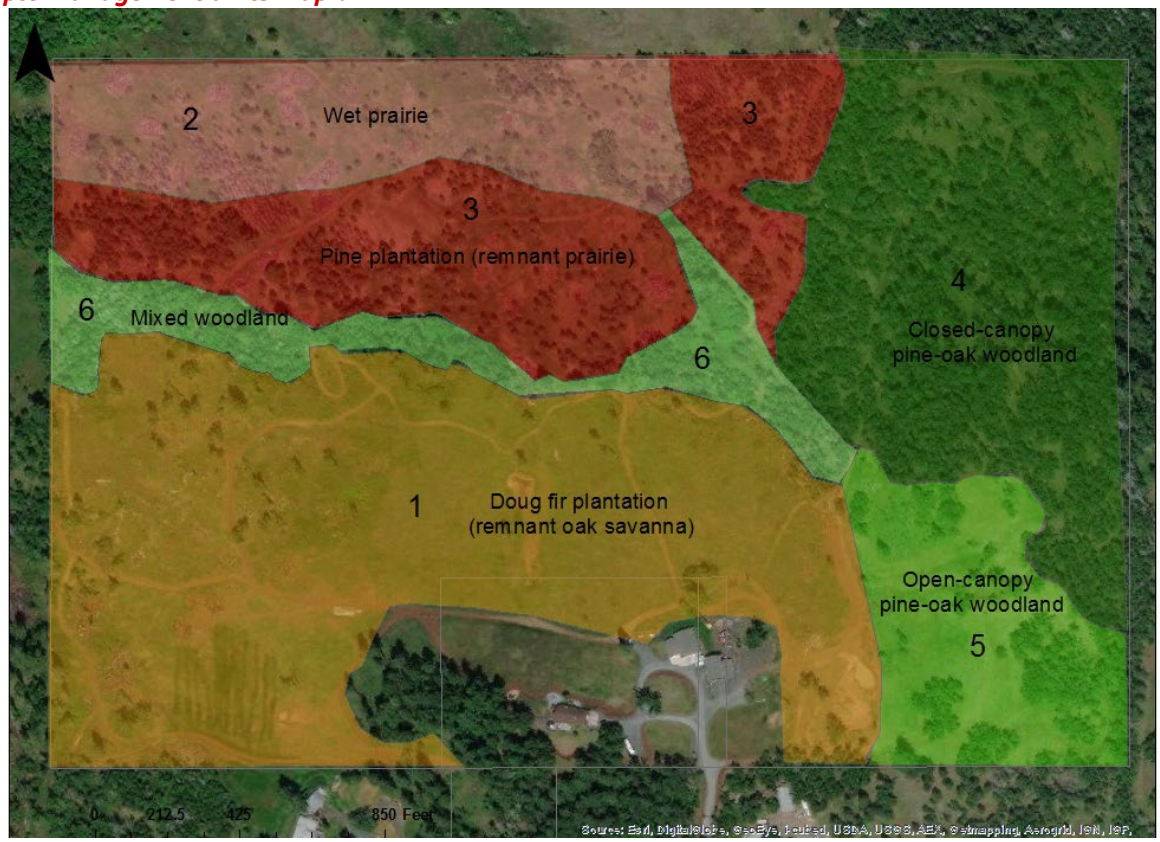
Numerous pathogens attack Oregon white oak. The hairy mistletoe is widespread. Shoestring root rot, *Armillaria ostoyae* (*A. mellea*), and white pocket rot and butt rot (*Polyporus dryophilus*) cause significant damage. One episode of anthracnose disease (*Gnomonia quericina*) appeared to cause significant damage in Washington in 1968.

List and describe known forest health concerns on the site.
Click here to enter text.

Management Units

Delineate distinct stands or landscape types on the property. Make and include an overview map of the management units. Name and/or number the units. Include at least one representative photo for each unit.

Sample management units map :



Stand Assessments

Assess each stand in order to assess and quantify current conditions, to be able to use as a reference and comparison after management activities have occurred. Use the following ***Rapid Stand Assessment*** *designed specifically for oak habitats, or use another method. If more detailed timber volume or tree basal area information is needed, supplement with an existing forest stand inventory protocol such as Oregon State University's Basic Forest Inventory for Family Forest Owners (Zobrist, Hanley, Grotta, & Schnepf, 2012). Summarize your findings in paragraph form in the next sections.*

Sample stand assessments for different woodland types are provided in ***Appendix D.*** *Digitize your stand assessments and replace the examples.*

Stand Assessment Data Collection Form		Complete one for each stand type/unit		**Characteristic picture**
Property name:		**Lat/Long**		
Unit name:		**Unit Acreage:**		
Person doing assessment:		**Date:**		
Slope		**Aspect**		
General Description				

Use "Oak Habitat Types" reference to help identify current and recommended conditions

Overstory Stand Structure	**Current** Select one (X)	**Recommended** Select one (X)
Savanna (5-25% canopy cover)		
Open Woodland (25-50% canopy cover)		
Closed Woodland (50-75% canopy cover)		
Forest (75%+ canopy cover)		
Comments:		

Understory Structure	**Current** Select one (X)	**Desired** Select one (X)
Open (<25% shrub cover)		
Semi-open (25-50% shrub cover)		
Semi-closed (50-75% shrub cover)		
Closed (>75% shrub cover)		
Comments:		

Fuel Category	**Select one (X)**	**Code (USDA Fuel model 2005)**
Grass (nearly pure grass/forb)		
Grass/Shrubland (mix, up to 50% shrub)		
Shrub (>50% shrub)		
Timber-Understory (grass/shrub mix with forest canopy litter)		
Timber Litter (Dead/down woody fuel beneath forest canopy)		
Slash/Blowdown (activity fuel or wind damage debris)		
Nonburnable		

Current Overstory Composition

Overstory Species Composition	**Current relative % of canopy**	**Recommended relative % of canopy**
Oaks		
Conifers		
Other Hardwoods		

Trees per acre Fixed Plots / Visual Estimate / Other method _____(circle one)

Species	**DBH >20"**	**DBH 12-20"**	**DBH 8-12"**	**DBH 4-8"**	**DBH 1-4"**	**Seedlings <1" DBH**
Oregon white oak						
California black oak						
Douglas fir						
Ponderosa pine						
Incense cedar						
Pacific madrone						
Big leaf maple						
Oregon ash						
Other						
TOTAL live trees						
Conifer snags						
Hardwood snags						

Understory condition (note top 5 dominant species, notable native plant species observed, and problematic weeds)

Management Recommendations

Management Units Summary Table:

Fill out for individual property

Unit Name/#	# of Acres	Current stand/habitat type
1	27	Douglas fir plantation (remnant oak savanna)
2	8	Wet prairie
3	12	Pine plantation (remnant prairie)
4	15	Closed-canopy conifer-oak woodland
5	7	Open-canopy oak-pine woodland
6	3	Mixed woodland

Unit 1: Douglas fir plantation (remnant oak savanna) - Stand description and current conditions

The forest was clear cut in the last century and replanted to a Douglas fir forest. In 2017, the property owners noted that a significant portion of the firs were weakened or dying, and cleared all of the Douglas fir in this section, leaving the most open-form remnant oak trees (about 8-20" DBH) that were present in the understory. Other oaks, having grown up with minimal light under the canopy of the firs, had quite spindly trunks and closed-form crown structure, and were thinned out. Others that were previously intermediate or understory trees, including sporadic ponderosa pine, Oregon ash, and incense cedar, are now released to full sun exposure. The understory is a mix of native and non- native woodland and upland prairie/savanna shrub and herbaceous species. Shining geranium carpets the understory at a high density, and there are scattered dense patches of dogtail fescue, Himalayan blackberry, and bull thistle. After thinning, stumps were removed in about half of this section, soil re-graded, brush piled and some of the piles burned. After thinning, the area was seeded with native grasses and forbs. Weed management and supplemental seeding is ongoing.

Unit 2: Wet Prairie - Stand description and current conditions

The wet prairie habitat type extends about 8 acres in the very northern edge of the property and is contiguous with Unit 3. Characterized by hydric soil, this area holds standing water with some surface flow during the wet season. As described in Unit 3 below, Ponderosa pines were planted in this wet prairie and through restoration actions have been thinned to savanna-like densities.. The wet prairie is characterized by hummocks and ant mounds, which are typical of functional wet prairie habitats. Ground disturbing actions, including machinery involved in the pine planting and removal, has degraded the habitat quality, though some intact microtopography and plant community remains. Rushes (Juncus spp.) are common, and there are patches with a high diversity of native wet prairie associated forbs and graminoids. These patches have the potential to host rare plants such as Sisyrinchium hitchcockii, which is present immediately across the fence on the neighboring property. Non-native tall fescue is the dominant grass, and pennyroyal (Mentha pulegium) is common in the wettest areas. Himalayan blackberry, English hawthorne, and rose (Rosa sp.) comprise the shrub layer.

Unit 3: Pine plantation (remnant prairie) - Stand description and current conditions

Much of this 12 acre area, in the northwest section of the property, was historically upland prairie and savanna, and grades into the wet prairie of Unit 2. In both Units 2 and 3, valley Ponderosa pines were

planted in 1994. These trees were evenly spaced at a distance of 10 feet apart, and as of 2014 covered about 80% of these units. Historic images show dead pines beginning to appear starting in 2014, with a total of about 2 acres completely dead by 2016, and up to half weakened or dying from three years of drought followed by infestation of the pine beetle Dendroctonus ponderosae. The landowners began removing dead and weakened trees in 2018, stacking logs and brush in a series of piles to be burned. Interspersed within the young pines (6-9" DBH) are large diameter Ponderosa pine (15-25" DBH), white oak, and black oak, spaced approximately one every acre with a higher density patch near the western boundary. Himalayan blackberry is present across the pine forest in sporadic dense patches. Tall fescue dominates the groundcover.

In 2019, the majority of pines were masticated and mulched, leaving approximately 10-15% of the pines standing. Bare areas including burn pile footprints and machine scuff marks were seeded with diverse native grass and forb mixes, the area is being monitored and managed for weeds and seed establishment.

Unit 4: Closed-canopy conifer-oak woodland - Stand description and current conditions

The northeast portion of the property, comprising 15 acres, is dominated by Oregon white oak with scattered Douglas fir and Ponderosa pine. Canopy cover of the oak woodland was 95% until 2016, when restoration thinning began. Conifers grow mostly as codominant or intermediate trees with periodic dominance over the oaks, and density being highest in the drainage basin. Fallen branches and suppressed or dead firs create a significant fuel ladder from the ground into the canopy layer. Remnant open-form oak trees (>20" DBH) are spaced about one tree per acre. Surrounding oaks of diverse ages and sizes are variably dense with 6 to 30 ft spacing between trunks, and a great abundance of oak seedlings emerging in the understory. There are occasional madrone in the emergent and intermediate layers. There are several standing snags and large cavities in older trees. The shrub layer, consisting primarily of poison oak with a few other species, is minimal in places (10-20%), and denser in patches (around 50%) especially in the drainage basin. The ground cover layer has a relatively intact native plant assemblage, especially where there has been low disturbance. There is some encroaching shiny geranium, primarily along roadways and habitat edges.

