

Natural Resource Management Plan for Champoeg State Heritage Area



12/22/2023

Prepared for Oregon Parks & Recreation
Department

Report prepared by Sara Alaica and Andrew
Esterson
Institute for Applied Ecology



PREFACE

IAE is a non-profit organization whose mission is conservation of native ecosystems through restoration, research, and education. IAE provides services to public and private agencies and individuals through development and communication of information on ecosystems, species, and effective management strategies. Restoration of habitats, with a concentration on rare and invasive species, is a primary focus. IAE conducts its work through partnerships with a diverse group of agencies, organizations, and the private sector. IAE aims to link its community with native habitats through education and outreach.



Questions regarding this report or IAE should be directed to:

Institute for Applied Ecology
4950 SW Hout Street
Corvallis, Oregon 97333

phone: 541-753-3099
email: info@appliedeco.org

ACKNOWLEDGMENTS

Thank you to the Oregon Watershed Enhancement Board for funding this project (Grant #220-3034-17383) and Liz Redon for supporting and administering the grant. The team at the Oregon Parks and Recreation Department (OPRD) including Noel Bacheller, Ryan Sparks, David Figgins, Ryan Sevey, Daniel Klug, and Brian Pinson were invaluable in providing background information and feedback throughout the report-writing process. Bruce Newhouse completed the wildlife habitat survey for the site, and along with Zade Clark-Henry, Brooke Morrow, Cierra Dawson, Rolando Beorchia, and Andy Neill, ground-truthed the site and collected habitat data. We also gratefully acknowledge the contributions and cooperation of Lindsay McClary, Annaliese Ramthun, and Jeremy Ojua from the Confederated Tribes of Grand Ronde (CTGR) for providing their recommendations. Photos in this report are by Sara Alaica, unless otherwise stated.

Maps throughout this document were created using ArcGIS® software by Esri. ArcGIS® and ArcMap™ are the intellectual property of Esri and are used herein under license. Copyright © Esri. All rights reserved. For more information about Esri® software, please visit www.esri.com.

Cover photograph: Camas at Champoeg.

SUGGESTED CITATION

Alaica, S, Esterson, A. 2023. Natural Resource Management Plan for Champoeg State Heritage Area. Institute for Applied Ecology. Corvallis, Oregon.

TABLE OF CONTENTS

PREFACE.....	II
ACKNOWLEDGMENTS.....	III
SUGGESTED CITATION.....	III
TABLE OF CONTENTS.....	IV
1. INTRODUCTION	1
1.1 Site overview.....	1
1.2 Guiding principles	2
1.3 Methods.....	3
1.4 History.....	3
2. CURRENT SITE CONDITIONS	7
2.1 Climate	7
2.2 Soils	7
2.3 Hydrology.....	11
2.4 Wildlife	12
2.5 Existing vegetation communities.....	14
2.6 Invasive species.....	21
2.7 Threatened and endangered species.....	29
3. DESIRED FUTURE CONDITIONS.....	31
4. GOALS AND OBJECTIVES	33
5. MANAGEMENT RECOMMENDATIONS	34
5.1 Integrated pest management plan	34
5.2 Conservation priorities.....	39
5.3 Restoration opportunities	51
5.4 Gathering opportunities.....	57
6. MONITORING.....	60
6.1 Vegetation monitoring	60
6.2 Wildlife monitoring	62
7. IMPLEMENTATION PLAN	64
8. REFERENCES	68
APPENDIX A. PLANT SPECIES LISTS.....	71
APPENDIX B: NATURAL RESOURCE FUNCTION & VALUE ASSESSMENT	81
APPENDIX C: WILDLIFE HABITAT ASSESSMENT.....	82

Natural Resource Management Plan for Champoeg State Heritage Area

1. INTRODUCTION

1.1 Site overview

Champoeg State Heritage Area (“Champoeg”) is in Marion County, Oregon, near Newberg, on the banks of the Willamette River (Figure 1). It’s approximately 700 acres include a variety of habitat types such as riparian and upland forest, prairie, creeks, wetlands, recreational areas and agricultural fields. The site is owned and operated by the Oregon Parks and Recreation Department (OPRD) and is protected under the National Register of Historic Places for its location as an early settlement site.

OPRD lists Champoeg as one of its high priority sites for conservation. Out of 134 OPRD-managed properties in the Willamette Basin, Champoeg ranked in the top ten for habitat value due to its size, diversity, native vegetation, and rare species and habitats (OPRD 2017).

Because of its location on the Willamette River floodplain, Champoeg is also listed as a conservation opportunity area (COA) by the Oregon Department of Fish and Wildlife (ODFW). ODFW recommends focusing actions in COAs to greater benefit strategy species and habitats (Oregon Conservation Strategy 2016). Oregon Conservation Strategy defines “Strategy Habitats” as areas that were once common in the Willamette Valley but have declined heavily since colonization. Champoeg contains multiple high-value Strategy Habitats: grasslands and upland prairie; riparian and flowing water; wetlands and wet prairies; as well as oak woodlands (Oregon Conservation Strategy 2016).

Strategy Habitats are also valued for their importance to strategy species. Like their associated habitat, “Strategy Species” are rare, and are at risk of extirpation because of their small or declining populations. Several Strategy Species are known to occur at Champoeg: the northern red-legged frog (*Rana aurora*), chipping sparrow (*Spizella passerina*), western bluebird (*Sialia mexicana*), monarch butterfly (*Danaus plexippus*), and peacock larkspur (*Delphinium ×pavonaceum*).

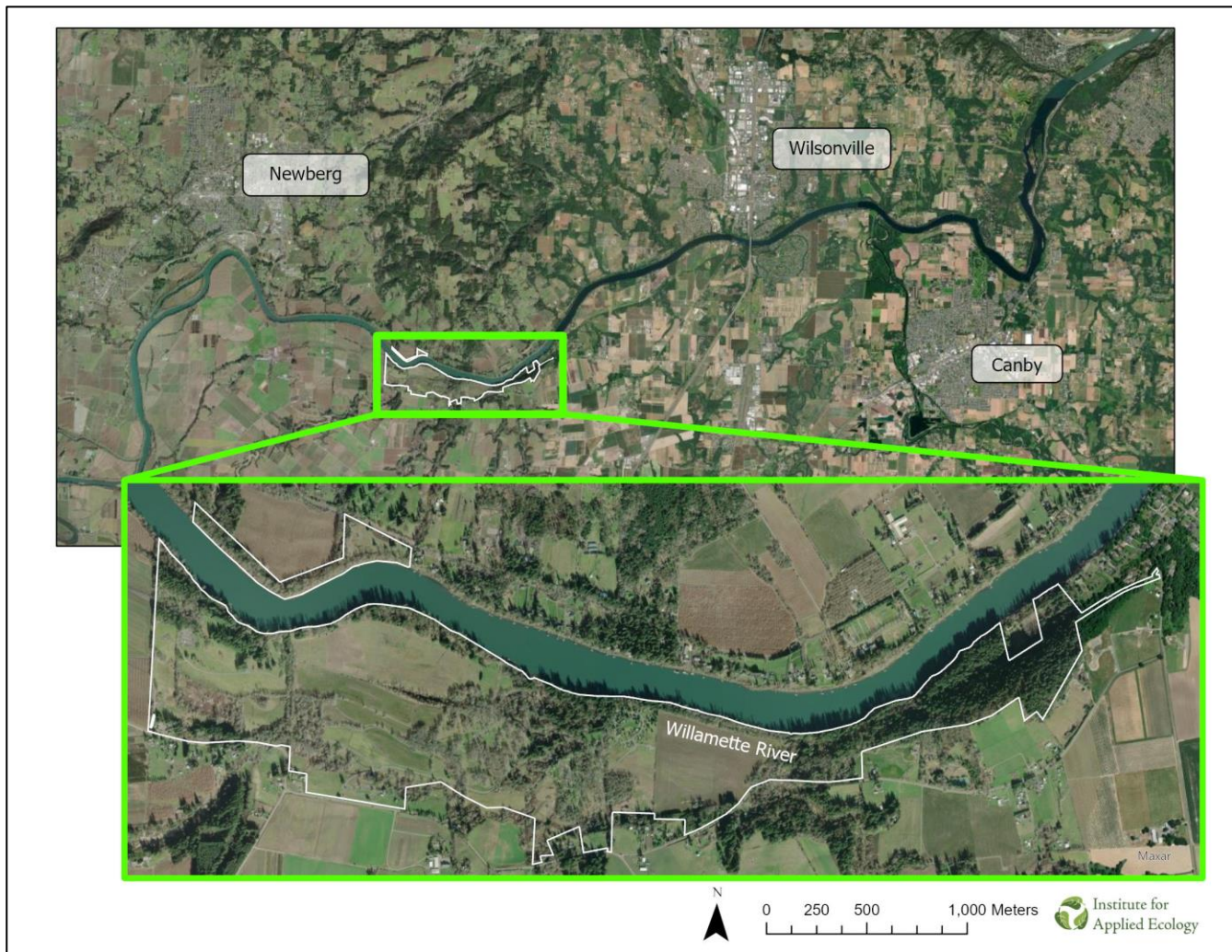


Figure 1. Location of Champoege State Heritage Area in Marion County, OR.

1.2 Guiding principles

OPRD's mission is to provide and protect cultural and natural resources for public enjoyment and education. The Natural Resources and Environmental Management Policy as well as the Forest Management Policy direct OPRD to protect and enhance ecosystems to promote biodiversity and native species. Watersheds are also protected by the Oregon Plan for Salmon and Watersheds, which restricts the use of restoration or development work that would harm salmonids or their habitat.

Where invasive species are negatively affecting these ecosystems, the Invasive Species Management Policy calls for an integrated pest management (IPM) strategy to manage and monitor Champoege. IPM is a multi-faceted approach combining prevention, early detection, monitoring, and management. IPM uses biological, cultural, mechanical, thermal, and chemical methods to control invasive species at an ecosystem-wide scale.

With its important place in Oregon's early history, management recommendations for Champoeg must also consider archaeological impacts and public access to the site. People are an important aspect of OPRD's mission, and park staff are directed to provide interpretive and educational opportunities that inform and inspire visitors. OPRD's Tribal Traditional Use Policy waives day use fees for Oregon Tribal members wanting to access sacred sites within Champoeg and allows for the sustainable collection of park resources for personal use by tribal members.

The purpose of this plan is to document historical and existing site conditions, identify high priority habitats, and provide management and restoration recommendations to protect these natural resources over a 10-year period (2023-2033). Feedback from partners, the public, and local tribes will be incorporated into the plan to increase engagement and transparency. The plan will improve park management and decision-making by allowing OPRD to increase the scale and scope of restoration efforts and guide the implementation of federal, state, and local planning efforts.

Because ecosystems are inherently complex, this plan will follow an adaptive management approach. Adaptive management allows for ongoing monitoring of conservation actions so that park managers can adjust in real time and better inform future projects.

1.3 Methods

From May to September 2021, IAE staff conducted surveys across Champoeg, mapping locations of invasive and rare plants and delineating habitat types. OPRD provided historical data for the report, including previous management and strategic plans, water quality reports, research publications, and field assessments. Bruce Newhouse used data from BioBlitzes, NatureServ, Oregon Biodiversity Information Center (ORBIC), Oregon Department of Fish and Wildlife (ODFW), and Oregon Conservation Strategy to map known occurrences of at-risk wildlife species. From May to September 2022, Newhouse conducted site visits to map habitats that would likely support at-risk species. Staff from the Confederated Tribes of Grand Ronde provided input into gathering opportunities at Champoeg.

1.4 History

Prior to European contact, Champoeg was used by the Kalapuya Indians for hunting, fishing, and food harvesting. The Kalapuyans managed the habitat through periodic burns that kept the area an open grassland with scattered trees (Hulse et al. 2002). Early depictions of Champoeg describe it as heavily forested with areas of prairie that extended down to the river (Hussey 1967). The prairies had extensive "natural flowers...the most beautiful that our eyes ever beheld," while the forests included "groves of fir and oak" (Hussey 1967). Tree cores taken at Champoeg show several trees to be over 300 years old (Dresner 2010).

Colonists noted the geographical importance of Champoeg, as it was the first point along the river from Willamette Falls that was clear of trees. This made the area an important meeting location for the Kalapuya, and the name Champoeg likely derives from the Kalapuyan word "campuik," describing the edible root yampah (*Perideridia gairdneri*) that was harvested on the site (Hussey 1967).

In the 1830s, a Hudson's Bay trading post was established at Champoeg that shipped wheat grown in French Prairie northward on the Willamette (Himes 1915). The site of the settlement also included the homestead of prominent Oregon settlers, including statesman Robert Newell. On May 2, 1843, Newell

joined other settlers in voting to form the first provisional government of Oregon at Champoege (Himes 1915).

Settlers altered the landscape for agricultural use, haying and seeding upland grasslands and draining wet prairies: a practice that continues today on approximately 120 acres of the site. Burning was prohibited, allowing shrubs and young trees to establish in the prairies as early as 1852 (Hulse et al 2002). The prohibition of burning also affected the forest composition. Oak trees became shaded out by faster-growing Douglas-fir (*Pseudotsuga menziesii*) (Hulse et al 2002), and grand fir (*Abies grandis*), which is very susceptible to fire, became more commonplace (Dresner 2010). Logging of the old-growth trees in the eastern portion of the site named La Butte began sometime in the 1800s (Dresner 2010).

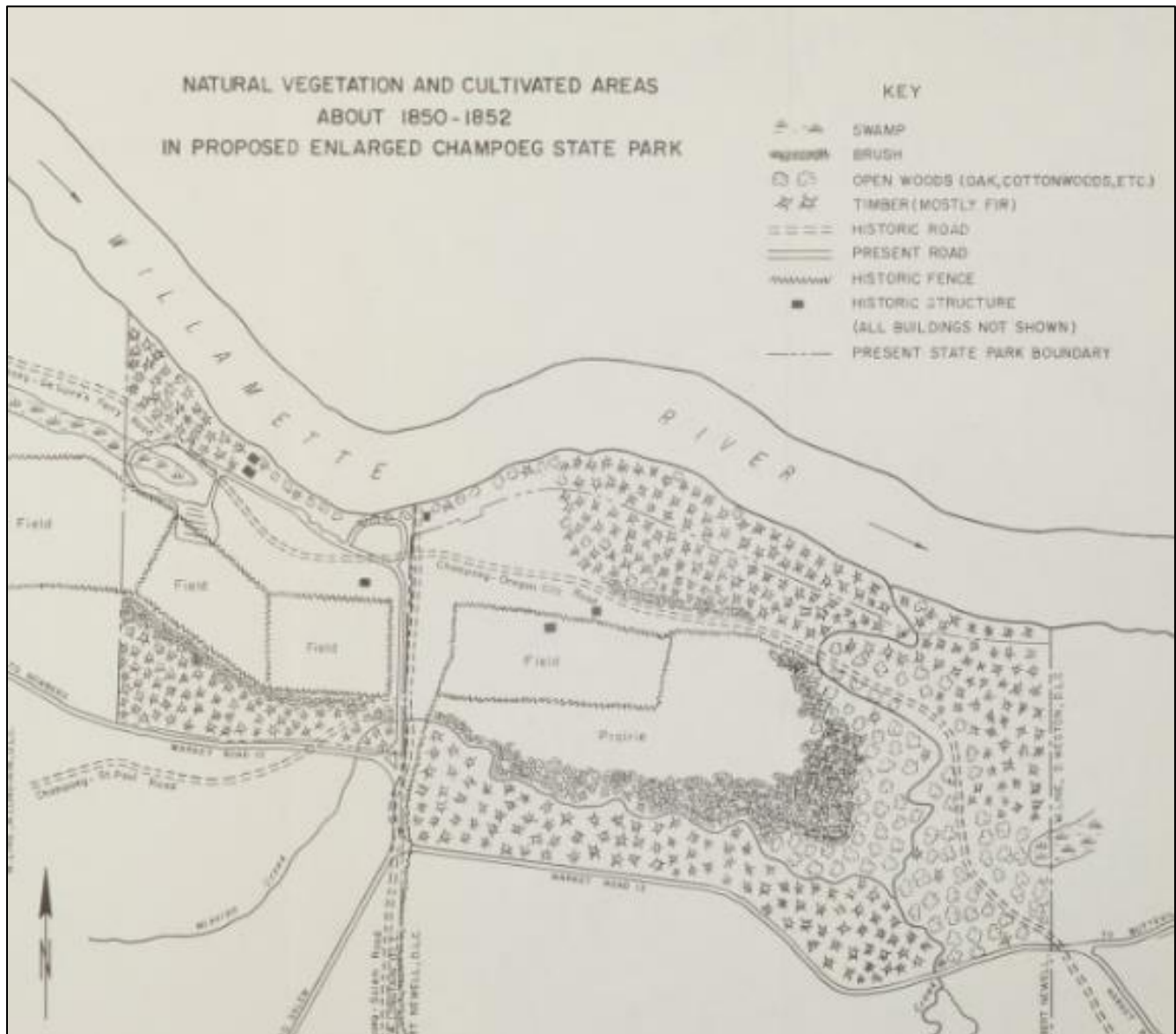


Figure 2. Prairie and riparian forest extent at Champoege State Heritage Area in 1850-1852 (Hussey 1962).

Notes taken as part of land claim surveys in the 1840s and 1850s describe Champoeg as open prairie with a thin border of riparian trees along the river (Figure 2). The open prairie extended from the river southward to Mission Creek and ended to the east in an oak woodland (Hussey 1962).

The riparian forest consisted of Oregon ash (*Fraxinus latifolia*), willow (*Salix* spp.), black cottonwood (*Populus trichocarpa*), red alder (*Alnus rubra*), bigleaf maple (*Acer macrophyllum*), and Oregon white oak (*Quercus garryana*). The understory consisted of beaked hazelnut (*Corylus cornuta*), salal (*Gaultheria shallon*), snowberry (*Symphoricarpos albus*), thimbleberry (*Rubus parviflorus*), Oregon grape (*Mahonia aquifolium*), Lewis' mock orange (*Philadelphus lewisii*), arrowwood (*Viburnum ellipticum*), western brackenfern (*Pteridium aquilinum*), serviceberry (*Amelanchier alnifolia*), and poison oak (*Toxicodendron diversilobum*) (Hussey 1962).

Burn scars on old-growth trees in La Butte (Dresner 2010) suggests that burning was a regular feature of the Champoeg landscape. Modeling done as part of the Landscape Fire and Resource Management Planning Tool (LANDFIRE) estimates La Butte experienced fires on an average every 6-10 years, with the majority of Champoeg burning on average every 400 years (Figure 3).

It is likely that prairies in Champoeg burned more regularly than the LANDFIRE modelling suggests. The LANDFIRE model is based on natural ignitions, but the Kalapuyans historically used the site for harvesting food and used fire to keep the prairies in an early seral state suitable for growing herbs and roots (Hulse et al. 2002).

In 1861, higher-than-average rainfall caused intense flooding at Champoeg, leading to the abandonment of the town. News reports at the time wrote that “all the homes at Champoeg are stated to be carried off,” and “the site is now bare as a sand beach” (Atherton 1973).

