Willamette Valley Oak and Prairie Cooperative

Strategic Action Plan

March 2020

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Cover Photo: Oaks at Bald Hill Farm in Benton County (Greenbelt Land Trust)

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Baskett Slough NWR (J. Krueger)

1 Introduction

1.1 Background

Oak and prairie habitats in the Willamette Valley are some of the most iconic, culturally important, and imperiled in Oregon. The First Peoples of the Willamette Valley, including the Kalapuya, have been inseparable from the landscape since time immemorial. As the original land stewards, they used fire to maintain open conditions and nurture habitats that support hundreds of plant and animal species, many of which hold cultural importance as food, medicine, tools, weaving and home materials, decorations, essences for storytelling, and more. Prior to European colonization, approximately two million acres of prairie and oak habitat and 25,000 Kalapuyan people existed in the Willamette Valley (Christy and Alverson 2010; Lewis 2016). Early Euro-American settlers to the Valley described wide expanses of prairie interspersed with scattered oaks, maintained in an open condition by fires set by Native Americans. The last 170 years have brought dramatic change to the Valley. Settlement resulted in conversion of many native ecosystems to urban and agricultural land use and regular burning was halted, allowing woody vegetation and conifers to move into prairies, oak savannas, and woodlands.

Why Oak and Prairie Habitats?

"Concerns about the dramatic declines of historically widespread oak and prairie habitat in the Willamette Valley are reflected in the prioritization of protection and restoration of these habitats in numerous conservation plans, including the Oregon Conservation Strategy, the Willamette Subbasin Plan, and USFWS Willamette Valley Conservation Study and Prairie Species Recovery Plan. Addressing this priority will necessarily bring together practitioners, planners and community groups, leveraging their individual skills and capacities through a cooperative approach and guided by a region-wide Strategic Action Plan."

-Damien Miller, Project Leader, Willamette Valley National Wildlife Refuge Complex

Today, it is estimated that oak habitat in the Valley is found on under ten percent of its pre-settlement area while prairie is found on less than two percent (see Figure 4-1). Much of what remains is fragmented, isolated, and heavily impacted by fast-growing conifers and invasive species. Despite 170 years of loss and fragmentation, significant and timely habitat conservation opportunities are still before us. These opportunities, if acted upon, will have essential and lasting benefits both to Oregon's natural and human communities. Without swift action, however, this window of opportunity will close. In addition to continued loss of biodiversity, additional oak-prairie dependent species could be added the endangered species list, complicating conservation and creating new barriers to economic development. More importantly, we risk the loss of some of the signature features of this landscape, and an important part of what has long made the Willamette Valley such a unique and special place to live.

1.2 Purpose

The Willamette Valley Oak and Prairie Cooperative (WVOPC) is newly formed partnership with a long-term vision to conserve and maintain prairie and oak habitats within the Willamette Valley through a regionally-focused, collaborative, and sustainable program. This Strategic Action Plan (SAP) describes the Cooperative's aspirations over the long term (30 years) and what will be required to achieve ecological goals in the partnership's focal area. In essence, the SAP will serve as the road map, or blueprint, for the partnership's conservation, restoration, and habitat management activities. The SAP will be the catalyst for partners to coordinate their work under a unified and focused strategy for oak and prairie conservation. The SAP will guide long-term actions that will result in the conservation, restoration, and management of a connected network of prairie and oak habitats. These interconnected habitats will be capable of supporting native plants, pollinators, and wildlife that is resilient in the face of climate change, land use changes, and invasive species. Proposed strategies contained within this SAP were developed through a collaborative process that involved multiple stakeholders and are intended to provide a high-level framework for implementation. Future participation of landowners and partners is voluntary.

1.3 Strategic Planning Process

Development of the SAP began in January 2018, in a process built upon the input and expertise of partners and stakeholders from around the Willamette Valley (see Figure 1-1: Strategic Planning Framework Diagram). A twelve person Steering Committee and a Working Group of over forty technical experts have participated in this planning process and have provided critical input toward the development of the SAP. Many of these partners will oversee its implementation in the coming years and decades.

Steering Committee

The WVOPC Steering Committee was formed to oversee the development and implementation of the Willamette Valley Oak and Prairie Cooperative SAP and support collaborative, sustainable partnerships for conservation and restoration of oak and prairie habitats in the Willamette Valley. The Steering Committee is made up of members representing Tribal, municipal, and non-profit organizations. Roles and responsibilities of the Steering Committee have been:

Steering Committee and Working Group touring Bald Hill Farm (photo: J. Krueger)

- Securing funding to support the development and implementation of the Strategic Action Plan;
- Working with the key partners and contractors to develop the SAP and implement stakeholder outreach;
- Assisting the contractors as needed in defining and accomplishing the tasks associated with development of the SAP; and
- Facilitating the development of a membership, governance, and operational structure for the Willamette Valley Oak and Prairie Cooperative over the long term.

Working Group

The Working Group serves as a panel of technical experts assembled to provide input and feedback in support of the development of the SAP. The Working Group is made up of over 40 members representing organizations and agencies from around the valley.

Roles and responsibilities of the Working Group included:

- Meeting with the WVOPC Steering Committee and contractors at key junctions of the planning process to provide input;
- Being available for topic specific consultation by email, phone, or survey as needed;
- Providing feedback on draft materials as needed; and
- Serving to represent the mission and goals of their organization.

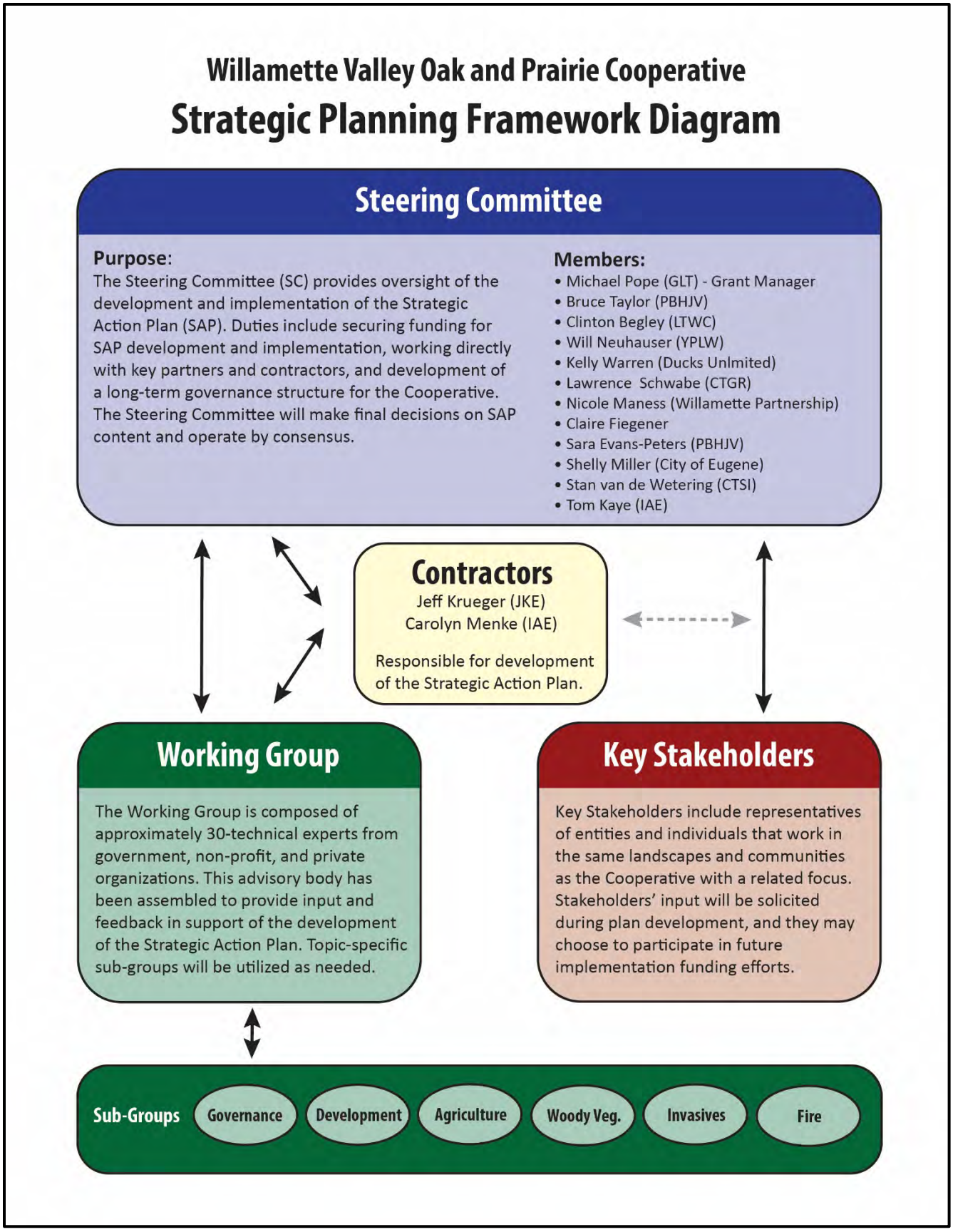
Working Group members met for two half-day work sessions during the development of the SAP (see summary reports in Appendix A and B) and participated in filling out two on-line questionnaires. The second questionnaire asked for feedback on the draft strategies and 30-year Conservation Concept Map (see summary report in Appendix C). The Working Group was instrumental in ranking threats, identifying potential strategies and actions, and identifying geographic priorities within the planning area. Additionally, many of the Working Group members participated in sub-group meetings to develop results chains for high priority threat categories. Upon completion of the SAP, the Working Group will remain in place to continue to provide technical feedback to the WVOPC as needed and Working Group membership will be refreshed as needed to maintained a balanced technical and geographic representation.

Small group exercise during the April 2018 Working Group meeting (photo: J. Krueger)

Stakeholders

Interested parties representing Tribal, State, Federal, and local governments, non-profit organizations, and landowners have been identified and were kept up to date on the planning effort. Support and buy-in from the Stakeholders will be key to the successful implantation of the Strategic Action Plan. The WVOPC will continue to coordinate with stakeholders as the SAP is implemented and stakeholders will have the opportunity to participate in the governance of the Cooperative in the future.

Figure 1-1: Strategic Planning Framework Diagram



Bumble bee on lupine (C. Kerst)

2 Partnership Structure and Roles

2.1 Mission of the Willamette Valley Oak and Prairie Cooperative

The Willamette Valley Oak and Prairie Cooperative is an emerging partnership with a long-term vision to conserve and maintain prairie and oak habitats within the Willamette Valley ecoregion through a regionally-focused, collaborative, and sustainable program. As defined by the Steering Committee and included as the guiding purpose of the partnership in the WVOPC Operations Manual and Memorandum of Understanding, the mission of the Willamette Valley Oak and Prairie Cooperative is stated below:

Willamette Valley Oak and Prairie Cooperative Mission

To protect, restore, and maintain a functional, resilient network of oak and prairie habitats in the Willamette Valley through a coordinated and strategic approach that leverages resources, focuses on priority geographies and species, and produces substantial ecological returns.

2.2 Guiding Principles for the WVOPC

Six overarching guiding principles have been developed to guide the long-term protection, restoration, and management of a functional resilient network of oak and prairie habitat within the planning area. The 30-year Conservation Concept Map (Section 5), conservation goals (Section 6), and strategies and actions (Section 8) all build upon these principles. These guiding principles are also central for the long-term operation of the WVOPC and have been incorporated directly into the partnership's Operations Manual (Appendix E).

Principle 1: Diversity, Equity, and Inclusion

The success of conserving and managing healthy oak and prairie habitats in the Willamette Valley, depends upon a broad and inclusive coalition of interests diverse in race, ethnicity, gender, sexual orientate, socio-economic status, and ability. It is essential that we continue to prioritize principles of diversity, equity, inclusion, and justice to be expressed in all of the activities and governance activities of the WVOPC.

Principle 2: Conservation and Connectivity

Multiple core oak-prairie conservation areas of adequate size and quality are necessary to support viable populations of oak-prairie species over the long term, and a network of managed habitat corridors are vital for connecting these areas and providing for long term resilience with changing climate and socio-economic drivers.

Principle 3: Habitat Management

The quality of oak and prairie habitat will be maintained and improved through active management and restoration efforts on both conserved lands and other lands that contribute to achieving regional conservation goals as expressed in this plan. Science-based best management practices, innovative approaches, climate resiliency research, and traditional ecological knowledge (traditional tribal practices) will be incorporated.

Principle 4: Knowledge and Understanding

Land managers can succeed through the compilation, development and distribution of adequate research, guidance, and spatial data to support improvement of conservation and stewardship activities across the Valley. Tools will be developed and shared to track future progress such as land acquisition, establishment of conservation easements, and major on-the-ground habitat enhancement and restoration projects.

Principle 5: Partnership and Collaboration

Collaboration on a landscape scale is essential to address challenges of this scope and complexity. The WVOPC fills a critical role as a coordinating body of key oak and prairie interests including non-profits, private landowners, Tribes, and local, state, and federal governments to oversee the implementation of the Strategic Action Plan vision, promote collaboration, secure funding, and track accomplishments.

Principle 6: Community and Decision Maker Support and Advocacy

For oak and prairie ecological outcomes to be successful, our work must address social limiting factors to habitat health through increased community awareness of the cultural, economic, and ecological importance of oak and prairie habitat and build support for expanded conservation and restoration efforts.

2.3 Governance Structure of the Willamette Valley Oak and Prairie Cooperative

The following is a description of the anticipated functions and structure of the Willamette Valley Oak and Prairie Cooperative. This structure is subject to modification and refinement as the WVOPC Operations Manual and Memorandum of Understanding are finalized in 2020.

2.3.1 Background

The WVOPC is a diverse group of organizations working together to develop and implement this Strategic Action Plan with a shared commitment to the guiding principles (see Section 2.2) and goals (see Section 6.2) of the plan. The WVOPC will oversee and track the implementation of the strategies outlined in the plan (see Section 8.2). Involvement in the WVOPC is completely voluntary, and there is no expectation that any one organization will be the sole or primary funding source for partners or that participation in the WVOPC. The operation on the WVOPC is dependent on the voluntary contributions and commitments of its members.

2.3.2 Memorandum of Understanding

The WVOPC is not a 501 c3 and does not expect to form an Internal Revenue Service recognized nonprofit in the near future. However, it is a membership organization comprised of a set of formal partners who are unified by a shared vision and purpose described in the SAP. The WVOPC members are more formally bound together by a Memorandum of Understanding (MOU) that describes the shared principles, and roles and responsibilities of the individual members, Steering Committee and Working Groups/Committees, and the purposes of the WVOPC. The MOU will not be a legally binding agreement and does not constitute a formal contract between the organizations or individuals participating in the agreement. The MOU takes effect upon the signatures of the authorized individual(s) of the participating member organizations. It is anticipated that the MOU will be completed and signed by partner organizations in 2020.

2.3.3 Member Roles and Responsibilities

- WVOPC members will commit to support the WVOPC's Guiding Principles and work towards achieving the goals and strategies described in the SAP.
- WVOPC members agree to participate actively and in a timely fashion in the planning, decision-making and implementation processes.
- WVOPC members support the long term sustainability of the WVOPC and its collaborative activities.

2.3.4 Decision Making Structure

Some WVOPC decisions will require a formal vote by the full membership or the Steering Committee (SC) or the Working Groups (WG) including:

- Adding or removing members from the MOU (Full Membership)
- Election of members to the SC (Full Membership)
- Adoption of standing Committee or Working Group Charters (Full Membership)
- Major SAP revisions (Full Membership)
- Selection of members to Technical Advisory and Project Implementation Committee (SC)
- Final project selections for OWEB FIP Implementation proposals (SC, Geographic Working Groups)
- Letters of support and funding allocations (SC, Geographic Working Groups)
- Selection of Fiscal Agent (SC)
- Hiring of Coordinator or other contractors (Full Membership)
- Amending or terminating the MOU (Full Membership)
- Creating and populating ad hoc Action Teams (SC, Geographic Working Groups)

2.3.5 Meetings

All meetings (Committees, Working Groups, ad-hoc Working Groups) will be open and inclusive. Meetings will be open to the public and anyone in attendance may participate and contribute. A set time for public comments will be allocated to each agenda. Full member meetings will be held at least quarterly each year. Efforts will be made to conduct membership and SC meetings in different locations in the Willamette Valley. Participants on the Committees and Working Groups agree to the following operating principles:

- Attend meetings and follow through on commitments
- Respond to requests in a timely and thoughtful manner
- Bring ideas and concerns from their entity up for discussion
- Share all relevant information that may assist the group in achieving its goals
- Participate in an open and mutually respectful exchange of ideas, views and information
- Articulate interests that underlie issues and concerns in an effort to find common ground
- Test assumptions by asking questions
- Act in good faith which requires that individuals express consistent views and opinions in the Committee/Working Group and in other forums
- Seek to learn and understand each other's perspective
- Encourage respectful, candid and constructive conversation
- Provide balance of speaking time and encourage input from all Committee members
- Seek to resolve differences and reach consensus on major decisions
- Discuss topics together rather than in isolation

2.3.6 Progress Monitoring

The ecological progress achieved under this SAP will be monitored by the WVOPC to track progress and measure the reduction in limiting factors to oak and prairie habitats (see Section 9.2 and Figure 9-1). The proposed approach is to track indicators of ecological progress (intermediate ecological results) in four key areas:

- Total acres of oak and prairie habitat conserved and managed
- Total number of sites and total acres of core conserved and managed lands meeting the Anchor Site criteria (see Section 4.7 for definition)
- Total acres of oak and prairie habitat burned through prescribed fire
- Total acres treated for woody encroachment and invasive species

3 Geographic Scope and Planning Horizon

Indian Head in Linn County (J. Krueger)

3.1 Geographic Scope

Primary Planning Area
The Primary Planning Area addressed by this Strategic Action Plan includes all lands within the Willamette Valley ecoregion, minus the Portland metropolitan area, which is currently being addressed in a parallel planning effort (See Figure 3-1: Planning Area Map). In total, the area encompasses approximately 2.4 million acres and is bound by the conifer forest-dominated lands of the Coast Range to the west and Cascade Range to the east. The majority of the Primary Planning Area is in private ownership and less than 4% of the land area (approximately 94,000 acres) is currently managed by public or non-profit organizations for habitat conservation purposes or is otherwise in a permanent conservation status (see Figure 4-4: Ownership Table). Agricultural and urban uses dominate the valley and portions of 8 counties and 35 incorporated cities lie within the Primary Planning Area.

Climate Change Resiliency Area
An expanded planning area has also been established to account for possible future shifting of habitat conditions due to the effects of climate change. This Climate Change Resiliency Area extends approximately ten miles beyond the Willamette Valley ecoregional boundary. Based on available vegetation data, this buffer area captures much of the inventoried oak-prairie in the adjacent ecoregions across a variety of elevations. The oak and prairie habitats within this area tend to be found on dryer south facing slopes and rocky outcrops. Habitat patches tend to be relatively small and isolated compared to the conditions in the Primary Planning Area. Public lands, primarily U.S. Bureau of Land Management- and the U.S. Forest Service-owned, make up approximately half of the 2.2 million acres contained within the Climate Change Resiliency Area.