Desired Stand Conditions

Use oak habitat type descriptions and/or **Appendix B: Oak Habitat Types** as a reference for desired future conditions that are appropriate for each management unit. Include measurable metrics like % canopy cover, % shrub cover, trees per acre by species and size class, etc. Include them in a separate section here or nested within unit descriptions above.

Desired Habitat Features

Oak savannas and woodlands are used by more than 200 species of native wildlife in the region. Many of these species are imperiled by habitat loss and degradation and introduced species. A variety of features in oak habitats and oak trees offer conditions for nesting, foraging, and protection for a diversity of birds, plants, insects, mammals, reptiles, fungi, and other diverse life forms. For more details about how these features impact wildlife, see *Landowners Guide to Restoring and Managing Oregon White Oak Habitats* (Vesely and Tucker 2004).

1. *Large diameter open-form trees*
   Retain all trees over 20" with large horizontal branches which can extend in some cases all the way to the ground. Clear all trees and tall shrubs from within 1-1.5x the dripline of each legacy tree. Larger conifers should be retained where they are not impacting oaks or their size, location or character is such that removal is not aesthetically or ecologically desirable.
2. *Age diversity of trees*
   Maintain a diversity of age classes, as indicated by relative sizes of tree stems. Prioritize retaining the largest diameter trees. Leave some younger/smaller diameter trees to become the next generation. See **Appendix B: Oak Habitat Types** for recommendations on the number of trees to retain for each habitat.
3. *Snags and dead wood/cavities*
   Retain 1-4 snags (dead standing mature trees) per acre. Select the largest diameter snags possible and of a diversity of tree species. Retain all hardwood snags unless they pose hazards to humans or infrastructure. Retain living trees with dead or decaying limbs, especially in large oak trees. If there are no snags, create some by girdling bark and cambium in a 12" wide ring all the way around the selected trees. Leave occasional down woody debris (logs) >8" DBH scattered or in "habitat piles"
4. *Patchy shrub cover*
   Retain scattered patches of shrubs in a mosaic with low-statured grass- and forb-dominated understory. See **Appendix B: Oak Habitat Types** for recommendations on the density of shrubs to leave for each habitat.
5. *Edge habitat and forest openings*
   Create a "feathered edge", or gradual transition from open landscapes (pasture, prairie, lawn, etc) into denser forest. Retain occasional openings within woodlands. Keep woodland densest along waterways. Do not thin or plant trees at a uniform density.

IV. MANAGEMENT PRACTICES

Restoration Actions - Short Term

The following outlines common short-term management practices that are applicable in many oak habitats and are available for cost-share funding from NRCS.

Forest Stand Thinning - NRCS Practice 666

Unit # to apply practice	Method	Photo	Considerations
Click here to enter text.	*Mulch* - Chip and disperse entire tree into fine particles in place from the top down with forestry mulcher		~Returns nutrients to the soil ~Excess wood will change soil chemistry in favor of woody species and can suppress native oak-prairie grasses/forbs ~Limit to smaller tree diameters (3-6") to reduce chip build-up ~High fossil fuel consumption
Click here to enter text.	*Masticate* - Grind entire tree or downed wood/slash into medium sized pieces by making several passes over the wood on the ground with a machine		~Creates significant ground disturbance–not ideal for high quality or sensitive existing native understory plants ~Larger pieces of wood may interfere with future mowing ~Limit to smaller tree diameters (3-6") to reduce chip build-up ~High fossil fuel consumption ~Not suitable for steep slopes or wet ground
Click here to enter text.	*Hand fell* - cut tree with chainsaw and process within unit or haul to landing for processing		~Remaining stumps will inhibit mowing ~Least ground impact ~Longer seasonal window–may be done in rainy season on upland sites ~Labor-intensive ~Less fossil fuel consumption
Click here to enter text.	*Machine fell* - cut or shear trees at base with feller-buncher, harvester-forwarder, skid steer, or other forestry machine		~Remaining stumps will inhibit mowing ~Risk of ground compaction from heavy machine ~Time- and cost-efficient for large scales ~High fossil fuel consumption ~Limited machine availability, depending on timber industry demands (historically)

Woody Residue (Slash) Treatment - NRCS Practice 384

Unit # to apply practice	Method	Photo	Considerations
Click here to enter text.	Mulch	see above	see above ~Can do simultaneous to thinning
Click here to enter text.	Masticate	see above	see above ~Can do simultaneous to thinning
Click here to enter text.	Pile and burn		~Pile by hand or by machine ~Can make smaller, tighter, tidier piles ~Dispersed footprint ~Reduce soil scarring by keeping pile small, wood <4" diameter, lighting from the top, and raking out coals/ash after burning ~Keep dirt out of pile
Click here to enter text.	Chipping & Tub grinding		~Obtain a yield ~Labor and fossil fuel intensive ~Alternative to burning if not feasible ~Need to move chips afterwards ~Chip piles suppress all vegetation ~Excess chips can encourage blackberry ~Large chip mounds can build heat from decomposition and ignite
Click here to enter text.	Lop and scatter		~Not appropriate for oak habitats, unless part of a prescribed burn plan or no other method is feasible ~Suppresses native plant understory and restricts seed germination ~Encourages blackberry ~Makes mowing unfeasible, may hinder prescribed grazing ~Restricts movement of humans and wildlife ~Occasional large downed wood is beneficial

Click here to enter text.	Biochar (NRCS practice E384)		~Captures carbon for long-term storage ~Obtain a yield ~Labor intensive ~Reduces smoke emissions ~Learning curve to effectively produce ~See: https://wilsonbiochar.com/

Brush Treatment - NRCS Practice 314

Unit # to apply practice	**Method**	**Considerations**
Click here to enter text.	*Chemical*** - The management or removal of woody (non-herbaceous or succulent) plants including those that are invasive and noxious. Typically, following the thinning and/or mechanical treatment, a spot application of herbicide should be applied to hardwood stumps, blackberries, poison oak, and Scotch Broom, etc.	~Cost-efficient and effective in quickly achieving ecological objectives ~May be incompatible with indigenous/traditional food and basketry materials harvesting ~Possible risks to human and wildlife health, and contamination of soil and waterways ~Usually requires repeat treatments
Click here to enter text.	*Mechanical* - The management or removal of woody (non-herbaceous or succulent) plants including those that are invasive, noxious, or undesirable. Depending on size of woody species, slopes, and intensity of infestation, the removal of brush is done by use of mechanical equipment, such as mechanical cutter, chopper, masticating, grubbing, chaining, raking, or piling to improve degraded sites. Treatment should be applied to blackberries, poison oak, Scotch Broom, English ivy, clematis, Japanese knotweed, Russian olive, English hawthorn, tree of heaven, black locust, etc.	See "Long term management" section
Click here to enter text.	*Biological* - targeted grazing by livestock to selectively eat persistent woody vegetation such as blackberry, resprouting hardwood stumps, tree/shrub seedlings, and re-emerging shrubs where a more herbaceous understory is desired	See "Long term management" section

Herbaceous Weed Treatment - NRCS Practice 315

Unit # to apply practice	Method	Considerations
	Mechanical - The management or removal of herbaceous, non-woody plants including those that are invasive, noxious, or undesirable through hand-pulling, digging, mowing, string-trimming, etc. Treatment should be applied to shiny geranium, false brome, etc.	Varies depending on species
	*Chemical*** - The management or removal of herbaceous, non-woody plants including those that are invasive and noxious. Treatment methods may include aerial, spot or ground application.	Varies depending on species
	Biological - Use of biological control agent or targeted grazing to achieve effective control of pervasive herbaceous, non-woody species.	Varies depending on species

Seeding Native Grasses and Flowers - NRCS Practice 327 or 420

Establishing wildlife habitat by planting herbaceous vegetation or shrubs. Native grasses and wildflowers will be established in all of the bare soil areas created by restoration activities.

Order seeds pre-mixed or consult a technical service provider on developing a custom mix appropriate for your site. Numerous factors impact successful seeding. See Heritage Seedling's resource page about site preparation and seeding for more information.

OAK WOODLAND - dry site		OAK WOODLAND - Wet/riparian	
* = include in high diversity mix			
Achillea millefolium	Yarrow	*Bromus sitchensis*	Sitka brome
Acmispon americanus	Spanish clover	*Elymus glaucus*	Blue wild rye
*Aquilegia formosa**	Columbine	*Achillea millefolium*	Yarrow
Bromus sitchensis	Sitka brome	*Aquilegia formosa**	Columbine
Clarkia amoena, C. purpurea	Farewell to spring	*Artemisia douglasiana**	Mugwort
Collinsia grandiflora	Blue-eyed mary	*Camassia leichtlinii**	Common camas
Collomia grandiflora	Large-flowered collomia	*Collinsia grandiflora*	Blue-eyed mary
Elymus glaucus	Blue wild rye	*Geum macrophyllum*	Large-leaved avens
Eriophyllum lanatum	Oregon sunshine	*Iris tenax**	Oregon iris
Geum macrophyllum	Large-leaved avens	*Ligusticum apiifolium**	Celery leaf licorice root
*Iris tenax**	Oregon iris	*Lomatium dissectum**	Fern leaf biscuit root

*Ligusticum apiifolium**	Celery leaf licorice root	*Madia elegans*	Common tarweed
*Lomatium nudicaule**	Nine-leaf biscuit root	*Plagiobothrys nothofulvus*	Rusty popcorn flower
*Lomatium dissectum**	Fern leaf biscuit root	*Plectritis congesta*	Rosy plectritis
Madia elegans	Common tarweed	*Dryomycalis glandulosa*	Sticky cinquefoil
*Madia gracilis**	Sticky tarweed	*Prunella vulgaris var lanceolata*	Self heal
Phacelia nemoralis var oregonensis	Shade phacelia	*Ranunculus uncinatus**	Woodland buttercup
Potentilla gracilis	Cinquefoil	*Rupertia physodes**	Scurf pea
Prunella vulgaris var. lanceolata	Self-heal	*Sidalcea campestris*	Meadow checkermallow
*Rupertia physodea**	Scurf pea	*Thalictrum polycarpum**	Tall meadow rue
*Sanguisorba annua**	Western burnet		
*Sanicula crassicaulis**	Pacific snakeroot		
*Sidalcea malviflora ssp. virgata**	Dwarf checkermallow		
Sidalcea campestris	Meadow checkermallow		

Additional Practices to Consider

Unit # to apply practice	NRCS Code	Practice Name	Description
Click here to enter text.	112*	Prescribed burning plan	A written plan completed by a certified technical service provider that includes a design for controlled fire that is applied to a predetermined area.
Click here to enter text.	338*	Prescribed burning	Controlled fire applied to a predetermined area.
Click here to enter text.	660	Pruning – wildlife, mast increase	Pruning of oaks to stimulate increased nut production for wildlife food.
Click here to enter text.	383*	Fuel break	A strip of land mostly cleared of brush with widely spaced trees. To be effective, the minimum width will be 66 feet, and maximum width will be 660 feet.
Click here to enter text.	394*	Fire break	Natural firebreaks are roads, streams, railroads, pastures, cliffs, utility right of way, cultivated fields. Tie in constructed firebreaks (bare ground or vegetative) to natural firebreaks whenever possible. Firebreaks will be of sufficient width and length to contain the expected fire.