The site's importance in the early establishment of the state of Oregon led to the creation of a park in 1901. The park started as a 10 ft² donation from John Hoefer and Casper Zorn, as a location to build a marker commemorating the 1843 vote. Prior to OPRD purchasing and including La Butte in the park boundary, the old-growth forests were logged in the 1920s and 1930s.

OPRD purchased additional land from 15 different landowners to grow the park to 159 acres by 1961. (Hussey 1962). That year the National Park Service produced a report describing the current vegetation distribution of the site. Hussey (1962) describes the riparian border along the river as considerably expanded from historical conditions, now extending into what was once prairie. This is most evident in the western section of the park, where conifers were planted in the 1950s. Hussey (1962) also describes established non-native species such as cacti and giant sequoia (*Sequoiadendron giganteum*) planted as part of an arboretum.

OPRD gives further detail of species found at the park in the 1990 master plan for Champoeg, noting the presence of camas (*Camassia* sp.) and the threatened peacock larkspur. Rare birds are also present, including the pileated woodpecker (*Dryocopus pileatus*), western meadowlark (*Sturnella neglecta*), Vaux's swift (*Chaetura vauxi*), and western bluebird (Oregon State Parks and Recreation Department 1990). As for the forests, the authors note that English ivy (*Hedera helix*) is ubiquitous and should be removed.

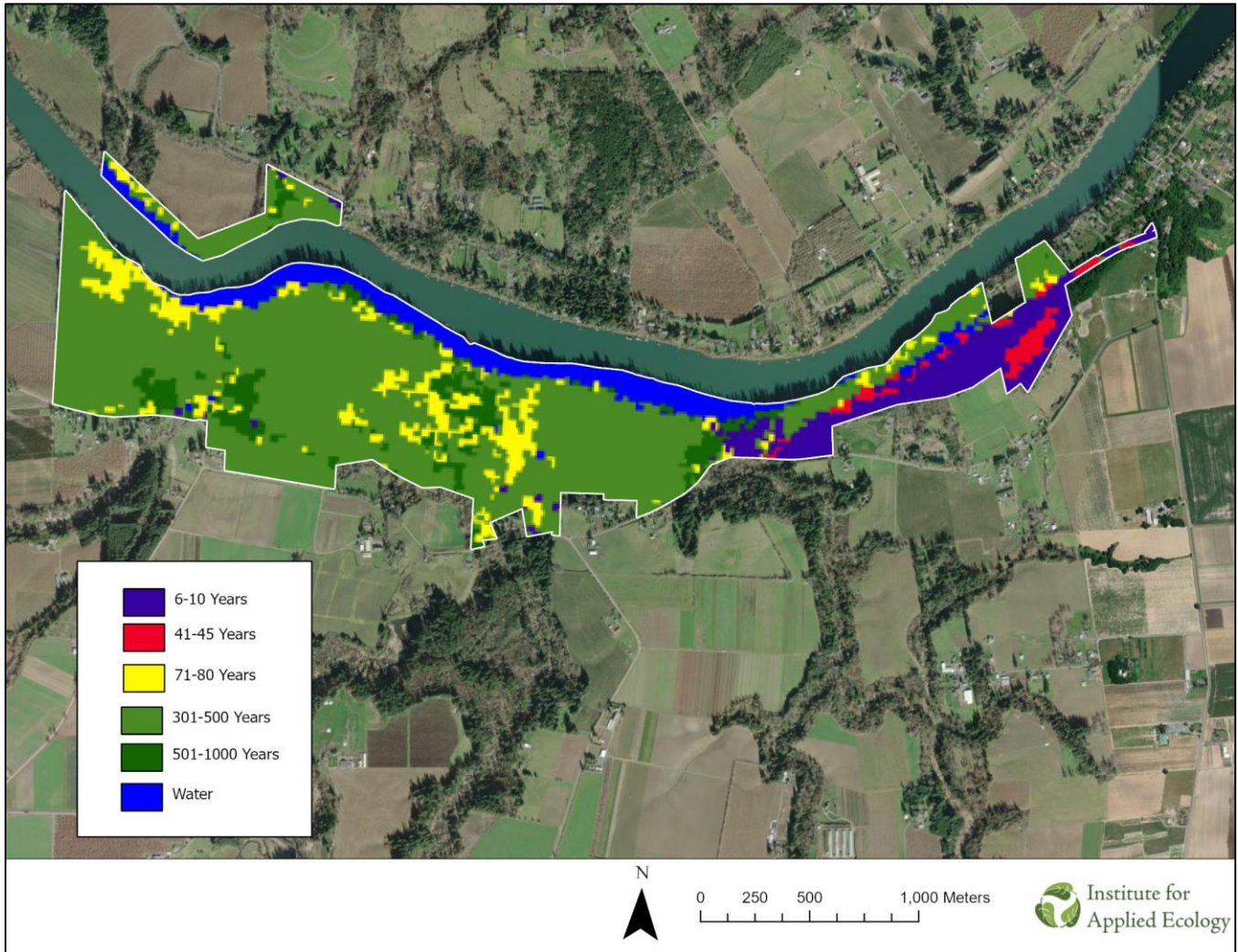


Figure 3. Burn interval at Champoeeg State Heritage Area as modelled by Landscape Fire and Resource Management Planning Tool (LANDFIRE).

In 2000, OPRD began restoration of a 45-acre prairie on the north side of the site. OPRD filled a ditch that bisected the prairie, and blocked the ditch to the south, creating a small wetland. The field was kept in chemical fallow for two years (2005-2006) and was subsequently seeded with tufted hairgrass (*Deschampsia cespitosa*), blue wildrye (*Elymus glaucus*), Roemer's fescue (*Festuca roemerii*), California brome (*Bromus carinatus*), and California oatgrass (*Danthonia californica*) (IAE 2014). In 2014, the Institute for Applied Ecology (IAE) developed a restoration plan for the prairie and created four diversity blocks to introduce native forbs (IAE 2014). In 2018, with the assistance of the Confederated Tribes of Grand Ronde, IAE planted approximately 6,000 bare root plants and bulbs in the restoration prairie to reintroduce culturally important plants to a site where they were historically harvested (Moore 2020).

A 24-hour BioBlitz event took place in 2000 and 2001, where teams of volunteers identified over 800 species of plants, animals, fungi, and other organisms. Volunteers found several species of concern, including the northern red-legged frog, chipping sparrow, common nighthawk (*Chordeiles minor*), western bluebird, Pacific lamprey (*Lampetra tridentata*), and western gray squirrel (*Sciurus griseus*).

Additional rare species were found in 2010, when Marion Dresner from Portland University surveyed the La Butte forest, listing percent cover for 13 understory species and a variety of prairie species seen in forest openings. Dresner pointed out a large population of the globally vulnerable tall bugbane (*Actaea elata*), which was negatively associated with the presence of English ivy.

2. CURRENT SITE CONDITIONS

2.1 Climate

Thirty-year climate data (1991-2022) gathered from the North Willamette Experiment station, about six miles northeast of the park, showed an average annual temperature of 53.9°F, with average annual precipitation of 42.38 inches (Arguez et al. 2012). Champoege receives the highest precipitation between November and March, with lows in July and August (Figure 4).

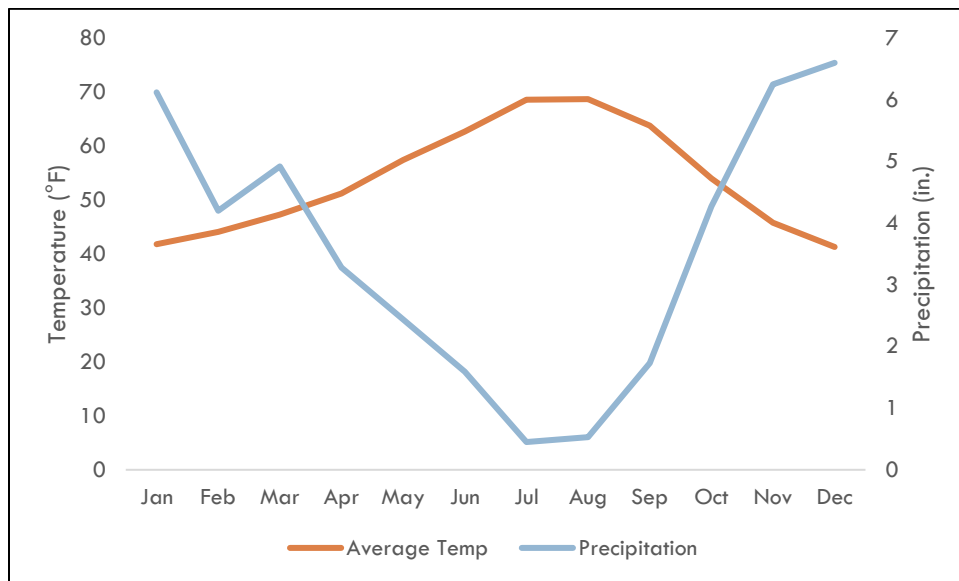


Figure 4. Annual average temperature and precipitation at Champoege State Heritage Area (1991-2022).

According to the most recent Oregon Climate Assessment, Oregon's annual average temperatures are projected to increase by 5°F by 2050, and 8.2°F by 2080 (Dalton and Fleishman 2021). As temperatures increase, summer flow in the Lower Willamette River Basin decreases, with each 2°F of warming leading to a 15% decrease in stream flow (Pacific Northwest Climate Impacts Research Consortium 2020). This may lead to stream temperature increases of as much as 7.2°F by 2080 in the Willamette River Basin (Dalton and Fleishman 2021). Because a warmer atmosphere holds more water, Oregon is also expected to have more intense precipitation events and a 5-10% increase in days with atmospheric rivers (Dalton and Fleishman 2021).

2.2 Soils

The park is primarily composed of four soil types – McBee silty clay loam, Wapato silty clay loam, Newberg fine sandy loam, Cloquato silt loam – all of which are typical of floodplain and wetland

environments (Figure 6; USDA 2023). Two soil types – Bashaw clay and Wapato silty clay loam – are hydric soils, one of three indicators of wetland conditions by the State of Oregon. These soils are poorly drained and are usually saturated with water for several months of the year. The other two indicators of wetland conditions are the presence of hydrophytic vegetation and wetland hydrology. Champoeg has three areas that qualify as wetlands under these conditions (Figure 7).

These soils were created from deposition by the Willamette River during flood events that have been occurring in the valley since the ice age. The site has a long history of connectivity with the Willamette River. The earliest recorded flooding was in 1814, when a trader for the Northwest Company just west of Champoeg wrote in his journal that the post was flooded (Hussey 1962). Champoeg flooded at regular intervals, with records for 1843, 1861, 1890, 1923, 1927, 1943, 1945, 1955, 1964, and 1996 (Figure 5), with many smaller flood events occurring between those dates.

In southern areas of the park further away from the river, upland soils are more common: Terrace escarpments, Woodburn soil loam, and Amity silt loam. These soils support Douglas-fir, well-spaced oaks, and a grass-dominated understory. The soils in La Butte forest are particularly well-drained and are at risk of erosion if unvegetated.



Figure 5. Satellite image of the 1996 flooding event at Champoeg State Heritage Area (OPRD 2008).

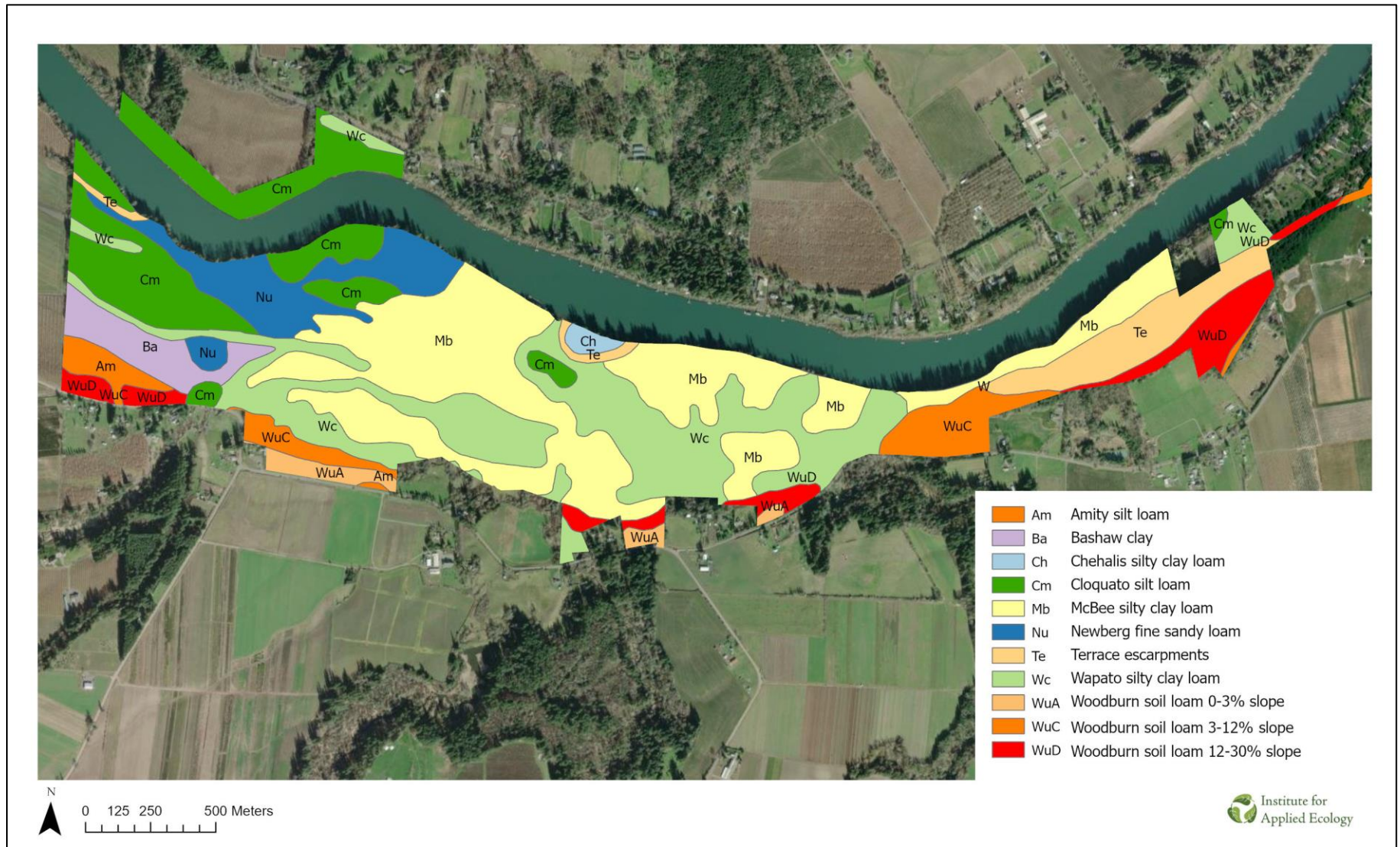


Figure 6. Soil types at Champoeg State Heritage Area. Soil types Mb (yellow), Nu (blue), Wc (light green), and Cm (dark green) are representative of wetland and floodplain environments.



Figure 7. Hydric soils at Champoeg State Heritage Area. Wetland indicator plant species are found in the dark pink regions.

2.3 Hydrology

Four creeks pass through Champoeg State Heritage Area: Mission, Champoeg, Ryan, and Case (Figure 8). Mission Creek covers the largest amount of area, travelling 1.4 miles through the park. It connects to Champoeg Creek, which runs 0.4 miles north before discharging into the Willamette River. Ryan Creek traverses 0.2 miles at the eastern end of the park, while a small 0.6-mile section of Case Creek crosses into the park boundary to the south.

Mission Creek also connects to two drainage ditches, a remnant of the long history of agricultural use of the site. Farmers use ditches to convert wet prairies and wetlands into drier upland conditions more suitable for farming and grazing. One of the ditches in the northern part of the site is no longer connected to any streams after park staff plugged it in the early 2000s (Figure 8). This ditch is now home to many native wetland waterfowl, songbirds, and wetland-associated rare plants (See 2.7 Threatened and endangered species). The presence of drainage ditches suggests that the site was historically wetter, likely containing a higher percentage of wet prairie habitat than currently present.

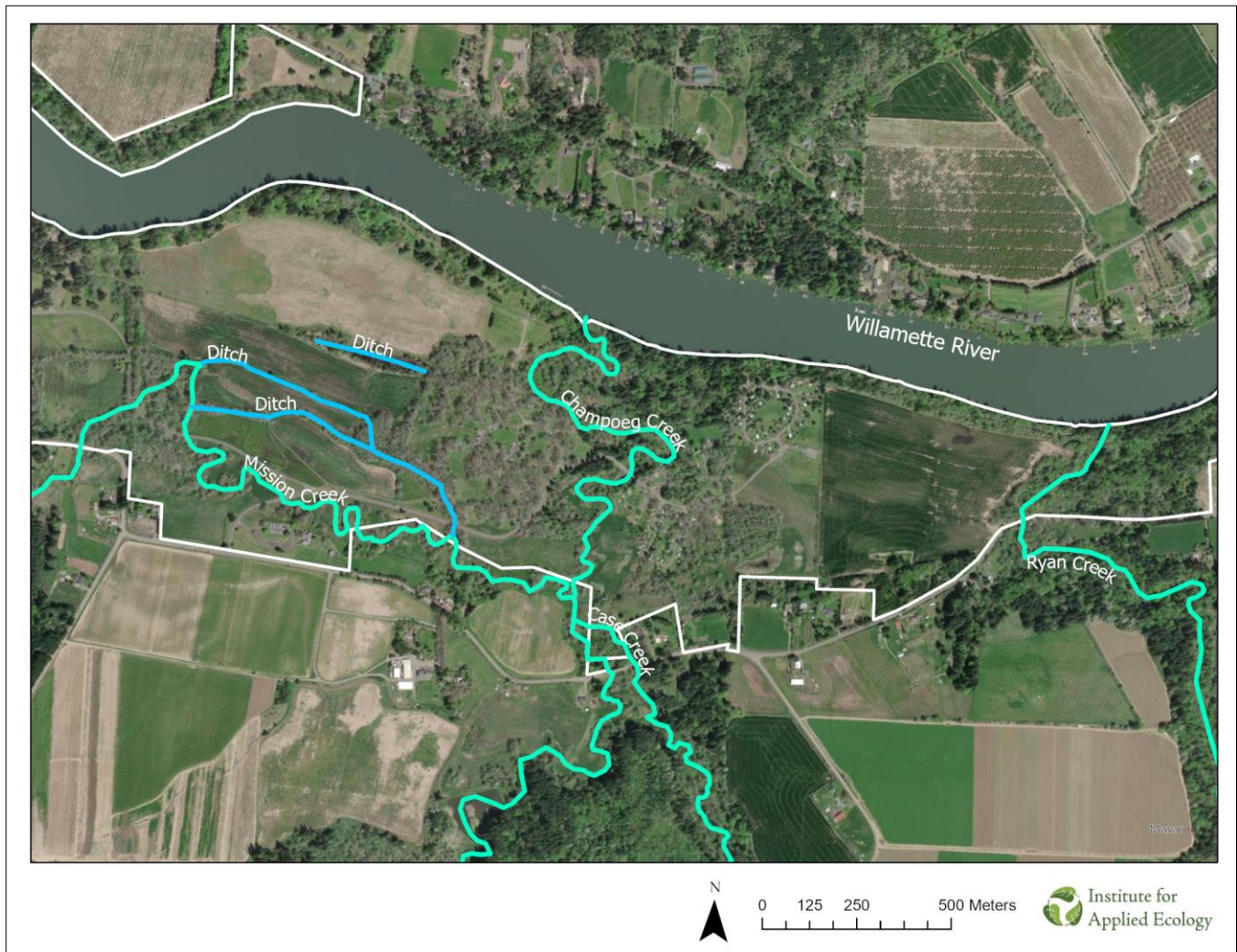


Figure 8. Waterways in Champoeg State Heritage Area.