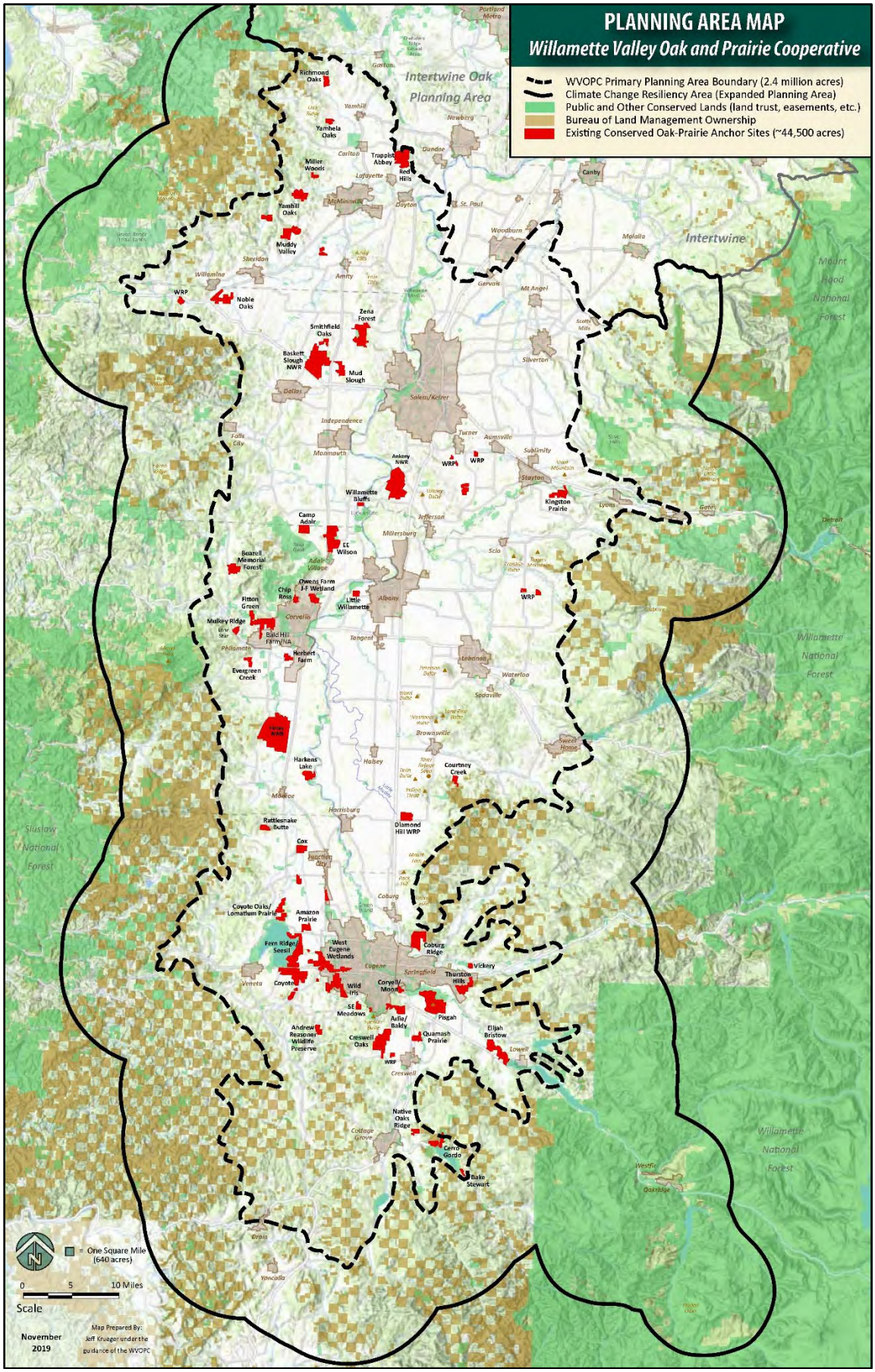
3.2 Planning Horizon

This Strategic Action Plan provides a 30-year landscape-scale vision for oak and prairie habitat conservation and management with more specific strategies and actions prioritized for short-term implementation:

- Short-term (6 years), covering the first three State biennium
- Medium-term (12 years), covering the second three State biennium
- Long-term (30 years), covering the full extent of the Strategic Action Plan vision

Figure 3-1: Planning Area Map

Click map to see a higher resolution PDF



Buford Recreation Area (E. Alverson)

4 Profile of Oak and Prairie Habitat in the Willamette Valley

4.1 Geographic Setting

Bordered by the vast expanses of Pacific Northwest conifer forest, a network of inland oak and prairie habitat extends from southern British Columbia to northern California. A central component of this network, and the focus of this Strategic Action Plan, is the Willamette Valley ecoregion of Oregon. The defined planning area includes the entire ecoregion, minus the area in and around Portland which was addressed by a parallel strategic action planning effort. In total, the core planning area covers 2.4 million-acre (3,750-square mile) and is approximately 120 miles long (north-south) and 40 miles wide (east-west), bound by the Coast Range to the west and Cascade Range to the east.

4.2 Historical Context

4.2.1 Native American Influences and Cultural Significance

Humans have lived in the Willamette Valley for over 10,000 years and were 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 were 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.

Camas (photo: E. Alverson)

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 (Christy et al. 2011). 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.). Evidence of these food production

practices can be found in the form of camas oven remnants located throughout the Willamette Valley. The oldest archeological evidence of camas ovens and charred bulbs in the Willamette Valley date back 7,750 years. Several ovens excavated near Eugene measure six feet in diameter and contain the remains of cooked camas and baking stones (Sultany et al. 2007).

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.

4.2.2 Historical Vegetation Patterns

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 rivers (see Figure 4-1: Historical and Current Extent of Oak and Prairie Habitats within the Planning Area and Figure 4-2: Historical Oak and Prairie Vegetation Map). 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 planning area was occupied by oak or prairie habitat at the time.

David Douglas Description of Willamette Valley Conditions in 1827

David Douglas was a Scottish botanist and explorer who visited the Willamette Valley in 1827. Selected journal entries from the exploration are listed below:

"Country undulating; soil rich, light, with beautiful solitary oaks and pines interspersed through it, and must have a fine effect, but being burned and not a single blade of grass except on the margins of rivulets to be seen. This obliged us to camp earlier than we would have otherwise done."

-Journal entry, September 27, 1827.

"Camped on the south side of the Yamhill River, a small stream about twenty-five yards wide; channel for the greater part mud and sand. Two hundred yards below where we forded are fine cascades 7 feet high. Country much the same as yesterday; fine rich soil; oaks more abundant, and pines scarcer and more diminutive in growth."

-Journal entry, September 28, 1827.

"Started at nine and continued our route in a southernly direction, on the opposite side of the hill from where we were yesterday. Most parts of the country burned; only on little patches in the valleys and on flats near the low hills that verdure [green vegetation] to be seen. Some of the Natives tell me it is done for the purpose of urging the deer to frequent certain parts to feed, which they leave unburned and of course are easily killed. Others say that it is done in order that they might better find honey and grasshoppers, which both serve as articles of winter food."

-Journal entry, September 30, 1827

4.3 Current Extent

As described earlier, the extent of oak and prairie habitat is greatly diminished in the valley and now covers significantly less than 10% of its historic range (see Figure 4-1). What remains is generally found in highly fragmented patches and in most cases is significantly impacted by invasive species and colonizing woody vegetation (see Figure 4-3). It should be noted that the total extent of oak woodland is shown to have increased slightly, likely due to the fact that denser patches of oak trees have now colonized areas that were formerly oak savanna or prairie.

Figure 4-1: Historical and Current Extent of Oak and Prairie Habitats within the Planning Area

Vegetation Community	*Historical Extent (acres)	**Estimated Current Extent (Acres)	Estimated Remaining % of Historical Extent
Oak Woodland	**45,229**	**59,178**	**131%**
Grasslands (combined)	**1,416,320**	**70,690**	**5%**
• Oak Savanna	475,329	16,635	**3%**
• Upland Prairie	641,569	19,278	**3%**
• Unmanaged Pasture	0	29,777	-
• Wetland Prairie	299,422	5,000	**2%**
Total Oak-Grasslands Combined	**1,461,549**	**129,868**	**9%**
Other (all non-oak or prairie)	930,023	2,261,704	**243%**
Total Planning Area (Acres)	**2,391,572**	**2,391,572**	-

**Based on General Land Office surveys of the 1850s*

***USFWS vegetation data (2017) derived from various sources. Wetland prairie is estimated from a subset of the 34,022 acres of mapped wetland.*

4.4 Biophysical Context

4.4.1 Ecoregional 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. The "Climate Change Resiliency Area" potion of the planning area extends approximately ten miles into the West Cascade and Coast Range ecoregions and ranges in elevation from 1,000 feet to over 4,000 feet.

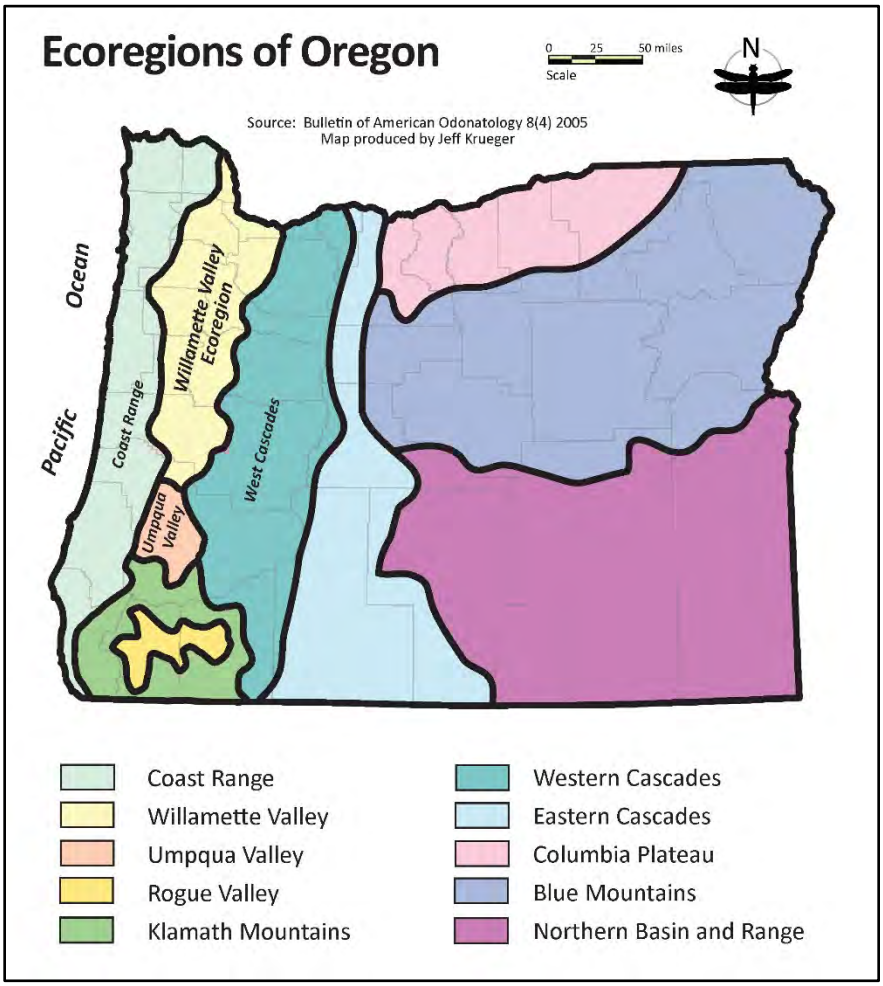
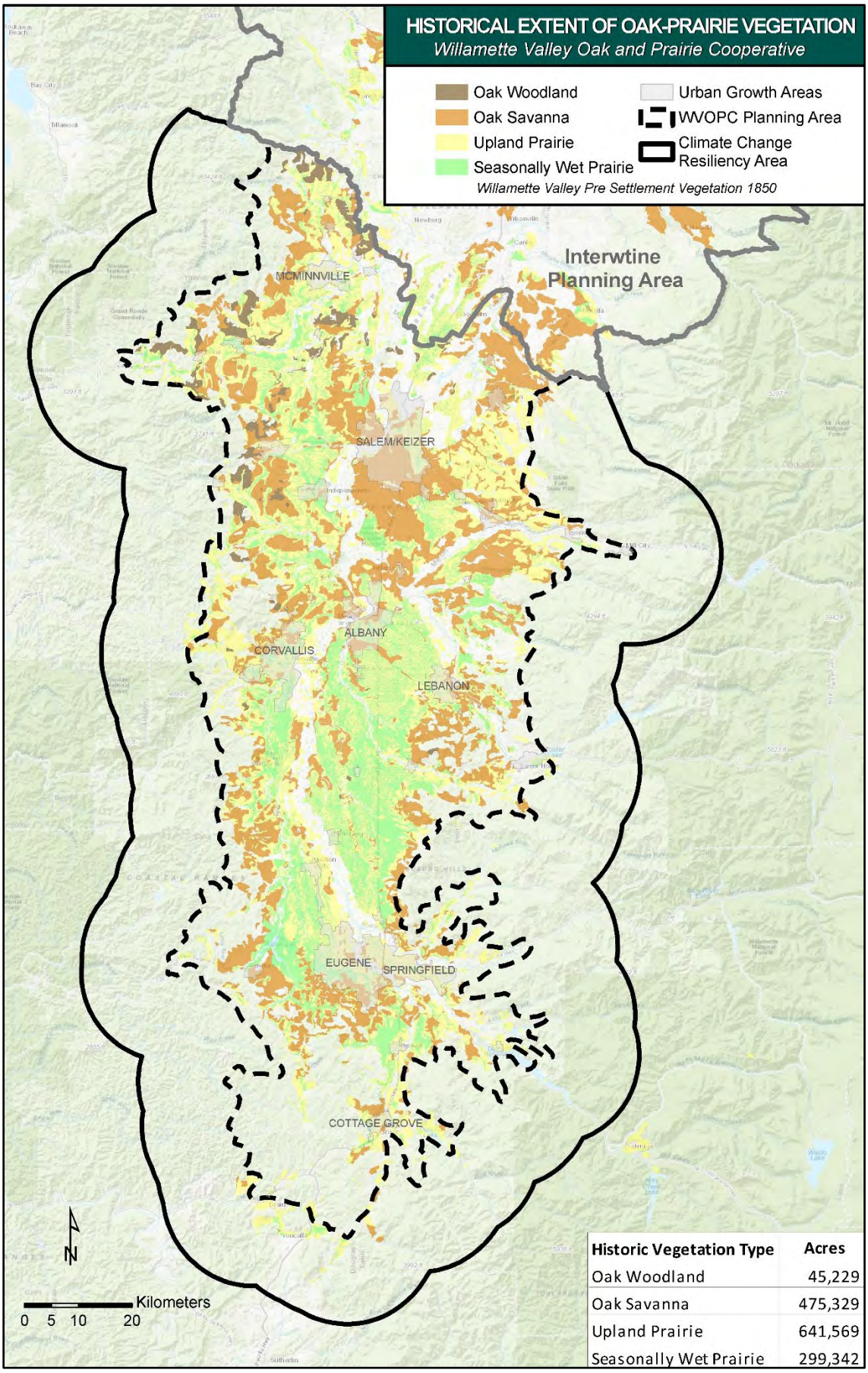


Figure 4-2: Ecoregions of Oregon Map

Figure 4-3: Historical Extent of Oak-Prairie Vegetation Map

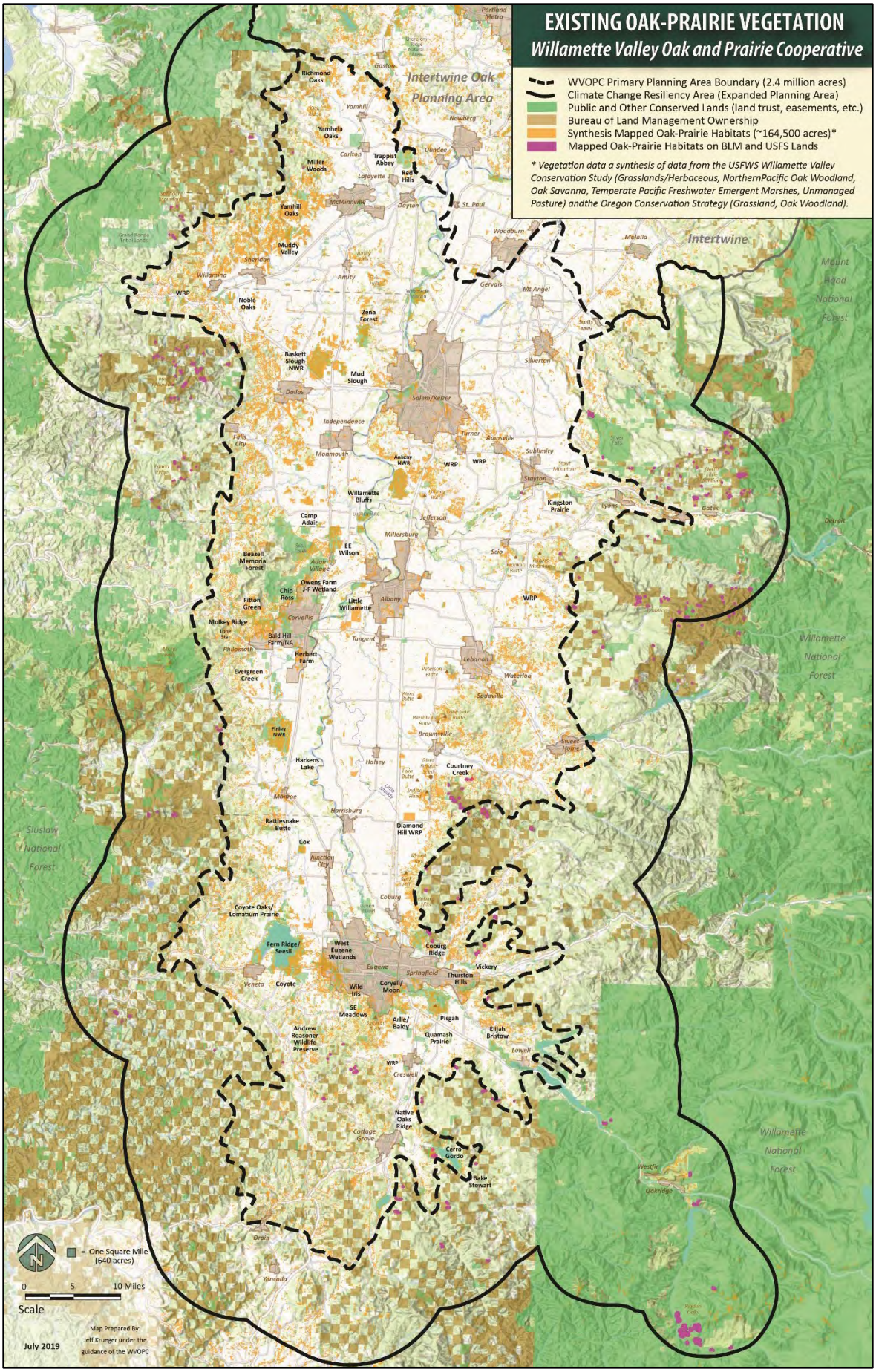
Click map to see a higher resolution PDF



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

Figure 4-4: Existing Synthesis Oak and Prairie Vegetation Map

Click map to see a higher resolution PDF



4.4.2 Terrestrial Ecosystems and Supported Species

Oak and prairie habitats of Willamette Valley are considered to be fire-dependent ecosystems that are well adapted to a frequent fire return interval. These habitats, once dominant in the valley, are inhabited by a diverse assemblage of plant and animal species that flourished for many thousands of years under this frequent cycle of disturbance. Prairie and oak habitats in the Willamette Valley/Puget/Georgia ecoregion support approximately 350 native plant species including grasses dominant throughout the year with seasonal displays of wildflowers (Alverson 2005).