Unit # to apply practice	NRCS Code	Practice Name	Description
Click here to enter text.	528	Prescribed grazing -	Manage stocking rates and grazing period to adjust the intensity, frequency, timing, duration, and distribution of grazing to meet the objectives for the plant communities and associated resources
Click here to enter text.	649	Structures for Wildlife	A structure to enhance or sustain non domesticated wildlife; to modify an existing conservation structure that poses a hazard to wildlife
Click here to enter text.	338A*	CSP Enhancement 338A	Strategically planned, patch burning for grazing distribution and wildlife habitat
Click here to enter text.	338B*	CSP Enhancement 338B	Short-interval burns to promote a healthy herbaceous plant community
Click here to enter text.	338C*	CSP Enhancement 338C	Sequential patch burning
Click here to enter text.	381A	CSP Enhancement 381A	Silvopasture to improve wildlife habitat

**All burning practices will be done in compliance with all pertinent state laws and permits.*
***All chemical applications will be applied according to the label instructions. Refer to your local OSU Extension for chemical and or product recommendations*

Long Term Management

Oak savannas and woodlands maintain their structure and sparser tree density through regular disturbance to the understory (approximately every 3-10 years). Without regular management of the understory, shrubs and trees will naturally encroach. An understory dense with woody vegetation suppresses native grasses and forbs, and can pose a wildfire risk. After a big restoration effort in an oak habitat, regular understory disturbances in the form of burning, mowing, targeted grazing/browsing, or other methods are necessary to maintain oak habitat integrity.

The following long-term management strategy(ies) will be used to maintain the woodland understory:

X if apply	Long-term strategy	Frequency
☐	Mowing/masticating	Every 3-10 years
☐	Prescribed burning	Every 3-10 years
☐	Targeted grazing/browsing	Every 3-10 years
☐	Other: Click here to enter text.	Click here to enter text.

Comments on long-term and adaptive management strategies
Click here to enter text.

Box 1: Additional Oak Management Resources

"A Practical Guide to Oak Release" (Harrington & Devine, 2006) offers a how-to guide and FAQs for forestry professionals on legacy oak release and stand thinning in oak savannas and woodlands.

A Landowners Guide for Restoring and Managing Oregon White Oak Habitats (Vesely & Tucker, 2004) is a comprehensive document outlining practices for landowners wishing to manage their own oak savanna or woodland.

"Management strategies for Invasive Plants in Pacific Northwest Prairies, Savannas, and Oak Woodlands" (Dennehy, et al., 2001) provides a help outline of detrimental non-native plants in prairie, savanna, and oak woodland habitats of the Pacific Northwest, their impacts on ecosystems, and recommended management strategies including chemical, mechanical, biological, fire, and other methods.

"The Willamette Valley Landowner's Guide to Creating Habitat for Grassland Birds"
This oak bird guide is intended to provide land managers in oak habitats with information on bird species status, distribution, density, habitat relationships, and potential responses to oak habitat management and restoration activities.

"Planting Native Oaks in the Pacific Northwest" by Devine & Harrington (2010) provides tips on establishing oaks by acorns or seedlings.

Considerations for ongoing understory management practices in oak habitats

Mowing or masticating	Prescribed burning	Targeted grazing/browsing
• Mowing/masticating will return thatch and woody debris to the soil. While recycling nutrients and maintaining habitat structure, this will not support fire-dependent native plants. • The size of woody debris produced through mowing, mulching, or masticating can have important and distinct implications. Smaller debris breaks down quicker than larger debris. Different machines result in different outcomes. • Stumps, both small and large, can restrict access or damage equipment. When carrying out an initial thinning, grind/masticate stumps flush with ground or make sure mower/masticator can be set to a height above cut stump level. • Timing: avoid equipment work while the ground is saturated. Avoid mowing between March 15 and July 15 so as not disturb nesting birds. If you must mow during this window (i.e. to reduce fire hazard around residences or roads), walk through the area first to locate nests and flush out birds and other wildlife. Observe the life cycle of native plants and mow after they have set seed (typically by late July, with some late-blooming exceptions). • Maintain refugia (unmowed/masticated areas) each season for insects, birds, and mammals. • A large tractor with a mowing attachment may function if shrubs are young and tender. A weed whacker with a brush-cutting attachment is effective for woody stems <1" diameter. A heavier duty machine such as a skid steer may be required for more established shrubs and saplings.	• **Do not** attempt a prescribed burn without professional help and trained fire personnel and equipment. • Many oak-associated plant species are fire-dependent, meaning they cannot persist without fire. Fire and associated smoke can reduce pests, return a stable form of carbon to the soil, and open up bare ground which is useful for bird and insect pollinator nesting and plant reseeding. Depending on a variety of factors, fire could also stimulate growth of some invasive weeds and pasture grasses. • Are you willing to work with external agencies like Tribes, ODF, USFWS, and contractors to carry out a burn? • A controlled burn can take years to plan and carry out, is dependent on favorable weather, and involves numerous logistical hurdles. Is there a back-up management option if burning is not feasible? • A thick layer of mulched material can smolder and create lots of smoke during a burn making it infeasible until said material breaks down. • Burning in a woodland will require some build-up of 1 hour and 10 hour fuels to carry the fire. • Emphasize reduction of "fuel ladders" to prevent canopy fires. • In preparation for burning, prioritize creating accessible fire breaks around potential burn units.	• Are there other places for the animals to be when they aren't being used for ecological maintenance? • Do grazers compete with or displace native ungulates? • *Breed*—Different species and breeds have different nutritional needs and ecological impacts ("A goat is not a goat"). • *Seasonality*—Animals may trample emerging spring plants and eat flowers. This can either be damaging to desirable native plants, or beneficial in the case of invasive plants. Time grazing strategically according to habitat goals, and do plant surveys regularly to monitor impacts. • *Duration and intensity*--animals must be rotated frequently in order to provide ecological benefit. Rotational grazing/browsing requires regular and frequent management and attention to the plant community. • *Infrastructure*—Mobile fencing, water, shelter. • *Number of animals*—mob grazing by a larger herd can be beneficial for a short period of time, but should not exceed carrying capacity of the ecosystem to support them otherwise they will cause degradation. • *Ground saturation*—hoof prints in wet soil can damage plant communities and cause soil compaction. • *Seed spread*—animals can introduce unwanted seeds through their manure, hooves, fur/wool, or supplementary feed.

Fuels Treatments and Oak Woodland Management

Recommended management practices to maintain oak habitats are often similar to the practices recommended as "fuels treatments" to reduce wildfire risk. Where fuels treatments are to occur in oak-dominant landscapes, slight modifications can be made to be the most compatible with oak habitat ecology. Consider incorporating the desired habitat features for oak woodlands into fuels treatment prescriptions.

Sample Fuels Treatment Prescriptions for Oak Habitats	
Example fuels treatment prescription *yellow highlights=additions for oak habitats*	**Ecological Impacts**
Shaded fuels break along egress route ☐ Driveway, 20' buffer ☐ Main road, 50' buffer ☐ Forested edge, 100' buffer	The transition between woodland and grassland is ideal habitat for numerous birds. Maintain a 100' or more "feathered edge" where open space gradually transitions into denser forest.
Brush management ☐ Removal of 80-90% of fuel ladders (shrubs and fallen limbs) to be cut to no more than 2' high. Limbs of larger trees pruned up to 8' high). Well-formed living native shrubs to be left intact.	Living native shrubs with minimal dead branch accumulation do not pose a significant fire hazard. They provide nesting material, foraging, and shelter for birds and other wildlife, and offer resources for pollinators.
Non-commercial tree thinning ☐ Oak-dominant stand (removing small or suppressed trees up to 8" diameter from within drip-line of mature oaks and to achieve canopy cover of 40-70%) Conifer-dominant stand (12-16' tree spacing)	Tree spacing can be much wider for oak-dominant stands. Canopy cover is a better metric for stand health.
Fuels treatment method ☐Mechanical masticator/mulcher ☐Chainsaws and/or manual brushcutters ☐ Jackpot pile for landowner to burn. Seed burn pile footprint with native grasses/forbs ☐ Stage in windrows for landowner to chip or biochar ☐ Lop and scatter in place (limit within oak habitats)	Factor in long-term management strategies. Scattered wood can pose challenges for mowing, grazing/browsing, and/or prescribed burning. Also, since oak stands often occur on drier sites and more light reaches the understory, scattered wood is less likely to decompose and turn into soil, and can also suppress emerging grasses and forbs. Reseed native grasses and forbs where bare ground is exposed, i.e. burn pile footprints

Timeline

Time activities with regard for wildlife life cycles and soil saturation

- Manual work only while soil is saturated–no equipment. Generally, use machines July 15-October 15, in accordance with fire restrictions.
- In general, avoid all activities during March 15-July 15 to respect bird nesting and native plant life cycles. If you must work during this time, flush the area of birds in advance and leave a buffer around any suspected or known nesting locations
- Conduct maintenance activities in a mosaic pattern–always leave some untouched areas / shrubby patches for wildlife refugia

Table: Sample timeline of conservation and management activities for all units: Fill out for individual property