In 2022, The Oregon Department of Environmental Quality (DEQ) assessed Champoeg Creek at a collection station in Champoeg State Heritage Area. Champoeg Creek is listed as impaired for its substandard dissolved oxygen levels during spawning season, and for the presence of arsenic and the long-lived insecticides DDT and Dieldrin (Oregon Department of Environmental Quality 2022).

Ryan Creek was last assessed in 2010 using the Oregon Department of Fish and Wildlife’s STEP protocol (Oregon Department of Parks and Recreation 2013). Evaluators found that fish spawning habitat was limited due to the presence of fish passage barriers, the lack of a gravel substrate, and only 50-60% vegetation cover along the banks (Figure 9).



Figure 9. Lack of vegetation cover along the banks of Ryan Creek on Aug 9, 2022, leading to erosion.

2.4 Wildlife

In 2022, biologist Bruce Newhouse conducted a wildlife habitat assessment for Champoeg (Appendix C: Wildlife Habitat Assessment). Using existing information and a series of site visits, Newhouse mapped areas where wildlife species are expected to occur to prioritize them for conservation. Due to its size and diverse array of habitat types, Champoeg supports a wide variety of wildlife species, including significant populations of several at-risk grassland oak-associated bird species: acorn woodpecker, chipping sparrow, western bluebird, and slender-billed nuthatch. A full list of uncommon and at-risk species likely to occur at Champoeg are described in Table 1.

Table 1. Summary of uncommon and at-risk species likely to occur at Champoeg. Location of suitable habitat codes refer to polygons in Figure 11 and Figure 12. FM: Forest – Mixed; O: Oak woodland; A: Agriculture; PW: Prairie – Wet; PU: Prairie – Upland; PR: Prairie – Restoration; R: Riparian

Scientific name	Common name	Type	Location of suitable habitat
<i>Rana aurora</i>	Northern red legged frog	Amphibian	R4, FM1-12
<i>Melanerpes formicivorus</i>	Acorn woodpecker	Bird	O2, FM12

Scientific name	Common name	Type	Location of suitable habitat
<i>Spizella passerine</i>	Chipping sparrow	Bird	O2, A2
<i>Melanerpes lewis</i>	Lewis's woodpecker	Bird	O2
<i>Empidonax trailii brewsteri</i>	Little willow flycatcher	Bird	PW1-3, A3, PU4
<i>Progne subis</i>	Purple martin	Bird	PR
<i>Sitta carolinensis aculeata</i>	Slender-billed nuthatch	Bird	O2, PU14
<i>Sialia mexicana</i>	Western bluebird	Bird	O2, A2, PU1, PU11
<i>Sturnella neglecta</i>	Western meadowlark	Bird	PR
<i>Arborimus longicaudus</i>	Red tree vole	Mammal	Unknown
<i>Actinemys marmorata</i>	Western pond turtle	Reptile	All creeks
<i>Chrysemys picta</i>	Painted turtle	Reptile	All creeks, Willamette
<i>Bombus fervidus</i>	Yellow bumblebee	Invertebrate	PR
<i>Danaus plexippus</i>	Monarch	Invertebrate	PU11
<i>Driloleirus macelfreshi</i>	Oregon giant earthworm	Invertebrate	FM1-12
<i>Anodonta oregonensis</i>	Oregon floater	Invertebrate	Mission Creek
<i>Megomphix hemphilli</i>	Oregon megomphix	Invertebrate	R1-8

Amphibians

Most amphibians are aquatic breeders, so many species such as red-legged frogs, Pacific tree frogs, roughskin newts, and long-toed and northwestern salamander are found in the largest wetland at Champoege, on the edge of the restoration prairie (Figure 11, R4). Other amphibian species breed in moist terrestrial habitats such as large, old logs. Current threats to amphibians at Champoege include the invasive American bullfrog, who is known to eat native amphibians and reduce red-legged frog populations, as well as limited nesting areas such as large logs and riparian buffers.

Birds

Birds nest throughout Champoege's habitats: common yellowthroats, willow flycatchers, yellow warblers, and yellow-breasted chat perch and breed in shrubs and trees along riparian corridors; western bluebirds, chipping sparrows, savannah sparrows, and Lincoln's sparrows are found in the restoration prairie (Figure 11, PR); and slender-billed nuthatches and acorn woodpeckers nest in the oak woodland (Figure 11, O2). A bald eagle nest is present along the river, and barn swallows nest in the barn-like portion of the visitor's center. Non-native European starlings, house sparrows, and collared doves are present but likely do not have major impacts on native bird use. The overall small scale, fragmentation, and woody encroachment of Champoege's prairies limits this habitat for grassland species that favor

large areas of open landscape. Disturbance by dogs and pedestrians negatively impacts ground-nesting birds as well as acorn woodpeckers while they are gathering on the ground.

Mammals

Small mammals at Champoeg likely include voles, shrews, moles, mice, rats, gophers, chipmunks, weasels, and California ground squirrels. Expected medium-sized mammals include rabbits, raccoon, skunk, opossum (introduced), and possibly porcupine, fox, and bobcat. They likely also include muskrats, beaver, and otter, which are partly aquatic and partly terrestrial, and occasionally are seen by attentive humans – but most activity is nocturnal. Larger mammals likely include coyote, black-tailed deer, mountain lion and black bear. Several bat species of conservation concern may feed on insects over the river, and if so, they might roost and breed in snags in riparian areas and bat boxes installed at Champoeg. While suitable habitat exists for western gray squirrels, they are uncommon at Champoeg. If eastern gray squirrels are allowed to expand their range, competition for food and nest sites can be very detrimental for the native western grays. Similarly, invasive Virginia opossums may eat native snakes, nestlings, and bird eggs as part of their varied diet.

Reptiles

No reptiles were observed incidentally during site visits for this project. There are sightings of western painted turtles at Champoeg, however they are several decades old. Champoeg lacks sufficient wetlands and has too many predators and human impacts for supporting resident turtles. Champoeg's highest value for turtles is as a movement corridor to connect the Willamette River and habitats upstream.

Invertebrates

Butterfly and bee diversity seemed quite low during brief visits to Champoeg in the summer of 2022. The monarch butterfly was spotted in the park during the Bioblitz, and many other insects, spiders, slugs, and snails use the sites. Ryan and Champoeg Creeks may be good habitat for aquatic invertebrates, but no survey information was mentioned or located while conducting this assessment. Feral European honeybees, common during field visits, may compete with cavity-nesting or roosting birds, squirrels, or bats. Its use of resources may compete with use by native bees. Introduced earthworms may change plant communities, however, this has not been studied in this region.

Fish

No survey information was found for any fish or invertebrate inventories for any of Champoeg's creeks. Small creek mouths may be used by small fish and salmon smolts as refugia during periods of winter and spring high water. Some species need the silty bottoms that appear to be in Champoeg's creeks. Many potential native species such as cutthroat trout, stickleback, and red shiner could use the creeks at least seasonally, as could introduced species such as mosquitofish and yellow perch.

2.5 Existing vegetation communities

Champoeg contains a range of vegetation communities that can be grouped into seven general categories (Table 2). A broad range of conditions exist within these categories, including transitional areas that straddle different vegetation communities.

IAE used OPRD's function and value assessment categories (OPRD 2017) to assess the current conditions of each habitat type. Since OPRD designed their categories for ecosystem-scale assessments of parks, we selected only the categories suitable for smaller habitat scales assessments:

- Quantity and quality of native vegetation: 0-5
- Human-caused disturbance factors: 0-5
- Presence of habitat altering non-native invasive plant species: 0-5
- Presence of rare plant and/or wildlife species: 0-10
- Presence of specialized habitat or unique habitat features: 0-4

We grouped the scores into five categories: very poor (0-4), poor (5-9), fair (10-14), good (15-18), and excellent (19-25). The full assessment is in Appendix B: Natural resource function & value assessment.

Approximate locations for these vegetation communities can be seen in Figure 11 and Figure 12. A full species list can be found in Appendix A. Plant Species List.

Table 2. General vegetation communities at Champoeg State Heritage Area and their condition in 2023. The full breakdown of the Function & Value Score can be found in Appendix B.

Habitat	Size (acres)	Function & Value Score (0-25)	Current Condition (Very poor, poor, fair, good, excellent)
MIXED FOREST	307	8	Poor; limited native understory, high level of invasive species, minimal human disturbance, old growth trees, bald eagle nesting
AGRICULTURE	93	3	Very poor; poor native understory, highly disturbed
UPLAND PRAIRIE	85	11	Fair; significant native understory, minimally disturbed, specialized habitat
OAK WOODLAND	72	7	Poor; average native understory, highly disturbed, old growth trees, mature oaks
RIPARIAN	66	9	Poor; average native understory, minimally disturbed, rare plant species
MANAGED GRASSLAND	38	4	Very poor; poor native understory, moderately disturbed
WET PRAIRIE	27	9	Poor; average native understory, minimally disturbed, specialized habitat

Mixed forest

The largest vegetation community at Champoege is mixed forest, encompassing approximately 300 acres of the site (Figure 10). The canopy is a mixture of hardwoods and conifers, with Douglas-fir, bigleaf maple, and Oregon white oak as the predominant tree species. On the northern part of the site, where the forest meets the river, these species are intermixed with Oregon ash, and on La Butte to the east, are found alongside mature grand fir. Several non-native trees are found in the forest, particularly fruit trees such as paradise apple (*Malus domestica*) and European plum (*Prunus domestica*), which reflect the site's past as a homestead and town site. Generally, the understory is a monoculture of English ivy and Himalayan blackberry (*Rubus armeniacus*). The most common native species are western swordfern (*Polystichum munitum*), and shrubs such as beaked hazelnut and snowberry. A population of the rare native species tall bugbane is present in Champoege's mixed forest (See 2.7 Threatened and endangered species).



Figure 10. Mixed forest at Champoege State Heritage Area (L), with English ivy understory (R).

Agriculture

Approximately 120 acres of Champoege are actively farmed. The largest fields (Figure 11; A1-A6) are used to grow tall fescue (*Schedonorus arundinaceus*) and are crisscrossed with a network of ditches bordered by Oregon ash. The field to the east (Figure 11; A7) will be transitioned away from farming and will be replaced with facilities that will connect to, and expand, the central campground. The smaller agricultural unit (Figure 12; A8) is a mix of non-native grasses and is hayed annually. Nootka rose (*Rosa nutkana*) and Himalayan blackberry form dense thickets at the edges of fields.

Upland prairie

Upland prairie covers approximately 80 acres of Champoege. Most of the upland prairie sites are a mix of introduced grasses such as meadow foxtail (*Alopecurus pratensis*), tall oatgrass (*Arrhenatherum elatius*), and sweet vernalgrass (*Anthoxanthum odoratum*). The exception to this trend is the 45-acre upland prairie that has been in active restoration since 2000 (Figure 11; PR). The restoration prairie has a dense cover of native tufted hairgrass (*Deschampsia cespitosa*), with patches of native forbs such as common selfheal (*Prunella vulgaris*) and dwarf checkermallow (*Sidalcea malviflora*) (Figure 13). Himalayan blackberry grows on the edges of the upland prairies, with small patches encroaching into the fields.

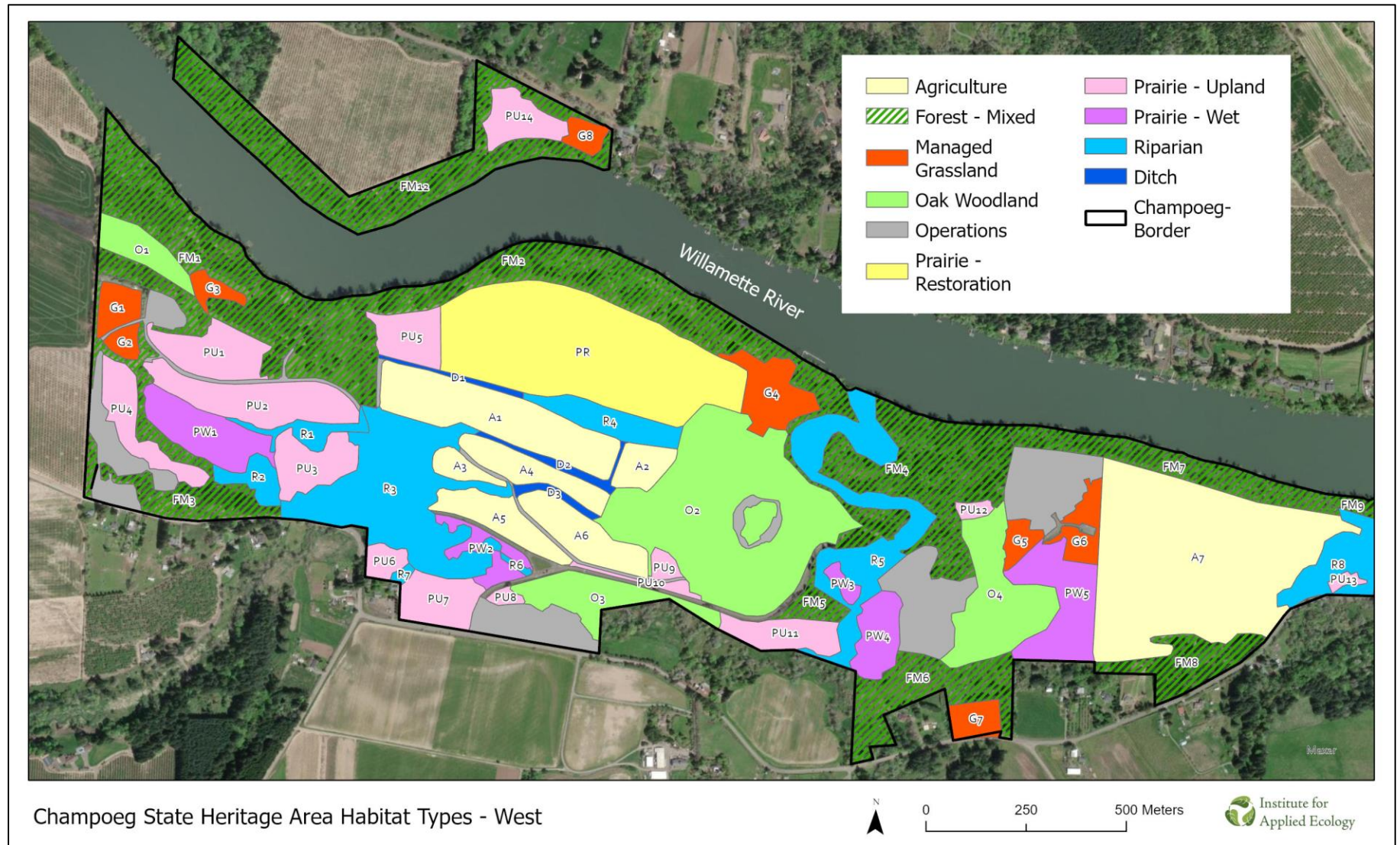


Figure 11. Habitat types in the western portion of Champoege State Heritage Area.

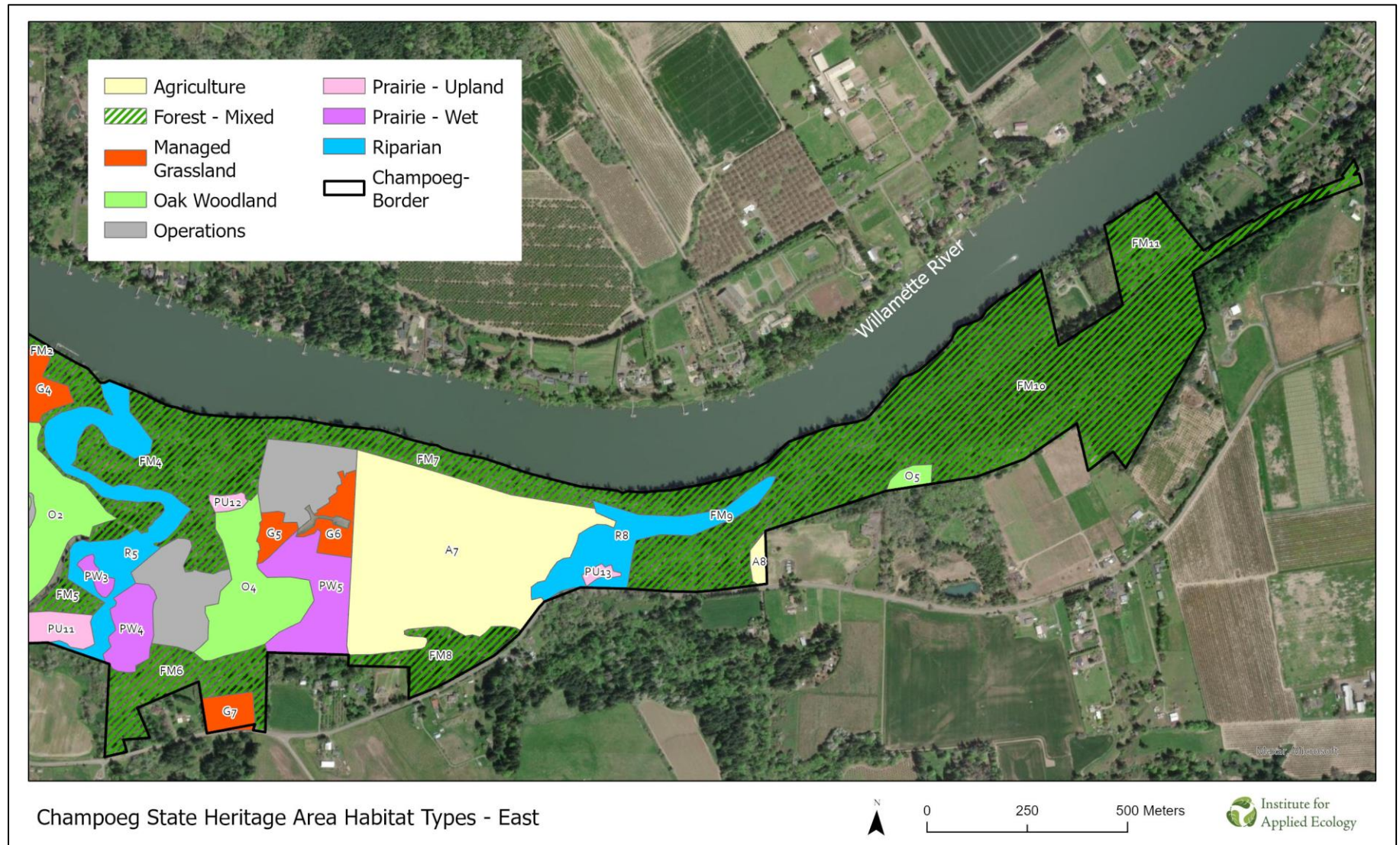


Figure 12. Habitat types in the eastern portion of Champoege State Heritage Area.