Oak and prairie habitats are home to a diverse array of native wildlife species as well, with over 200 native prairie- and oak-dependent wildlife species found in the valley. Streaked horned lark, Western meadowlark, and short-eared owl nest exclusively in prairies. Acorn woodpeckers and western gray squirrels feed on acorns produced by oaks. Many birds such as the western bluebird forage for insects among lichens, mistletoe, and mosses growing on large oak limbs. Nuthatches, kestrels, northern pygmy-owls, and the California myotis bat all nest in cavities or under loose bark on oak trees. In just one spring and summer, a group of citizen scientists observed 40 species of birds in one large Oregon white oak tree in the West Eugene Wetlands. The Oregon Conservation Strategy (ODFW 2016) designates a total of 23 grassland and oak dependent plant and wildlife species as "Strategy Species". Strategy Species are of high conservation priority for the State and also include several Federally listed Threatened or Endangered species (see Section 6.1.2).

The Cycle and Diversity of the Willamette Valley Prairie

In April the floral display in the prairies and savannas swings into full gear, with yellow buttercups (*Ranunculus occidentalis*), pink shooting stars (*Dodecatheon hendersonii*), white saxifrage (*Saxifraga integrifolia*) and white Oregon fawn lilies (*Erythronium oregonum*) brightening the landscape. In May the prairies are often filled with sheets of purple camas lilies (*Camassia quamash)*, accentuated with larkspurs (*Delphinium* spp.), pink sea blush (*Plectritis congesta*), and yellow balsamroot (*Balsamorhiza deltoidea*). Peak diversity of flowering species is in late spring; a single square meter of high-quality prairie may support over 20 species of native plants. Increasing summer drought in July and August brings seed maturation and vegetative dormancy, along with the burn season, but a few composites (*Aster* spp.*, Grindelia integrifolia*) and umbels (*Perideridia montana* and *P. oregana*) flower into late summer and fall.

-Ed Alverson, Preserving Prairies and Savannas in a Sea of Forest, 2005.

4.5 Social Context

4.5.1 Land Ownership and Uses

A total of 35 incorporated cities are located within the planning area with major cities including (from north to south) McMinnville, Dallas, Salem, Keizer, Stayton, Albany, Corvallis, Lebanon, Sweet Home, Brownsville, Eugene, Springfield, and Cottage Grove. Based on available spatial data, approximately 93 percent of the land within the Primary Planning Area is currently in private ownership (See Figure 4-5: Ownership Table).

Figure 4-5: Ownership Table

Ownership	Acres	Percent
Private	2,213,182	92.5%
Conserved and Managed for Conservation (public and non-profit)	94,415	4.0%
BLM O&C Timber Lands*	83,975	3.5%
Total:	**2,391,572**	**100.0%**

** Oregon and California Railroad Revested Lands*

Source: Various land ownership spatial data sets.

4.5.2 Key Stakeholders

There is a long history of partners working together to coordinate and achieve shared habitat conservation and restoration goals in the Willamette Valley. Successful implementation of this Strategic Action Plan will rely heavily on continuing to grow and build upon the collaboration of a wide array of Stakeholders. In addition to Tribal, Federal, State, and local governmental organizations operating in the valley, key Stakeholders in this effort also include vineyard and small woodland owners, farmers, land trusts, watershed councils, extension services, and an array of non-profit organizations. The coordination of this diverse group of Stakeholders will be an essential function of the WVOPC.

4.6 Planning Context: Related Plans, Studies, and Initiatives

A significant number of high-level plans, studies, and initiatives related to Willamette Valley oak and prairie habitat have been completed or are underway and provide important background and direction for the development of the WVOPC Strategic Action Plan. Appendix D includes a list of many of these resources along with a brief summary of its relationship to the WVOPC planning process. In addition to these valley- and region-wide efforts, there are an extensive number of site- or watershed-specific efforts that are too numerous to be listed.

The following high-level resources have been particularly valuable for guiding this planning process:

- *Prairie, Oaks, and People: A Conservation Business Plan to Revitalize the Prairie-Oak Habitats of the Pacific Northwest* (Cascadia Prairie-Oak Partnership and Pacific Birds, 2017)
- *Willamette Valley Conservation Study – Strategic Habitat Conservation in Oregon's Willamette Valley* (U.S. Fish and Wildlife Service, 2017)
- *Oregon Conservation Strategy* (Oregon Department of Fish and Wildlife, 2016)

4.7 Existing Conserved Oak and Prairie Anchor Sites

The identification of existing conservation lands in the Willamette Valley that currently contains significant areas of oak and prairie habitat was an important task of the strategic action planning process. Referred to as "Anchor Sites", these conserved oak and prairie habitats form the foundation, or starting point, for future conservation efforts that can be built upon in the future.

Using the professional knowledge and available spatial data, the WVOPC Steering Committee and select members of the Working Group went through a process of defining and identifying known Anchor Sites. Lands that met the following criteria were designated as Anchor Sites:

- Must have permanent conservation status (public land or private lands with conservation easement);
- Must be contained within the Willamette Valley ecoregional boundary;
- Must contain a significant component of oak or prairie habitat (based on available spatial data and professional knowledge); and
- Must be 100 acres or larger with some exceptions for smaller sites that were also included due to the known presence of outstanding habitat.

Anchor Sites were identified by Steering Committee members based on professional knowledge of the valley and review of available spatial data. Following the nomination process, planning intern Alejandro Brambila from the University of Oregon created a spatial data set and compiled attributes for each site. It is important to note that considerably more oak and prairie habitat exists in the Willamette Valley, but is either contained on privately owned land or within conserved land in smaller patches. A total of 76 Anchor Sites have been mapped, covering a total of 44,390 acres (see Figure 3-1: Planning Area Map).

The conservation vision contained within this Strategic Action Plan (see Section 5) describes a future network of large blocks of conserved oak and prairie habitat, connected through a series of habitat corridors. To achieve this vision, Anchor Sites will be managed and enhanced for oak and prairie habitat and where possible, expanded in size to create viable habitat conditions able to support a diverse and sustainable assemblage of oak and prairie dependent plant and animal species.

5 Willamette Valley Oak and Prairie Vision

Working Group site visit at Bald Hill Farm (J. Krueger)

5.1 Consensus 30-Year Vision for Oak and Prairie in the Willamette Valley

At the onset of the strategic action planning process, the Working Group and Steering Committee members were asked to articulate their ideal future Willamette Valley oak and prairie system using the following prompt:

> **Visioning Scenario**
> *Imagine you're able to time travel to 30 years into the future. When you arrive, you spend several days touring the Willamette Valley (perhaps by flying car) and are overcome by the quality and extent of the oak and prairie habitats you are seeing. You also spend a day with members of the Willamette Valley Oak and Prairie Cooperative, and they explain to you how this on-the-ground success was achieved. Please describe this ideal future Willamette Valley oak and prairie system you are seeing and the mechanisms that were used to achieve this success. Please try to be visionary and as concise as possible in your description.*

Responses were limited to 150 words or less and were submitted via an on-line survey form. The verbatim (word for word) responses to this visioning scenario are included verbatim in Appendix A. The following ten vision elements were derived from common themes that were articulated by the Working Group and Steering Committee members during this visioning exercise:

Aspirational Vision Elements

1. Oak and prairie-dependent species are stable and thriving.
2. The largest and highest quality oak-prairie remnants have been permanently preserved through acquisition and easements.
3. New habitats are being restored.
4. A web of interconnected oak and prairie corridors stretch across the valley, providing connectivity between large conservation areas.
5. Urban growth is contained and oak and prairie habitat is integrated into newly developing areas.
6. Fire has returned to the landscape.
7. Oak and prairie habitats are expertly managed on both private and public lands.
8. Public understanding, enjoyment, and support for oak and prairie habitats has blossomed.
9. Partnership and collaboration are thriving.
10. Stable and abundant funding and favorable policies are achieved.

5.2 Development and Purpose of the 30-Year Conservation Concept Map

5.2.1 Purpose and Use of the Map

The WVOPC Conservation Concept Map is intended to provide a high-level spatial framework for future oak and prairie conservation and restoration efforts in the planning area (primary planning area plus the lands included within the climate change resiliency area. The concept displayed on the map highlights broad areas of interest and opportunity for oak and prairie conservation efforts based on available data and Working Group input. The map will be used to:

- Identify high priority conservation target areas and habitat corridors;
- Guide partners on where to focus/invest limited resources in oak and prairie restoration;
- Serve as a communication tool for partners, landowners, and elected officials;
- Show how individual projects and conservation efforts fit into the big picture; and
- Support efforts to obtain funding.

The map is not intended to be property-specific at this time and undoubtedly, conservation and restoration opportunities exist beyond those areas depicted on the map. Implementation of the concept depicted on the map will be reliant on voluntary participation by landowners and partners. Specific properties to be targeted for specific conservation and habitat management actions will be determined over time based on partnership input, interest of landowners, availability of funds, and additional analysis.

5.2.2 Development of the 30-Year Conservation Concept

On November 15, 2018, a total of 38 Working Group and Steering Committee members met and participated in a half-day work session to help develop the 30-year Conservation Concept Map for the planning area. This interactive work session used a design charrette process where participants were asked to complete a mapping exercise to identify high priority oak and prairie geographies. A charrette process is an interactive and collaborative work-session in which a diverse group of participants develops a solution to a design problem within a defined period of time. The Working Group and Steering Committee members split into six teams to complete the small group design charrette process with the goal of developing a Conservation Concept Map using the following prompt (next page):

Small group exercise during the 2018 charrette (photo: J. Krueger)

Charrette Assignment
We have assembled the best and brightest conservation minds in the Willamette Valley to work together to develop a 30-year Conservation Concept Map for oak and prairie habitats within WVOPC planning area. This map will be based on your group's assessment of the available conservation data, evaluation of threats and opportunities, and your personal on-the-ground knowledge of the planning area. Your team has approximately two hours to produce a proposed Conservation Concept Map that you will present to the larger group.

Each team worked for two and a half hours to complete the exercise and presented their results to the larger group. A set of thematic maps including data such as existing oak-prairie vegetation, ODFW Conservation Opportunity Areas (COAs), USFWS Priority Conservation Areas (PCA), The Nature Conservancy's Key Oak Parcels data, Oak-Prairie Anchor Sites (derived by WVOPC Steering Committee), conserved lands, and tax lots were provided to each team to help guide their decision-making process.

After identifying high priority conservation areas and key connections, team members were each given ten sticker dots (symbolizing money) and asked to place them on what they thought were the highest priority areas. At the end of the work session, each team presented their vision map. Each of the six map products developed by the teams are included in Appendix B.

These six maps were the basis for the 30-Year Conservation Concept Map (see Figure 5-1) developed by the Steering Committee and Contractors. Following the Working Group meeting, the six maps were carefully reviewed by the Contractors and Steering Committee members and common themes were noted and synthesized into a single 30-Year Conservation Concept Map. The polygons showing on the map were refined based on close inspection of underlying thematic map data and aerial photo interpretation. As noted, the map is intended to provide a high-level/big picture framework for future oak and prairie conservation and restoration efforts in the planning area over the next 30 years. The concept depicted on the map highlights broad areas of interest and opportunity based on available data and Working Group input and is not intended to be property specific.

Presentation of small group work (photo: J. Krueger)

5.3 Conservation Concept Overview and Map Key

5.3.1 Conservation Concept Overview

The 30-year concept for protecting, restoring, and maintaining a functional, resilient network of oak and prairie habitats in the Willamette Valley includes:

- Establishing several large core conservation areas of sufficient size to support viable populations of a variety of oak and prairie species over the long term. Conservation actions within these high priority areas would include land acquisition and establishment of permanent easements to build on existing, and establish new, Anchor Sites (see definition below). This would be done in combination with increased restoration and management support for habitats on private lands located within these core areas including oak release, habitat restoration, increased ecological burning, and implementation of habitat-friendly best management practices (BMPs) on agricultural lands.
- Creating a network of opportunity-based conservation areas that provides connectivity between core areas. Efforts in these areas would rely primarily on habitat management and restoration actions implemented on private lands where opportunities exist. Future land acquisition could be focused in these areas in the future with the goal of establishing new and emerging Anchor Sites.
- Creating corridors and stepping-stones of managed habitat to provide opportunities for species to move across the agricultural landscape on the Valley floor and up into the higher-elevation oak-prairie habitat patches.

5.3.2 Map Key

Definitions of the themes depicted on the 30-Year Conservation Concept Map are listed below:

WVOPC Primary Planning Area Boundary
The Primary Planning Area includes the land contained within the Willamette Valley Ecoregion of Oregon. It excludes the Portland Metropolitan area which is covered by a separate oak-prairie SAP. Totaling 2.4 million acres, the planning area is bounded by the conifer forest-dominated lands of the Coast Range to the west and Cascade Range to the east.

Climate Change Resiliency Area
An expanded planning area has been established to account for possible future shifting of habitat conditions due to the effects of climate change. The defined area extends approximately ten miles beyond the Willamette Valley ecoregional boundary. Based on available vegetation data, this buffer area captures much of the inventoried oak-prairie in the adjacent ecoregions across a variety of elevations.

Public and Other Conserved Lands
These lands include a mix of Federal, Tribal, State, county, and local government-owned lands and other non-profit properties (land trust ownership, conservation easements, etc.). Although managed for a variety of purposes, all of these lands are off-limits to urban or rural development.

Bureau of Land Management Ownership
Also off-limits to development, the U.S. Bureau of Land Management (BLM) -owned lands are dominated by conifer forest and are predominantly managed for timber harvest, although special habitats, including numerous oak and prairie sites, have been inventoried and often receive special management considerations.

BLM/USFS Inventoried Oak-Prairie Sites
These include oak and prairie vegetation communities that have been inventoried and mapped on U.S. Bureau of Land Management and U.S. Forest Service lands. Many of these sites are located within higher elevation areas and could provide an important climate resiliency function in the future.

Existing Conserved Oak-Prairie Anchor Sites
Anchor Sites are defined as relatively large parcels of permanently conserved lands that contain a significant component of oak or prairie habitat. Anchor Sites were identified by Steering Committee members based on professional knowledge and review of available spatial data. Anchors range in size from 50 to over 1,000 acres and cover a total land area of 44,390 acres combined. A total of 76 Anchor Sites have been identified.

Proposed Focus Areas (30-Year Vision)

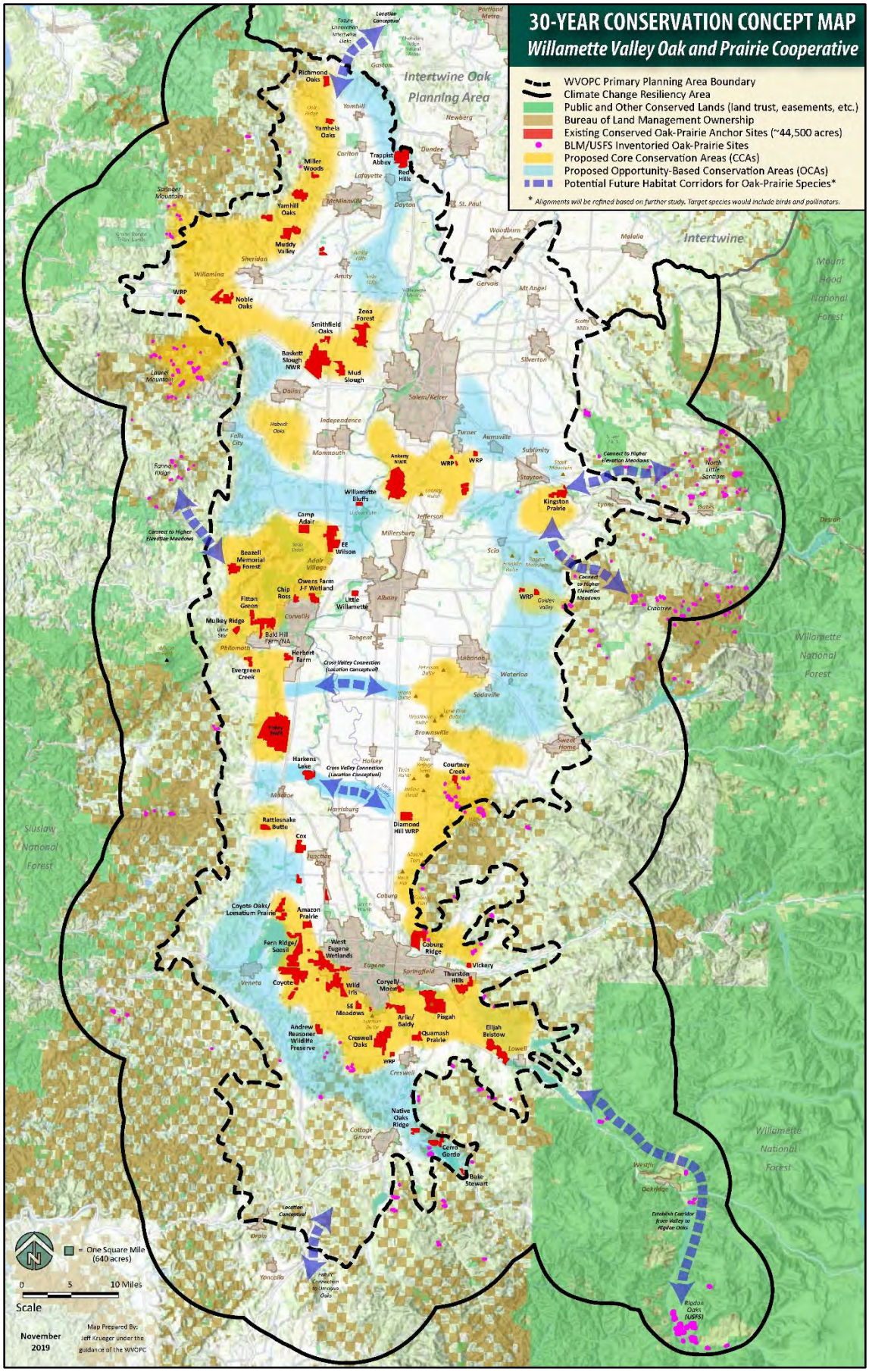
Proposed Core Conservation Areas (CCAs)
Core Conservation Areas (CCAs) are the highest priority geographies for immediate and focused investment for habitat acquisition, increased management, and restoration. The areas shown were selected based on their proximity to existing Anchor Sites; known concentrations of particularly high-quality oak and prairie habitat on larger parcels; or because areas of high-value oak or prairie habitat are under a high level of threat (e.g., agricultural conversion, urban development, incompatible management). Focusing future conservation and restoration efforts within these CCAs will support the Strategic Action Plan goal of conserving blocks of high-value oak and prairie habitat of adequate size to support viable populations of oak and prairie species over the long term. The CCAs shown are not intended to be property specific and their exact extent will be based on further analysis and landowner outreach.

Proposed Opportunity-Based Conservation Areas (OCAs)
These areas contain dispersed oak and prairie habitats and have been identified by the Working Group as being critical areas for providing connectivity between CCAs. Efforts to integrate oak-prairie ecosystem functions within farm, forest, and urban lands will be a focus in these areas. Strategies that help improve management and restore habitats on private lands would be the primary focus (e.g., Oak Accord, watershed council assistance, Natural Resource Conservation Service Wetland Reserve Program and Conservation Reserve Program, etc.), as relationships with landowners are established. Long-term land acquisition goals in these areas would focus on aligning with local restoration and management efforts and would be designed to build new Anchor Sites where high-quality conservation opportunities are developed.