Year	Season	Action	Units
Phase I (2019-2023): Activities planned in conjunction with habitat restoration grant funding			
Year 1	Summer	Remove 80% of pine trees. Masticate and/or grind into chips	2, 3, 5
		Thinning oak woodland--first pass, trees <8" diameter	4, 5, 6
		Thin trees encroaching around legacy oaks and pines. Leave a mix of deciduous and coniferous trees	6
	Fall	Burn slash and stump piles from previous thinning operations	1, 6
		Seed native seed mix (mostly forbs) in bare patches and burn pile footprints	2, 3, 6
		Spot application of herbicide on thistles and blackberries	1, 3, 6
Year 2	Spring	Biochar production	2, 3, 6
		Slash pile burning	4, 5, 6
	Summer/Fall	Biomass processing: Masticate remaining slash from thinning operations, or pile and burn	1, 2, 3
	Summer/ Fall	Continue oak woodland thinning	4, 5
	Fall	Weed management: Mow blackberries and thistle, spot application of herbicide	1, 2, 3, 6
		Slash pile burning	4, 5
		Seeding native grasses and forbs	All units
Year 3	Spring	Continue slash pile burning	1, 2, 4, 5
	Summer	Continue oak woodland thinning, if needed	4, 5
	Fall	Mow to reduce thatch and shrub density in prep for burn (if necessary)	4, 5, 6
		Weed management: mowing (avoid herbicide application prior to prescribed burning)	1, 2, 3, 6

Year	Season	Action	Units
		Prescribed burning	TBD
		Seeding native grasses and forbs	All units
Year 4	Spring	Plant/transplant oak seedlings	1, 2, 3
	Fall	Seeding native grasses and forbs	All units
Year 5	Spring	Stump resprout treatment - chemical or mechanical	4, 5
	Spring/fall	Weed management: mow or herbicide as needed	All units
	Fall	Seeding native grasses and forbs	4, 5, 6
Phase II (2024-2029)			
Year 6-10		Follow-up oak woodland thinning, if needed	4, 5, 6
		Prescribed burning	All units
		Weed management: Mowing to manage blackberry, shrubs, and herbaceous weeds; spot application of herbicide as needed	1, 6, other units as needed
		Targeted grazing in prairie	2, 3
		Biomass processing: Piling limbs and fallen trees, burn piles, and biochar creation	4, 5
		Seeding native grasses and forbs	All units

Monitoring & Adaptive Management

Monitoring means checking in on your progress and outcomes after management activities. Monitoring gives you information you will use to make adjustments to your management strategy as needed.

Adaptive management means you make changes to your plans over time based on new information. A management plan is not designed to be restrictive–rather it helps you think through your long-term strategy and outline some information to guide you as you get started. As you see the results of your actions, you should pay attention and make changes in order to continue meeting your objectives.

Ask yourself the following questions regularly as you progress. Based on your answers, review your plan and either adjust it or try to get back on track.

- Are you meeting the objectives you listed in the plan? Do you need to adjust objectives?
- Have you implemented the activities outlined in your plan on the intended schedule?
- Are the management activities accessible, affordable, and achievable for you?
- Has the desired plant/wildlife community responded positively or negatively to your actions?
- Are management activities across the property compatible with each other? (i.e. timing of livestock grazing, forestry operations, and wildlife nesting season in critical habitat areas)
- What barriers, if anything, are preventing you for meeting your management objectives?
- What additional resources would help you?

V. ECONOMICS: Tax Assessment, Forest Products, and Cost-Share Programs

Tax Deferral Regulations

X if apply	Property considerations	Notes
☐	This property is currently enrolled in a forestry tax deferral program	Click here to enter text.
☐	The recommended management practices are consistent with standard forest management practices	Click here to enter text.
☐	The landowners intend to enroll in the Wildlife Habitat Conservation Management tax deferral program, if available	Click here to enter text.
☐	The recommended management practices will require an Plan for Alternate Practices through Oregon Department of Forestry	Click here to enter text.
☐	Other consideration: Click here to enter text.	Click here to enter text.

Land that is enrolled in the Designated Forestland (DFL), Small Tract Forestland (STF), or other forestland special tax assessment programs are required to manage the designated acreage for merchantable species for the forest products markets. Each stand is assessed on a case-by-case basis. If the acreage in question is to be managed for uses other than merchantable species, it may be disqualified from the forestland special assessment program. Forest stands managed for more than 20% hardwood species, including Oregon white oak, may meet the standard reforestation and stocking standards if the landowner can demonstrate that the stand is being managed for marketable products. This situation will require a written plan by the landowner (i.e. this plan) and a Plan for Alternate Practices to be completed by Oregon Department of Forestry.

The Oregon Department of Revenue maintains the statutes regarding forestland tax assessment. The county, however, ultimately has tax assessment authority and may have unique interpretations, criteria, or administrative capacity for assessing taxes on forestland or enrolling new properties into the Wildlife Habitat Conservation Management Program.

See **Appendix F: Oregon Department of Revenue Statutes for Lands Zoned for Forestry** for an online of the regulations relevant to reforestation and forested lands tax assessment.

If there is a desire to manage a stand for wildlife and habitat value in a way that is incompatible with forestry regulations (i.e. lower tree density open oak woodland or savanna), those portions of the property can be considered for enrollment in the Wildlife Habitat Conservation Management Program under the Oregon Department of Fish and Wildlife. Note that ODFW may choose to limit the number of plans approved each year due to workload constraints. Management of forested land primarily for wildlife habitat and conservation also requires a Plan for Alternate Practices to be completed by the Oregon Department of Forestry.

Merchantable Forest Products in Oak Forests & Woodlands

Merchantable forest product to be managed (list below)	**Notes**

If you are pursuing cost-share or tax deferral programs focused on wildlife habitat, merchantable products should be secondary to providing habitat value. Management that seeks to maximize profit is usually incompatible with wildlife habitat management goals. However, diversified income from byproducts of restoration are possible. Be clear about your priorities and trajectory from the beginning.

The harvest of merchantable sawlogs as part of an oak habitat restoration project can often offset or fully pay for the cost of the project. Consult a land management technician, contractor, or forester for more information about marketing merchantable trees.

The market for merchantable products from oak-dominant forests is much smaller than for conifer timber and byproducts. However, the "Oak Marketplace" is growing to keep up with the increased regional recognition of the value of oaks for drought resilience and ecosystem services. Products that can be generated from oaks and their associated ecosystems are diverse and include sawlogs (see "Managing Oaks for Sawlogs" box), firewood, woodchips, herbal medicine and botanical arrangements, culinary mushrooms grown on small-diameter logs, BBQ briquettes, posts and poles for small building projects, and more.

To learn more about regional businesses and networks utilizing and growing markets for oak-associated products or working on a non-industrial scale, consult the following resources:
Zena Forest Products, Sustainable Northwest,The Oak Accord, Oregon Woodland Cooperative
National Non-Timber Forest Products Inventory

Box 2: Managing Oaks for Sawlogs

Management practices designed to maximize harvest of merchantable oak sawlogs differ from practices designed to maximize wildlife habitat value. Whereas broadly spaced trees with low sprawling branches are considered highest value for wildlife; a stand managed for sawlogs will maintain a higher density of trees to encourage vertical growth with minimal branching, as the trees compete with each other to reach sunlight. Managing an oak forest or woodland for sawlogs provides an economic incentive to conserve this declining forest type and provides some wildlife habitat value for species that can tolerate less sunlight and higher tree density.

Oaks grow much slower than conifers, resulting in very dense strong wood as well as a longer harvest interval. Single-tree selection on regular intervals in an existing mature stand of trees will provide the most regular and sustainable economic benefit. Oaks will resprout from the stump when cut; the resulting shoots can be thinned and managed for the next generation of growth. This practice of woodland management is called "coppicing", and the resulting grove of multi-stemmed trees called a "copse". Coppicing is a common practice in traditional British Isles woodland management. Once a mature oak produces acorns, natural regeneration is very likely and the desired density of young oaks can be selected and encouraged by the woodland manager.

Dimensional lumber from Oregon white oak is primarily used for flooring, cabinetry, pallets, barrels, boats, and miscellaneous industrial uses. Oregon white oak is far denser than Eastern white and Red oaks, and can be put to the same use as these more common commercial oak species. Oak sawlogs can be transported to an industrial hardwood sawmill, or processed with an on-site or mobile mill. See the "Economics" section of this plan for more information on other non-timber uses for oak logs and other products in oak ecosystems.

Here are tips and facts about managing an oak stand for sawlogs[3]:

- *Keep stands fairly dense with close spacing when trees are young.*
- *Start thinning only after trees are 40 years or more old. If you thin too early, the trees will get bushy*
- *Oaks can grow on tough upland sites where other timber species won't; however, oaks also grow quite well in deep river bottom and other productive soils and will grow good quality timber more quickly in these locations.*
- *Oaks thinned and managed for timber grow much faster than oaks in a suppressed and unmanaged stand. Faster grown oaks have denser wood than slow growing oaks.*
- *Managing competition from conifers is important*

[3] Thanks to Ben Deumling from Zena Forest Products for the tips on managing oaks for sawlogs. www.zenaforest.com

Cost-Share & Assistance Programs for Oak Woodland Management and Restoration

The property owners are recommended to look into and apply for the following funding opportunities to help complete the recommendations in this plan.

X if apply	Funding program	Contact
☐	NRCS Environmental Quality Incentives Program *Oak Habitat Restoration program* NRCS Conservation Stewardship Program *Supports conservation enhancement practices*	Tom Snyder, District Conservationist, Lane County Thomas.snyder@usda.gov Amy Kaiser, District Conservationist, Linn & Benton County amy.kaiser@usda.gov
☐	Oregon Department of Forestry *Fuels reduction and hazardous wildfire risk mitigation funding (various sources)*	McKenna Armantrout, Community Wildfire Forester Mckenna.armantrout@odf.oregon.gov
☐	Oregon Watershed Enhancement Board habitat restoration grant *Find your local watershed council on Oregon Explorer*	• Long Tom Watershed Council • Mary's River Watershed Council • Middle Fork Willamette Watershed Council • Coast Fork Willamette Watershed Council • McKenzie Watershed Council • Calapooia Watershed Council
☐	Oregon Department of Fish and Wildlife *Wildlife Habitat Conservation Management Program*	Joe Stack, Regional Habitat Biologist Joseph.p.stack@odfw.oregon.gov Chris Yee, District Wildlife Biologist Christopher.g.yee@state.or.us
☐	Oregon State University Extension Service *Technical assistance, literature, workshops, and other resources*	Lauren Grand, Extension Forester Lauren.grand@oregonstate.edu
☐	Soil and Water Conservation District *Free technical assistance, resources, and education*	• Upper Willamette SWCD • Benton SWCD • Linn SWCD

VI. SIGNATURES AND APPROVALS

Landowner

I have reviewed this plan and believe the management recommendations will help me meet my goals and objectives for my property. I agree to follow this plan to ensure the sustainability of my management.

Click here to enter text. Click here to enter a date.

_____

_____ Landowner

Date

ODF Plan for Alternate Practices

I certify that this Forest Management Plan meets the requirements of the federal Forest Stewardship Program.

Click here to enter text. Click here to enter a date.

_____

_____

Plan Author Date

I certify that this Forest Management Plan meets the requirements of the Plan for Alternate Practices for the Oregon Department of Forestry.

Click here to enter text. Click here to enter a date.