Figure 13. Native forbs blooming in the restoration prairie (L); a dwarf checkermallow (*Sidalcea malviflora*) (R).

Oak woodland

Oak woodland comprises approximately 70 acres of Champoeg and is predominated by Oregon white oak with scattered Oregon ash in wetter areas. At Champoeg, this vegetation community is primarily found in the center of the site, around the disc golf course (Figure 11; O2). Heavy visitor use, particularly in the drier summer months, has led to soil compaction, limited sapling establishment, and tree loss (Figure 14). The understory consists primarily of introduced species such as narrowleaf plantain (*Plantago lanceolata*) and tall fescue. Himalayan blackberry is present in patches, but encroachment is limited in the disc golf course area because the understory is mowed for recreational use.



Figure 14. Oak woodland at Champoeg State Heritage Area centered around the disc golf course (L); fallen Oregon white oak (*Quercus garryana*) (R).

Riparian

Riparian vegetation covers approximately 60 acres at Champoeg and is found along Mission, Champoeg, and Ryan Creeks, as well as around the ditches bordering agricultural fields (Figure 15).

Oregon ash and poplar (*Populus tristis*) predominate the overstory, while the understory is heavily invaded with reed canary grass (*Phalaris arundinacea*) and Himalayan blackberry. The riparian habitat is unique at Champoeg in that it is home to a rare native species, peacock larkspur (See 2.7 Threatened and endangered species) (Figure 15).



Figure 15. Riparian vegetation along Champoeg Creek (L); the threatened peacock larkspur (*Delphinium x pavonaceum*)(R).

Managed grassland

Managed grasslands are open areas that were likely historical prairie and are now kept mowed for public use. Approximately 40 acres at Champoeg are managed grassland, primarily in high-use areas like the picnic area (Figure 11, G1-G3) and the campground (Figure 11, G5-G7). They are predominated by common non-native weeds such as meadow foxtail, Queen Anne's lace (*Daucus carota*), Canada thistle (*Cirsium arvense*) and Himalayan blackberry.

Wet prairie

Approximately 27 acres of Champoeg are wet prairie. Wet prairies differ from other vegetation communities by their high soil moisture content, seasonal inundation, and the presence of hummocks. Like other prairie habitats at Champoeg, wet prairies are predominated by non-native grasses such as meadow foxtail, tall oat grass, and reed canary grass (Figure 16). Himalayan blackberry, Nootka rose and oneseed hawthorn (*Crataegus monogyna*) are also encroaching into the prairies (Figure 16). Despite the presence of these invaders, Champoeg's wet prairies retain remnant native species such as yampah, possibly because their wet soils made them unsuitable for farming.



Figure 16. Nootka rose (*Rosa nutkana*, L) and reed canary grass (*Phalaris arundinacea*, R) encroaching into prairie habitat.

2.6 Invasive species

As invasive species enter new ecosystems, they move through five stages of biological invasion: (1) transport, (2) introduction, (3) establishment, (4) spread, and (5) negative impacts (Figure 17).

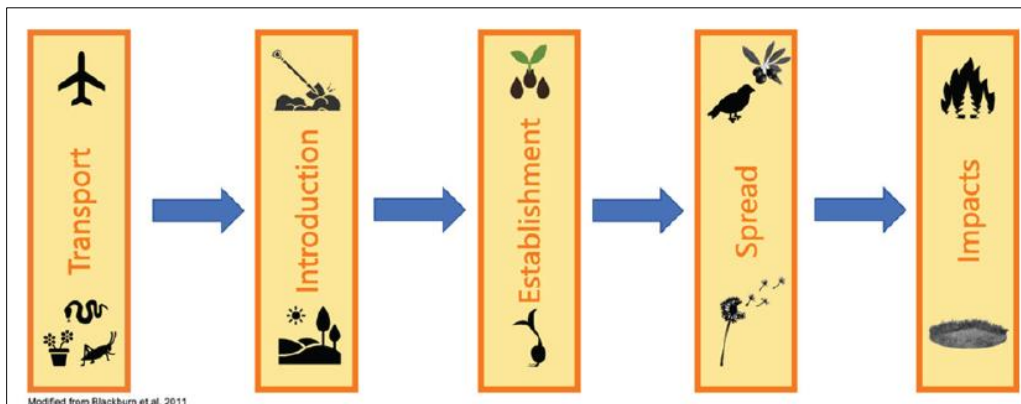


Figure 17. The process of biological invasion (Lieurance et al 2022).

Rapid detection can stop invasions at the introduction phase, but it is more likely that species will be identified when they have reached the establishment phase and can maintain a self-sustaining population. Once established, aggressive invaders will spread throughout the system, producing an array of negative consequences.

In August and September of 2021, IAE mapped the presence and abundance of 57 invasive and non-native species across Champoege. While all 57 are included in OPRD's list of species of management concern, their impacts on native ecosystems vary according to their ability to modify native habitat and their present distribution at Champoege. We have ranked the top species of concern present at Champoege by grouping them into three general categories based on how far they have advanced through the process of invasion (Table 3).

- **Priority 1** species are in the final stage of invasion and are causing a significant change to ecological processes at Champoeg.
- **Priority 2** species are those that are actively spreading throughout Champoeg and have the ability to create monocultures but are still at low densities. They may progress to Priority 1 if they remain unchecked.
- **Priority 3** species have an established population but are unlikely to spread widely or create monocultures. They can become dominant members of a plant community by outcompeting native species.

Table 3. Invasive species at Champoeg State Heritage Area, as grouped by priority.

Priority	Scientific name	Common name	State Status
Priority 1	<i>Hedera helix</i>	English ivy	List B
	<i>Rubus armeniacus</i>	Himalayan blackberry	List B
	<i>Phalaris arundinacea</i>	Reed canary grass	List B
Priority 2	<i>Cirsium arvense</i>	Canada thistle	List B
	<i>Crataegus monogyna</i>	Oneseed hawthorn	List B
	<i>Cytisus scoparius</i>	Scotch broom	List B
	<i>Lythrum salicaria</i>	Purple loosestrife	List B
Priority 3	<i>Senecio jacobaea</i>	Tansy ragwort	List B
	<i>Hypericum perforatum</i>	St Johnswort	List B
	<i>Prunus avium</i>	Sweet cherry	Not listed
	<i>Pyrus communis</i>	Common pear	Not listed
	<i>Ilex aquifolium</i>	English holly	Not listed

Priority 1 species

- **English ivy** has successfully invaded all forested areas at Champoeg, in many places crowding out all other native understory species creating “ivy deserts” (Figure 18). English ivy actively changes forest structure, preventing sapling establishment and suppressing root development of mature trees, shifting the site to a more open habitat (Okerman 2000). As English ivy climbs

upward, it girdles trees, and competes for water, light, and nutrients, weakening host plants. Those with sensitive skin can also have a reaction to the mild toxins present in English ivy leaves, which is of particular concern at a publicly accessible park like Champoeg.



Figure 18. English Ivy (*Hedera helix*) in early stages of tree girdling (L), and overtaking a tree (R).

- **Himalayan blackberry** is found throughout Champoeg in every vegetation community, but is particularly abundant in riparian corridors (Figure 19). Native riparian vegetation overhangs the streams, providing shade that regulates the temperature and provides refugia to salmonids. Their roots also stabilize the banks and prevent erosion. Himalayan blackberry, on the other hand, is too low-growing to provide shade, and has a shallow root system. Instead of holding the bank together, the opposite is happening at Champoeg: Himalayan blackberry grows on the surface, and the banks below it become undercut (Figure 19). Without intervention, the undercut banks will continue to erode, depositing silt into the stream, negatively impacting aquatic wildlife. The dense stands of Himalayan blackberry not only prevent establishment of saplings and native vegetation, but actively grow over and choke out other species, growing the monoculture and compounding the negative effects. Given that Champoeg has fish-bearing streams, managing Himalayan blackberry will have a positive downstream effect on native plant diversity.



Figure 19. A portion of Mission Creek is overtaken by Himalayan blackberry (*Rubus armeniacus*, L); Himalayan blackberry growing on the banks of Champoeg Creek, leading to undercut banks (R).

- **Reed canary grass** is a perennial wetland plant that has created a thick layer of thatch along portions of all Champoeg’s waterways (Figure 20). This thatch limits the growth and establishment of native species, creating a monoculture. Like the other Priority 1 species, reed canary grass also alters the surrounding ecosystem, in this case by reducing organic soil content and increasing soil moisture, changing both the native plant and invertebrate communities (Weilhoefer et al. 2017). Reed canary grass presence is of particular concern in the wetland west of the disc golf course (Figure 22), as it is invading the restoration prairie and has the potential to negatively impact the population of peacock larkspur to the south.



Figure 20. Reed canary grass (*Phalaris arundinacea*) monocultures along Champoeg Creek.

Priority 2 species

- **Canada thistle, oneseed hawthorn, and Scotch broom** (*Cytisus scoparius*) are found primarily in upland edge habitat at Champoeg, but are spreading into rare oak woodland and prairie habitat (Figure 23). These aggressive species regularly create monocultures. Canada thistle has

been known to cover up to 75% of a field (McClay 2002), while Scotch broom can make up 100% cover of an infested site (Hill et al. 2016). Oneseed hawthorn regrows from cut stumps, producing impenetrable thickets of multi-stemmed trees.

- **Purple loosestrife** was found at only one location at Champoege: at the boat dock on the Willamette River (Figure 23). This incredibly competitive species alters the hydrology, soil structure, chemistry, and nutrient cycling of ecosystems. Although only a few individuals were found, this is a high-priority species given the amount of riparian habitat available at Champoege for it to invade.

Priority 3 species

- **Tansy ragwort** (*Senecio jacobaea*) and **St. Johnswort** (*Hypericum perforatum*) are found primarily in upland prairie habitat at Champoege (Figure 24). Both species are toxic to animals and can be a threat to neighboring rural properties. Animals ingesting St. Johnswort can develop lesions, and tansy ragwort can be fatal to horses and cattle. A healthy population of cinnabar moth caterpillars are present on tansy ragwort (Figure 21), which were released as a biological control agent. The caterpillars defoliate and stress the plants, but tansy ragwort can rebloom after the caterpillars pupate, so they do not eradicate the species.
- **English holly** (*Ilex aquifolium*), **sweet cherry** (*Prunus avium*), and **common pear** (*Pyrus communis*) are forest species found most abundantly at La Butte (Figure 24). None of these species are considered noxious by the state of Oregon, however all three spread rapidly by wildlife who consume their fruit, displacing native species.



Figure 21. Tansy ragwort (*Senecio jacobaea*) with biological control cinnabar moth larvae growing on it.

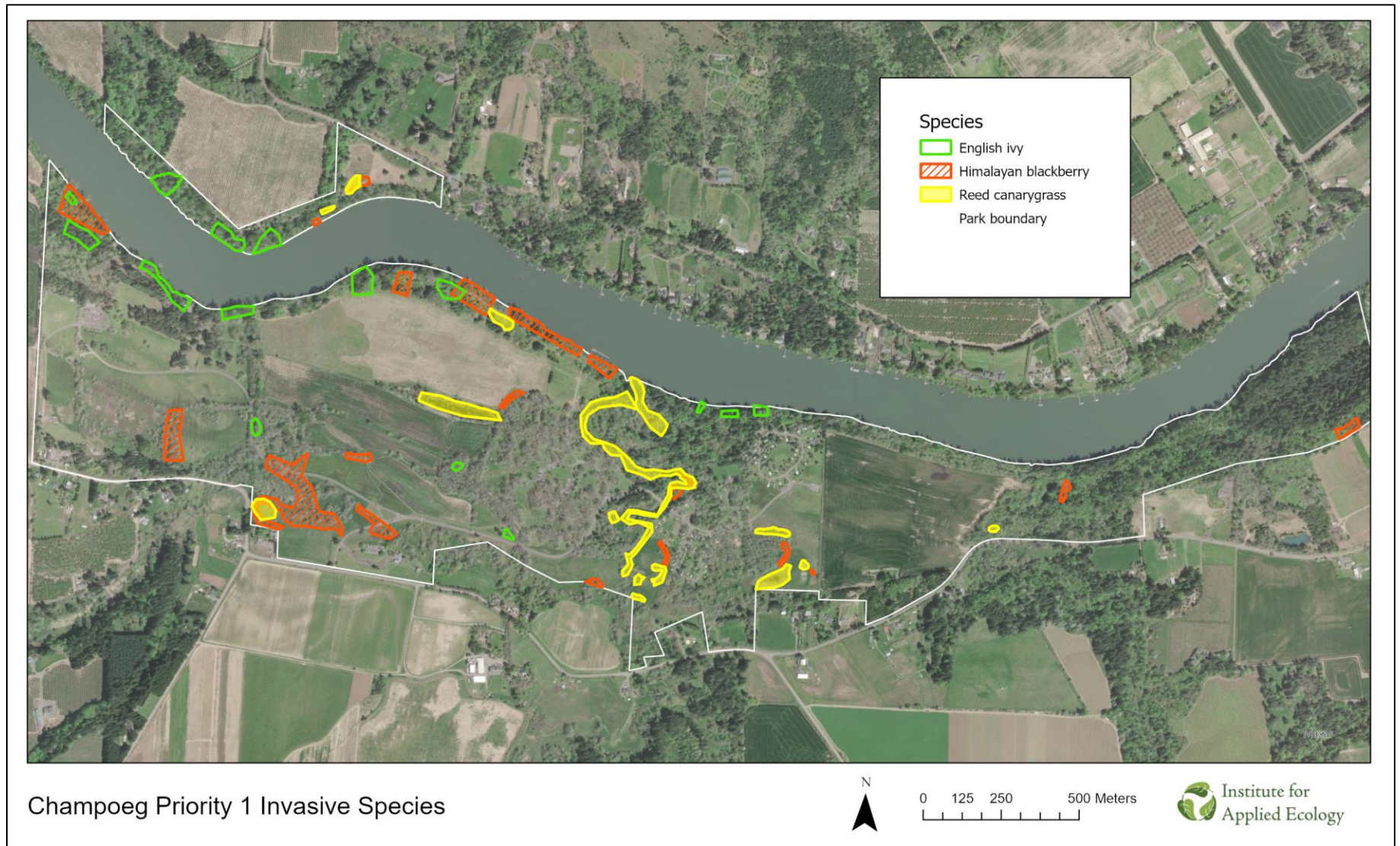


Figure 22. Priority 1 invasive species at Champoege State Heritage Area. Priority 1 species are in the final stage of invasion and are causing a significant change to ecological processes.

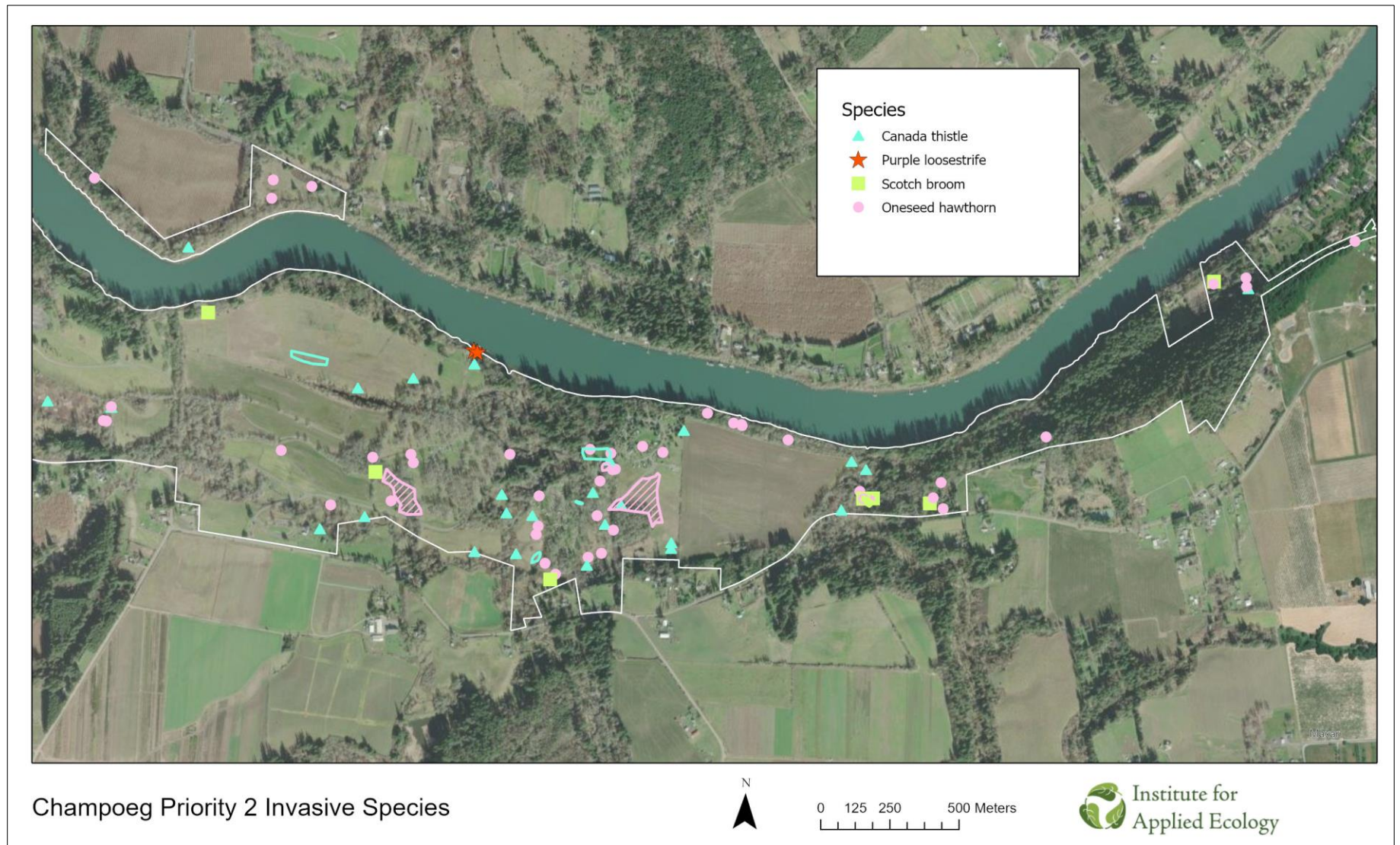


Figure 23. Priority 2 invasive species at Champoeg State Heritage Area. Priority 2 species are actively spreading and have the ability to create monocultures but are still at low densities.