Potential Future Habitat Corridors for Oak-Prairie Species
These areas been identified as potentially important corridors for movement of oak and prairie dependent species. These corridors would either provide cross-valley connectivity or provide connectivity between CCAs and the higher-elevation oak-prairie patches located within the Climate Change Resiliency Area. Managing for oak and prairie habitats within these corridors could include oak release projects, thinning, integration of nectar producing forbs for pollinators in agricultural areas, and restoration of “stepping-stones” of oak and prairie habitat.

Figure 5-1: 30-Year Conservation Concept Map

Click map to see a higher resolution PDF



6 Ecological Priorities, Conservation Targets, and Goals

Post-burn West Eugene Wetlands (P. Gordon)

6.1 Ecological Priorities

6.1.1 Priority Habitats

The ecological priorities of this Strategic Action Plan are the historically fire-dependent ecosystems of the Willamette Valley that include a spectrum of oak and prairie habitats. These habitats can be classified based on canopy cover and soil conditions:

- Oak forest (71-100% canopy)
- Oak woodland (31-70% canopy)
- Mixed forest/woodland with an oak component (31-100% canopy)
- Oak savanna (6-30% canopy)
- Upland prairie (0-5% canopy with upland soils)
- Wet prairie (0-5% canopy with hydric soils)

Oak woodland at Bald Hill Farm (J. Krueger)

Oak savanna at Finley NWR (E. Alverson)

Upland prairie at Kingston Prairie (M. Benotsch)

Wetland prairie at Coyote Prairie (J. Krueger)

Why are Oak and Prairie habitats important to the State of Oregon?

In a national assessment, oak and associated prairie and chaparral habitats were found to be one of the most endangered ecosystems in the U.S. due to land conversions and altered fire regimes. Yet, these habitats are home to numerous bird, terrestrial, and plant species addressed in the Oregon Conservation Strategy. Maintaining the connectivity of oaks and their associated prairie and chaparral habitats is crucial to support species utilization of greater habitat range, but also to facilitating the gradual movement of species to the north from California in response to climate change. Many species dependent on oak habitats may be considered for ESA-listing in the future; thus, an increase in habitat connectivity, complexity and acreage will benefit these vulnerable species. In addition, these habitat types are iconic and culturally important to the Native American tribes.

– Oregon Watershed Enhancement Board, 2018

Oak woodland at Buford Recreation Area (E. Alverson)

6.1.2 Priority Species

The Oregon Conservation Strategy (ODFW 2016) lists the following oak and grassland (prairie and savanna) dependent species as high priority for conservation and recovery efforts in the Willamette Valley ecoregion (see Figure 6-1).

Figure 6-1: Priority Wildlife and Plant Species

Common Name	Scientific Name	State Status	Federal Status
Wildlife			
Acorn Woodpecker	*Melanerpes formicivorus*	Sensitive	Species of Concern
Chipping Sparrow	*Spizella passerina*	Sensitive	
Fender's Blue Butterfly	*Icaricia icarioides fenderi*		Endangered
Grasshopper Sparrow	*Ammodramus savannarum perpallidus*	Sensitive	
Great Spangled Fritillary	*Speyeria cybele*		
Monarch Butterfly	*Danaus plexippus*		
Oregon Vesper Sparrow	*Pooecetes gramineus affinis*	Sensitive	Species of Concern
Short-Eared Owl	*Asio flammeus*	Sensitive	
Streaked Horned Lark	*Eremophila alpestris strigata*	Sensitive	Threatened
Taylor's Checkerspot Butterfly	*Euphydryas editha taylori*		Endangered
Western Bluebird	*Sialia mexicana*	Sensitive	
Western Gray Squirrel	*Sciurus griseus*	Sensitive	
Western Meadowlark	*Sturnella neglecta*	Sensitive	
White-breasted Nuthatch	*Sitta carolinensis aculeata*	Sensitive	
Plants			
Bradshaw's Desert Parsley	*Lomatium bradshawii*	Endangered	Endangered
Golden Paintbrush	*Castilleja levisecta*	Endangered	Threatened
Kincaid's Lupine	*Lupinus oreganus*	Threatened	Threatened
Nelson's Checkermallow	*Sidalcea nelsoniana*	Threatened	Threatened
Peacock Larkspur	*Delphinium pavonaceum*	Endangered	Species of Concern
Wayside Aster	*Eucephalus vialis*	Threatened	Species of Concern
White Rock Larkspur	*Delphinium leucophaeum*	Endangered	Species of Concern
White-topped Aster	*Sericocarpus rigidus*	Threatened	Species of Concern
Willamette Daisy	*Erigeron decumbens*	Endangered	Endangered

Acorn Woodpecker (C. Kerst)

Willamette Daisy (G.D. Carr, Oregon Flora Project)

6.2 Conservation Goals

The following conservation goals have been developed to address conservation needs and threats (see Section 7).

Goal 1: Increase Conservation and Connectivity
Establish multiple core oak-prairie conservation Anchor Sites of adequate size and quality to support viable populations of oak-prairie species over the long term and establish a network of managed habitat corridors to connect these areas.

Goal 2: Increase Habitat Management
Maintain and improve the quality of oak and prairie habitat for priority species through increased active management and restoration efforts using science-based best management practices, traditional ecological knowledge and practices, and innovative approaches.

Goal 3: Limit Impacts of Urban and Rural Development
Limit future impacts of urban and rural development through implementation of more ecologically friendly development regulations and policy, preservation of high-value habitats where threatened, and technical assistance to landowners and developers.

Goal 4: Decrease Woody Encroachment and Habitat Management
Manage existing and future restored oak and prairie habitats to control woody vegetation, release oaks, and enhance native understory on conserved and private lands.

Goal 5: Decrease Agricultural Conversion and Increase Compatible Management
Work with landowners to limit agricultural conversion, implement habitat management best management practices specific to oak and prairie habitat on agricultural lands, and conserve key habitats.

Goal 6: Limit Non-Native Invasive Species Invasions
Limit or eradicate invasive species invasion using improved tools and information for land managers, increase Early Detection Rapid Response (EDRR) resources, increase weed management capacity, and increase supply of affordable native plant materials. Support existing networks to share information on impactful species and methods of control.

Goal 7: Decrease Fire Exclusion
Increase the scale and frequency of ecological burning by increasing burn capacity and training, increasing and stabilizing funding, strengthening tribal partnerships, and implementing coordinated planning.

Goal 8: Increase Knowledge and Understanding
Compile, develop, and distribute the best available research, guidance (including Traditional Ecological Knowledge), and spatial data to support improvement of conservation and stewardship activities across the Willamette Valley and track future progress of activities such as land acquisition, establishment of conservation easements, and major on-the-ground habitat management (e.g., fire and thinning) and restoration projects.

Goal 9: Increase Partnership and Collaboration
Form and operate the WVOPC as a coordinating body of key oak and prairie interests including non-profits, private landowners, Tribes, and local, State, and Federal governments that oversees the implementation of the Strategic Action Plan vision, promotes collaboration, secures funding, and tracks accomplishments.

Goal 10: Increase Community Capacity to Support Healthy Ecosystems and Promote Environmental Justice
Promote community awareness of the cultural, economic, and ecological importance of oak and prairie habitat, engage and involve underrepresented populations and perspectives, and build broad support for expanded conservation and restoration efforts that includes meaningful participation by a broad and inclusive coalition of interests diverse in race, ethnicity, gender, and ability.

Ward Butte in Linn County (J. Krueger)

7 Conservation Needs and Opportunities

7.1 Conservation Need, Limiting Factors, and Threats

7.1.1 Conservation Need

As described earlier, oak and prairie are some of the most culturally and ecologically important habitats in the Willamette Valley, and once covered an estimated 1,400,000 acres of the Willamette Valley prior to Euro-American settlement. The rapid decline of these habitats over the past 150 years to just a fraction of their historic range has resulted in steep declines in many oak and prairie dependent species. These habitats are now considered some of the most imperiled ecosystems in Oregon and the United States. Ecologists, wildlife biologists, botanists, foresters, and land managers recognize the critical role that prairie and oak woodlands play in preserving overall biodiversity in the Willamette Valley. Over the past 25 years, conservation efforts have begun to focus on these habitats and restoration and management techniques are becoming much more refined. The Oregon Conservation Strategy (OCS), first released in 2006 and refined in 2016, has designated grasslands (including upland prairie and savanna), wet prairie, and oak habitats as "strategy habitats" meaning they are given high priority for conservation and restoration efforts.

7.1.2 Oregon Conservation Strategy Limiting Factors

The Oregon Conservation Strategy identifies the following limiting factors impacting oak and prairie habitat in the Willamette Valley ecoregion:

- Land use conversion and urbanization: Habitat continues to be lost through conversion to other uses.
- Altered fire regimes: Maintenance of open-structured habitats such as grassland, oak savanna, and wet prairie is dependent, in part, on periodic burning. Fire exclusion has allowed succession to more forested habitats.
- Habitat fragmentation: Habitats for at-risk native plant and animal species are largely confined to small and often isolated fragments, such as roadsides and sloughs. Habitat fragmentation also limits species' ability to move across the landscape to fulfill life history needs.
- Invasive species: Invasive plants and animals disrupt native plant and animal communities and impact populations of at-risk native species.

7.2 Threats and Threat Rating

7.2.1 Threat Categories and Rating Results

For the purpose of this analysis, a threat is defined as a human-induced actions or events that will directly degrade a system or habitat. Threats to the ecological integrity (biological diversity and resilience) of oak and prairie habitats in the Willamette Valley have been well documented in numerous plans and studies. From this background information the Steering Committee identified the following categories of threats:

- Rural & Urban Development
- Conversion to Agriculture
- Fire Exclusion
- Non-Native Species Invasion
- Woody Encroachment
- Transportation and Utilities
- Human Intrusion and Disturbance
- Incompatible Agricultural Management
- Incompatible Water Management

Through an April 2018 questionnaire with the Working Group and Steering Committee, members were asked to rank the threat categories based on their Scope, Severity, and Irreversibility relative to oak and prairie habitats. Approximately 50 responses were submitted. Reponses were tabulated and scored using Miradi Adaptive Management software (see Figure 7-1: Threats Rating Results).

7.2.2 Scoring Definitions for Scope, Severity, and Irreversibility

The following definitions were provided to participants in the threat rating exercise:

Scope: Most commonly defined spatially as the geographic scope of impact on the conservation target (oak and prairie habitat) that can reasonably be expected within ten years under current circumstances (i.e., given the continuation of the existing situation).

- Very High: The threat is likely to be very widespread or pervasive in its scope and affect the conservation target throughout the target's occurrences at the site.
- High: The threat is likely to be widespread in its scope and affect the conservation target at many of its locations at the site.
- Medium: The threat is likely to be localized in its scope and affect the conservation target at some of the target's locations at the site.
- Low: The threat is likely to be very localized in its scope and affect the conservation target at a limited portion of the target's location at the site.

Severity: The level of damage to the conservation target that can reasonably be expected within ten years under current circumstances (i.e., given the continuation of the existing situation).

- Very High: The threat is likely to destroy or eliminate the conservation target over some portion of the target's occurrence at the site.
- High: The threat is likely to seriously degrade the conservation target over some portion of the target's occurrence at the site.
- Medium: The threat is likely to moderately degrade the conservation target over some portion of the target's occurrence at the site.
- Low: The threat is likely to only slightly impair the conservation target over some portion of the target's occurrence at the site.

Irreversibility: The degree to which the effects of a threat can be undone.

- Very High: The effects of the threat are not reversible (e.g., wetlands converted to a shopping center).
- High: The effects of the threat are technically reversible, but not practically affordable (e.g., wetland converted to agriculture).
- Medium: The effects of the threat are reversible with a reasonable commitment of resources (e.g., ditching and draining of wetland).
- Low: The effects of the threat are easily reversible at relatively low cost (e.g., off-road vehicles trespassing in wetland).

7.2.3 Threats Rating

The threats rating results are sorted from most to least severe based on their overall score and address human interactions/anthropogenic activities that are a threat to oak and prairie habitat.

Figure 7-1: Threat Rating Results

Threat	Scope	Severity	Irreversibility	Final Ranking
Rural & Urban Development	High	Very High	Very High	Very High
Conversion to Agriculture	High	Very High	High	High
Fire Exclusion	Very High	High	Medium	High
Non-Native Species Invasions	Very High	High	Medium	High
Woody Encroachment	High	High	Medium	High
Transportation and Utilities	Medium	Medium	High	Medium
Human Intrusion and Disturbance	Medium	Medium	Medium	Medium
Agriculture Management	Medium	Medium	Medium	Medium
Incompatible Water Management	Medium	Medium	Medium	Medium

Source: Rating based on Working Group and Steering Committee input with calculations by Pacific Birds Habitat Joint Venture Miradi software

7.3 Contributing Factors

The top five highest ranked threat categories are listed below with contributing factors (indirect issues and opportunities related to each threat). The April 2018 Working Group meeting was dedicated to identifying contributing factors (issues and opportunities) listed below and brainstorming potential strategies and actions that could be employed to address these to threats. These are the basis for the Results Chains listed in Section 8.

Rural and Urban Development

Issues:

- Lack of effective land use policy and code to protect oak and prairie habitat
- Many developers do not currently value oak or prairie habitat
- New development produces tax revenue for cities and counties
- Real and perceived benefit of rapid development
- Limited land availability within UGBs adds to development pressure in rural areas
- Many elected officials and public employees have limited appreciation of oak and prairie
- Strong desire to live in the country is driving rural development, especially near cities
- Many landowners do not currently understand the importance of oak and prairie habitat
- Rural development patterns fragment habitat patches
- Many golf courses are managed in ways that limit habitat benefit

Opportunities:

- Citizens are beginning to understand the cultural heritage and habitat benefits of oak and prairie
- Homeowners may be willing to manage habitat if provided with guidance materials
- Tribes are increasingly interested in off-reservation acquisition and protection
- Many park managers and open space providers are beginning to focus more on oak and prairie conservation

Conversion to Agriculture

Issues:

- Large scale agricultural conversion, especially land conversion to vineyards and orchards, has been significant in the valley over the past decade
- Many farmers do not currently recognize the value of oak or prairie
- Existing tax deferral benefit discourages habitat conservation on agriculturally zoned lands
- Value of agricultural land is increasing, resulting in conversion for intensive agriculture and family farms are being sold to larger commercial or international farm operations
- Agriculture is a business, so maximizing profit is a high priority

Opportunities:

- Generational turnover and potential openness of new landowners to conservation values
- Hobby farms may be more open to integration of habitat with agricultural uses
- Marketing opportunities for incorporating habitat into agricultural uses (e.g., wineries)

Fire Exclusion

Issues:

- Fire exclusion has led to a loss of biological diversity and educed habitat resiliency
- Many citizens and elected officials are unaware of the benefits of ecological burning
- Lack of understanding of history and cultural significance of fire in our valley
- Negative perception of fire by the media
- Some landowners and residents do not support prescribed fire (dislike smoke)
- Decades of fire suppression policies have created dense stands of fuel in some areas
- Stringent burn policies often severely limit the available burn window
- Lack of indigenous burning
- Lack of available crews during burn windows
- Lack of regular funding for burn planning
- Insufficient supply of affordable native seed to replant areas following a burn
- Much of the current public fire budgets goes toward suppression and not prescribed fire
- Limited educational materials currently exist

Opportunities:

- Burning is a traditional indigenous practice and Tribes have interest in growing capacity for burns
- Overall burn expertise is on the rise in the Willamette Valley
- Public perception and understanding of the benefits of ecological burning is beginning to change in some areas
- Many interested citizens would be available to assist with post burn seeding and monitoring if trained
- Willamette Valley Native Plant Materials Partnership is beginning to increase seed availability for replanting

Non-native Species Invasion

Issues:

- Invasive species have caused a loss of biological diversity and reduced habitat resiliency
- Fire exclusion along with timber practices has resulted in favorable conditions for invasive plant species
- Invasive vegetation has significantly displaced native species, especially understory and grasses and forbs
- Invasive grasses dominate many grassland areas and restored areas require continued medium- and long-term management commitment to keep invasives from reestablishing
- Communication sometimes lacking between Farm Bill programs, research, and implementation of BMPs
- Insufficient supply of native plants to replant areas following invasive species treatment
- Lack of resources and expertise being dedicated toward Early Detection Rapid Response (EDRR) efforts
- Limited understanding of the economic impacts of invasive species
- Lack of understanding and support from many elected officials
- Perceived danger from herbicide
- Lack of public awareness and understanding
- Retail "wildflower" packages often contain invasives
- Invasives often unintentionally spread by equipment and vehicles
- Invasives often unintentionally spread by humans and pets
- Ornamental invasive frequently spread from residential areas

Opportunities:

- Public educational materials are currently available
- Many city and county governments are beginning to support weed management efforts
- Citizen science efforts could help EDRR efforts with proper training and resources
- Traditional burn practices may aid in invasive control and favor native beneficial species

Woody Encroachment

Issues:

- Lack of available funding to support thinning
- High cost of treatment and maintenance, especially if done at a small scale
- Sale of timber and wood from ecological thinning does not always cover cost
- Lack of understanding of the relationship between dense vegetation and wildfire
- Overgrown oak and prairie areas are often seen as good habitat by untrained observers
- Insufficient supply of native plants to replant after woody plants are removed
- Lack of public support for herbicide use
- Lack of public and elected official support for ecological burning
- Lack of homeowner understanding of habitat values of thinning
- Lack of market for thinned trees (especially non-conifers)

Opportunities:

- Coordinating thinning efforts could reduce per acre cost
- Markets for hardwood could be further developed
- Legacy individual savanna oaks and oak stands are still present and restoration of habitat structure (overstory) is a fairly straightforward and achievable process

Oregon saxifrage in prairie (City of Eugene)

8 Theory of Change

8.1 Background

A *theory of change* is an articulation of the hypothesized relationships and underlying assumptions between strategy implementation, resulting intermediate ecological outcomes, and long-term ecological goals (defined in Section 5) (Conservation International 2013). Results chains are a process and a tool contained in the Conservation Measures Partnership's Open Standards for the Practice of Conservation (Conservation Measures Partnership 2013), to develop and document theories of change (Margoluis et al. 2013, Foundations of Success 2007, and Association of Fish and Wildlife Agencies 2011).

Results chains include strategies, actions, and outputs. A strategy is a group of related actions that is intended to reduce or eliminate limiting factors in order to restore critical ecological processes or functions associated with ecological priorities. Actions are specific tasks that support implementation of strategies, and are specific ecological conservation or restoration treatments, projects, or other activities that have specific aims. Outputs are the immediate, measurable results that would be anticipated based on successful implementation of a strategy or a series of related actions. Collectively, outputs will reduce threats and lead to achievement of the long-term ecological goals, improving the status of the ecological priorities (oak and prairie habitats).

Volunteers from the WVOPC Working Group and additional outside subject matter experts met in small groups for two-hour sessions in February and March of 2019 to develop results chains for each of the five highest ranked threat categories. Each sub-group was facilitated by Steering Committee members. Participants were provided with copies of the strategies developed in the April 2018 Working Group meeting in advance, then met to collaboratively build results chains for each threat. The draft result chain output was sent back to the sub-groups and the Steering Committee for review and comment and were then updated based on the feedback (see results chains in Figures 8-1, 8-4, 8-7, 8-10, and 8-13).