_____

_____

Oregon Department of Forestry Representative Date

NRCS Incentive Programs

I certify that this Forest Management Plan meets the requirements of the USDA Environmental Quality Incentives (EQIP) Program and/or the Quality Criteria for forest activity plans in Section III of the USDA NRCS Field Office Technical Guide.

Click here to enter text. Number Click here to enter a date.

_____

_____ Technical Service Provider Number

Date

Click here to enter text. Click here to enter a date.

_____

_____

District Conservationist Date

REFERENCES & ADDITIONAL RESOURCES

Altman, B., & Stephens, J. L. (2012). *Land Manager's Guide to Bird Habitat and Populations in Oak Ecosystems of the Pacific Northwest.* American Bird Conservancy and Klamath Bird Observatory.

Altman, B., Evans-Peters, S., Kim, E. H., Maness, N., Stephens, J., & Taylor, a. B. (2017). *Prairie, Oaks, and People: A Conservation Business Plan to Revitalize the Prairie-Oak Habitats of the Pacific Northwest.* Pacific Birds Habitat Joint Venture.

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Scott, Joe H.; Burgan, Robert E. 2005. Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model. Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 72 p.

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APPENDICES

Appendices highlighted red require plan writer to create and/or edit and upload their own documents. The remainder are landscape level and apply to all properties.

A. Property Inventory Maps - LandMapper
B. Oak Habitat Types of the South Willamette Valley
C. Species of Conservation Concern in South Willamette Valley Oak and Adjacent Habitats
D. Rapid Stand Assessments
E. Fuel Types
F. Oregon Department of Revenue Statutes for Lands Zoned for Forestry

Appendix A: Property Inventory Maps

Instructions:

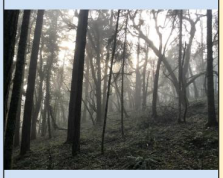
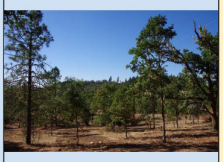
1. Visit the LandMapper website by EcoTrust.
2. Enter the property address or select the property on the map.
3. Follow prompts to generate a series of PDF maps of the property's features.
4. Upload the PDFs as an appendix to the property plan in place of this page.

Appendix B: Oak Habitat Types of the South Willamette Valley

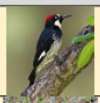
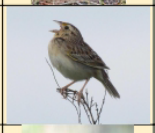
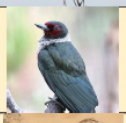
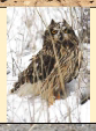
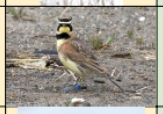
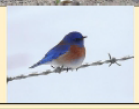
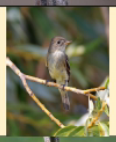
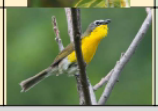
Oak Habitat Types of the South Willamette Valley

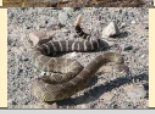
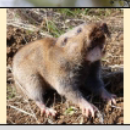
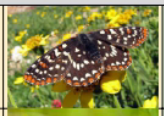
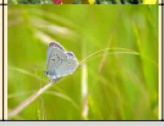
Based on: "Land Manager's Guide to Bird Habitat and Populations in Oak Ecosystems of the Pacific Northwest" by Altman & Stephens, 2012. Modified for the WV. Compiled by Long Tom Watershed Council.

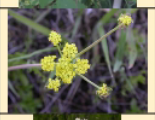
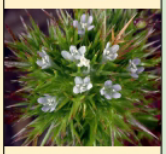
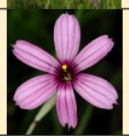
Version 1.0, April 2022 *Oak Habitat Types are based on historic conditions. Combined with current conditions, they are used to inform desired future conditions.*

Habitat Type	Representative Photo	Structure (canopy cover)	Structure (stand density and age class)	Desired Overstory composition	Desired Understory composition	Existing Conditions	Implication	Management strategy
Oak Savanna		5-25%	1-5 large trees or 1-10 younger trees per acre	>90% of mature trees are oak	5-10% shrub/small tree cover; remainder grasses and forbs	Significantly more shrub and small tree cover	Fire suppression	Fuels reduction actions
						Low native grass/forb diversity; sparse or low stature vegetation	Overgrazed or overmowed	Controlled burn, replenish soil carbon, plant natives
Open Oak Woodland		25-50%	5-10 large trees or 10-20 younger trees per acre	>90% of mature trees are oak	<30% shrub/small tree cover; remainder grasses and forbs	Significantly more shrub and small tree cover	Fire suppression; absence of management or disturbance	Fuels reduction actions
						Low native grass/forb diversity; sparse or low stature vegetation	Overgrazed or overmowed	Controlled burn, replenish soil carbon, plant natives
						Legacy trees crowded with younger trees	Fire suppression; absence of management or disturbance	Release legacy oaks, and/or restore to oak savanna
Closed Oak Woodland		50-75%	10-30 large trees or 20-40 younger trees per acre	>90% of mature trees are oak	<30% shrub/small tree cover; remainder grasses and forbs	Patches of shrub and small tree cover in woodland canopy openings	Fire suppression	Fuels reduction actions. Consider restoring to open oak woodland conditions, or manage for merchantable sawlogs.
						Legacy trees crowded with younger trees	Fire suppression; absence of management or disturbance	Release legacy oaks and restore to open or closed oak woodland
Oak Forest		75%+	~>30 large trees or >40 smaller trees/acre	>90% of mature trees are oak	5-10(30)% shrub/small tree cover; remainder grasses and forbs	Trees are columnar in shape with limited branching and crown foliage volume	Competition for resources	Consider restoring to open or closed oak woodland conditions, or manage for merchantable sawlogs
						Subcanopy and understory devoid of woody vegetation	Lack of sunlight reaching forest floor (fire suppression)	Consider restoring to open or closed oak woodland conditions, or manage for merchantable sawlogs
						Subcanopy and understory densely vegetated with shade tolerant shrub and tree species	Moist, productive soil	Consider restoring to open or closed oak woodland conditions, or manage for merchantable sawlogs. Fuels reduction actions.
Oak/ Fir Forest		75%+	~>30 large trees or >40 smaller trees/acre	Oak-fir codominant	<5%-sparse shrub; small tree cover; remainder ferns, graminoids and forbs	Significantly more shrub and small tree cover	Fire suppression; absence of management or disturbance	Fuels reduction actions
						Dead or dying oak trees in canopy or subcanopy / younger firs overtopping older oaks	Fire suppression	Restore to open oak woodland or oak savanna conditions. Harvest fir for timber
						Foothill elevational transition into Doug-fir forest / north aspect or moister soil types w/in oak habitats	Natural community type	Sustain management actions
Oak/ Pine Woodland or Savanna		5-75%	1-5 (sav, min) - 10-30 large trees (woodland, max); 1-10 (sav, min) - 20-40 (woodland, max) younger trees	Oak-pine codominant	0-10(30)% shrub cover; remainder grasses and forbs	Grasses dominate spaces between oaks and pines, age class diversity in tree species, but no more than canopy cover targets	Natural community type, drier site, older pines persistent	Sustain management actions
						Significantly more shrub and small tree cover	Fire suppression	Fuels reduction actions
Oak/ Hardwood		50%+	10-30 large trees or 20-40 younger trees per acre	Oak-ash (wetter), Oak-maple (drier), Oak-madrone (driest) codominant	Variable depending on canopy cover and wet or dry. Closed canopy = sparse shrubs, remainder grasses and forbs. Open canopy = ~30% shrub cover, remainder grams and forbs (wetter); sparse shrubs, remainder grasses and forbs (drier, driest)	Dense canopy, trees are columnar in shape with limited branching and crown foliage volume	Fire suppression	Fuels reduction actions
						Open or closed canopy with robust native shrub, tree, forb and gram understory. see riparian oak	Natural community type	Sustain management actions
Riparian Oak		50%+	10-30 large trees or 20-40 younger trees per acre	Oak dominant to codominant with hardwood or rarely conifer	Variable, more likely denser understory shrubs and sub-canopy trees. if seasonal pools, more herbaceous composition	Productive soils, adjacent to water body(s) (could be seasonal)	Natural community type	Sustain management actions

Appendix C: Species of Conservation Concern in WV Oak Habitats

Species of Conservation Concern in South Willamette Valley Oak and Adjacent Habitats											
Version 1.0, April 2022	*Wet and upland prairie and riparian habitats are included since several species of conservation concern occur across this gradient of adjacent habitats*										
SPECIES			**CONSERVATION STATUS**			**HABITAT ASSOCIATION**					
Common Name	*Scientific Name*	*Image***	*Federal Status*	*State Status*	*OCS Species**	*Wet prairie*	*Upland prairie*	*Oak Savanna*	*Oak Woodland*	*Riparian Woodland*	*Habitat Req.*
Birds											
Acorn woodpecker	*Melanerpes formicivorus*		Species of Concern	Sensitive	X			X	X		Oak canopies, open understory, dead limbs/snags for acorn storage
Chipping Sparrow	*Spizella passerina*			Sensitive	X			X	X		Sparse understory, drier woodland edge
Grasshopper Sparrow	*Ammodramus savannarum perpallidus*			Sensitive Critical	X		X	X			Low shrub cover, large habitat area
Lewis's Woodpecker	*Melanerpes lewis*		Species of Concern	Sensitive	X			X	X		Large snags, open canopy, aerial insects
Oregon Vesper Sparrow	*Pooecetes gramineus affinis*		Species of Concern	Sensitive Critical	X		X	X			Grasslands with interspersed trees, shrubs, bare ground
Short-eared owl	*Asio flammeus flammeus*			Sensitive	X	X	X				Marsh and wet prairie
Streaked Horned Lark	*Eremophila alpestris strigata*		Threatened	Sensitive	X	X	X				Bare ground, sparsely vegetated grassland
Western Bluebird	*Silia mexicana*			Sensitive	X		X	X			Oak cavities
Western Meadowlark	*Sturnella neglecta*			Sensitive Critical	X	X	X	X			Expansive grassland
White-breasted Nuthatch (Slender billed)	*Sitta carolinensis aculeata*			Sensitive	X			X	X		Large oak trees, high canopy cover in connected patches
Willow flycatcher	*Empidonax traillii*		Species of Concern	Sensitive	X					X	Interconnected riparian shrubs esp. willows
Yellow-breasted chat	*Icteria virens auricollis*		Species of Concern	Sensitive	X					X	Dense, brushy thickets near streams
Reptiles											
Western Pond Turtle	*Actinemys marmorata*		Species of Concern	Sensitive Critical	X		X			X	Aquatic and forested/shrubby habitats, and safe passage between, basking logs