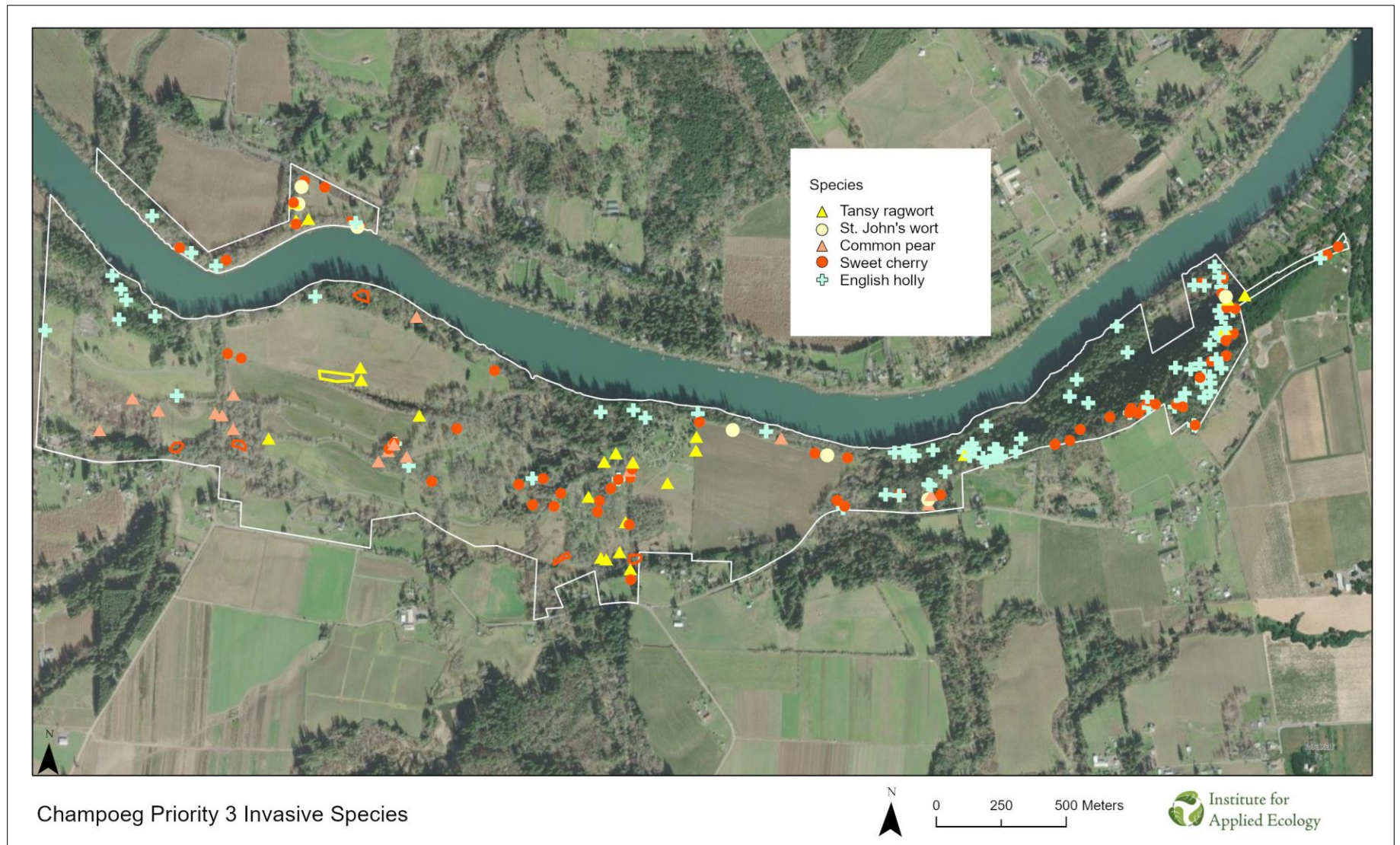


Figure 24. Priority 3 invasive species at Champoege State Heritage Area. Priority 3 species have an established population but are unlikely to spread widely or create monocultures.

2.7 Threatened and endangered species

Two rare plant species are found at Champoeg: peacock larkspur and tall bugbane. Peacock larkspur is endemic to the Willamette Valley and is critically endangered in Oregon due to its rarity. It prefers shady edges of wet prairies: habitat that is rare and fragmented throughout its range. In June 2021, IAE identified and mapped 43 peacock larkspur at Champoeg (Figure 25). Peacock larkspur is primarily found in ditches between agricultural fields and in the restoration prairie at Champoeg.

Removed from online document

Figure 25. Locations of the critically endangered peacock larkspur (*Delphinium ×pavonaceum*) at Champoeg State Heritage Area.

Tall bugbane is a rare species in Oregon and is a candidate for listing as threatened or endangered by the Oregon Department of Agriculture. It is a species of old-growth forests, a habitat that is limited across its range, where it proliferates in short-lived canopy gaps created by infrequent disturbance. In July 2023, IAE staff identified and mapped 162 flowering and 8 non-flowering tall bugbane stems at Champoeg (Figure 26). The population is limited to the north-facing slope of La Butte under deciduous trees and is also present immediately adjacent to the hiking trail (Figure 27).

Removed from online document

Figure 26. Locations of tall bugbane (*Actaea elata*) at Champoeg, as surveyed in July 2023.



Figure 27. Tall bugbane (*Actaea elata*) in flower (L), and along the hiking trail (R) at Champoeg.

3. DESIRED FUTURE CONDITIONS

Managing Champoeg's natural habitats requires a balance between ecological integrity and visitor use. All four of the strategy habitats found at Champoeg – upland prairie, wet prairie, riparian, and oak woodland – have portions designated for visitor use that are part of OPRD's mission to provide recreational sites. A large upland prairie is an off-leash dog area (Figure 11; PU2), a campground is located on wet prairie habitat (Figure 11, map code PW4), a walking trail is found in riparian habitat (Figure 11; R3), and the oak woodland is home to a disc golf course (Figure 11; O2). These areas should be managed for noxious weeds, mowed to maintain open-canopy habitat, monitored to assess ongoing impacts of visitor use, and augmented with native species when opportunities arise.

Habitats currently not used by visitors and in more remote areas of the park are strong candidates for more aggressive restoration activities that can enhance biodiversity and habitat value. These areas include riparian areas along Champoeg Creek (Figure 11; R5) and remnant wet prairie (Figure 11; PW5). Additional restoration activities in these areas could include chemical fallowing followed by seeding, earth-movers to build habitat complexity, and tree felling and prescribed fire to maintain vegetation structure. The desired future conditions for habitats at Champoeg are summarized in Table 4.

Table 4. Desired future conditions for Champoeg State Heritage Area. The full breakdown of the Function & Value Score can be found in Appendix B.

Habitat	Function & Value Score (0-25)	Desired Future Conditions (Very poor, poor, fair, good, excellent)
MIXED FOREST	12	Fair; average native understory, minimal human disturbance and invasive species, old growth trees, bald eagle nesting, rare plant species
AGRICULTURE	5	Poor; no invasive species present, highly disturbed
UPLAND PRAIRIE	14	Fair; significant native understory, minimally disturbed, specialized habitat
OAK WOODLAND	10	Fair; significant native understory, moderately disturbed, old growth trees, mature oaks
RIPARIAN	10	Fair; average native understory, minimally disturbed, rare plant species
MANAGED GRASSLAND	5	Poor; limited native understory, moderately disturbed
WET PRAIRIE	11	Fair; Significant native understory, minimally disturbed, specialized habitat

Managing Champoeg’s natural habitats requires a balance between ecological integrity and visitor use. All four of the strategy habitats found at Champoeg – upland prairie, wet prairie, riparian, and oak woodland – have portions designated for visitor use that are part of OPRD’s mission to provide recreational sites. A large upland prairie is an off-leash dog area (Figure 11; PU2), a campground is located on wet prairie habitat (Figure 11, map code PW4), a walking trail is found in riparian habitat (Figure 11; R3), and the oak woodland is home to a disc golf course (Figure 11; O2). These areas should be managed for noxious weeds, mowed to maintain open-canopy habitat, monitored to assess ongoing impacts of visitor use, and augmented with native species when opportunities arise.

Habitats currently not used by visitors and in more remote areas of the park are strong candidates for more aggressive restoration activities that can enhance biodiversity and habitat value. These areas include riparian areas along Champoeg Creek (Figure 11; R5) and remnant wet prairie (Figure 11; PW5). Additional restoration activities in these areas could include chemical fallowing followed by seeding, earth-movers to build habitat complexity, and tree felling and prescribed fire to maintain vegetation structure. The desired future conditions for habitats at Champoeg are summarized in Table 4.

Table 5. Desired future conditions for Champoeg State Heritage Area. The full breakdown of the Function & Value Score can be found in Appendix B.

Habitat	Function & Value Score (0-25)	Desired Future Conditions (Very poor, poor, fair, good, excellent)
MIXED FOREST	12	Fair; average native understory, minimal human disturbance and invasive species, old growth trees, bald eagle nesting, rare plant species
AGRICULTURE	5	Poor; no invasive species present, highly disturbed
UPLAND PRAIRIE	14	Fair; significant native understory, minimally disturbed, specialized habitat
OAK WOODLAND	10	Fair; significant native understory, moderately disturbed, old growth trees, mature oaks
RIPARIAN	10	Fair; average native understory, minimally disturbed, rare plant species
MANAGED GRASSLAND	5	Poor; limited native understory, moderately disturbed
WET PRAIRIE	11	Fair; Significant native understory, minimally disturbed, specialized habitat

4. GOALS AND OBJECTIVES

By averaging the Function & Value Scores across the different habitat types, Champoeg is rated poor: an 8 out of a possible 25. By working to achieve the desired future conditions for each habitat type (Table 5), Champoeg's average score can be raised to a fair: 10 out of 25. To achieve this, IAE has created five goals based on the Function & Value Scores, as well as one goal based on feedback from the Confederated Tribes of Grand Ronde. The numbers in brackets refer to the scoring outlined by OPRD (OPRD 2017).

Goal 1: Maintain number of habitat-altering invasive species to moderate/typical (3).

Objective 1.1: Reduce existing 46 acres of Priority 1 invasive species by at least 25% to minimize negative impacts on native vegetation.

Objective 1.2: Keep Priority 2 and 3 invasive species cover to existing nine acres or less to prevent their spread into adjoining habitats.

Objective 1.3: Reduce presence of purple loosestrife, common pear, and sweet cherry to less than one percent cover while they still exist at low densities to protect sensitive areas from negative effects.

Objective 1.4: Keep invasive species not currently present at Champoeg to zero percent cover through Early Detection and Rapid Response (EDRR).

Goal 2: Reduce human-caused disturbance factors from moderately disturbed (2) to minimally disturbed (3).

Objective 2.1: Maintain 180 acres of upland prairie in an open condition by removing and preventing encroachment of woody vegetation.

Objective 2.2: Improve resiliency of oak woodlands by reducing mature tree loss and increasing sapling to tree ratio (S:T) to between 0.5 and 1.

Objective 2.3: Initiate research project to investigate causes of Oregon white oak mortality.

Goal 3: Increase relative quantity and quality of native vegetation from a site with pockets of natives present (1) to a site with an average number of natives (2).

Objective 3.1: Transition first 0.5 miles of bank and riparian area of Champoeg Creek closest to the mouth of the Willamette River from a non-native monoculture to diverse native plant assemblages that support salmonids and aquatic wildlife.

Objective 3.2: Augment six acres of wet prairie and restore hydrologic diversity to increase presence and diversity of native wet prairie flora and fauna.

Objective 3.3: Convert 46 acres of current agricultural fields into a contiguous 136-acre upland prairie that connects with the existing restoration sites and increases native cover and connectivity.

Goal 4: Improve gathering opportunities for tribal members by increasing access and augmenting and reintroducing culturally significant plant species.

Objective 4.1: Expand two-acre harvest area in restoration prairie to 15 acres of culturally significant prairie and riparian species.

Objective 4.2: Create an additional eight-acre herbicide-free gathering area to increase diversity of available habitat for culturally significant plant species.

Objective 4.3: Support tribal gathering events at Champoeg through permitting and the installation of permanent event structures.

Goal 5: Protect existing populations of documented rare plants and/or wildlife species (2)

Objective 5.1: Conduct annual surveys to capture population changes over time of rare plants peacock larkspur and tall bugbane to capture opportunities for intervention.

Objective 5.2: Collect baseline data for wildlife species likely to be present at Champoeg.

5. MANAGEMENT RECOMMENDATIONS

To raise Champoeg's Function & Value Score to a 10 out of a possible 25, the following sections provide management recommendations to guide OPRD on each goal and objective.

5.1 Integrated pest management plan

Goal 1: Maintain number of habitat-altering invasive species to moderate/typical (3).

Invasive species population density exists on a spectrum, depending upon the stage of invasion they have reached and the speed of their spread. Small populations can be eradicated quickly and at a low cost, but as they become widespread and abundant, focus shifts to management and resource protection (Figure 28). At Champoeg, the Priority 1 species Himalayan blackberry, English ivy, and reed canary grass (see 2.8 Invasive species) have reached the stage where the goal is to minimize harmful impacts. Most of the Priority 2 and 3 species are at the containment stage, with eradication unlikely. It is possible that with a concerted effort, species that are highly localized such as purple loosestrife, common pear, and sweet cherry can be extirpated from Champoeg.

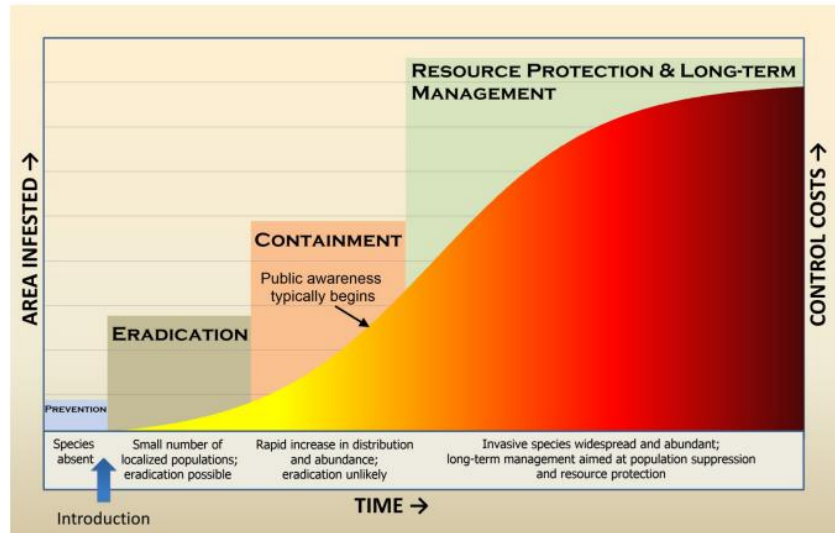


Figure 28. The invasion curve showing how species spread over time (Harvey and Mazzotti 2014)

Objective 1.1: Reduce existing 46 acres of Priority 1 invasive species by at least 25% to minimize negative impacts on native vegetation and prevent continued spread.

Priority 1 invasive species – English ivy, Himalayan blackberry, and reed canary grass – spread rapidly and have already made significant changes to Champoeeg’s ecosystem (see Priority 1 species). To mitigate impacts from these species, an aggressive, multi-faceted approach of mechanical and chemical management is recommended to target the invasive monocultures that are currently established at Champoeeg. A schedule of treatments can be found in Table 6.

ENGLISH IVY

English ivy has a waxy coating that allows it to remain green year-round. This benefits management practices because OPRD can spray English ivy monocultures (Figure 22) during winter when other species are senescing. Applying triclopyr with a surfactant will allow the chemical to break through the waxy cuticle.

Where English ivy is climbing trees (Figure 10), enlisting volunteers from a local chapter of the No Ivy League can help free the trees. Since their inception in 2011, the No Ivy League has freed over 1,500 trees from ivy encroachment (City of Portland 2023). Removing ivy does not require any special training: the vines can simply be pulled from the trees year-round. Vines higher up in the trees or that are too large to pull can be cut at the base and left to die on the branch.

HIMALAYAN BLACKBERRY

Himalayan blackberry is best managed through a combination of herbicide applications and mowing. In late summer, Himalayan blackberry monocultures (Figure 22) can be treated with triclopyr followed by mowing a few weeks later to remove aboveground biomass. After several years of treatment, the areas should be replanted with native shrubs to prevent reestablishment of Himalayan blackberry (see Appendix A. Plant Species Lists for species list).

REED CANARY GRASS

Reed canary grass can be managed in the same way as Himalayan blackberry: with a regular schedule of herbicide applications and mowing. In the spring when plants are actively growing, an aquatic-safe glyphosate formulation can be applied to new shoots, followed by mowing in the fall to remove thatch that builds up over time. Planting shrubs along Champoeg Creek where the reed canary grass is most abundant will help shade out the invasive grass and reduce the need for active management (see Appendix A. Plant Species Lists for species list).

Objective 1.2: Keep Priority 2 and 3 invasive species cover to existing nine acres or less to prevent their spread into adjoining habitats.

Managing existing populations of Priority 2 and 3 invasive species at Champoeg (Table 3) will help prevent their spread and protect existing high-priority habitats from additional stressors. A schedule of treatments can be found in Table 6.

CANADA THISTLE AND TANSY RAGWORT

Both Canada thistle and tansy ragwort are found in open areas, primarily in Champoeg's prairies (Figure 23, Figure 24). In spring, when the species are actively growing, both species can be treated with clopyralid, a selective herbicide for broadleaf weeds. Where the species are growing in the restoration prairie, regular volunteer events are helpful for hand-pulling the species.

ST. JOHNSWORT

Hand pulling St. Johnswort is not recommended as it can reestablish from plant fragments. Large populations such as those found along Champoeg's trail systems can be treated with glyphosate in spring before the blossoms open.

ONESEED HAWTHORN AND SCOTCH BROOM

A combination of mechanical and chemical treatments can be used to manage oneseed hawthorn and Scotch broom. Where the species have grown into trees, they can be cut at the stump and stumps can be sprayed or painted with triclopyr to prevent regrowth. Oneseed hawthorn saplings can be treated with triclopyr. However, because of the sparse vegetation on Scotch broom, it is better hand-pulled while still young.

Table 6. Recommended control methods for invasive species at Champoeg State Heritage Area.