The strategies identified in the results chains were then ranked by the Working Group and Steering Committee, using an online questionnaire (see Appendix C: Summary Report - Working Group Questionnaire #2). The questionnaire asked participant to rank each strategy based on the following two factors:

- **Potential Impact**: How effective will each strategy be at reducing the impact of the threat category to oak and prairie habitats (Very Effective, Effective, Less Effective, or Not Effective)?
- **Urgency:** What is the urgency of implementing this strategy relative to the other proposed strategies in this category (Very High, High, Medium, or Low)?

Ranked data were analyzed using the Miradi Adaptive Management software, which categorized potential impact on a scale from most effective to not effective and categorized urgency on a scale from very high to very low. Miradi also assigned an overall (rolled-up) score for each strategy. It should be noted that none of the proposed strategies scored in the "not effective" or "low" range indicating that the proposed strategies were generally accepted by Working Group and Steering Committee members as having some importance. The results of the Miradi output is included by subcategory in the sections below (see Figures 8-2, 8-5, 8-7, 8-11, and 8-14) along with single-selection questionnaire results (see Figures 8-3, 8-6, 8-9, 8-12, and 8-15). This information was then utilized by Steering Committee members to help determine implementation priorities for this Strategic Action Plan.

8.2 Strategies, Actions, and Outputs

8.2.1 Rural and Urban Development

Threat Summary

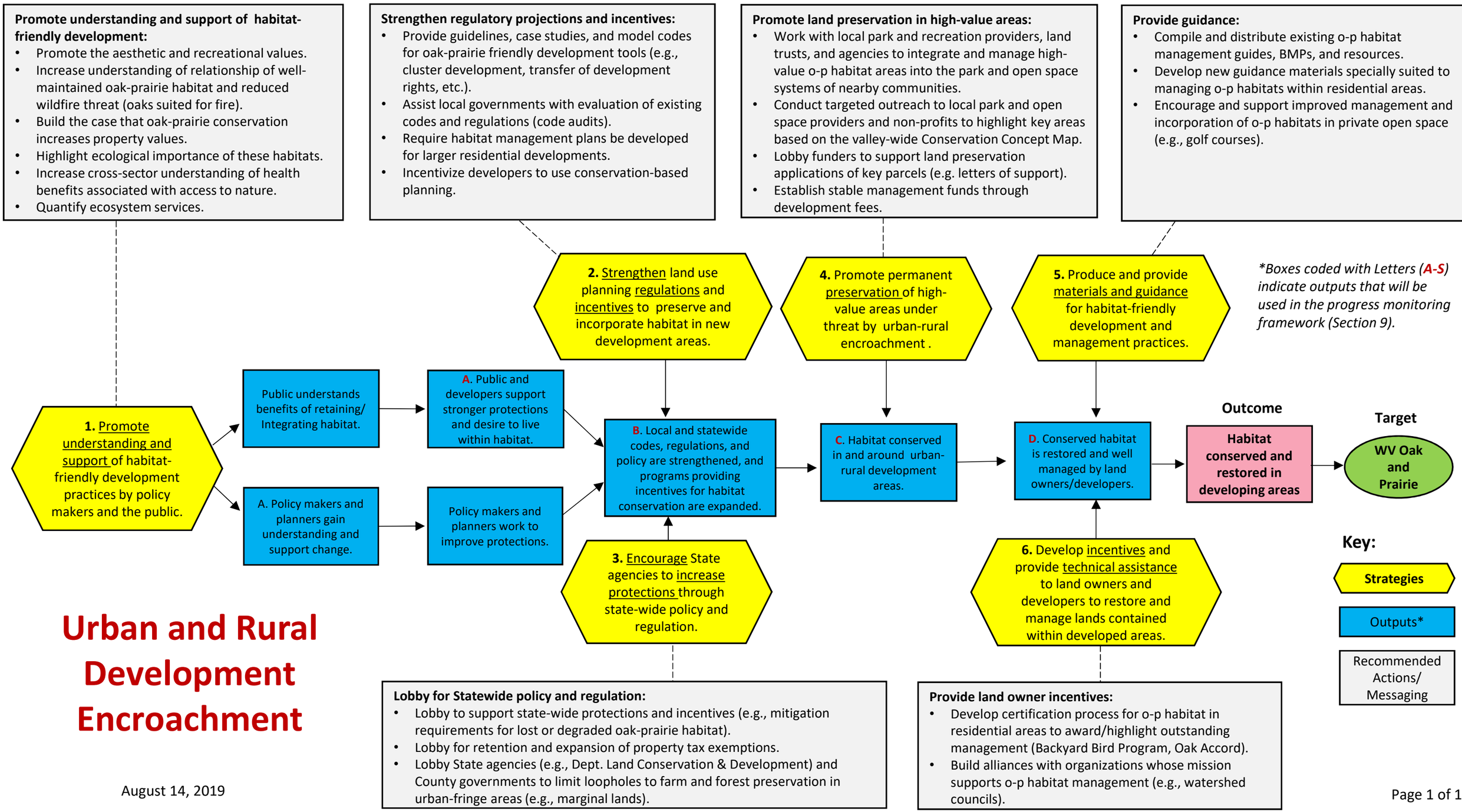
The majority of Oregon's population and industry is located in the Willamette Valley, with significant human population growth forecast in the coming decades. Future development pressure is the highest in urban fringe areas and along transportation corridors where remnant oak and prairie habitats and associated species are often found. Although Oregon's land use planning laws and local development codes provide some minimal protections, oak and prairie habitats are likely to continue to decline due to the fragmentation and degradation resulting from urban and rural development under the current scenario.

Theory of Change for Addressing Impacts of Rural and Urban Development

Limiting impacts from rural and urban development on oak and prairie ecosystems will require a wholesale shift in how development projects are planned, designed and implemented. In order for policy makers and planners, developers, and the public to support more oak-prairie compatible development, the WVOPC will work with those groups to build an awareness and understanding of the importance of and need for habitat-friendly development practices. With broader support, we will work to strengthen local and statewide land use planning regulations and policies, and increase funds for open space preservation and access to incentive programs that will motivate developers to incorporate conservation within existing codes, and provide models and tools for oak-prairie friendly development. These policies and programs will need to be supported by guidance on best management practices so developers and landowners can make more habitat-friendly decisions on the ground. Long-term management of oak and prairie systems will require substantial resources, thus developing incentives and providing technical assistance will be critical to support that ongoing need. The outcome will be that urban and rural development actions will, where possible, limit impacts to oak and prairie and ideally improve the network of protected and restored oak and prairie habitat. See Results Chain on next page (see Figure 8-1) for detail on proposed strategies, actions, and outcomes.

Urban Development in west Eugene (J. Krueger)

Figure 8-1: Rural and Urban Development Encroachment Results Chain



Urban and Rural Development Encroachment

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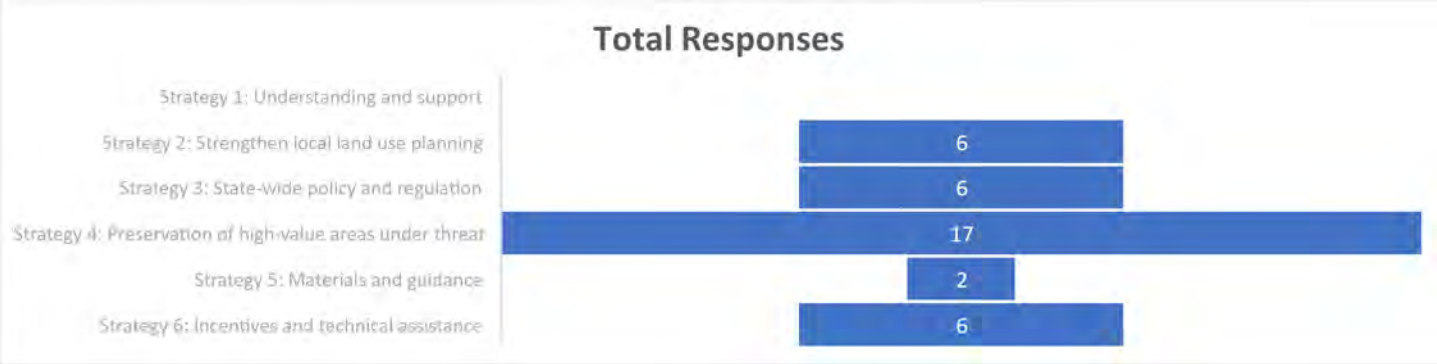
Figure 8-2: Rural and Urban Development Strategy Rating for Potential Impact and Urgency

Threat Category and Proposed Strategies	Potential Impact	Urgency	Roll-up
Rural and Urban Development			
1. Understanding and support	Effective	High	Effective
2. Strengthened local land use planning	Effective	High	Effective
3. Strengthened State-wide policy/regulation	Effective	High	Effective
4. Preservation	**Most Effective**	**Very High**	**Very Effective**
5. Materials and guidance	Effective	Medium	Less Effective
6. Incentives and technical assistance	**Most Effective**	**Very High**	**Very Effective**

Source: The Strategy rating shown in the table above is a compilation of input from the Working Group and Steering Committee provided through in a spring 2019 questionnaire. The input was analyzed using the Miradi Adaptive Management software, which categorized potential impact on a scale from most effective to not effective and categorized urgency on a scale from very high to very low.

Figure 8-3: Rural and Urban Development Single Strategy Selection Results

Survey Question: If you only had enough funding to implement one of the strategies, which one would it be?



Source: Working Group and Steering Committee responses from the spring 2019 questionnaire.

8.2.2 Woody Encroachment

Threat Summary

In the absence of regular fire or other management interventions, encroachment of trees and shrubs threatens the persistence of prairie and oak habitats, and requires short- and long-term action.

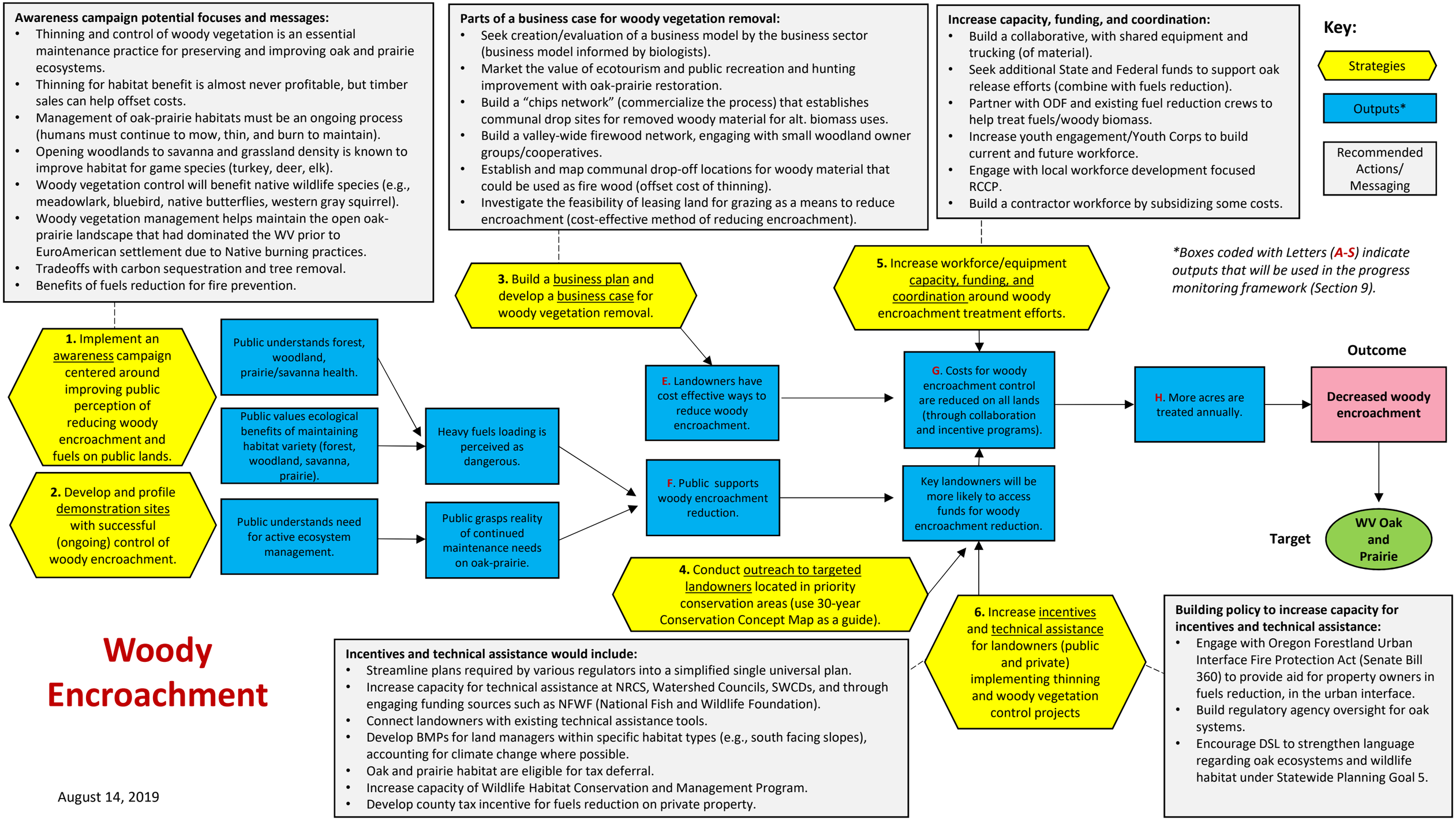
Theory of Change to Address Woody Encroachment

Addressing the woody encroachment threat to oak and prairie will first require a shift in public understanding of the issue. To increase broader support of woody encroachment treatments, the general public will need to understand that fuels loading significantly increases the risk of wildfire, and that ongoing maintenance of oak and prairie systems is important to ecosystem health. The WVOPC will implement an awareness campaign centered on communicating the benefits that come from woody encroachment treatment on public and private lands, namely the reduction of wildfire risk and improvements in oak and prairie ecosystem function. Strengthening state and local policy will increase availability of incentives and technical assistance to promote woody encroachment management on private lands. Options for this include a conservation tax deferral policy, increased funds and capacity from NRCS, watershed councils, and SWCDs, as well as private foundation engagement. The cost of removing woody vegetation is high and often requires specialized equipment, making it mostly unaffordable and inaccessible to landowners. Developing incentive programs and providing technical assistance to both public and private landowners will reduce that barrier. Costs can be further reduced through workforce development programs and by increasing landowner access to specialized equipment. Increased capacity, funding, and coordination around woody encroachment treatment combined with targeted outreach to landowners that have large tracts of encroached oak habitat, increases the likelihood those landowners will engage in conservation programs. As more encroached acres on private and public lands are treated, the overall risk of wildfire is reduced resulting in more acres of healthy oak and prairie.

Completed oak release project in Yamhill County (E. Alverson)

See Figure 8-3 for detail on proposed strategies, actions, and outcomes.

Figure 8-4: Woody Encroachment Results Chain



Woody Encroachment

August 14, 2019

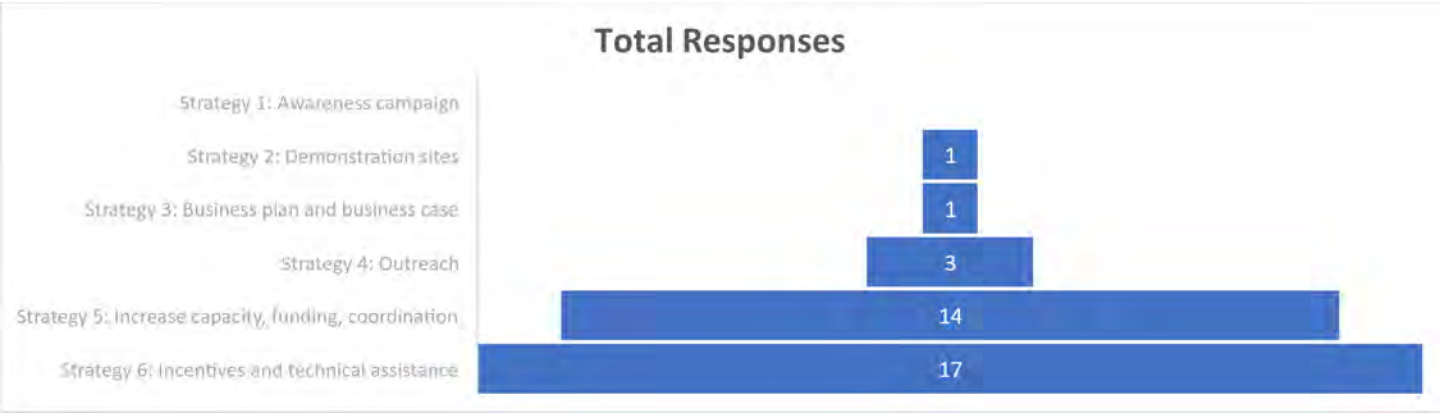
Figure 8-5: Woody Encroachment Strategy Rating for Potential Impact and Urgency

Threat Category and Proposed Strategies	Potential Impact	Urgency	Roll-up
Woody Encroachment			
1. Awareness campaign	Effective	Medium	Less Effective
2. Demonstration sites	Effective	Medium	Less Effective
3. Business plan and business case	Effective	Medium	Less Effective
4. Outreach	Effective	High	Effective
5. Increase capacity, funding, coordination	**Most Effective**	**Very High**	**Very Effective**
6. Incentives and technical assistance	**Most Effective**	**Very High**	**Very Effective**

Source: The Strategy rating shown in the table above is a compilation of input from the Working Group and Steering Committee provided through in a spring 2019 questionnaire. The input was analyzed using the Miradi Adaptive Management software, which categorized potential impact on a scale from most effective to not effective and categorized urgency on a scale from very high to very low.

Figure 8-6: Woody Encroachment Single Strategy Selection Results

Survey Question: If you only had enough funding to implement one of the strategies, which one would it be?



Source: Working Group and Steering Committee responses from the spring 2019 questionnaire.

8.2.3 Agricultural Conversion and Incompatible Management

Threat Summary

Much of the remaining oak and prairie habitat in the Willamette Valley is located on privately-owned lands. Conversion of pastures to agricultural uses, or conversion of existing agricultural lands to more intensive production such as vineyards, orchards, and cropland, will often displace these remnant habitats. Likewise, incompatible management of pastureland may degrade habitat for native species and reduce biodiversity.

Theory of Change to Address Agricultural Conversion and Incompatible Management

The key driver in conversion of oak-prairie habitat to agricultural use or less compatible agricultural use is economic opportunity and value. Without regulation-based protection, there are no mechanisms to limit the amount of oak or prairie converted. The business case for habitat conservation on working lands will provide evidence to landowners that incorporating conservation into agricultural operations can actually improve their bottom line while also generating important co-benefits such as habitat, carbon sequestration, pollination, and healthy soil. The success of this messaging will depend in part on where it comes from and peer-to-peer outreach is one of the most effective. Therefore, building strong relationships with key members of the agriculture community to serve as 'ambassadors' of the conservation business case, along with successful examples of its on-the-ground application, will be important to convincing landowners to engage in conservation-compatible agriculture.