Western Painted turtle	*Chrysemys picta*			Sensitive Critical	X		X			X	Muddy waters, basking logs, safe corridor between aquatic and terrestrial sites
Western Rattlesnake	*Crotalus oreganus*			Sensitive Critical	X		X	X	X		Rocky areas
Mammals											
California Myotis (vesper bat)	*Myotis californicus*			Sensitive	X						Large snags
Fringed Myotis	*Myotis thysanodes*		Species of Concern	Sensitive	X				X		Large snags in forested habitat, caves
Columbia White-tailed deer	*Odocoileus virginianus leucurus*		Threatened	Sensitive Critical	X				X	X	Riparian areas, low-elevation oak woodlands
Western Gray Squirrel	*Sciurus griseus*			Sensitive	X			X	X		Large oak limbs, continuous canopy cover
Camas pocket gopher	*Thomomys bulbivorus*		Species of Concern				X	X			Kincaid's lupine as host plant
Invertebrates											
Taylor's Checkerspot Butterfly	*Euphydryas editha taylori*		Endangered; Critical Habitat		X		X				Non-native narrow-leafed plantain as host plant
Fender's Blue Butterfly	*Icaricia icarioides fenderi*		Endangered; Critical Habitat		X		X	X			
Plants											
White Rock Larkspur	*Delphinium leucophaeum*		Species of Concern	Endangered	X		X				Loose, well-drained soil with high organic matter
Willamette Valley Larkspur	***Delphinium oreganum***		Species of Concern	Candidate				X	X	X	Riparian forest
Peacock larkspur	*Delphinium pavonaceum*		Species of Concern	Endangered	X	X	X	X	X		Shady edges of oak-ash and oak woodland
Willamette Daisy	*Erigeron decumbens*		Endangered; Critical Habitat	Endangered	X	X	X				No woody cover, low stature vegetation

Wayside Aster	*Eucephalus vialis*		Species of Concern	Threatened	X		X	X	X		Forets, roadsides, open slopes and prairies
Shaggy Horkelia	*Horkelia congesta var. nemorosa*		Species of Concern	Candidate			X				
Thin-leaved Peavine	*Lathyrus holochlorus*		Species of Concern					X	X		Roadsides, fencerows, deciduous woodlands
Bradshaw's Lomatium	*Lomatium bradshawii*		recently delisted	recently delisted	X	X					
Kincaid's Lupine	*Lupinus sulphureus ssp. kincaidii*		Threatened; Critical Habitat	Threatened	X	X	X				
Willamette navaretia	*Navaretia willamettensis*		Species of Concern			X	X				Hard clay of vernal pools
Rigid white-topped Aster	*Sericocarpus rigidus*		Species of Concern	Threatened	X	X	X	X			
Nelson's Checkermallow	*Sidalcea nelsoniana*		Threatened	Threatened	X	X	X	X			
Hitchcock's blue-eyed grass	*Sisyrinchium hitchcockii*		Species of Concern	Candidate			X	X	X		

*OCS=Oregon Conservation Strategy

**All images from Oregon Conservation Strategy. For image credit see oregonconservationstrategy.org

If you find or suspect the presence of one or more of the above listed birds on your property, you can use the digital OakBirdPop to understand potential impacts from management activities

If you suspect he presence of any of the above listed species, contact your local watershed council, soil and water conservation district, or the Institute of Applied Ecology to verify

Sources:

Altman & Stephens (2012). *Landmanager's Guide to Bird Habitat and Populations in Oak Ecosystems of the Pacific Northwest.* American Bird Conservancy and Klamath Bird Observatory.

Willamette Valley Landowner's Guide to Creating Habitat for Grassland Birds. 2016. Oregon Conservation Strategy, Oregon Department of Fish and Wildlife.

Willamette Valley Oak and Prairie Cooperative Strategic Action Plan. 2020.

Oregon Conservation Strategy, Oregon Department of Fish and Wildlife 2016

Institute of Applied Ecology website (Lathyrus holochlorus photo)

Oregon Flora Project (Horkelia congesta, Navaretia willamettensis, Sisyrinchium hitchcockii photos)

Bruce Newhouse, Salix Associates (plant reports for LTWC project sites and personal communications)

US. Fish & Wildlife Service, Jeff Dillon (Sericocarpus rigidus image)

Appendix D: Rapid Stand Assessment for WV Oak Habitats

Stand Assessment Data Collection Form		Complete one for each stand type/unit		**Characteristic picture**
Property name:		**Lat/Long**		
Unit name:		**Unit Acreage:**		
Person doing inventory:		**Date:**		
Slope		**Aspect**		
General Description				

Use "Oak Habitat Types" reference to help identify current and recommended conditions

Overstory Stand Structure	**Current** Select one (X)	**Recommended** Select one (X)
Savanna (5-25% canopy cover)		
Open Woodland (25-50% canopy cover)		
Closed Woodland (50-75% canopy cover)		
Forest (75%+ canopy cover)		

Understory Structure	**Current** Select one (X)	**Desired** Select one (X)
Open (<25% shrub cover)		
Semi-open (25-50% shrub cover)		
Semi-closed (50-75% shrub cover)		
Closed (>75% shrub cover)		

Fuel Loading	**Current** Select one (X)	**Desired** Select one (X)
Low		
Medium		
High		

Current Overstory Composition		
Overstory Species Composition	**Current % of canopy cover**	**Recommended % of canopy cover**
Oaks		
Conifers		
Other Hardwoods		

Trees per acre — **Fixed Plots / Visual Estimate / Other method** _____

Species	**DBH >20"**	**DBH 12-20"**	**DBH 8-12"**	**DBH 4-8"**	**DBH 1-4"**	**Seedlings <1" DBH**
Oregon white oak						
California black oak						
Douglas fir						
Ponderosa pine						
Incense cedar						
Other						
Other						
Other						
Pacific madrone						
Big leaf maple						
Oregon ash						
Other						

Habitat features	**Present (X)**	**Condition**
Legacy trees		
Snags		
Down woody debris		
Dead limbs w/ cavities		
Rare, culturally significant, or indicator species		
Other		

Notes

% live crown, conifer encroachment

per acre, avg size, species

Management Recommendations

Invasive species	**% cover (estimate)**	**Management implications**
Blackberry		Will spread with more sunlight. Eliminate before thinning or plan to aggressively manage afterwards.
Scotch Broom		Lasts a long time in seed bank, some individuals can resprout from roots. Stem smaller than thumb-->pull by hand or weed wrench. Stem larger than thumb-->cut at base. Or spray to kill.
Canada thistle		Thrives with soil compaction. Spreads through rhizomes and wind-born seeds. Prevent from going to seed, avoid soil compaction, and elimate population to the extent possible prior to thinning
Invasive annual grasses		Easily spread through seeds and rhizomes. Will spread with disturbance and sunlight. Eliminate prior to thinning.
Other		
Other		
Other		

Stand Assessment Data Collection Form		Complete one for each stand type/unit		Characteristic picture
Property name:	AR	**Lat/Long**		
Unit name:	Communtiy Land Trust	**Unit Acreage:**	160	
Person doing inventory:	KM	**Date:**	6-6-22	
Slope	10-40%, occ. cliffs	**Aspect**	West-facing	
General Description	Historic oak-pine savanna with legacy trees filling in with incense cedar, fir, and pine due to lack of disturbance. Blackberries dense in patches. Site has a conservation easement and will be managed through collaborative prescribed burn team			

Use "Oak Habitat Types" reference to help identify current and recommended conditions

Overstory Stand Structure	Current Select one (X)	Recommended Select one (X)
Savanna (5-25% canopy cover)		X
Open Woodland (25-50% canopy cover)	X	
Closed Woodland (50-75% canopy cover)		
Forest (75%+ canopy cover)		

Comments: Legacy oak and pine at savanna density, occ. madrone, filling in with younger age class of trees, mostly conifers.

Understory Structure	Current Select one (X)	Desired Select one (X)
Open (<25% shrub cover)		X
Semi-open (25-50% shrub cover)	X	
Semi-closed (50-75% shrub cover)		
Closed (>75% shrub cover)		

Comments: Occ. patches of blackberries and thick stands of hazel

Fuel Category	Select one (X)	Code (USDA Fuel model 2005)
Grass (nearly pure grass/forb)		
Grass/Shrubland (mix, up to 50%	X	GS2
Shrub (>50% shrub)		
Timber-Understory (grass/shrub mix with forest canopy litter)		
Timber Litter (Dead/down woody fuel beneath forest canopy)		
Slash/Blowdown (activity fuel or wind damage debris)		
Nonburnable		

Current Overstory Composition

Overstory Species Composition	Current relative % of canopy	Recommended relative % of canopy
Oaks	50%	75%
Conifers	50%	15%
Other Hardwoods	10%%	10%

Trees per acre Fixed Plots / Visual Estimate / Other method _____(

Species	DBH >20"	DBH 12-20"	DBH 8-12"	DBH 4-8"	DBH 1-4"	Seedlings <1" DBH
Oregon white oak	1	1	6	4		40
California black oak	1	1	6	4		40
Douglas fir				8	20	
Ponderosa pine	1			10	2	
Incense cedar			2	4	8	
Pacific madrone		1	3			
Big leaf maple						
Oregon ash						
Other						
TOTAL live trees	*3*	*3*	*17*	*30*	*30*	*80*
Conifer snags		1				
Hardwood snags			1			

Understory condition (note top 5 dominant species, notable native plant species observed, and problematic weeds)

High diversity perennial native forbs and grasses including camas, yampah, California oat grass, blue wildrye, Oregon iris, and comandra. Build-up of thatch and needles suppresing plants. Former log landing weedy with invasive annual grasses and thistles.

Management Recommendations

Recommended NRCS Practices:
-Stand thinning - dense
-Slash treatment - heavy
-Brush management - >1" diameter shrubs or shrubs posing fuel ladder concerns cut and remove as slash (burn in piles), cut and leave small shrubs as dry fuel to carry fire
-Fire break - Work with burn boss to plan; create fire breaks around burn units, mow lines in grassy patches, or mineral soil in woodland
-Prescribed burn planning
-Prescribed burn implementation - contracted crew
-Herbaceous weed treatment - spot spray thistles, other weeds with herbicides following fire
-Diverse native wildflowers - seed into bare areas in the fall after burning

Stand Assessment Data Collection Form		Complete one for each stand type/unit	
Property name:	RM	**Lat/Long**	
Unit name:	The Family Wood	**Unit Acreage:**	80
Person doing inventory:	AC & RM	**Date:**	6-6-22
Slope	10-15%	**Aspect**	South-facing
General Description	Closed canopy oak woodland to be managed for merchantable oak sawlogs and firewood. Understory low-diversity and lacking shrubs.		