Management Area	Timing	Prescription
MIXED FOREST (FM1-10)	Spring; young growth	Spot spray St. Johnswort with glyphosate before blossoms open
	Summer; actively growing	Lead volunteers on English ivy removal from trees at a Champoeg chapter of the No Ivy League
	Fall; after fruiting	Cut English holly, oneseed hawthorn, and Scotch broom, then spray or paint the stumps with triclopyr

Management Area	Timing	Prescription
UPLAND PRAIRIE (PU1-10)	Winter; senescence	Spot spray English ivy monocultures with triclopyr with surfactant to cut through waxy coating
	Spring; young growth	Spot spray Canada thistle and tansy ragwort with clopyralid
OAK WOODLAND (O2)	Summer; in bloom	Conduct bimonthly hand weeding events at restoration prairie with the support of the Confederated Tribes of Grand Ronde, focusing on Canada thistle and tansy ragwort
	Spring; young growth	Spot spray Canada thistle and tansy ragwort with clopyralid
	Summer; in bloom	Mechanically remove Scotch broom, ensuring tap root is pulled up. Seedlings can be hand pulled; larger individuals with a weed wrench
RIPARIAN (R1-8)	Fall; after fruiting	Cut oneseed hawthorn and spray or paint stumps with triclopyr
	Spring; young growth	Spot spray reed canary grass monocultures with aquatic-safe glyphosate
	Summer; actively growing	Spot spray Himalayan blackberry monocultures with triclopyr ensuring leaves are thoroughly wet
	Fall; after fruiting	Mow treated Himalayan blackberry and reed canary grass monocultures
WET PRAIRIE (PW1-5)	Winter; at senescence	Plant native shrubs in areas where reed canary grass and Armenian blackberry have been controlled to fill bare ground and provide competition (see Appendix A. Plant Species Lists for species list)
	Spring; young growth	Spot spray reed canary grass monocultures with aquatic-safe glyphosate
	Fall; after fruiting	Mow treated reed canary grass monocultures

Objective 1.3: Reduce presence of purple loosestrife, common pear, and sweet cherry to less than one percent cover while they still exist at low densities to protect sensitive areas from negative effects.

Eradication requires a large financial and time investment, so is only recommended for species that are either at low densities, such as purple loosestrife, or have low establishment rates, such as common pear and sweet cherry (Table 7). Once an eradication program has begun, ongoing treatments and monitoring (Table 8) are vital to maintain stress on the target species and prevent them from rebounding.

PURPLE LOOSESTRIFE

Purple loosestrife grows in the water, so spraying with an aquatic-safe glyphosate is necessary to target the species. To eradicate this highly aggressive invader, small populations of purple loosestrife can be treated in June, July, and August while it is in bloom and easy to identify. In fall, flower heads that remain should be cut to prevent seed set.

SWEET CHERRY AND COMMON PEAR

In the winter, sweet cherry and common pear trees throughout Champoeg's mixed forest can be felled and chipped. Chipped wood can be dispersed or used by Park staff as needed.

Table 7. Management recommendations for purple loosestrife (*Lythrum salicaria*), common pear (*Pyrus communis*), and sweet cherry (*Prunus avium*).

Management Area	Timing	Prescription
RIPARIAN	Summer; in bloom	Spray purple loosestrife monthly in June, July, and August with aquatic-safe glyphosate (Rodeo at 1%), focusing on outbreak location at boat dock
	Fall; before seed set	Cut any flowering purple loosestrife heads that may have been missed through herbicide application in September to prevent seed set.
MIXED FOREST	Winter; at senescence	Fell all sweet cherry and common pear trees to stop continued production of fruit used in spread and establishment of non-native tree canopy

Objective 1.4: Keep invasive species not currently present at Champoeg to zero percent native cover through Early Detection and Rapid Response (EDRR).

Control and eradication should be paired with a regular monitoring strategy to prevent the establishment and spread of invasive species (Table 8). As a public park, Champoeg has an opportunity to educate the public about their role in invasive species transmission, as well as engage volunteers in monitoring outbreaks. Continuing to lease unrestored areas of the site for agricultural use is also a useful weed prevention tool, as land managers will target invasive species that diminish crop yields.

Table 8. Monitoring strategy for invasives at Champoege State Heritage Area.

Management Area	Timing	Prescription
UPLAND PRAIRIE; OAK WOODLAND; RIPARIAN	Summer; in bloom	Conduct annual invasive species monitoring each summer at high-traffic locations most likely to be routes of transmission: boat dock, disc golf course, campground, picnic areas, and day-use areas
MIXED FOREST; WET PRAIRIE	Summer; in bloom	Perform biennial invasive species monitoring in summer of areas with little to no public access, in particular La Butte
ALL	Throughout year	Engage volunteers to track and notify OPRD of invasives through the creation of educational brochures and a 'Report an Invader' section of the website
ALL	Throughout year	Install education signage on the threats of invasive species to native ecosystems, particularly in high-use areas. Install boot brush stations at trail heads.

5.2 Conservation priorities

Goal 2: Reduce human-caused disturbance factors from moderately disturbed (2) to minimally disturbed (3).

Champoege's upland prairie and oak woodland habitats have both been heavily affected by human-caused disturbance. Grasslands were once found throughout the Willamette Valley, but land conversion for development and agriculture, coupled with fire suppression and invasive species, diminished upland prairies to an estimated 1% of their former distribution. Similarly, it is estimated that less than 5% of historical oak woodlands remain in the Willamette Valley due to land conversion, fire suppression, and the introduction of invasive species (Oregon Conservation Strategy 2016). At Champoege these habitats continue to be affected by fire suppression and heavy visitor use.

Objective 2.1: Maintain 180 acres of upland prairie in an open condition by removing and preventing encroachment of woody vegetation.

The harvest area in Champoege's restoration prairie, restored in cooperation with the Confederated Tribes of Grande Ronde, has many important First Foods including camas, brodiaea (*Brodiaea elegans*), and ookow (*Dichelostemma congestum*). Rare and sensitive grassland-dependent species rely on upland prairie habitat at Champoege, including the western bluebird and monarch butterfly.

Aside from aggressive invasives that displace native species (see 5.1 Integrated pest management plan), the greatest threat to upland prairie habitat at Champoege is encroachment from shrubs and trees that transition upland prairies into forest. This process of succession can be prevented through the continued use of mowing and the expansion of prescribed fire to other areas of Champoege.

MOWING

Late-season mowing suppresses the growth of woody vegetation, reduces thatch, opens bare ground annual natives rely on to germinate, and paired with targeted herbicide treatments, reduces the presence of non-native and invasive species. Best practices are to mow biennially after native seed set in August, and after ground bird nesting season in July, to heights of approximately six inches. See below for a map of mowing locations (Figure 29) and a mowing schedule (Table 9).

PRESCRIBED BURNING

Prescribed burning provides similar benefits as mowing, with the addition of improving soil health through added nitrogen and phosphorous, stimulating seed germination of native species, and creating bare ground for seeding. The highest priority is to burn the restoration prairie, given its size, the presence of endangered species, high native species diversity, and the amount of resources and time already invested into the site (Figure 30). The second priority for burning is the western prairie complex for its large camas populations, a species that thrives in post-burn environments. The remaining prairies are logistically complicated to burn given their location along park boundaries and camping areas.

In a given year, the prairies can be either mowed or burned, but not both. If a prescribed burn does not occur due to scheduling conflicts, availability, or weather, then the appropriate unit should be mowed. A four-year schedule is listed below (Table 9), which would be repeated once the fourth year is complete.

Table 9. Mowing and prescribed burning schedule for Champoeg State Heritage Area. Once completed, the sequence would be repeated starting at year one.

Year	Prescribed Burn Areas	Mowing Areas
1	Burn Area 1 (PU5, PR)	None
2	None	PU6-13
3	Burn Area 2 (PU1-4)	None
4	None	PU6-13

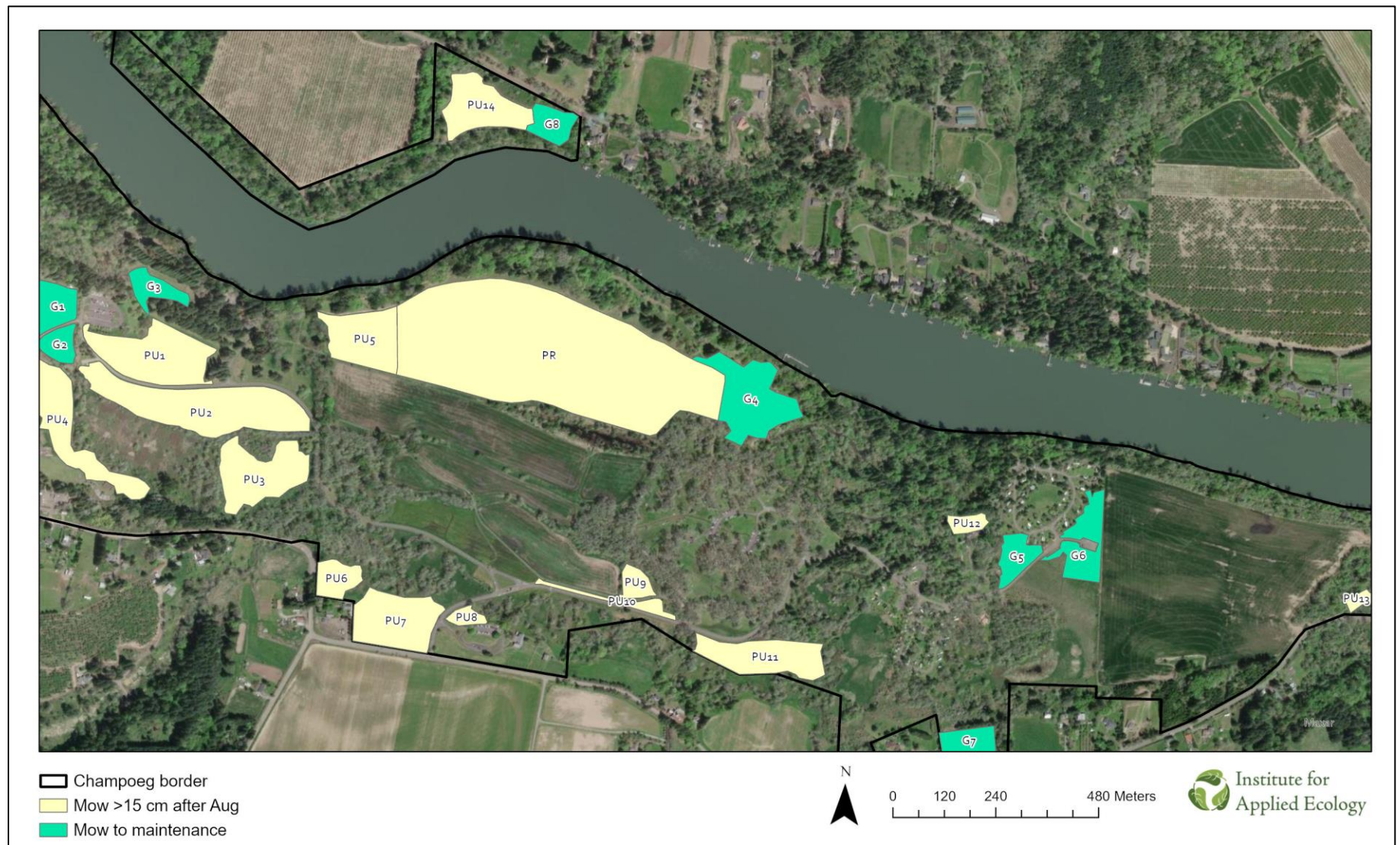


Figure 29. Areas requiring mowing to maintain open grassland habitat at Champoeg State Heritage Area.

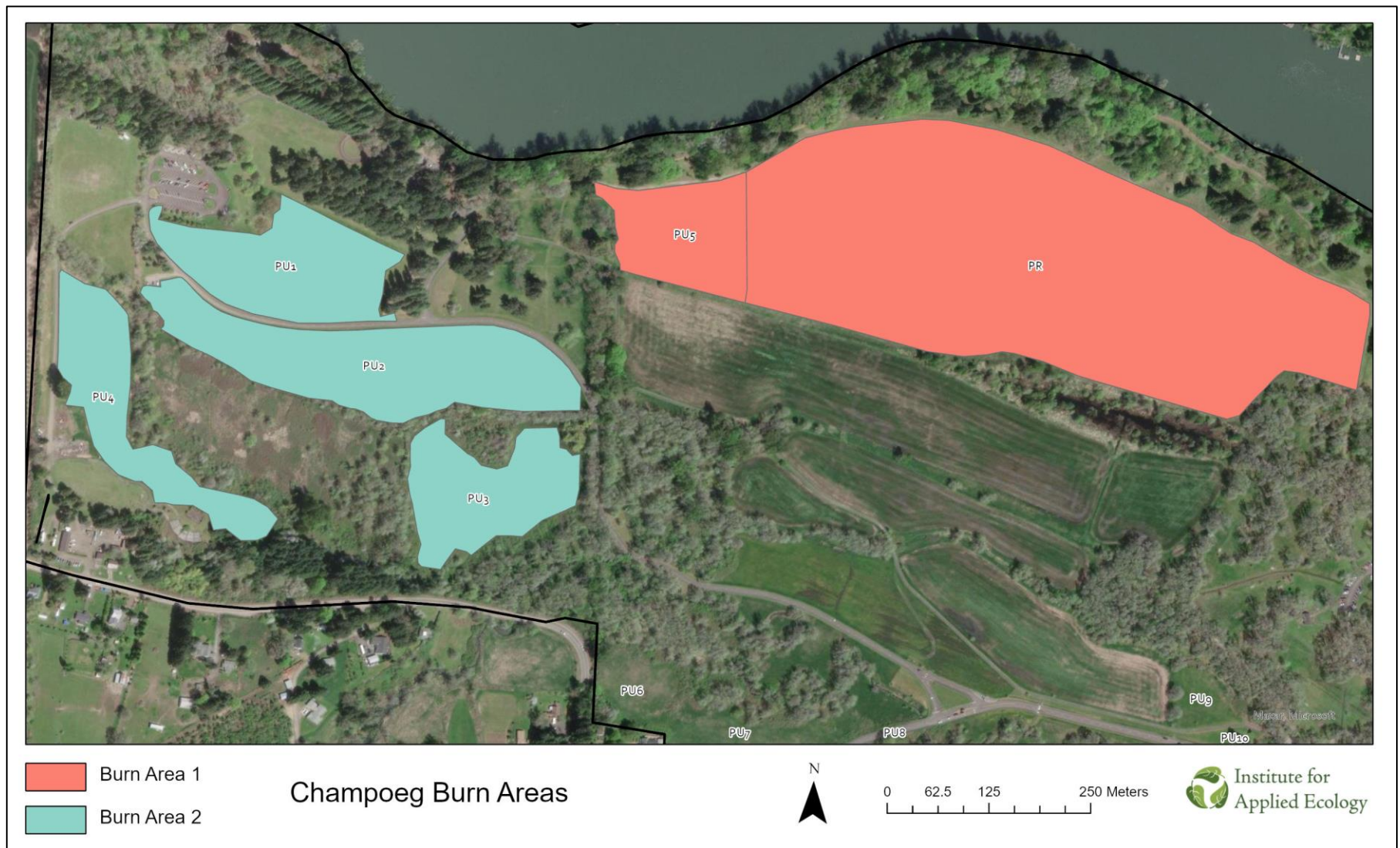


Figure 30. Suggested areas for prescribed burning at Champoeg State Heritage Area.

SPECIES ENHANCEMENT

Both mowing and prescribed burning can produce bare soil that improves germination of native annuals through increased seed-soil contact. However, bare soils can also be an entry point for invasive and non-native species to establish, particularly if there are few or no native species to compete with them. Seeding the prairies after burning, and in the bare patches produced by mowing, will enhance the resiliency and diversity of the upland prairies. Further augmentation of the existing endangered species will also help protect this local population from extirpation. The disturbed ground seed mix from Heritage Seedlings is a hardy mix to sow when bare ground is exposed and is outlined in Table 9.

Table 10. Disturbed ground/late-seeding mix forbs & grass seed mix from Heritage Seedlings.

Scientific name	Common name	Scientific name	Common name
<i>Elymus glaucus</i>	Blue wildrye	<i>Gilia capitata</i>	Bluehead gilia
<i>Festuca roemerii</i>	Roemer's fescue	<i>Lomatium utriculatum</i>	Common lomatium
<i>Koeleria macrantha</i>	Prairie junegrass	<i>Lupinus rivularis</i>	River lupine
<i>Poa secunda</i>	Sandberg bluegrass	<i>Madia elegans</i>	Common madia
<i>Achillea millefolium</i>	Yarrow	<i>Madia gracilis</i>	Grassy tarweed
<i>Acemispson americanus</i>	American bird's-foot trefoil	<i>Phacelia nemoralis</i>	Shade phacelia
<i>Amsinckia menziesii</i>	Menzies' fiddleneck	<i>Plectritis congesta</i>	Shortspur seablush
<i>Clarkia amoena</i>	Farewell to spring	<i>Prunella vulgaris</i>	Common selfheal
<i>Collinsia grandiflora</i>	Giant blue eyed Mary	<i>Ranunculus occidentalis</i>	Western buttercup
<i>Collomia grandiflora</i>	Grand collomia	<i>Rumex salicifolius</i>	Willow dock
<i>Epilobium densiflorum</i>	Denseflower willowherb	<i>Sanguisorba annua</i>	Prairie burnet
<i>Eriophyllum lanatum</i>	Common wooly sunflower	<i>Sidalcea campestris</i>	Meadow checkerbloom
<i>Geum macrophyllum</i>	Largeleaved avens	<i>Sidalcea elongata</i>	Dwarf checkerbloom

Objective 2.2 Improve resiliency of oak woodlands by reducing mature tree loss and increasing sapling to tree ratio (S:T) to between 0.5 and 1.

The slow-growing Oregon white oaks produce acorns only after reaching maturity at around 20 years of age, so protecting existing populations is vital for future tree establishment. Acorns have traditionally been harvested as a First Food at Champoeg and remain culturally significant to the Confederated

Tribes of Grande Ronde. Both the sensitive chipping sparrow and acorn woodpecker (*Melanerpes formicivorus*) found at Champoeg rely on oak woodland habitat.

PROTECTING MATURE TREES

The average diameter at breast height (DBH) of Oregon white oaks in the Champoeg woodland is 55 cm, with a limited spread (Figure 31). While it is not possible to accurately age an Oregon white oak based solely on DBH, we can make generalized assumptions. In one study, over 3,000 Oregon white oaks across 40 sites and 16 soil types were cored, and all > 40 cm DBH trees were over 200 years old (Gilligan and Muir 2011). We can thus extrapolate that Champoeg's oak woodland is likely to be at least 200 years old.

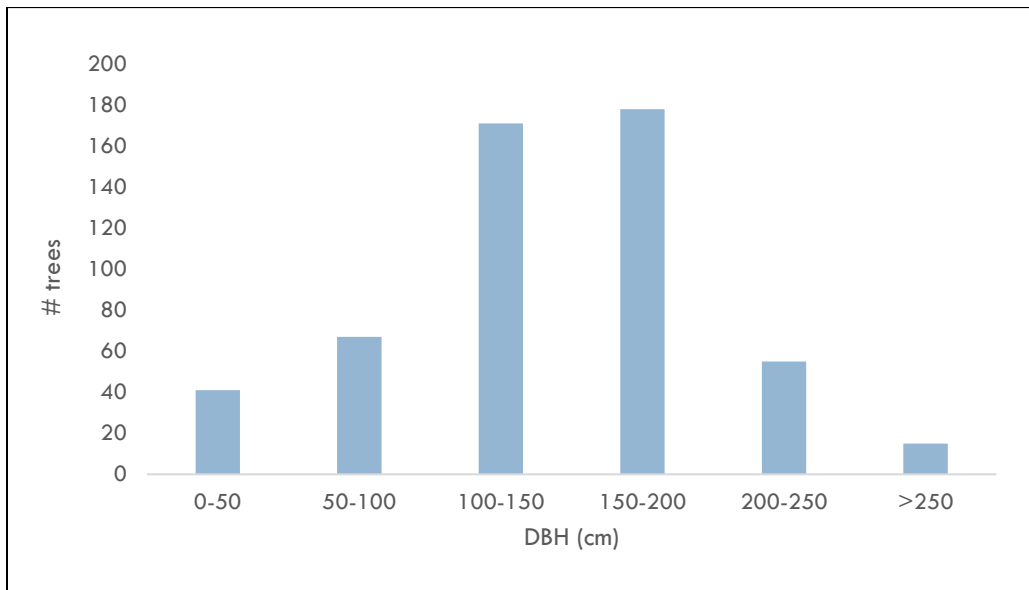


Figure 31. Measurement of Oregon white oak DBH in disc golf course oak woodland at Champoeg State Heritage Area.