Cost is a major prohibitive factor in decisions regarding conservation on private land, therefore once landowners are aware of and open to this message of conservation-based agriculture, we will need incentive programs as well as technical assistance to help them make the transition from a more conventional approach. The WVOPC will need to support the development and dissemination of management guides and technical assistance to ensure best management practices are being implemented. With increased financial support and information about how to implement best conservation management practices on the ground, it will be easier for landowners to make that transition.

Regulation and policies that effectively limit the amount of conversion of native habitat to agricultural production is an alternate strategy. Thus, the WVOPC will work to strengthen policies to decrease conversion of habitat to production.

See Figure 8-7 for detail on proposed strategies, actions, and outcomes.

Oregon Oak Accord habitat conservation at Mahonia Vineyard (Willamette Partnership)

Figure 8-7: Agricultural Conversion and Incompatible Management Results Chain

Agricultural Conversion and Incompatible Management

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Business case for conversion to ag. and compatible management:
- Identify supply and demand for oak products.
- Identify and support new markets for products that come from sustainably managed oak stands (creates incentives for forest landowners not to convert to another land use).
- Quantify and then market the value of ecotourism, public recreation, and hunting improvement with oak-prairie restoration.
- Identify and define oak/prairie conservation as a carbon-sequestration, water conservation and fire resiliency strategy (while measuring the costs of being vulnerable to those stressors).

Strengthen landowner incentive programs and outreach
- Understand what motivates landowners to engage in conservation-based practices.
- Expand Willamette Partnership's Oak Accord to more private landowners/new land use types.
- Collaborate with ODF, ODA, and OSU Extension to consider new incentive programs and landowner recruitment strategies, and build relationships for this with NFWF and other foundations.
- Develop eco-labeling and certification incentives for working landowners that conserve oak-prairie.
- Look for incentive opportunities around fire resiliency and carbon-sequestration.
- Encourage funding and implementation of ODFW's Wildlife Habitat Conservation and Management Program.
- Encourage expansion of NRCS incentive approaches (EQIP, ALE) in priority areas identified in the SAP.
- Support funding and implementation of OR Agricultural Heritage Program.
- Partner with Soil and Watershed Conservation Districts and Watershed Councils to deliver programs.

Increase acquisition and easements
- Focus on priority geographies (from WVOPC CC Map).
- Identify parcels at high risk of conversion and target for acquisition or easements and work with willing landowners to promote voluntary conservation.

Strengthen policies to decrease conversion
- Advocate for related Farm Bill funding
- Increase support for succession planning.
- Change appraisal system to value oak.
- Promote funding of Oregon Agricultural Heritage Program.

1. Develop a business and ethics case for oak-prairie habitat conservation.

2. Conduct Outreach on the value of oak-prairie using the business and ethics cases, using ambassadors w/connections to the ag community as an outreach vehicle.

3. Foster and build relationships with key members of the ag and business community to be ambassadors to conservation.

4. Develop, strengthen, and extend/offer landowner incentive programs to incentivize protection for conservation.

5. Develop new demonstration projects and share success stories of o-p conservation on working lands.

6. Increase acquisition and easements in priority geographies.

7. Provide technical assistance to support habitat management efforts on agricultural lands where needed

8. Develop and outreach agriculture management guides (IPM, grazing BMPs).

9. Strengthen policies to decrease conversion of habitat to production.

Landowners and managers get information from reputable sources.

Landowners and managers recognize messages and see how they fit into oak-prairie conservation.

Landowners and managers see the economic, intrinsic and/or ecological value of oak and prairie habitat.

Landowners and managers decide to conserve (protect and restore) habitat.

Landowners and managers see on-the-ground application of best management practices.

Landowners and managers see evidence of success of oak and prairie restoration on working lands.

More/sufficient funding and programs are available for landowners and managers.

I. Landowners and managers have access to funding and programs (to implement conservation and/or compatible management).

K. Policies (to decrease conversion of habitat to production) are implemented.

Landowners and managers have guidance and assistance to better manage for oak-prairie.

Landowners and managers don't convert habitat into production.

J. Landowners and managers implement Best Management Practices (BMPs).

Outcome

Decreased agriculture conversion

Outcome

Increased compatible management

Target

WV Oak and Prairie

Demonstrate success of oak-prairie restoration on working lands and recognize the good:
- Expand pasture walk programs with farmers and ranchers.
- Highlight "Oak Accord" farm, forest and ranching signatories.
- Identify pilot/demonstration projects that make the business case for conservation.
- Encourage peer-to-peer outreach/communication through SWCDS and OSU Extension.

Best Management Practice (BMP) needs
- Support NRCS in development of oak and prairie friendly Conservation Implementation Strategies and Priority Practices.
- Expand opportunities for working lands compatible grazing programs.

Key:

Strategies

Outputs*

Recommended Actions/ Messaging

Boxes coded with Letters (A-S**) indicate outputs that will be used in the progress monitoring framework (Section 9).*

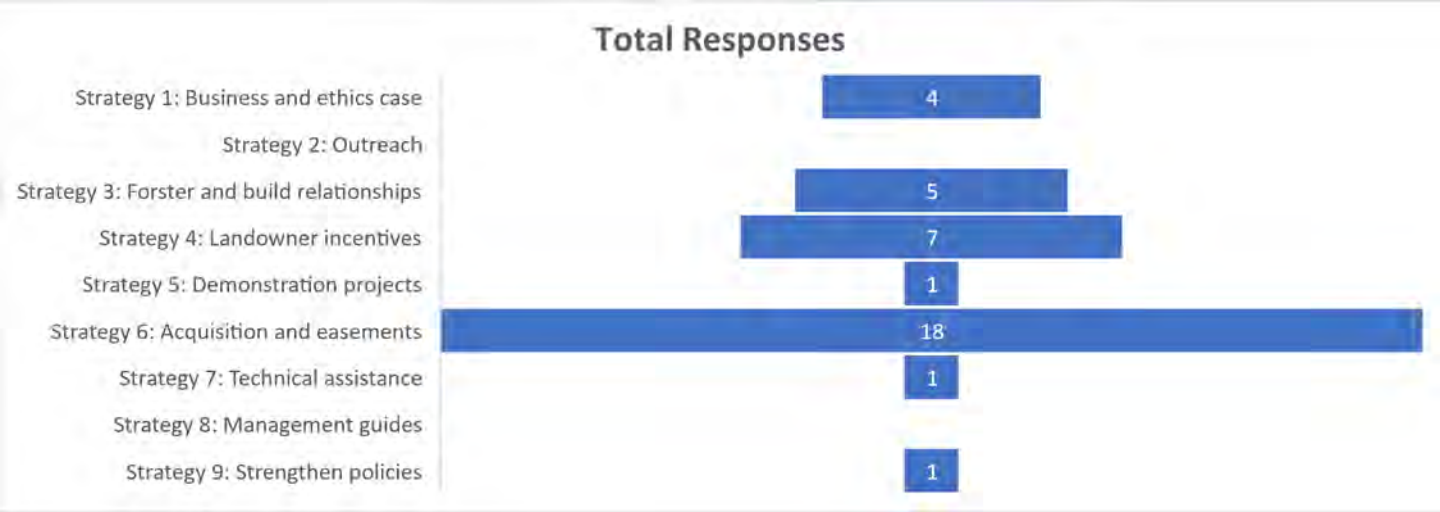
Figure 8-8: Ag. Conversion and Incompatible Management Strategy Rating for Potential Impact and Urgency

Threat Category and Proposed Strategies	Potential Impact	Urgency	Roll-up
Agricultural Conversion and Incompatible Management			
1. Business and ethics case	Effective	High	Effective
2. Outreach	Effective	High	Effective
3. Foster and build relationships	Effective	High	Effective
4. Landowner incentives	**Most Effective**	**Very High**	**Very Effective**
5. Demonstration projects	Effective	Medium	Less Effective
6. Acquisition and easements	**Most Effective**	**Very High**	**Very Effective**
7. Technical assistance	**Most Effective**	**Very High**	**Very Effective**
8. Management guides	Effective	Medium	Less Effective
9. Strengthen policies	Effective	Medium	Less Effective

Source: The Strategy rating shown in the table above is a compilation of input from the Working Group and Steering Committee provided through in a spring 2019 questionnaire. The input was analyzed using the Miradi Adaptive Management software, which categorized potential impact on a scale from most effective to not effective and categorized urgency on a scale from very high to very low.

Figure 8-9: Ag. Conversion and Incompatible Management Single Strategy Selection Results

Survey Question: If you only had enough funding to implement one of the strategies, which one would it be?



Source: Working Group and Steering Committee responses from the spring 2019 questionnaire.

8.2.4 Non-Native Invasive Species

Threat Summary

Non-native invasive vegetation is widespread in the Willamette Valley, resulting in a decline in native plant species cover and biodiversity and degrading habitat quality and functionality for pollinators, birds, and other oak and prairie dependent species. Aggressive invasive species pose significant challenges for management and restoration efforts in oak and prairie habitats.

Theory of Change to Address Non-Native Invasive Species

Garnering landowner, manager, and public support for invasive species management in oak and prairie systems will require an outreach campaign using a business and ethics case. This case will focus on the financial benefits of invasives management as well as connect invasives management to overall ecosystem health. With that support, the WVOPC will need to have the information and best management practices in place for landowners and managers to be able to address invasives on their property. As such, the WVOPC will work to increase Early Detection Rapid Response (EDRR) and monitoring for priority plant species and plant diseases in priority areas as well as update invasive species response best management practices. This will ensure land managers have the data, tools, and techniques they need to engage.

An additional barrier is the cost associated with invasive species management. Increasing weed management capacity and coordination will result in not only a more skilled workforce but also a system that supports shared equipment and resources and coordinated scheduling. Increasing the availability and reducing the cost of native plant materials can make restoration efforts more affordable and effective. Engaging with funders and decision makers to increase the funding available for invasive species management will ensure that invasive species management and incentive programs continue to grow and be sustained into the future.

See Figure 8-10 for detail on proposed strategies, actions, and outcomes.

Invasive species colonization in oak and prairie habitat in Linn County (J. Krueger)

Figure 8-10: Non-Native Invasive Species Results Chain

Non-Native Invasive Species

Components to monitoring approach:
- Improve understanding of the ecosystem as a whole (how can ecosystem processes promote resilience to invasion?)
- Identify priority areas using the Conservation Concept map (protect the best).
- Utilize existing lists, working groups and expertise to identify priority species and re-evaluate on a regular basis.
- Develop cost effective monitoring protocols to meet needs for baseline monitoring and restoration progress monitoring.
- Utilize citizen science approach to have landowners monitor for invasives.

Funding strategy may include:
- Implement outreach with agencies and politicians using the business and ethical case for invasive species control.
- Lobby for greater political support/funding for invasive species management.
- Build incentive programs to fund work on private lands.

Components of increasing availability/reducing cost of native plant material:
- Increase access to shared seed harvest/ cleaning equipment.
- Implement research to increase native seed yields.
- Coordinate large scale scheduled seed production with projected management actions to ensure adequate supply and lower cost.
- Lobby for ODA support for specialty crops funding for natives.
- Promote use of native seeds, large scale to small scale (e.g., including replacing "wildflower" mix packets).

Outreach campaign potential focuses and messages:
- Develop a business case, which includes benefit of EDRR.
- Develop an ethical case connected to health of habitats.
- Create Citizen Science program to engage, educate and support Invasive species control, including EDRR.
- Appreciation of native habitats to our identity (sense of place).
- Implement and promote demonstration projects.
- Educate and encourage nurseries, designers, horticulturalists, and landscapers to stop using non-native invasives.

1. Implement an outreach campaign to public using business and ethical case.

Landowners and managers see demonstrated success.

Public supports business and ethical case for invasive species control and understand habitat benefits.

Landowners and public want to implement invasive species management, funders willing to fund.

2. Increase Early Detection Rapid Response (EDRR) and monitoring for priority plant species and plant diseases in priority areas.

L. Data is available to inform and prioritize management decisions at priority sites.

Landowners and managers have tools and techniques.

3. Improve the tools and information that are available to managers and practitioners.

More individuals ready to engage in invasive species management.

M. Skilled workforce is available when needed.

4. Increase funding available for invasive species management through outreach to funders, politicians.

Politicians support invasive species mgmt. & advocate for funding & incentives.

Funders prioritize funding for invasive species management & incentive programs.

N. Landowners, managers and public have funding for invasive species management.

5. Increase weed management capacity and coordination.

6. Increase the availability and reduce cost of native plant materials for restoration.

Native seeds available and more cost-competitive.

O. Native seeds used more broadly in post-treatment restoration.

Land managers and public implement effective invasive species management.

Coordinated scheduling and shared equipment allow more work to be completed.

Boxes coded with Letters (A-S**) indicate outputs that will be used in the progress monitoring framework (Section 9).*

Outcome

Decreased invasive species invasion

WV Oak and Prairie

Target

Key:

Strategies

Outputs*

Recommended Actions/ Messaging

Approach to improve tools and information:
- Focus, standardize and update invasive species response IPM/BMPs.
- Identify timing and prep for successful re-seeding with natives.
- Integrate early involvement of stakeholders (e.g., restoration contractors, transportation departments, utility companies) and land managers into BMP development.
- Nurture a culture that convinces managers/workforce to use invasive species prevention/spread reduction BMPs.
- Improve data management and shared access to data.

Components of increasing capacity
- Develop systems to share equipment and resources.
- Coordinate workforces to multi-region schedules for treatments.
- Provide continuing education/training as part of applicator licensing process, so a skilled workforce is available.
- Develop blanket services/master contract for WVOPC with pool of certified contractors.
- Develop and consistently offer pesticide-applicator trainings and content focused on natural area management (Agencies in Portland have done this and ODA has approved a licensing requirement.

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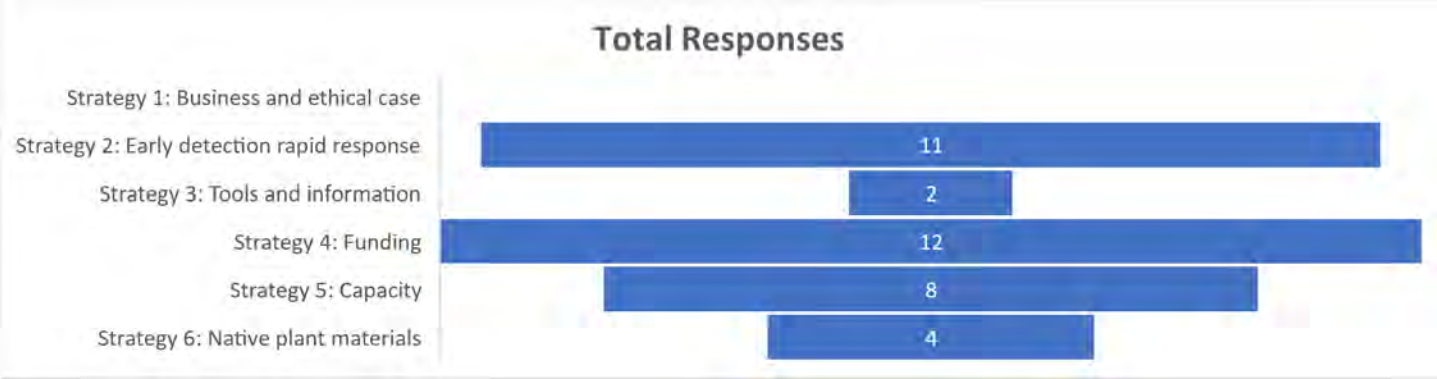
Figure 8-11: Non-Native Invasive Species Strategy Rating for Potential Impact and Urgency

Threat Category and Proposed Strategies	Potential Impact	Urgency	Roll-up
Non-native Species Invasion			
1. Business case and ethics case	Less Effective	Medium	Less Effective
2. Early detection and rapid response	Effective	High	Effective
3. Tools and information	Effective	High	Effective
4. Funding	Effective	**Very High**	Effective
5. Increase capacity and coordination	Effective	**Very High**	Effective
6. Native plant materials	Effective	High	Effective

Source: The Strategy rating shown in the table above is a compilation of input from the Working Group and Steering Committee provided through in a spring 2019 questionnaire. The input was analyzed using the Miradi Adaptive Management software, which categorized potential impact on a scale from most effective to not effective and categorized urgency on a scale from very high to very low.

Figure 8-12: Non-Native Invasive Species Single Strategy Selection Results

Survey Question: If you only had enough funding to implement one of the strategies, which one would it be?



Source: Working Group and Steering Committee responses from the spring 2019 questionnaire.

8.2.5 Fire Exclusion

Threat Summary:
Fire-adapted oak and prairie ecosystems dominated the valley floor, foothills, and tributary valleys for thousands of years. The cessation of burning by Native Americans by the mid-1800s followed by extreme fire suppression in the 1900s has led to replacement of these biodiverse ecosystems by conifer forest and other less fire-resilient vegetation types.

Summary of Theory of Change to Address Fire Exclusion

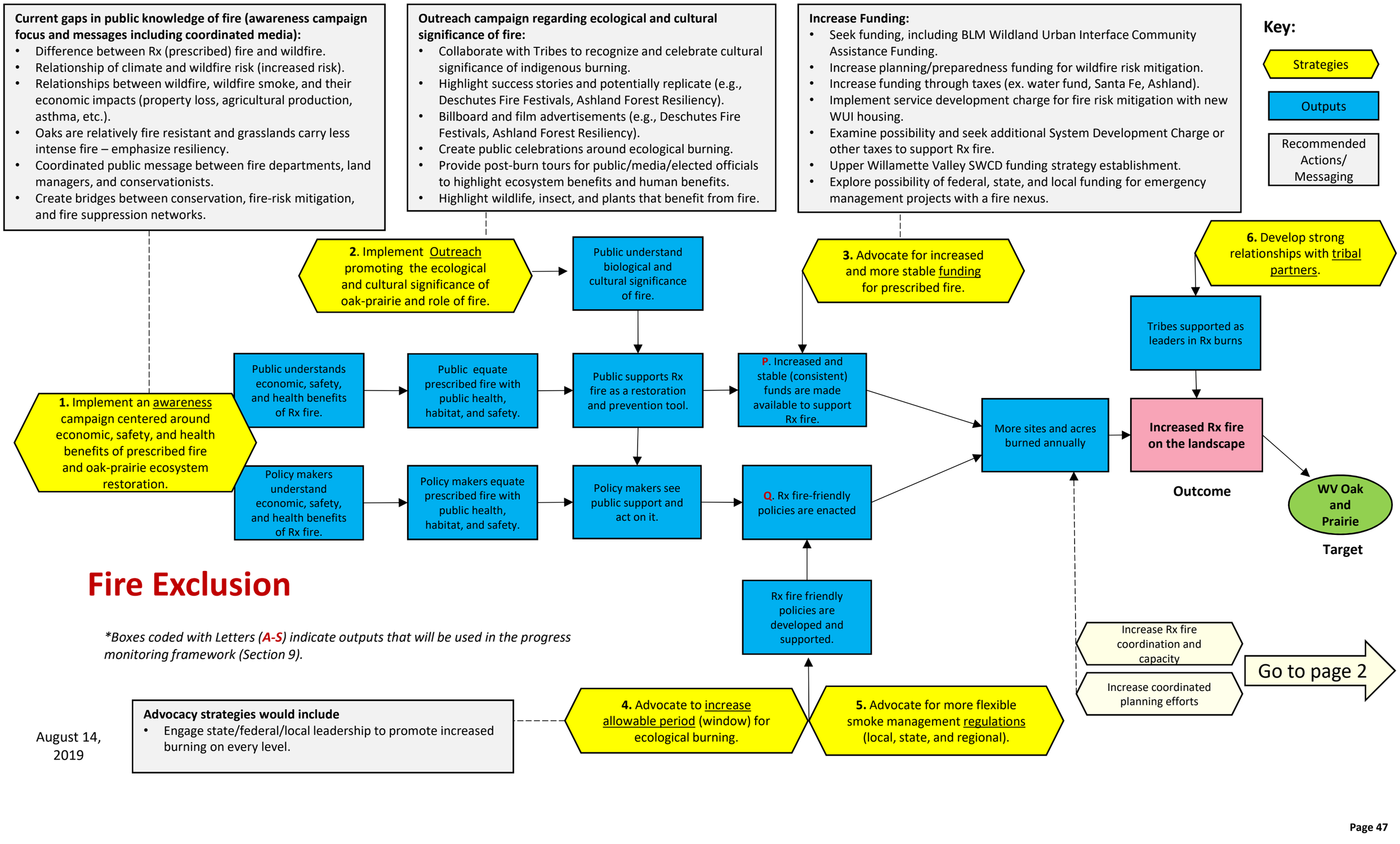
Prescribed fire has been identified as one of the most effective tools to restore oak and prairie systems in the Willamette Valley. Increasing the scale and intensity of prescribed fire on the landscape will require a supportive public, increased funding, and greater efficiency in the partnerships that implement prescribed burns. An awareness campaign centered on the economic and safety benefits of prescribed fire, as well as the ecological and cultural significance of fire, is the first step to build the support of policy makers and the public for the use of fire in oak-prairie ecosystem restoration. Engaging local, state, and federal leadership in advocating for consistent and sufficient funding levels, and practical burn periods and smoke management regulations, will make implementation of prescribed fire less restrictive.