Characteristic picture

Use "Oak Habitat Types" reference to help identify current and recommended conditions

Overstory Stand Structure	Current Select one (X)	Recommended Select one (X)
Savanna (5-25% canopy cover)		
Open Woodland (25-50% canopy cover)		
Closed Woodland (50-75% canopy cover)		X
Forest (75%+ canopy cover)	X	

Comments: Mature fir and pine mixed throughout oak woodland. Relatively even-aged stand, minimal regeneration, no legacy trees

Understory Structure	Current Select one (X)	Desired Select one (X)
Open (<25% shrub cover)	X	X
Semi-open (25-50% shrub cover)		
Semi-closed (50-75% shrub cover)		
Closed (>75% shrub cover)		

Comments: Understory completely shaded, no shrub layer

Fuel Category	Select one (X)	Code (USDA Fuel model 2005)
Grass (nearly pure grass/forb)	X	GR4
Grass/Shrubland (mix, up to 50%		
Shrub (>50% shrub)		
Timber-Understory (grass/shrub mix with forest canopy litter)		
Timber Litter (Dead/down woody fuel beneath forest canopy)		
Slash/Blowdown (activity fuel or wind damage debris)		
Nonburnable		

Current Overstory Composition

Overstory Species Composition	Current relative % of canopy	Recommended relative % of canopy
Oaks	70%	90%
Conifers	30%	10%
Other Hardwoods	0%	0%

Trees per acre Fixed Plots / **Visual Estimate** / Other method _____(c

Species	DBH >20"	DBH 12-20"	DBH 8-12"	DBH 4-8"	DBH 1-4"	Seedlings <1" DBH
Oregon white oak		6	12	4		
California black oak		2	4	2		
Douglas fir		3	6	6		
Ponderosa pine			2	4		
Incense cedar						
Pacific madrone						
Big leaf maple						
Oregon ash						
Other						
TOTAL live trees	***0***	***11***	***24***	***16***	***0***	***0***
Conifer snags		3				
Hardwood snags		1				

Understory condition (note top 5 dominant species, notable native plant species observed, and problematic weeds)

Understory low diversity of not receiving sunlight, mix of non-native and native grass and forb species. No shrub layer.

Management Recommendations

Thin woodland edge to a lower density (25-50% canopy cover) within 100' from meadow and plant pollinator-friendly native shrubs along edges. Retain canopy cover 50-75% throughout remainder of woodland. Through NRCS funding conduct initial merchantable harvest, thinining Doug fir and pine to 10% of canopy cover, retaining largest trees not encroaching on oaks, and selecting about 15% of straight-stemmed oaks >8" DBH to harvest for sawlogs. Break down slash and create brush dams in downcut perennial drainages.

Not appropriate for NRCS cost-share funding. Merchantable harvests to pay for management actions.

Stand Assessment Data Collection Form

Complete one for each stand type/unit

Property name:	DC	**Lat/Long**	
Unit name:	The Homestead	**Unit Acreage:**	20
Person doing inventory:	AC	**Date:**	6-6-22
Slope	5%	**Aspect**	West-facing
General Description	Open oak woodland, intact overstory, with thick overgrown understory of shrubs and young fruit trees, to be managed with herd of on-site sheep and goats		

Characteristic picture

Use "Oak Habitat Types" reference to help identify current and recommended conditions

Overstory Stand Structure	Current Select one (X)	Recommended Select one (X)
Savanna (5-25% canopy cover)		
Open Woodland (25-50% canopy cover)	X	X
Closed Woodland (50-75% canopy cover)		
Forest (75%+ canopy cover)		

Comments: Occ. mature non-native hawthorn and feral pear

Understory Structure	Current Select one (X)	Desired Select one (X)
Open (<25% shrub cover)		X
Semi-open (25-50% shrub cover)		
Semi-closed (50-75% shrub cover)		
Closed (>75% shrub cover)	X	

Comments: Impenetrable overgrown thicket of blackberry, sapling fruit trees, and rose

Fuel Category	Select one (X)	Code (USDA Fuel model 2005)
Grass (nearly pure grass/forb)		
Grass/Shrubland (mix, up to 50%		
Shrub (>50% shrub)	X	SH1
Timber-Understory (grass/shrub mix with forest canopy litter)		
Timber Litter (Dead/down woody fuel beneath forest canopy)		
Slash/Blowdown (activity fuel or wind damage debris)		
Nonburnable		

Current Overstory Composition

Overstory Species Composition	Current relative % of canopy	Recommended relative % of canopy
Oaks	95%	100%
Conifers	0%	0%
Other Hardwoods	5%	0%

Trees per acre Fixed Plots / **Visual Estimate** / Other method _____(

Species	DBH >20"	DBH 12-20"	DBH 8-12"	DBH 4-8"	DBH 1-4"	Seedlings <1" DBH
Oregon white oak	2	3	6		8	30
California black oak						
Douglas fir						
Ponderosa pine						
Incense cedar						
Pacific madrone						
Big leaf maple						
Oregon ash						
Other - English hawthorn, feral pear				1	15	15
TOTAL live trees	*2*	*3*	*6*	*1*	*23*	*45*
Conifer snags						
Hardwood snags		2				

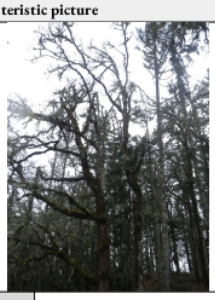
Understory condition (note top 5 dominant species, notable native plant species observed, and problematic weeds)

Shrub layer thick and dominant, including Scotch broom, sapling fruit trees, roses, and blackberry. Herbaceous layer mostly non-native pasture grasses and weedy forbs such as oxeye daisy and queen anne's lace.

Management Recommendations

Mulch understory brush in place initially. Prescribed grazing with goats and sheep to eat resprouts, during summer and fall when ground is not saturated for 3 years. Take animals off and seed bare areas in fall of year 3. Let rest for 1-2 years while plants establish. Then graze after wildflower bloom period in late summer/fall ongoing to maintain.

Recommended NRCS Practices:
-Brush management - heavy, mechanical
-Prescribed grazing - goats and sheep, 3 years
-Mobile fencing
-Diverse native wildflower seeding

Stand Assessment Data Collection Form		Complete one for each stand type/unit		Characteristic picture
Property name:	KT	**Lat/Long**		
Unit name:	The Back 40	**Unit Acreage:**	40	
Person doing inventory:	AC	**Date:**	6-6-22	
Slope	10-20%	**Aspect**	Ridgetop and east-facing	
General Description	Mixed woodland with suppressed mature oak and young fir trees encroaching into oak canopies near public trail system, patches of mature standing dead firs. Landowner plans to mow to maintain.			

Use "Oak Habitat Types" reference to help identify current and recommended conditions

Overstory Stand Structure	Current Select one (X)	Recommended Select one (X)
Savanna (5-25% canopy cover)		
Open Woodland (25-50% canopy cover)		X
Closed Woodland (50-75% canopy cover)		
Forest (75%+ canopy cover)	X	

Comments: Young conifers are almost but not yet overtopping oaks. Most mature firs are dying. Oaks are healthy. Occ. big leaf maple

Understory Structure	Current Select one (X)	Desired Select one (X)
Open (<25% shrub cover)		X
Semi-open (25-50% shrub cover)	X	
Semi-closed (50-75% shrub cover)		
Closed (>75% shrub cover)		

Comments: blackberry in openings and on edges

Fuel Category	Select one (X)	Code (USDA Fuel model 2005)
Grass (nearly pure		
Grass/Shrubland (mix, up to 50%		
Shrub (>50% shrub)		
Timber-Understory (grass/shrub mix with forest canopy litter)		
Timber Litter (Dead/down woody fuel beneath forest canopy)		
Slash/Blowdown (activity fuel or wind damage debris)	X	SB2
Nonburnable		

Current Overstory Composition

Overstory Species Composition	Current relative % of canopy	Recommended relative % of canopy
Oaks	50%	80%
Conifers	40%	10%
Other Hardwoods	10%	10%

Trees per acre Fixed Plots / Visual Estimate / Other method _____(

Species	DBH >20"	DBH 12-20"	DBH 8-12"	DBH 4-8"	DBH 1-4"	Seedlings <1" DBH
Oregon white oak	1	4	8		1	
California black oak		2				
Douglas fir	2	3	6	10	1	
Ponderosa pine						
Incense cedar						
Pacific madrone						
Big leaf maple			3	3		
Oregon ash						
Other						
TOTAL live trees	*3*	*9*	*17*	*13*	*2*	*0*
Conifer snags		10				
Hardwood snags						

Understory condition (note top 5 dominant species, notable native plant species observed, and problematic weeds)

Extensive patch of native California brome. Native wildflowers occurring in patches, including self-heal, yarrow, camas, yampah, and checkermallow, along with non-native pasture grasses and non-native forbs such as false dandelion and bur chervil. Blackberry encroaching on ~30% of the understory in woodland openings and on edges. Mature Scotch broom plants on old logging road.

Management Recommendations

Blackberry - Will spread with more sunlight. Eliminate before thinning or plan to aggressively manage afterwards.
Scotch broom - Lasts a long time in seed bank, some individuals can resprout from roots. Prevent from going to seed. Stem smaller than thumb-->pull by hand or weed wrench. Stem larger than thumb-->cut at base. Or spray to kill.

Harvest conifers and sell to sawmill or Wood Recovery if possible. Since mowing is the ongoing maintenance strategy, mulch stumps in place to ground level along with 85% of understory shrub layer. Preserve well-formed mature native shrubs. Leave mature DF and maple trees and 2-4 snags per acre, selecting largest diameter trees. Remove remaining snags.

Recommended NRCS Practices:
-Stand Thinning - dense forested stand
-Slash treatment - heavy slash (pile and burn, or chip at landings)
-Brush management - mechanical and chemical
-Conservation cover - simple, to enhance existing native plant community
-Fuel break - along road or property boundary to address wildfire concerns

Appendix E: Fuel Types

The following fire-carrying fuel types are categorized and explained in more depth in the following source: Scott, Joe H.; Burgan, Robert E. 2005. Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model. Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 72 p.