Oregon white oaks are long-lived, able to live up to 500 years and survive fire and drought. Unfortunately, the Champoeg oak woodland is experiencing regular oak mortality of seemingly healthy trees unaffected by disease or overtopping conifers. A detailed analysis investigating the wide range of abiotic and biotic factors that influence Oregon white oak health would be beneficial in determining the cause, or combination of factors, leading to tree mortality.

In the short term, known stressors to Oregon white oak should be reduced to support natural oak recovery. Oak roots are shallow, primarily growing within the top two to three feet of the soil surface. If compaction occurs in the drip line of the tree – the area below the outermost edge of the canopy – the roots can suffocate from a lack of oxygen (Giusti et al 2005). Disc golf is known to significantly increase soil compaction (Trendafinola and Waller 2011), and yet many sensitive Oregon white oaks are found within the fairways (Figure 32.). Protecting the fourteen largest – and likely oldest – Oregon white oaks (>100 cm DBH) by restricting public access to the dripline (Figure 33) is highly recommended. Low fencing, mulch within the drip line, and signage can all help in diverting foot traffic from these legacy oaks.

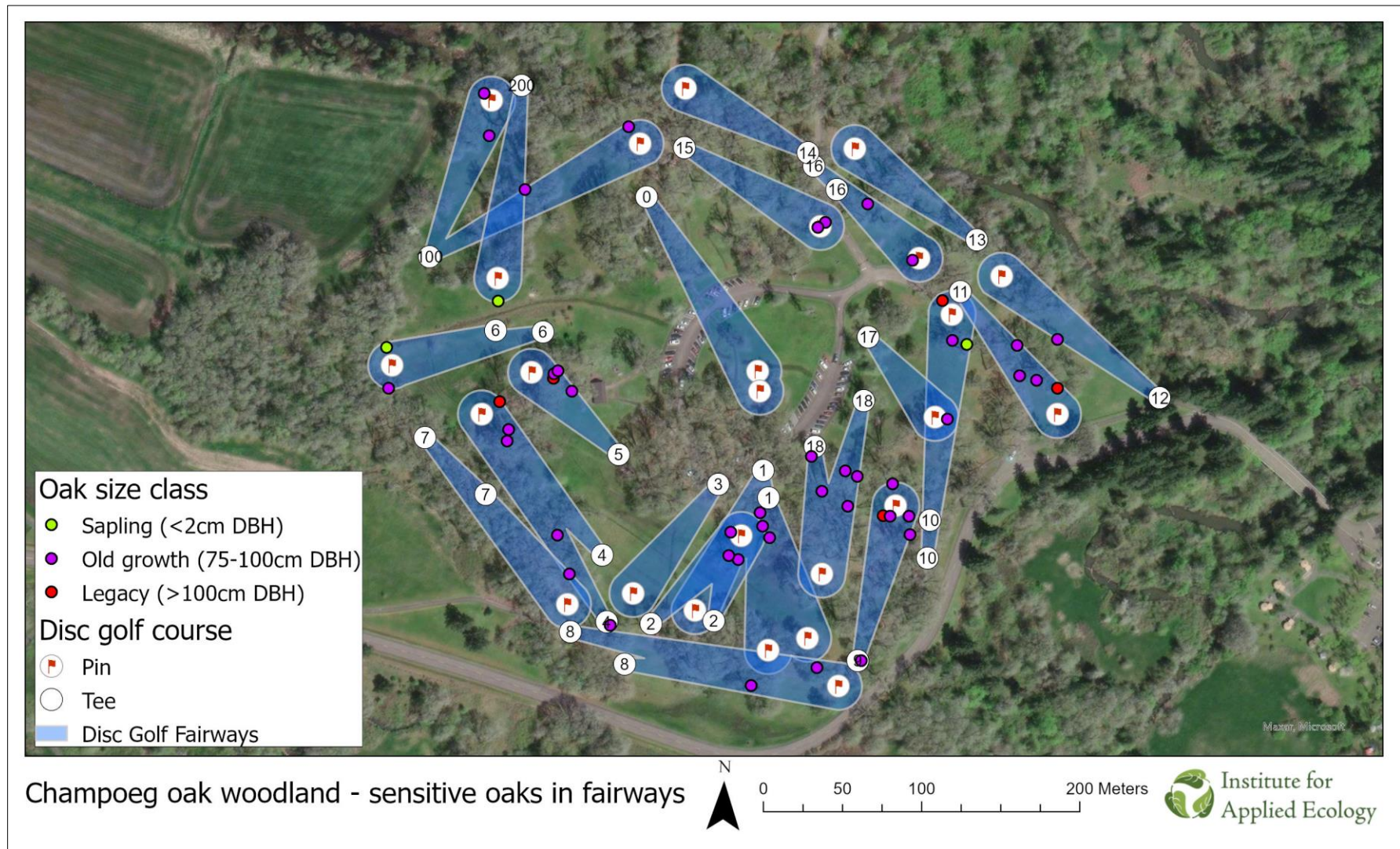


Figure 32. Saplings, old-growth, and legacy Oregon white oaks (*Quercus garryana*) in the disc golf fairways at Champoeg State Heritage Area.

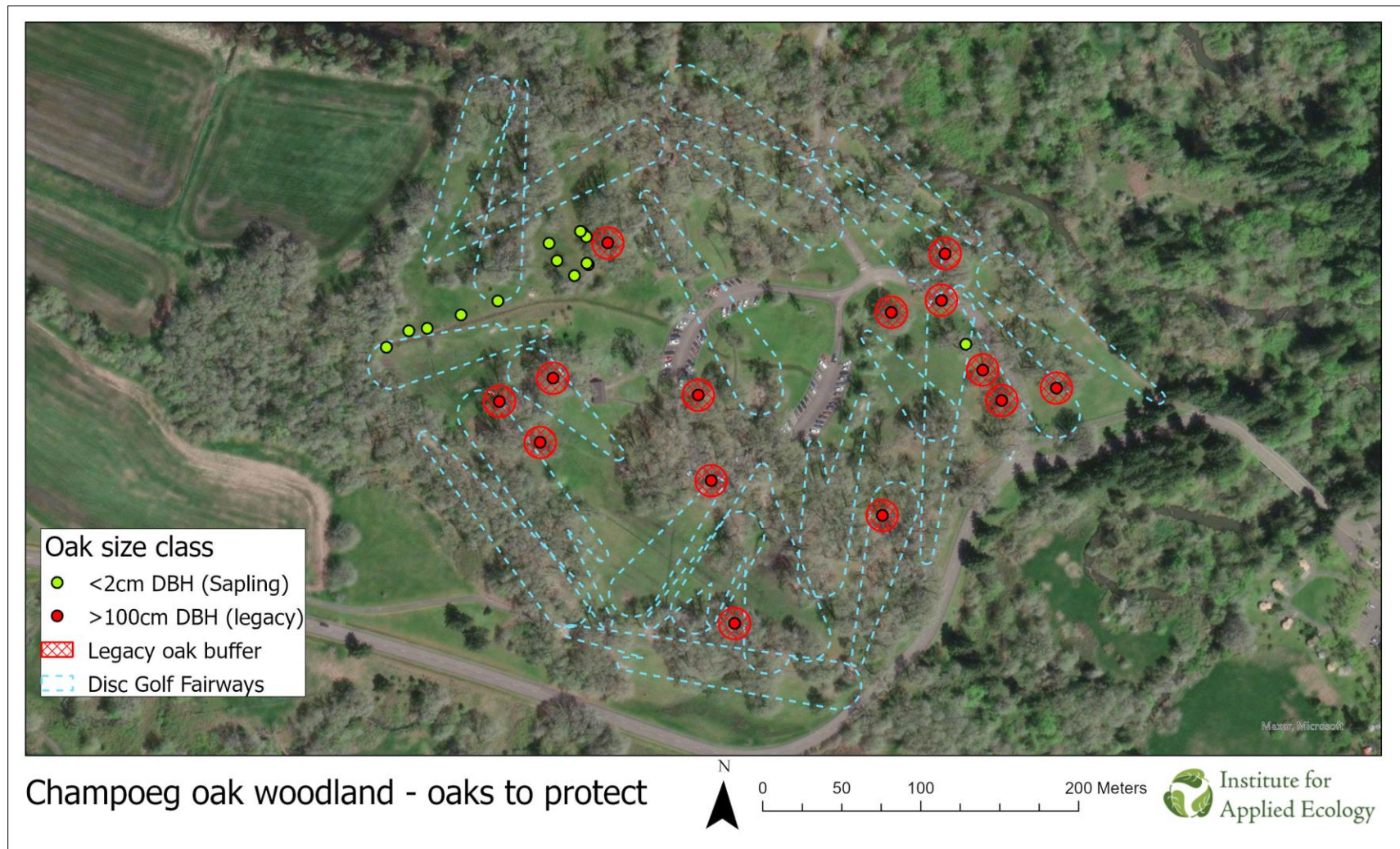


Figure 33. Locations of 14 largest and likely oldest Oregon white oak (*Quercus garryana*) in disc golf course at Champoeg State Heritage Area.

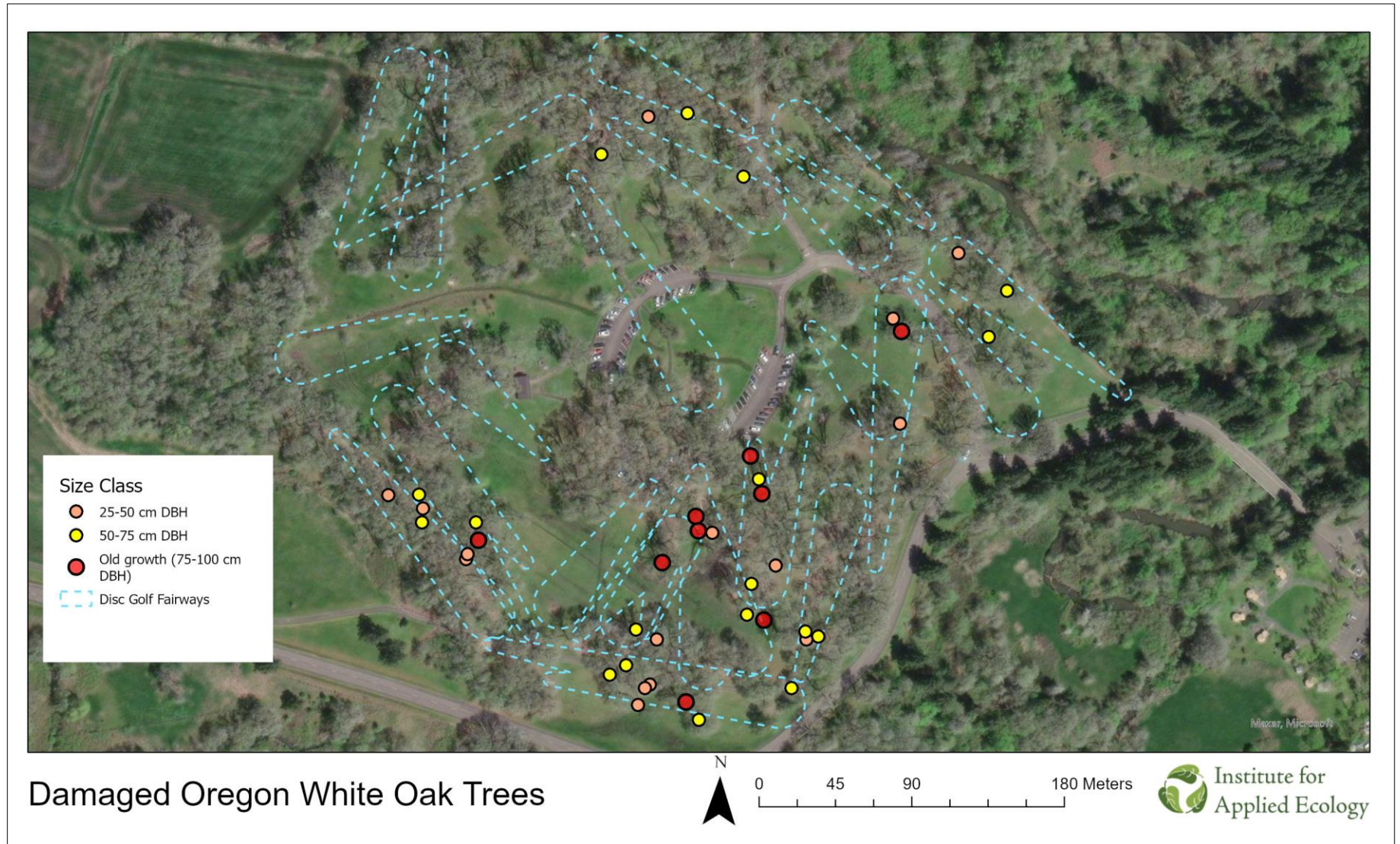


Figure 34. Locations of all Oregon white oaks (*Quercus garryana*) in Champoeg's oak woodland that show damage from golf discs.

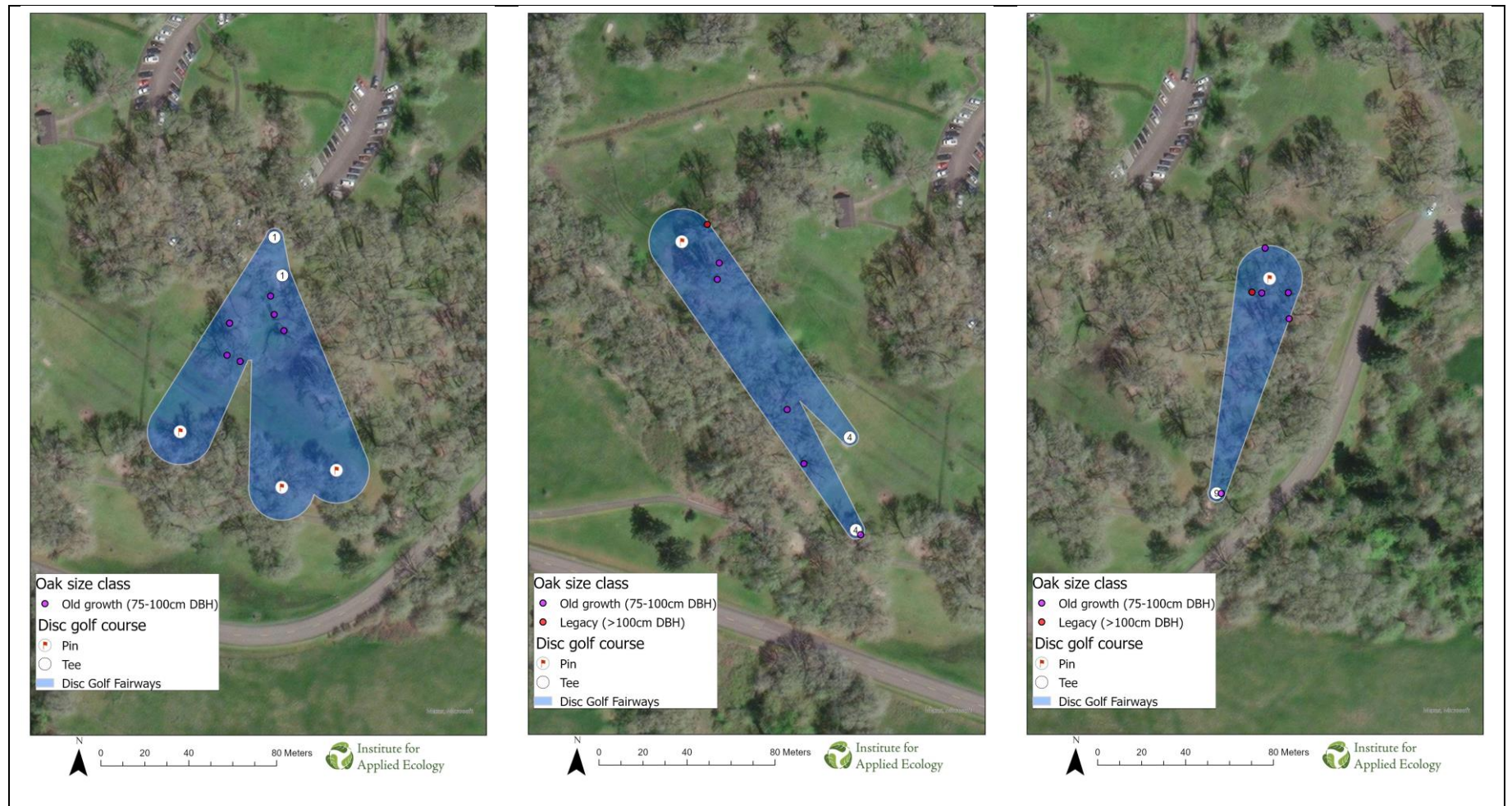


Figure 35. The three most damaging disc golf fairways to Oregon white oaks (*Quercus garryana*) at Champoege State Heritage Area (L-R): Hole 1, 4, and 9.

Many damaged trees were observed during site visits (Figure 36). The shape and regularity of the indents matches those of discs, and the damage is most evident on trees that are located within fairways (Figure 34). It may be that the trees are unaffected by this damage, but it is also possible that damaging the outer layer of the tree makes it more vulnerable to beetle or fungal infection. Installing shields, particularly on the old-growth oaks, will mitigate this effect.

Three disc golf holes are particularly dangerous to old-growth oaks: Holes 1, 4, and 9 (Figure 35). All three holes have more than five old-growth or legacy oaks, and all have damaged trees. We recommend shifting the baskets for Holes 1 and 4 towards adjacent open areas. The fairway for Hole 9 can be shortened by moving the basket closer to the tee, thus avoiding the old-growth trees.



Figure 36. Damaged mature trees (L, center), and tree loss (R) at Champoeg's disc golf course.