Safely and effectively implementing a prescribed fire strategy across the landscape will require significantly increased capacity including a more skilled workforce as well as a system that supports shared equipment and resources and coordinated scheduling. Promoting opportunities for contract crews, increasing fire training opportunities, and improving our knowledge base of prescribed fire behavior will result in both more practitioners available to implement prescribed fires and increase our collective understanding of fire behavior. Strong relationships with tribal partners to incorporate traditional ecological knowledge (TEK), increased coordinated planning efforts that support cross-boundary efforts, shared resources, and the development and utilization of best fire management practices, will increase the number of acres of oak and prairie habitat burned annually.

See Figure 8-13 for detail on proposed strategies, actions, and outcomes.

Ecological burn at underway at Coyote Prairie (P. Gordon)

Figure 8-13: Fire Exclusion Results Chain



Fire Exclusion (Continued)

From Page 1

Increase Rx fire training programs:
- Utilize existing National Wildfire Coordinating Group Rx fire practitioners (e.g., CNLM, Wildland Restoration International).
- Build Rx burn volunteers base.
- Increase number of burn bosses.
- Develop partnerships with Tribes to facilitate trainings.
- Define and share Rx fire BMPs (communications, safety, staffing, etc.).

Increase Rx fire capacity on private lands and build partnerships:
- Incentivize development of private landowner Rx Fire Cooperatives (Rx Burn Associations).
- Provide technical assistance to landowners.
- Continue work with NRCS on Capital Improvement Plan developments focused on oak and prairie, incorporating fire as a priority.
- Streamline procedures and approval process for Rx fire on private lands (e.g. liability and permitting issues).

Increase coordinated planning:
- Create a valley-wide ecological fire cooperative made up of a network of experts and advocates to coordinate cross-boundary efforts, share resources, and utilization of BMPs.
- Identify a lead organization for valley-wide ecological fire cooperative.
- Utilize tribal expertise/assistance in burning.
- Incorporate Rx fire into Community Wildlife Protection Plans.
- Define burn targets (30 years, short term) and goals.
- Coordinate and streamline air quality regulation/ burn permitting process with partners.
- Coordinate with Fire Departments.
- Ensure partner habitat management plans address wildfire issues.
- Leverage need and capacity valley-wide to increase qualified staff.

Target priority areas and resources :
- Overlay fire transmission zones with oak-prairie habitat.
- Use simulation modeling to find nexus between habitat and wildfire risk and behavior.
- Utilize Conservation Concept Map to direct efforts to high priority areas.

7. Increase prescribed fire training programs and opportunities.

8. Build partnerships, promote opportunity for contract fire crews.

9. Increase prescribed fire capacity on private lands.

10. Improve knowledge base for Rx fire behavior in slopes, wooded areas, and recently thinned areas.

11. Increase coordinated planning efforts.

12. Target priority areas to maximize Rx burning resources.

More contract crews are interested and available to implement burns.

R. Increased number of trained contract and volunteer Rx fire practitioners.

Organizations have more internal Rx fire capacity.

S. Increased capacity for implementing Rx fire programs on private land.

Organizations are collaborating - sharing resources, crews, and equipment.

More Rx trained practitioners available to implement Rx fire with better understanding of fire behavior.

Planning is coordinated between implementors and regulators.

Greater efficiency in partnership to implement Rx burns.

More sites and acres burned annually.

Increased Rx fire on the landscape

WV Oak and Prairie

Outreach biological and cultural significance

Implement an awareness campaign

Lobby to address smoke management burn period

Advocate for increased funding

August 14, 2019

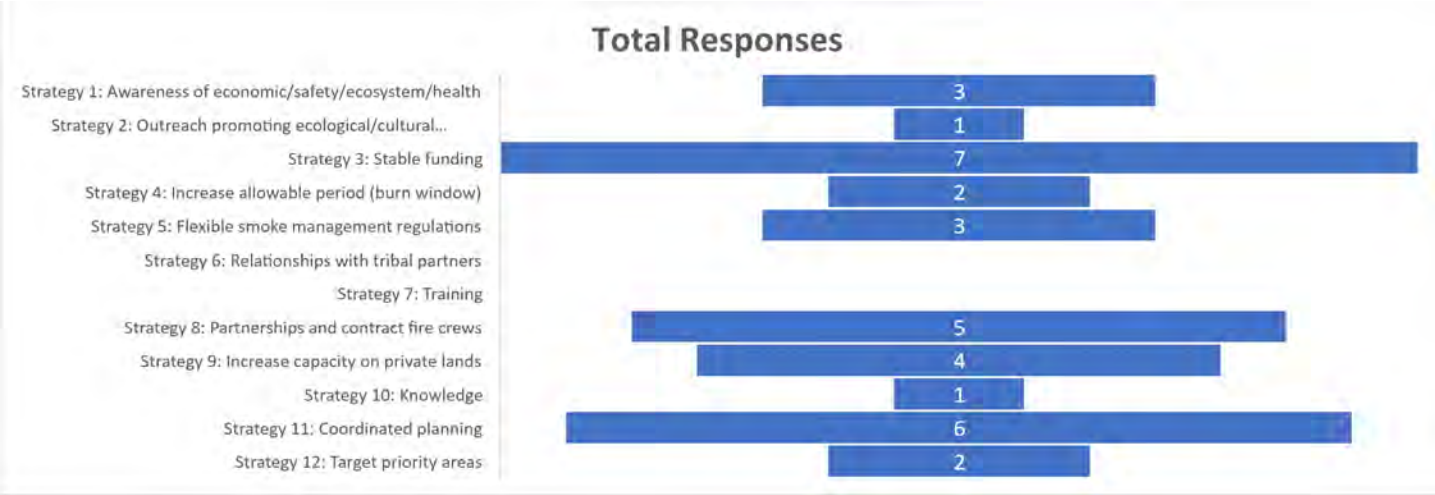
Figure 8-14: Fire Exclusion Strategy Rating for Potential Impact and Urgency

Threat Category and Proposed Strategies	Potential Impact	Urgency	Roll-up
Fire Exclusion			
1. Awareness campaign	Effective	High	Effective
2. Outreach (ecological/cultural significance)	Effective	Medium	Less Effective
3. Stable funding	**Most Effective**	**Very High**	**Very Effective**
4. Increase allowable period	Effective	High	Effective
5. Flexible smoke management regs.	Effective	High	Effective
6. Relationships with tribal partners (TEK)	Effective	High	Effective
7. Training	Effective	High	Effective
8. Partnerships and contract fire crews	Effective	High	Effective
9. Increase capacity on private lands	**Most Effective**	High	Effective
10. Knowledge	Effective	Medium	Less Effective
11. Coordinated planning	**Most Effective**	High	Effective
12. Target priority areas	Effective	High	Effective

Source: The Strategy rating shown in the table above is a compilation of input from the Working Group and Steering Committee provided through in a spring 2019 questionnaire. The input was analyzed using the Miradi Adaptive Management software, which categorized potential impact on a scale from most effective to not effective and categorized urgency on a scale from very high to very low.

Figure 8-15: Fire Exclusion Single Strategy Selection Results

Survey Question: If you only had enough funding to implement one of the strategies, which one would it be?



Source: Working Group and Steering Committee responses from the spring 2019 questionnaire.

8.2.6 Overarching Strategies and Actions

To build upon the strategies developed to address each of the five major threat categories (see Section 7.2), the WVOPC elected to identify four additional overarching strategies to support achievement of the conservation goals. These strategies center around the need for improved spatial data; greater integration of diversity, equity and inclusion; increasing the human connection to nature; and climate resiliency. These additional overarching strategies complement those identified in section 8.2.1-8.2.5, and are intended to act in concert.

Overarching Strategy 1: Develop and Maintain Improved Spatial Data

As identified in Guiding Principle 3 (Section 2.2), the WVOPC recognizes the importance of knowledge and understanding to the progress, success, and sustainability of this SAP. Therefore, developing spatial data to empower better, data-driven conservation decision-making and enhanced adaptive management is an essential strategy. Proposed actions to support this strategy will include, but are not limited to those described below:

Proposed Actions:

- Develop accurate and reliable spatial and tabular vegetation data for location and quality of oak and prairie habitats within the planning area and make available to partners.
- Conduct a threats analysis mapping effort to determine which areas are at highest risk from development and agricultural conversion.
- Work with state, federal, and Tribal partners to develop more robust wildfire threat assessment data to help partners prioritize woody encroachment and prescribed fire efforts.

Overarching Strategy 2: Integrate Diversity, Equity, and Inclusion into SAP Implementation

Guiding Principle #4 (see Section 2.2) describes how the success of the WVOPC in achieving its goals depends on engaging a broad and inclusive a coalition. The WVOPC is committed to a strategy that integrates principles of diversity, equity, and inclusion into WVOPC decision-making, and outreach, and community engagement. Proposed actions to support this strategy will include, but are not limited to those described below:

Proposed Actions:

- Create a governance structure that ensures the WVOPC supports diversity, equity, and inclusion, and commits time to regular discussion of how diversity, equity, and inclusion are essential to successful conservation of oak and prairie.
- Work to build effective partnerships with organizations and leaders representing communities and populations facing disparities.
- Develop a communications strategy that authentically engages diverse populations, sharing the WVOPC's activities and welcoming reciprocal engagement.
- Build strong, responsive relationships with under-represented groups and provide opportunities to connect as partnership leaders.
- Evaluate environmental justice considerations, including equitable investment in conservation actions, as a step in WVOPC decision making.

Overarching Strategy 3: Increase the Human Connection to Nature

While this Strategic Action Plan is focused on improving the ecological target of oak and prairie habitat by limiting impacts, the WVOPC recognizes that increasing evidence documents the positive effect of access to natural environments on human health. This concept of the essential linkage of the SAP's success to human factors is recognized in Guiding Principle 4, 5, and 6. Proposed actions to support this strategy will include, but are not limited to those described below:

Proposed Actions:

- Raise awareness of the importance of the human-outdoor connection with a diversity of communities spanning all age groups in conservation, prioritizing outdoor events, field trips, workshops, and tours in natural settings.
- Develop relationships with tribal communities to support cultural connections to landscapes and species.
- Build alliances between the health system and conservation organizations to increase collaboration towards the goal of healthy people and healthy environments.
- Work to overcome barriers that contribute to inequitable access to natural areas and outdoor education within the planning area.
- Work to promote public access, specifically of underserved communities, to conserved oak and prairie habitats, particularly in areas near population centers, to enable the public to experience, appreciate, and support these conserved habitats.

Overarching Strategy 4: Increase Climate Resilience

Climate change will bring changes to oak and prairie habitats, and also to agricultural lands and the patterns of urban and rural development. Working to anticipate and plan for its effects on oak and prairie habitats is an additional strategy in the WVOPC approach, and essential to the sustainability of the WVOPC's vision and mission over time. Climate change, with anticipated increases in temperatures, drought, invasive species, extreme precipitation events, wildfire frequency/intensity, changes in hydrology and water supply, and distribution of plant species and habitats, is a factor that interacts with all strategies in the SAP. The precise nature of that interaction will vary by threat category, and may be unknown at this time. Proposed actions to support this strategy will include, but are not limited to those described below:

Proposed Actions:

- Use the principles developed by the Oregon Global Warming Commission (2008) to guide the WVOPC integration of climate change considerations into implementation of SAP strategies: These principles are the maintenance and enhancement of key ecosystem processes; the establishment of an interconnected network of lands and waters that support fish and wildlife adaptation; acknowledgement of and evaluation of the risks of proposed management actions in the context of anticipated climate change conditions; and the need to coordinate across political and jurisdictional boundaries.
- Evaluate Anchor Sites and other priority conservation areas in the primary planning area for potential climate refugia, with particular consideration for at risk species that reside in prairie and oak habitats.
- Collaborate with USFWS, USBLM, ODF, and USFS to evaluate State and Federally managed lands within the "climate resiliency area" to determine those areas most likely to shift from conifer forest dominated habitat to oak-prairie habitat due to projected climate change and begin shifting management objectives in those areas accordingly. Areas most prone to this transition would likely include areas with south and west facing slopes and shallow soil. Initial focus should evaluate areas adjacent to known oak-prairie habitat patches and along Potential Future Habitat Corridors identified on the 30-year Conservation Concept Map.
- Regularly evaluate climate change as a consideration during adaptive management review of all SAP strategies.

9 Progress Monitoring Framework

Oak Basin (BLM)

9.1 Background

Habitat conservation is a long-term process and results are often not measurable in the timeframe of strategic action plans. Therefore, measuring threat reduction, and other intermediate outcomes, can help demonstrate the progress of strategy implementation. The progress monitoring approach of the WVOPC is based on OWEB guidance and will evaluate the effectiveness of the WVOPC's strategies on reducing threats to oak and prairie habitats in the planning area. This assessment structure will inform adaptive management of the strategies over the life of the SAP and will require consistency and collaboration by WVOPC partners, including regular reporting on project implementation as well as monitoring of metrics, some of which are outside normal conservation project reporting (i.e., tracking new policies, number of trainings, number of crews). Future OWEB and other funding requests that support implementation of the SAP will include progress monitoring frameworks (objectives and metrics) consistent with those outlined in this section.

Progress of the SAP will be tracked via intermediate ecological results and implementation results. Four primary categories of intermediate ecological results are outlined in Section 9.2. These are to be monitored by WVOPC partners and compiled by the WVOPC on an annual or six-year cycle (see Figure 9-1). A set of implementation results (outputs) considered to be most relevant and informative were selected from the results chains and are included in Section 9.3 (see Figures 9-2, 9-3, 9-4, 9-5, and 9-6). Implementation results will be monitored by WVOPC partners as SAP implementation projects targeting these results occur, whether funded by grants received from OWEB or supported by other related partnership activities. Monitoring results will then be reported to the WVOPC and compiled across the planning area.

9.2 Ecological Progress to be Tracked by the WVOPC

The ecological progress achieved under this SAP will be monitored by measuring the reduction in limiting factors to oak and prairie habitats (see Figure 9-1). Monitoring a comprehensive set of measures of ecological progress across the entire planning area is not feasible, and data describing baseline ecological conditions are not consistently available. The proposed approach is to track indicators of ecological progress (intermediate ecological results) in four key areas.

Figure 9-1: Ecological Results, Objectives, and Metrics to Reduce the Threats to Oak and Prairie Habitats

These intermediate ecological results will be tracked on an annual or six-year interval by the WVOPC:

Limiting Factor Reduction or Intermediate Ecological Results	Objectives	Metrics (annual tacking unless otherwise noted)
Habitat loss and fragmentation is decreased in the planning area	Increase total acres of oak and prairie habitat conserved and managed	• Acres of oak and prairie habitat conserved within the planning area (permanent conservation status via fee title ownership and easements)
Existing Anchor Sites for conservation are expanded and new anchors are added	Increase acres of core conserved and managed lands meeting the Anchor Site criteria (See section 4.6 for criteria; e.g., 100 acres minimum)	• Number of Anchor Sites established (based on WVOPC Anchor Site definition – see Section 4.7 for definition and 2019 data) • Total acres within all Anchor Sites combined (see Section 4.7 for 2019 acreage)
Increased prescribed fire on the landscape promotes diverse and fire adapted oak and prairie ecosystems	Increase acres burned annually	• Acres burned through prescribed fire (private and public lands)
Increased management supports the quality and function of oak and prairie habitats	Increase acres treated for woody encroachment and invasive species	The following data will be compiled on a six-year interval: • Acres of oak and prairie habitat mowed • Acres oak release • Acres of chemical weed control in oak or prairie habitats • Acres other weed control (manual, biocontrol, etc.) in oak or prairie habitats • Acres seeded with native species in oak or prairie habitats Note: A questionnaire will be sent out to land management organizations operating within the planning area once every six years asking for acreage estimates for all factors listed above for the previous six-year period. The first questionnaire will go out in 2021 asking for data for the previous six-year interval in order to establish a baseline.

9.3 Implementation Progress

Based on the theory of change in each threat category, and the strategy prioritization by WVOPC Working Group, Steering Committee members have identified select implementation results (outputs) that will be the most relevant and informative to track the progress of SAP implementation. These outputs, organized by threat category, are identified in the tables below (see Figures 9-2 to 9-6). The selected outputs are highlighted in the results chains in Section 8 with red letter coding. Projects supported by future implementation funding requests and other WVOPC sponsored efforts will utilize the consistent objectives and metrics outlined in the sections below so that progress of SAP implementation can be monitored using a common approach where feasible.

9.3.1 Rural and Urban Development

Critical implementation results from priority strategies to reduce the threat to oak and prairie from rural and urban development (see Figure 9-2) will include public and development community support, available incentive programs, and strengthened policy and regulations around habitat protection, in addition to habitat conservation and management.

Figure 9-2: Implementation Results, Objectives, and Metrics for Rural and Urban Development

Rural and Urban Development			
	Implementation Results (Selected Key Outputs)*	**Objectives**	**Recommended Metrics**
A	Public and development community support stronger protections and desire to live within habitat	• Increased property value in areas proximal to oak-prairie habitats.	• Property value in proximity to habitat (based on evaluation of sample urban fringe areas)
B	Local and statewide codes, regulations, and policy are strengthened, and programs providing incentives for habitat conservation are expanded (land use planning policy and codes support oak-prairie conservation)	• Engage the counties and cities in the planning area to implement code audits to assess and improve regulations to promote conservation. • Increase regulatory protections for habitats. • Increase the number of landowner incentive programs. • Increase the number of landowners and acreage enrolled in conservation land incentive programs. • Increase the number and quality of habitat management plans developed for retained habitat in larger developments.	• # Counties implementing code audits and updates • #, scope, and scale of new protections added • # Programs providing incentives for prairie and oak habitat conservation • # Landowners and acreage of land enrolled in incentive programs • # Habitat management plans, plan quality (per a standardized format)
C	Habitat conserved in and around urban-rural development areas.	• Add more lands with prairie and oak habitats to public parks and open space or land trust easements/ownership. • Establish development fees to fund stable management.	• Acres added to parks/open space • Revenue generated and directed to habitat management and acres of management funded
D	Conserved habitat is restored and well managed by landowners/developers.	• Build alliances that develop and distribute guidance materials to improve management practices. • Use a habitat certification process to encourage and highlight outstanding management (OSU Extension Service).	• Acres of new conservation in restoration and management • # of Certified lands participating

**Refer to results chains included in Section 8*

9.3.2 Woody Encroachment

Key implementation outputs in the process of reducing woody encroachment (see Figure 9-3)into the oak and prairie habitats of the planning area will include growing public support, in addition to cost-effective methods for woody vegetation removal, with costs for woody encroachment control reduced over the life of the SAP. Ultimately, these will result in a progressively greater number of acres being treated for woody species control in the planning area on an annual basis, particularly in key areas such as Anchor Sites.