1. **Nearly pure grass and/or forb type (Grass)**
   a. Arid to semiarid climate (rainfall deficient in summer). Extinction moisture content is 15 percent.
      i. **GR1** Grass is short, patchy, and possibly heavily grazed. Spread rate moderate; flame length low.
      ii. **GR2** Moderately coarse continuous grass, average depth about 1 foot. Spread rate high; flame length moderate.
      iii. **GR4** Moderately coarse continuous grass, average depth about 2 feet. Spread rate very high; flame length high.
      iv. **GR7** Moderately coarse continuous grass, average depth about 3 feet. Spread rate very high; flame length very high.
   b. Subhumid to humid climate (rainfall adequate in all seasons). Extinction moisture content is 30 to 40 percent.
      i. **GR1** Grass is short, patchy, and possibly heavily grazed. Spread rate moderate; flame length low.
      ii. **GR3** Very coarse grass, average depth about 2 feet. Spread rate high; flame length moderate.
      iii. **GR5** Dense, coarse grass, average depth about 1 to 2 feet. Spread rate very high; flame length high.
      iv. **GR6** Dryland grass about 1 to 2 feet tall. Spread rate very high; flame length very high.
      v. **GR8** Heavy, coarse, continuous grass 3 to 5 feet tall. Spread rate very high; flame length very high.
      vi. **GR9** Very heavy, coarse, continuous grass 5 to 8 feet tall. Spread rate extreme; flame length extreme.
2. **Mixture of grass and shrub, up to about 50 percent shrub coverage (GrassShrub)**
   a. Arid to semiarid climate (rainfall deficient in summer). Extinction moisture content is 15 percent.
      i. **GS1** Shrubs are about 1 foot high, low grass load. Spread rate moderate; flame length low.
      ii. **GS2** Shrubs are 1 to 3 feet high, moderate grass load. Spread rate high; flame length moderate.
   b. Subhumid to humid climate (rainfall adequate in all seasons). Extinction moisture content is 30 to 40 percent.
      i. **GS3** Moderate grass/shrub load, average grass/shrub depth less than 2 feet. Spread rate high; flame length moderate.
      ii. **GS4** Heavy grass/shrub load, depth greater than 2 feet. Spread rate high; flame length very high.
3. **Shrubs cover at least 50 percent of the site; grass sparse to nonexistent (Shrub)**
   a. Arid to semiarid climate (rainfall deficient in summer). Extinction moisture content is 15 percent.
      i. **SH1** Low shrub fuel load, fuelbed depth about 1 foot; some grass may be present. Spread rate very low; flame length very low.
      ii. **SH2** Moderate fuel load (higher than SH1), depth about 1 foot, no grass fuel present. Spread rate low; flame length low.
      iii. **SH5** Heavy shrub load, depth 4 to 6 feet. Spread rate very high; flame length very high.
      iv. **SH7** Very heavy shrub load, depth 4 to 6 feet. Spread rate lower than SH5, but flame length similar. Spread rate high; flame length very high.
   b. Subhumid to humid climate (rainfall adequate in all seasons). Extinction moisture content is 30 to 40 percent.
      i. **SH3** Moderate shrub load, possibly with pine overstory or herbaceous fuel, fuel bed depth 2 to 3 feet. Spread rate low; flame length low.
      ii. **SH4** Low to moderate shrub and litter load, possibly with pine overstory, fuel bed depth about 3 feet. Spread rate high; flame length moderate.
      iii. **SH6** Dense shrubs, little or no herb fuel, depth about 2 feet. Spread rate high; flame length high.
      iv. **SH8** Dense shrubs, little or no herb fuel, depth about 3 feet. Spread rates high; flame length high.
      v. **SH9** Dense, finely branched shrubs with significant fine dead fuel, about 4 to 6 feet tall; some herbaceous fuel may be present. Spread rate high, flame length very high.

4. **Grass or shrubs mixed with litter from forest canopy (Timber-Understory)**
    a. Semiarid to subhumid climate. Extinction moisture content is 20 percent.
        i. **TU1** Fuelbed is low load of grass and/or shrub with litter. Spread rate low; flame length low.
        ii. **TU4** Fuelbed is short conifer trees with grass or moss understory. Spread rate moderate; flame length moderate.
        iii. **TU5** Fuelbed is high load conifer litter with shrub understory. Spread rate moderate; flame length moderate.
    b. Humid climate. Extinction moisture content is 30 percent.
        i. **TU2** Fuelbed is moderate litter load with shrub component. Spread rate moderate; flame length low.
        ii. **TU3** Fuelbed is moderate litter load with grass and shrub components. Spread rate high; flame length moderate.
5. **Dead and down woody fuel (litter) beneath a forest canopy (Timber Litter)**
    a. Fuelbed is recently burned but able to carry wildland fire.
        i. **TL1** Light to moderate load, fuels 1 to 2 inches deep. Spread rate very low; flame length very low.
    b. Fuelbed not recently burned.
        i. Fuelbed composed of broadleaf (hardwood) litter.
            1. **TL2** Low load, compact. Spread rate very low; flame length very low.
            2. **TL6** Moderate load, less compact. Spread rate moderate; flame length low.
            3. **TL9** Very high load, fluffy. Spread rate moderate; flame length moderate.
        ii. Fuelbed composed of long-needle pine litter.
            1. **TL8** moderate load and compactness may include small amount of herbaceous load. Spread rate moderate; flame length low.
        iii. Fuelbed not composed broadleaf or long-needle pine litter.
            1. Fuelbed includes both fine and coarse fuels.
                a. **TL4** Moderate load, includes small diameter downed logs. Spread rate low; flame length low.
                b. **TL7** Heavy load, includes larger diameter downed logs. Spread rate low; flame length low.
            2. Fuelbed does not include coarse fuels.
                a. **TL3** Moderate load conifer litter. Spread rate very low; flame length low.
                b. **TL5** High load conifer litter; light slash or mortality fuel. Spread rate low; flame length low.
                c. **TL9** Very high load broadleaf litter; heavy needle-drape in otherwise sparse shrub layer. Spread rate moderate; flame length moderate.
6. **Activity fuel (slash) or debris from wind damage (blowdown) (Slash-Blowdown)**
    a. Fuelbed is activity fuel.
        i. **SB1** Fine fuel load is 10 to 20 tons/acre, weighted toward fuels 1 to 3 inches diameter class, depth is less than 1 foot. Spread rate moderate; flame length low.
        ii. **SB2** Fine fuel load is 7 to 12 tons/acre, evenly distributed across 0 to 0.25, 0.25 to 1, and 1 to 3 inch diameter classes, depth is about 1 foot. Spread rate moderate; flame length moderate.
        iii. **SB3** Fine fuel load is 7 to 12 tons/acre, weighted toward 0 to 0.25 inch diameter class, depth is more than 1 foot. Spread rate high; flame length high.
    b. Fuelbed is blowdown.
        i. **SB2** Blowdown is scattered, with many trees still standing. Spread rate moderate; flame length moderate.
        ii. **SB3** Blowdown is moderate, trees compacted to near the ground. Spread rate high; flame length high.
        iii. **SB4** Blowdown is total, fuelbed not compacted, foliage still attached. Spread rate very high; flame length very high.
7. **Insufficient wildland fuel to carry wildland fire under any condition (Nonburnable)**
    a. **NB1** Urban or suburban development; insufficient wildland fuel to carry wildland fire.
    b. **NB2** Snow/ice.
    c. **NB3** Agricultural field, maintained in nonburnable condition.
    d. **NB8** Open water.
    e. **NB9** Bare ground.

Appendix F: Oregon Department of Revenue Statutes for lands zoned for forestry

OAR 629-610-0050
Acceptable Species for Reforestation and Residual Stand Stocking
(1) The State Forester shall determine if tree species are acceptable for artificial reforestation, natural reforestation, and as residual seedling, sapling and pole, or larger tree stocking based on all of the following criteria:
(a) The species must be ecologically suited to the planting site;
(b) The species must be capable of producing logs, fiber, or other wood products suitable in size and quality for the production of lumber, sheeting, pulp or other commercial forest products; and
(c) The species must be marketable in the foreseeable future.
(2) Up to 20 percent of the site-based stocking levels required by 629-610-0020 (Reforestation Stocking Standards) may be met by using free to grow hardwood trees remaining after harvest if the trees are of species meeting the requirements of section (1) of this rule. An approved plan for an alternate practice is required before more than 20 percent of the required stocking may be met with residual, post-operation hardwood trees. Approval for the use of higher levels of hardwood residual stocking shall be based on a determination by the State Forester that there is a high probability the purpose of the reforestation rules will be achieved.
(3) Landowners are encouraged to reforest with a mixture of acceptable tree species, where appropriate, to reduce the risk of insect and disease losses and to promote stand diversity. Seedlings or seeds used for artificial reforestation should be from seed sources that are genetically adapted to the growing site.

ORS 321.267 Lands not eligible for special assessment. The following forestland may not be assessed under ORS 321.257 to 321.390:
(1) Forestland assessed by the Department of Revenue pursuant to ORS 308.505 to 308.674, 308.805 to 308.820 and 308.990.
(2) Except as provided in ORS 321.347, land that is prepared using intensive cultivation and tilling and on which all unwanted plant growth is controlled continuously for the exclusive purpose of growing Christmas trees.
(3) Land used for the purpose of growing hardwood timber, including but not limited to hybrid cottonwood, if:
(a) The land is prepared using intensive cultivation methods and is cleared of competing vegetation for at least three years after tree planting;
(b) The timber is of a species marketable as fiber for inclusion in the furnish for manufacturing paper products;
(c) The timber is harvested on a rotation cycle within 12 years after planting; and
(d) The land and timber are subject to intensive agricultural practices such as fertilization, insect and disease control, cultivation and irrigation.
(4) Small tract forestland qualified under ORS 321.700 to 321.754 and timber harvested from small tract forestland qualified under ORS 321.700 to 321.754.

ORS 321.257(2) "Forestland" means land in western Oregon that is being held or used for the predominant purpose of growing and harvesting trees of a marketable species and has been designated as forestland or land in western Oregon, the highest and best use of which is the growing and harvesting of such trees. Trees of a marketable species may vary in different areas in western Oregon and may change as the utilization of forest trees changes. The size, age, location, quality and condition of trees do not necessarily determine marketable species. Forestland often contains isolated openings which because of rock outcrops, river wash, swamps, chemical conditions of the soil, brush and other like conditions prevent adequate stocking of such openings for the

production of trees of a marketable species. If the openings in their natural state are necessary to hold the surrounding forestland in forest use through sound management practices, the openings are deemed forestland. Forestland does not include buildings, structures, machinery, equipment or fixtures erected upon, under or above the soil. Forestland includes roads described in ORS 308.236.

ORS 321.700(6) "Forestland" means land that meets the definition of forestland under ORS 321.257 if the land is located in western Oregon or land that meets the definition of forestland in ORS 321.805 if located in eastern Oregon.

ORS 321.805(4)"Forestland" means land in eastern Oregon that is being held or used for the predominant purpose of growing and harvesting trees of a marketable species and that has been designated as forestland under ORS 321.805 to 321.855 or land in eastern Oregon, the highest and best use of which is the growing and harvesting of such trees. Forestland is the land alone. Forestland often contains isolated openings that because of rock outcrops, river wash, swamps, chemical conditions of the soil, brush and other like conditions prevent adequate stocking of such openings for the production of trees of a marketable species. If such openings in their natural state are necessary to hold the surrounding forestland in forest use through sound management practices, the openings are deemed forestland.