Figure 9-3: Implementation Results, Objectives, and Metrics for Woody Encroachment

Woody Encroachment			
	Implementation Results (Selected Key Outputs)*	**Objectives**	**Recommended Metrics**
E	Landowners have cost effective ways to reduce woody encroachment.	• Develop a practical and sustainable business model for removal of woody encroachment and use of byproducts.	• Model developed
F	Public supports woody encroachment reduction.	• Increase the level of public support for woody vegetation removal and fuels reduction.	• Level of support relative to baseline level of support, as measured by survey
G	Costs for woody encroachment control are reduced on all lands (through collaboration and incentive programs).	• Establish a functional collaborative for sharing equipment and coordination of workforce. • Increase incentives in use by public and private landowners to implement thinning and woody control vegetation control projects.	• # Groups participating in collaborative, and volume of work completed • # Incentive programs available • # Enrolled in programs • Acres treated via programs annually • Cost of treatment/acre
H	More acres are treated annually.	• Increase the acres treated annually for woody vegetation control across the planning area.	• Acres treated in Anchor Sites • Acres treated via WVOPC partner projects

**Refer to results chains included in Section 8*

9.3.3 Agricultural Conversion and Incompatible Management

Implementation outputs in the process to decrease the threat from Agricultural Conversion and Incompatible Management (see Figure 9-4) will include sufficient access to funding and programs to implement conservation or compatible management, implementation of BMPS by landowners and managers, and strengthened policies to decrease conversion of oak and prairie habitat to agricultural production.

Figure 9-4: Implementation Results, Objectives, and Metrics for Agricultural Conversion/ Incompatible Management

Agricultural Conversion and Incompatible Management			
	Implementation Results (Selected Key Outputs)*	**Objectives**	**Recommended Metrics**
I	Landowners and managers have access to funding and programs (to implement conservation and or compatible management).	• Expand existing Oak Accord program to include more landowners and additional agricultural use types. • Increase the number of working lands in conservation easements. • Increase the landowner participation in working lands programs. • Understand competing priorities on working lands and develop BMPs for oak and prairie conservation.	• # Landowners and agricultural uses engaged in Oak Accord • # Working lands easements, # acres in easements • # Sites/acres enrolled in conservation via working lands programs with NRCS or other partners
J	Landowners and managers implement Best Management Practices (BMPs).	• Increase the availability of technical assistance.	• # New guidance materials available • # Projects/# acres involved with working lands implemented by WVOPC partners
K	Policies (to decrease conversion of habitat to production) are strengthened.	• Increase value of oak and prairie habitats in property appraisal process. • Engage lands in funding through Farm Bill. • Provide greater support for working lands succession planning.	• Trend over time in value/acre. • # Sites/acres engaged in Farm Bill programs • # Succession planning workshops offered, # attendees

**Refer to results chains included in Section 8*

9.3.4 Non-Native Invasive Species

Critical implementation results in the process to reduce the threat to oak and prairie habitats from non-native invasive species (see Figure 9-5) include having information available to inform and prioritize management decisions at priority sites, the availability of a skilled workforce, stable funding for invasives species management, and greater use of native seeds in post-invasive species treatment habitat restoration.

Figure 9-5: Implementation Results, Objectives, and Metrics for Non-Native Invasive Species

Non-Native Invasive Species			
Implementation Results (Selected Key Outputs)*		**Objectives**	**Recommended Metrics**
L	Data is available to inform and prioritize management decisions at priority sites.	• Increase participation in the EDRR program • Collect baseline data on invasive species at selected Anchor Sites, and revisit at least every 10 years.	• # EDRR reports received • # Anchor Sites with invasive species survey data, # with data < 10 yrs old
M	Skilled workforce is available when needed	• Increase availability of training focused on natural areas management (e.g., pesticide applicator, invasive species identification). • Streamline the process to find trained and qualified applicators through a blanket services/master contract.	• # Trainings offered, # enrollees • # Applicators in blanket service/master contract pool; acres treated by this group
N	Landowners, managers and public have funding for invasive species management	• Sustain incentive programs for treatment of invasive species on private lands.	• # Program enrollees; # acres enrolled/treated.
O	Native seeds used more broadly in post-treatment restoration.	• Increase the volume of native seed applied in restoration projects. • Decrease the cost of native seed for restoration projects.	• # lbs native seed used in planning area • Cost ($/lb) of widely used native species

**Refer to results chains included in Section 8*

9.3.5 Fire Exclusion

Reducing the threat to oak and prairie habitats from fire exclusion (see Figure 9-6) will be tracked by several implementation results, including increased and stable funds for prescribed fire, enacting prescribed fire friendly policies, and increasing the number of trained contract and volunteer prescribed fire practitioners, in addition to increasing the capacity for implementing prescribed fire programs on private land.

Figure 9-6: Implementation Results, Objectives, and Metrics: Fire Exclusion

Fire Exclusion			
	Implementation Results (Selected Key Outputs)*	**Objectives**	**Recommended Metrics**
P	Increased and stable (consistent) funds are made available to support Rx fire.	• Receive stable funding from multiple sources on an annual basis.	• # Fire funding sources • Total fire funding available
Q	Rx fire-friendly policies are enacted	• Increase the allowable period for prescribed burning. • Increase the flexibility of smoke management regulations.	• # Burns implemented in extended period • # Burns implemented that would not have been possible with prior smoke regulations
R	Increased number of trained contract and volunteer Rx fire practitioners.	• Increase the number of trained fire crews available.	• # Crews (by person hours/year)
S	Increased capacity for implementing Rx fire programs on public and private land.	• Increase the acres burned annually. • Streamline permitting and simplify landowner incentives and assistance programs	• # Acres burned/year on public and private land

**Refer to results chains included in Section 8*

9.3.6 Overarching Strategies

The "overarching strategies" listed in Section 8.2.6 support strategy implementation under all of the threat categories. These additional strategies have not been captured directly within a results chain and therefore strategy-specific outputs are not identified. However, the progress of overarching strategy implementation and outcomes will be tracked in parallel with implementation of all strategies in the SAP.

10.1 Background

As described by OWEB, adaptive management is the intentional practice of adjusting strategies through a cycle of assessing, planning, implementing, monitoring, and evaluation (Figure 10-1). As the WVOPC implements this SAP, adaptive management will be particularly useful to address gaps in the information describing the behavior of oak and prairie ecosystems, or if there is uncertainty in the effectiveness of strategies and actions. The WVOPC expects that its partners will gather new information as strategies are implemented and monitored. There may also be changes in conservation circumstances or new information available from advancements in research or emerging threats. Through adaptive management, this information can be used to improve strategies and refine actions to more effectively achieve ecological progress (Figure 10-1).

10.2 Areas of Uncertainty and Research

Over the 30-year period of the SAP, the progress of the WVOPC will undoubtedly intersect changes in ecological, political, and social circumstances affecting oak and prairie. Such changes may include new threats or changes in existing threats affecting oak and prairie, such as new invasive species, new pathogens and pests, or new agricultural crops or agricultural land uses. New insight into preservation, enhancement and management of oak and prairie habitats is also likely to emerge. This may include new tools and techniques that reshape habitat restoration best practices and integrated pest management (e.g., novel herbicides or biological controls). Climate change will interact with all aspects of the SAP, through changing the pressures of development, altering the patterns of woody species encroachment and non-native species invasion, modifying fire behavior or causing adaptations in agricultural practices. The scope and scale of change in these factors, in addition to other unidentified aspects, will determine whether adjustment of strategies is needed.

10.3 Mechanism to Capture and Evaluate Information

Each year, WVOPC partners will report on the progress of implementing the SAP to be compiled by the WVOPC Coordinator (once the position is funded). This will include a record of work completed, as measured with a sub-set of selected objectives metrics identified in the progress monitoring framework (see Section 9). Progress will include sharing lessons learned, and providing specific feedback on the efficacy and efficiency of the actions and strategies of the SAP. Information will be shared in a standardized format tiered from the objectives and metrics of the progress monitoring framework for implementation and ecological progress, as identified in Section 9. Where possible, reporting will be completed electronically, via an online format that compiles directly into a single database. Information in the database

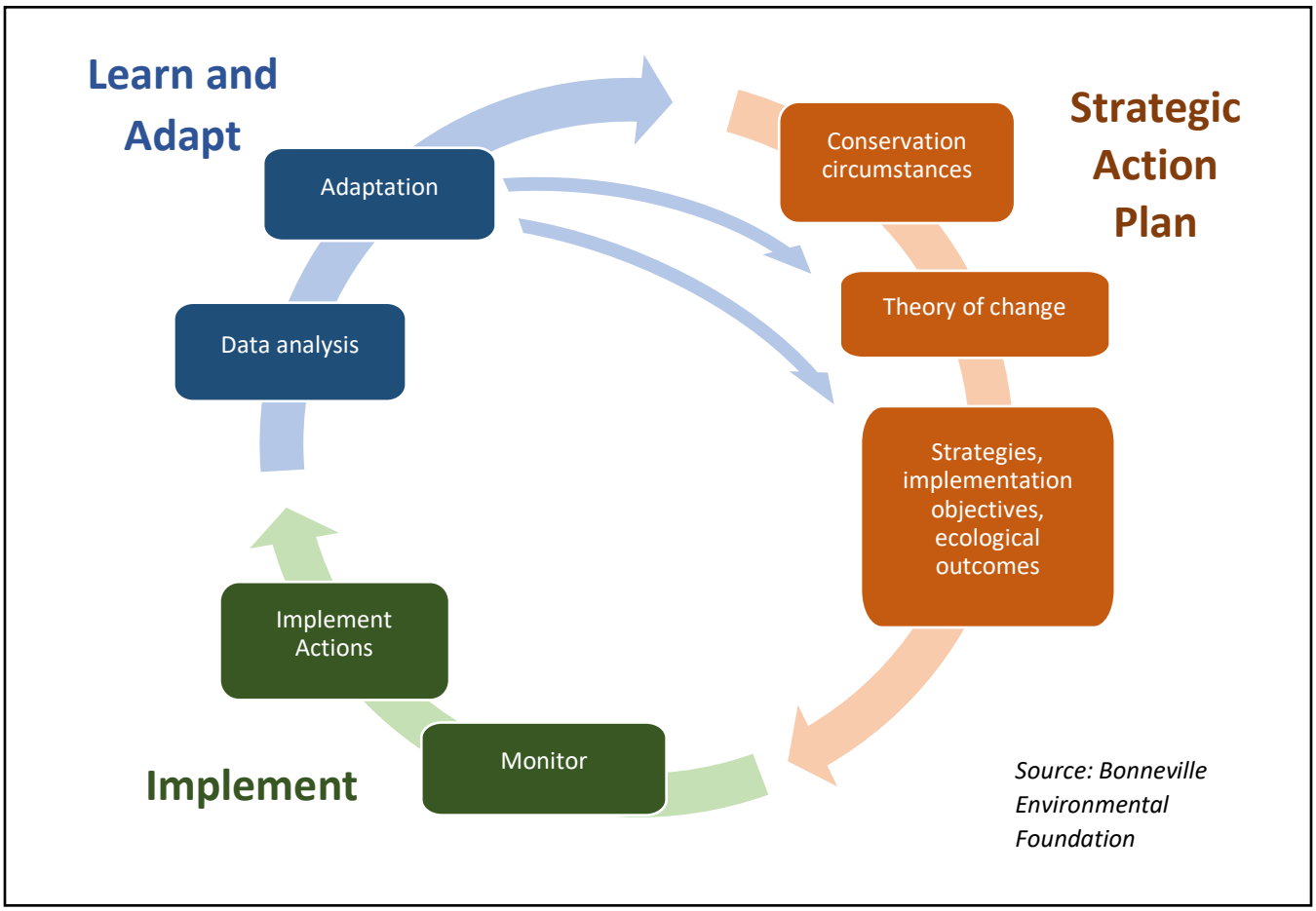
will then be analyzed and summarized on an annual and cumulative (over the term of the SAP) basis. Resulting outputs, will be described in a concise annual report shared with the WVOPC partners, funders, and made publicly available on the WVOPC website.

On at least a biennial (every other year) basis, the WVOPC will hold a partnership meeting to review SAP implementation progress, discuss feedback, and share new research relevant to the threats, strategies and actions within the SAP.

10.4 Process to Adapt the SAP

The WVOPC will evaluate cumulative implementation and ecological progress towards the implementation and ecological progress objectives annually and review and consider need for updating elements of the SAP approximately on a six-year cycle. Updates could include revising strategies and actions, updating the 30-Year Conservation Concept Map to reflect newly conserved lands and extent of Priority Conservation Areas, and refining the progress monitoring framework as needed.

Figure 10-1: Adaptive Management Diagram



11

References and Literature Citations

Coryell Ridge in Lane County (E. Alverson)

The following reports, plans, and studies were consulted during development of this Strategic Action Plan:

- Altman, Bob, Sara Evans-Peters, Elspeth Hilton Kim, Nicole Maness, Jamie Stephens, and Bruce Taylor. 2017. *Prairie Oaks and People – A Conservation Business Plan to Revitalize the Prairie-Oak Habitats of the Pacific Northwest*.
- Alverson, Ed. 2005. *Preserving Prairies and Savannas in a Sea of Forest – A Conservation Challenge in the Pacific Northwest.*
- Benton County. 2010. *Prairie Species Habitat Conservation Plan*.
- Campbell, B.H. 2003. *Restoring Rare Native Habitats in the Willamette Valley - A Landowner's Guide for Restoring Oak Woodlands, Wetlands, Prairies, and Bottomland Hardwood and Riparian Forests.*
- Christy, J. A., and E. R. Alverson. 2011. *Historical Vegetation of the Willamette Valley, Oregon, circa 1850.* Northwest Science 85:93-107.
- Floberg, J., M. Goering, G. Wilhere, C. MacDonald, C. Chappell, C. Rumsey, Z. Ferdana, A. Holt, P. Skidmore, T. Horsman, E. Alverson, C. Tanner, M. Bryer, P. Iachetti, A. Harcombe, B McDonald, T. Cook, M. Summers, D. Rolph. 2004. *Willamette Valley-Puget Trough-Georgia Basin Ecoregional Assessment, Volume One: Report*.
- Hulse, David, et al. 1998. *Willamette River Basin: A Planning Atlas.* Pacific Northwest Ecosystem Research Consortium. Institute for Sustainable Environment, University of Oregon.
- Institute for Applied Ecology. 2010. *Benton County, Oregon Prairie Conservation Strategy*.
- Krueger, Jeffrey J., Sarah T. Bois, Thomas N. Kaye, Diane M. Steeck, Trevor H. Taylor. 2014. *Practical Guidelines for Wetland Prairie Restoration in the Willamette Valley, Oregon: Field Tested Methods and Techniques*.
- Krueger, Jeffrey J. 2015. *A Conservation Concept Map for the Mid-Willamette Valley*.
- Lane Council of Governments. 2003. *Rivers to Ridges Parks and Open Space Vision*.
- Oregon Department of Land Conservation and Development. 2010. *The Oregon climate change adaptation framework*. On file at the State Library of Oregon Digital Collections. 97 pp plus appendices.
- Oregon Global Warming Commission. 2008. *Preparing Oregon's Fish, Wildlife, and Habitats for Future Climate Change: A Guide for State Adaption Efforts.*
- Oregon Watershed Enhancement Board. 2018. *OWEB Focused Investment Partnership Priority: Oak Woodland and Prairie Habitat*.
- Oregon Watershed Enhancement Board. 2018. *Strategic Action Planning for Prospective Focused Investment Partnerships*.
- Oregon Watershed Enhancement Board. 2018. *Who We Are*.
- Oregon Department of Fish and Wildlife. 2016. *Oregon Conservation Strategy*.
- U.S. Fish & Wildlife Service. March 2017. *Willamette Valley Conservation Study – Strategic Habitat Conservation in Oregon's Willamette Valley*.
- Sultany, Molly L., Susan R. Kephat, and H. Peter Eilers. 2007. *Blue Flower of Tribal Legend: Sky Blue Petals Resemble Lakes of Fine Clear Water*.
- Thorson, T.D., Bryce, S.A., Lammers, D.A., Woods, A.J., Omernik, J.M., Kagan, J., Pater, D.E., and Comstock, J.A. 2003. *Ecoregions of Oregon*.
- U.S. Fish and Wildlife Service. 2014. *Strategic Conservation Management in Oregon's Willamette Valley: Surrogate Species Pilot 1.0*. Review Copy. Region 1, Portland, Oregon.
- Vesely, David, and Gabe Tucker. 2004. *A Landowner's Guide for Restoring and Managing Oregon White Oak Habitats*. Pacific Wildlife Research.
- Yamhill Partners for Land and Water. 2015. *A Conservation Concept Map for Yamhill County, Oregon*.

Baskett Slough NWR (J. Krueger)

This Strategic Action Plan (SAP) was developed under the guidance of the WVOPC Steering Committee. The Steering Committee was formed to oversee the development and implementation of the SAP and support collaborative, sustainable partnerships for conservation and restoration of oak and prairie habitats in the Willamette Valley. The Steering Committee, made up of twelve members representing Tribal, municipal, and non-profit organizations, actively participated in the development and refinement of the Strategic Action Plan.

Certification

I certify that this Strategic Action Plan is a true and accurate representation of the proposed work and that I am authorized to sign as the Partner Representative.

			Signature	***Date***
Clinton Begley	Executive Director	Long Tom Watershed Council		12/16/19
Sara Evans-Peters	Conservation Planner	Pacific Birds Habitat Joint Venture		12-16-19
Claire Fiegener	Conservation Director	Greenbelt Land Trust		12/16/2019
Tom Kaye	Executive Director	Institute for Applied Ecology		12/16/19
Nicole Maness	Resilient Habitat Program Manager	Willamette Partnership		02/05/20
Shelly Miller	Supervisor, Ecological Services and GIS Teams	City of Eugene		12/16/19
Will Neuhauser	Partnership Member	Yamhill Partners for Land and Water		12/16/2019
Michael Pope	Executive Director	Greenbelt Land Trust		12/16/2019
Lawrence Schwabe	Hydrosystem Compliance Specialist	Confederated Tribes Grand Ronde		12-16-19
Bruce Taylor	Partnership Coordinator	Pacific Birds Habitat Joint Venture		12.16.19
Brenda Bremner	General Manager	Confederated Tribes of Siletz Indians		2/14/20
Kelly Warren	Regional Biologist – Western Oregon	Ducks Unlimited		12-16-19