PLANTING SAPLINGS

Since Oregon white oaks grow slowly, a healthy woodland requires a diversity of age classes to replace trees that are lost through age, disease, and stochastic events. Oregon white oak DBH was measured in the disc golf course at Champoeg to determine recruitment using a sapling to tree ratio (S:T). The S:T assumes that sapling-sized trees (<10 cm DBH) are younger than larger trees and uses a four-point scale to assess regeneration (Muick and Bartholome 1987):

- very low $S:T \leq 0.1$
- low $0.1 < S:T < 0.5$
- medium $0.5 < S:T < 1$
- high $S:T \geq 1$

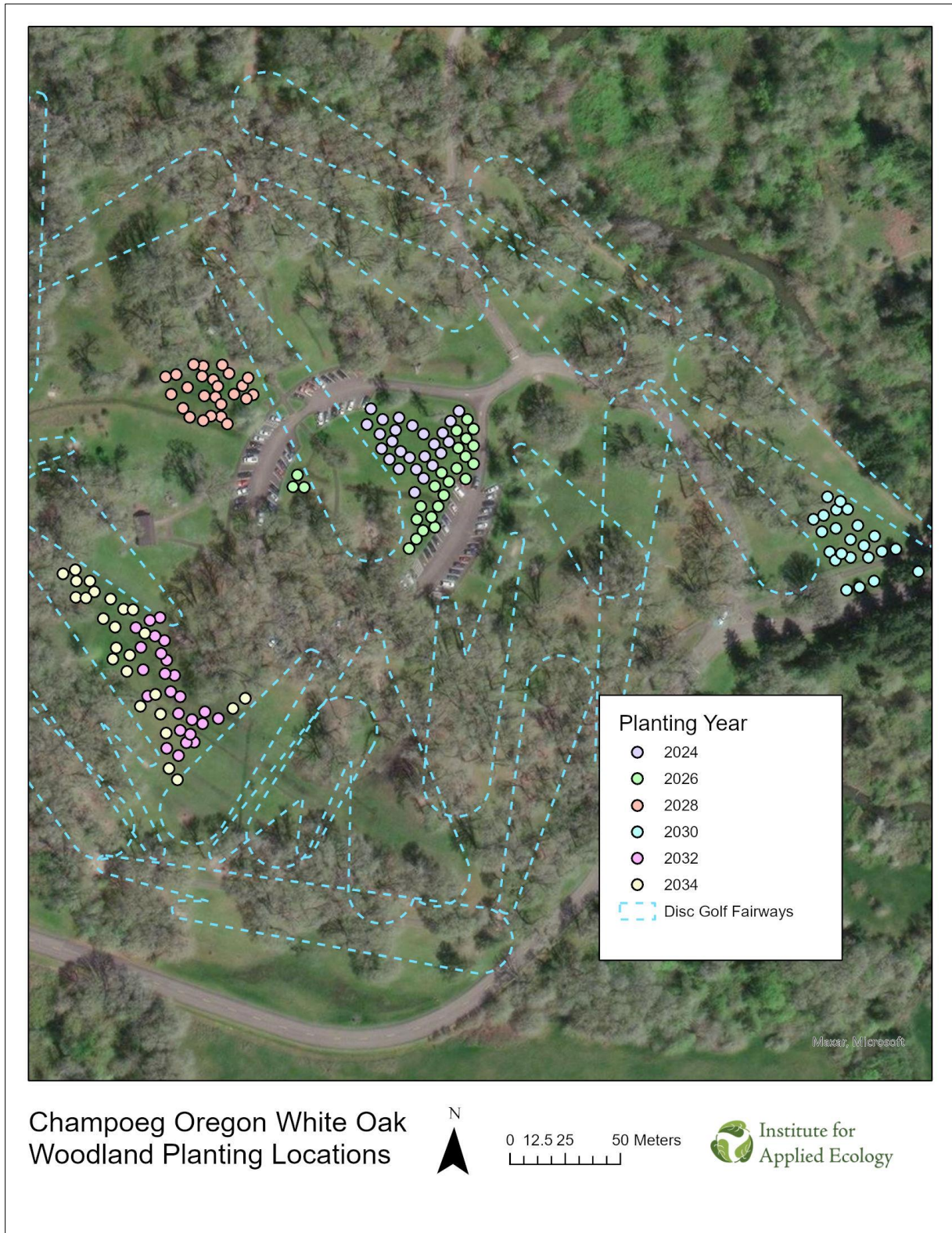


Figure 37. Planting schedule for Oregon white oak (*Quercus garryana*) in Champoeg disc golf course. Each point represents two trees.

At Champoeg, Oregon white oak recruitment is very low, with a S:T of 0.03. There are 15 saplings and 512 adults. A phased planting project of 300 saplings over 10 years can raise the S:T at Champoeg to a medium level of regeneration (Figure 37).

Where practicable, propagating the seedlings from acorns collected at Champoeg will ensure they have adapted to local environmental conditions. Planting should occur outside the fairways to limit soil compaction and disc damage (Figure 37). Installing galvanized steel stucco netting around the saplings will improve establishment (Clements et al 2011), with the added benefit of protecting them from mowers. Saplings will also benefit from regular watering during the summer drought months.

5.3 Restoration opportunities

Goal 3: Increase relative quantity and quality of native vegetation from a site with some pockets of natives present (1) to a site with an average number of natives (2).

Since restoration requires a significant input of time and financial resources, it is critical to focus on strategy habitats whose healthy functioning supports a diversity of plants and wildlife. At Champoeg this currently includes riparian habitats and their adjacent wet prairies, and in the long term extends to transitioning the agricultural fields away from active farming.

Objective 3.1: Transition first 0.5 miles of bank and riparian area of Champoeg Creek from a non-native monoculture to diverse native plant assemblages.

The largest threat to Champoeg's riparian areas is the widespread invasion of reed canary grass and Himalayan blackberry (see Priority 1 species). To restore riparian function, controlling and removing invasive species needs to be paired with plantings, erosion control, and the installation of large woody debris. Focusing restoration at the mouth of Champoeg Creek will enhance habitat for species found in the park and those inhabiting the Willamette River.

PLANTINGS

Planting a diverse mix of trees and shrubs along Champoeg's waterways will not only restore vegetative cover – providing refugia to wildlife and decreasing stream temperatures – it will also compete with Himalayan blackberry and reed canary grass (Figure 40). We recommend planting the first 0.5 miles of Champoeg Creek closest to the mouth of the river to provide the highest habitat value to salmonids entering from the Willamette River. IAE has had success displacing invasives and reintroducing native vegetative cover along the Marys River in the Willamette Valley using high density plantings of 2,000 to 2,500 stems per acre at a tree to shrub ratio of 1:3 (Moore & Esterson 2022). While this strategy has a higher up-front cost, the closely-spaced plantings will quickly form a closed canopy, shading out invasive species and requiring less long-term maintenance. A species list of trees and shrubs to plant is in Appendix A.

EROSION CONTROL

At several points along Champoeg Creek, the bank has eroded to a point where it is no longer possible to plant trees and shrubs (Figure 38). At these locations, live staking is a low-cost, highly effective method of stabilizing the bank while reintroducing vegetative cover to the stream. In fall when plants are senescing, approximately 20" long willow cuttings should be collected from established trees, placing them in buckets of water to keep them alive until installation. At least half the length of the stake is then

inserted into the eroded bank, at a 90-degree angle to the surface, approximately a foot apart, in a random arrangement (Descamp 2004). The willow will regrow from the cut shoots, and their roots will stabilize the banks and stop erosion.



Figure 38. Eroded banks along Champoeg Creek at Champoeg State Heritage Area.

HABITAT COMPLEXITY

Large woody debris (LWD) in streams creates habitat complexity that increases densities of juvenile salmonids (Roni et al. 2015). Champoeg Creek is particularly well-suited for LWD placement, since it has a relatively flat slope for easy access and has a narrow width so logs may require little to no anchoring. There are also several terraces in Champoeg Creek that would be ideal locations for LWD, as the water can back up onto the floodplain and create side channels (Figure 39). The terraces are also highlighted in the map below (Figure 40). Engineering firms can design a variety of LWD structures that use logs sourced at Champoeg such as hazard trees that have been removed from other areas of the site. Some examples can be seen naturally occurring in Ryan Creek (Figure 39).



Figure 39. Terrace floodplain in Champoeg Creek (L); naturally-occurring LWD in Ryan Creek (R).

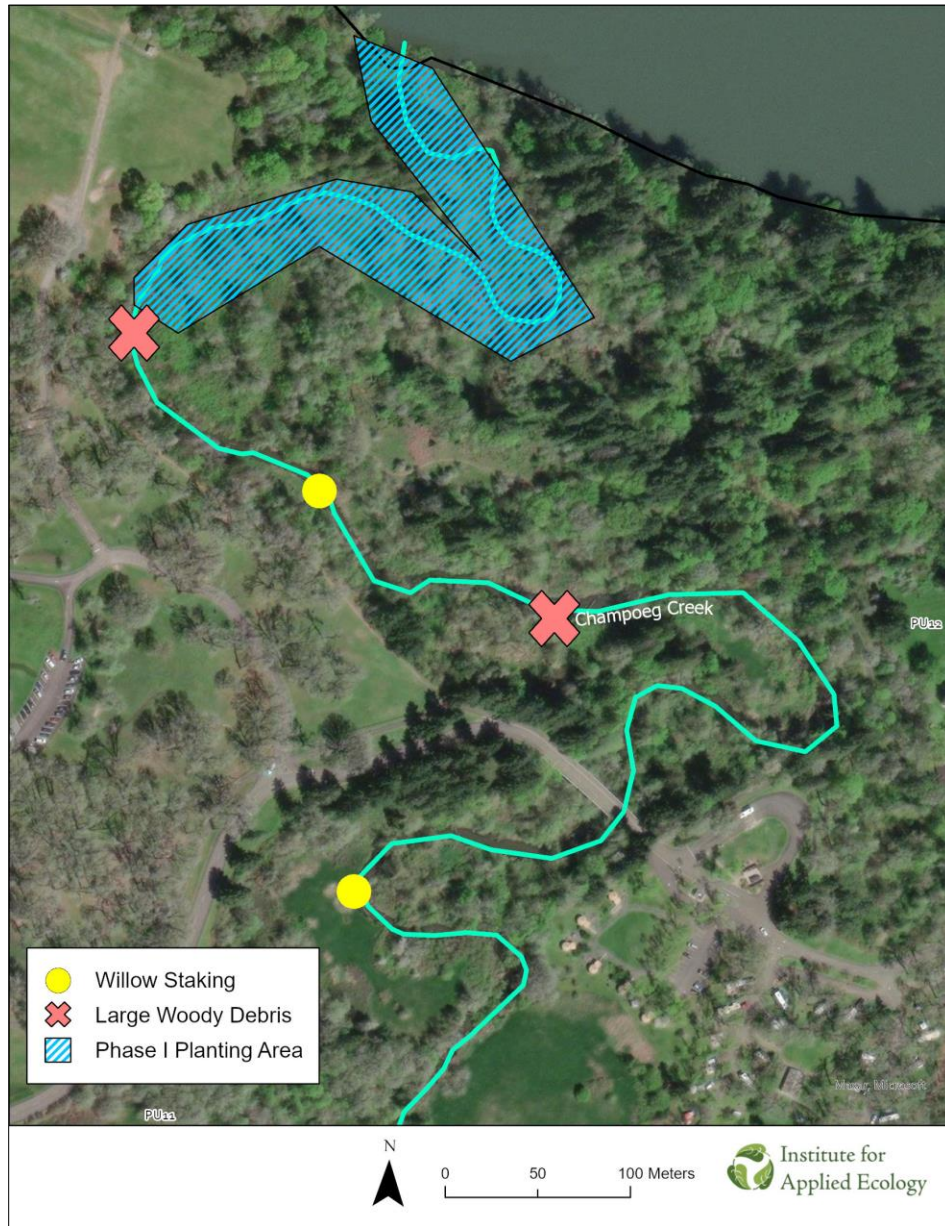


Figure 40. Restoration opportunities along Champoeg Creek.

Objective 3.2: Augment six acres of wet prairie and restore hydrologic diversity to increase presence and diversity of native wet prairie flora and fauna.

Champoeg has three remnant wet prairies that have high ecological value and restoration potential. Protecting and restoring these areas should be a long-term priority for OPRD. The western wet prairie (Figure 11; PW1) is adjacent to the off-leash dog area, so any vegetation removal will likely open the area to visitors and negatively impact wildlife habitat. The central wet prairie (Figure 11; PW2) is very small and bordered by a road. This leaves the far eastern wet prairie (Figure 11; PW5), which is a strong candidate for restoration since it is not easily accessible to the public and is adjacent to the area where OPRD is planning a new wetland complex (Figure 11; A7). This area has also retained many wet

prairie characteristics, such as hummocks and vernal pools (Figure 41). Hummocks are raised pedicels created by seasonal inundation over many years, adding important microtopographic variation and greater plant diversity. This spatial variability is removed when land is flattened for agricultural use, and restoration practices are unable to recreate this topography.



Figure 41. Hummocks (L) and vernal pools (R) at Champoeg’s wet prairie

HABITAT COMPLEXITY

Vernal pools are seasonally inundated wetlands that usually fill up during precipitation events in the fall and winter, and then dry out during the summer. They are one of the rarest wetland types in Oregon, and are important habitats for amphibians, including the northern red-legged frog that is known to occur at Champoeg. The only vernal pool in Champoeg found during habitat surveys was in the southern portion of the PW5 wet prairie (Figure 42). This rare habitat can be expanded by creating additional pools in existing wet areas using an earth mover during the dry summer months (Figure 43).



Figure 42. Vernal pool at Champoeg State Heritage Area during seasonal inundation, May 2017 (L), and during dry period, August 2020 (R).

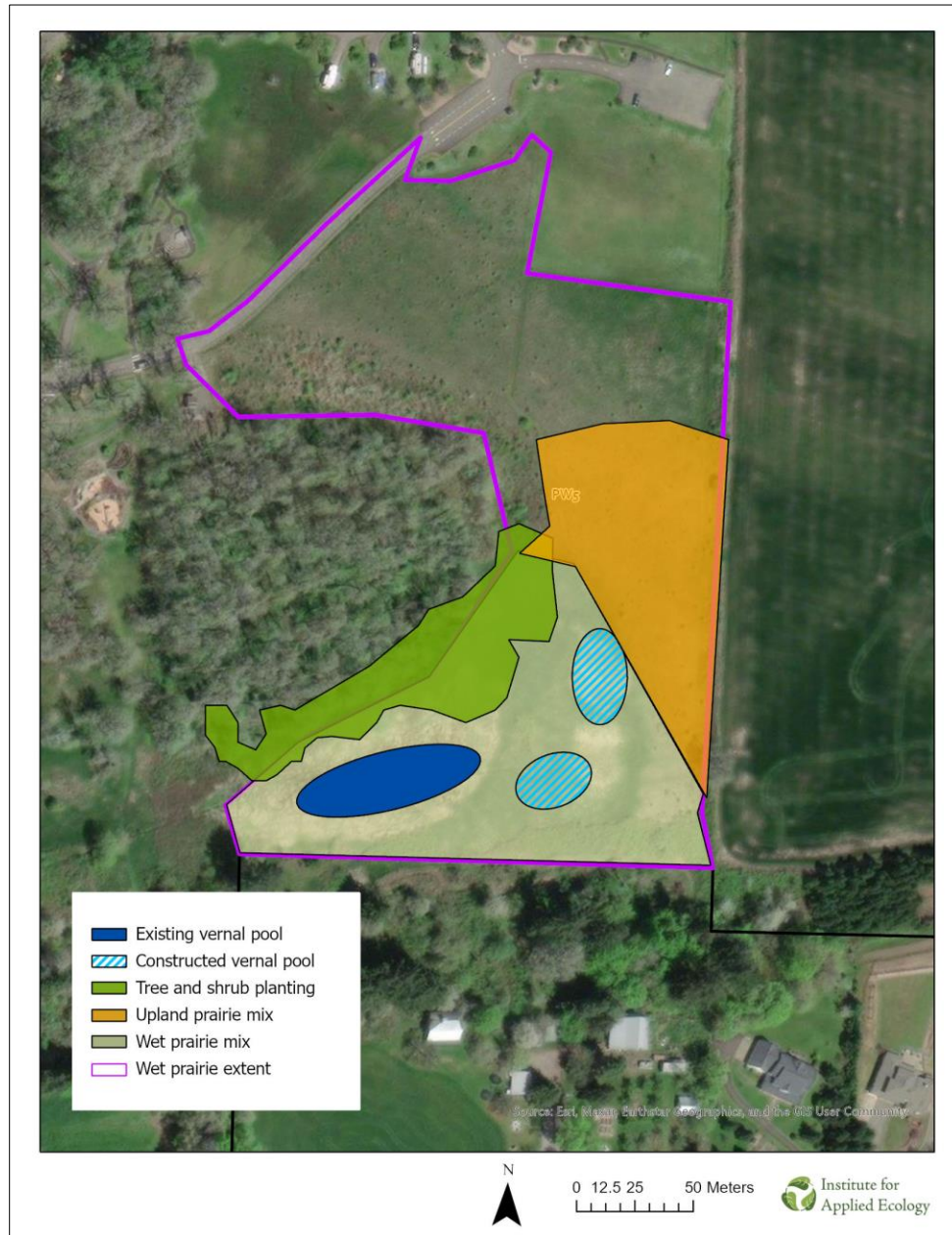


Figure 43. Wetland restoration opportunities at Champoeg's wet prairie.

SEEDING

The wet prairie is composed primarily of non-native annual grasses. To achieve the best native cover, conducting a chemical fallow for two years prior to seeding will not only provide ample bare ground for high seed to soil contact, but will also reduce competition from non-native species. A variety of seed mixes can be used across the site, each suited for wetter or drier conditions (Figure 43), but a forb-only seeding in the first year would allow for follow-up grass-specific herbicide treatments. Native grasses can be introduced the following year, as seen in the suggested species list in Appendix A.

PLANTINGS

Many amphibians lay their eggs in water but live their adult lives in forested habitat. Expanding the forest footprint by planting trees and shrubs up to the vernal pool edge would create a wildlife corridor reducing the need for species to move in the open (Figure 43). Shrubs and trees will also compete with the Himalayan blackberry that has established. A recommended planting list is in Appendix A.

Table 11. Schedule of events for wet prairie restoration at Champoeg State Heritage Area.

Year	Timing	Task
Year One	Aug	Construct vernal pools
	Sept	Mow or conduct prescribed burn to remove thatch layer
	Oct	Broadcast glyphosate to kill vegetation
Year Two	May	Broadcast glyphosate to kill vegetation
	July	Spot spray emerging non-native vegetation as needed
	Oct	Seed forbs with a focus on annuals with a no-till drill
Year Three	May	Grass-specific broadcast spray
	July	Spot spray as needed
	Oct	Seed grasses and additional perennials

Objective 3.3: Convert 46 acres of current agricultural fields into a contiguous, diverse 136-acre upland prairie that connects with the existing restoration sites and increases native cover and connectivity.

Champoeg has a unique opportunity to expand the current native prairie by incorporating the agricultural fields and creating a contiguous 136-acre grassland (Figure 44). Large habitat patches have fewer edge effects, are more resilient to disturbance, and can support a more diverse array of species. At Champoeg, this also represents the historical conditions at the time of the creation of the first provisional government of Oregon, when the prairie extended from the Willamette River to Mission Creek.

The agricultural fields can be slowly transitioned away from active harvest by first being chemically fallowed and then seeded over the course of several years. Additionally, the trees bisecting the site can be thinned to create more east-west connectivity, creating oak savanna that can be seeded in the understory with oak prairie species.

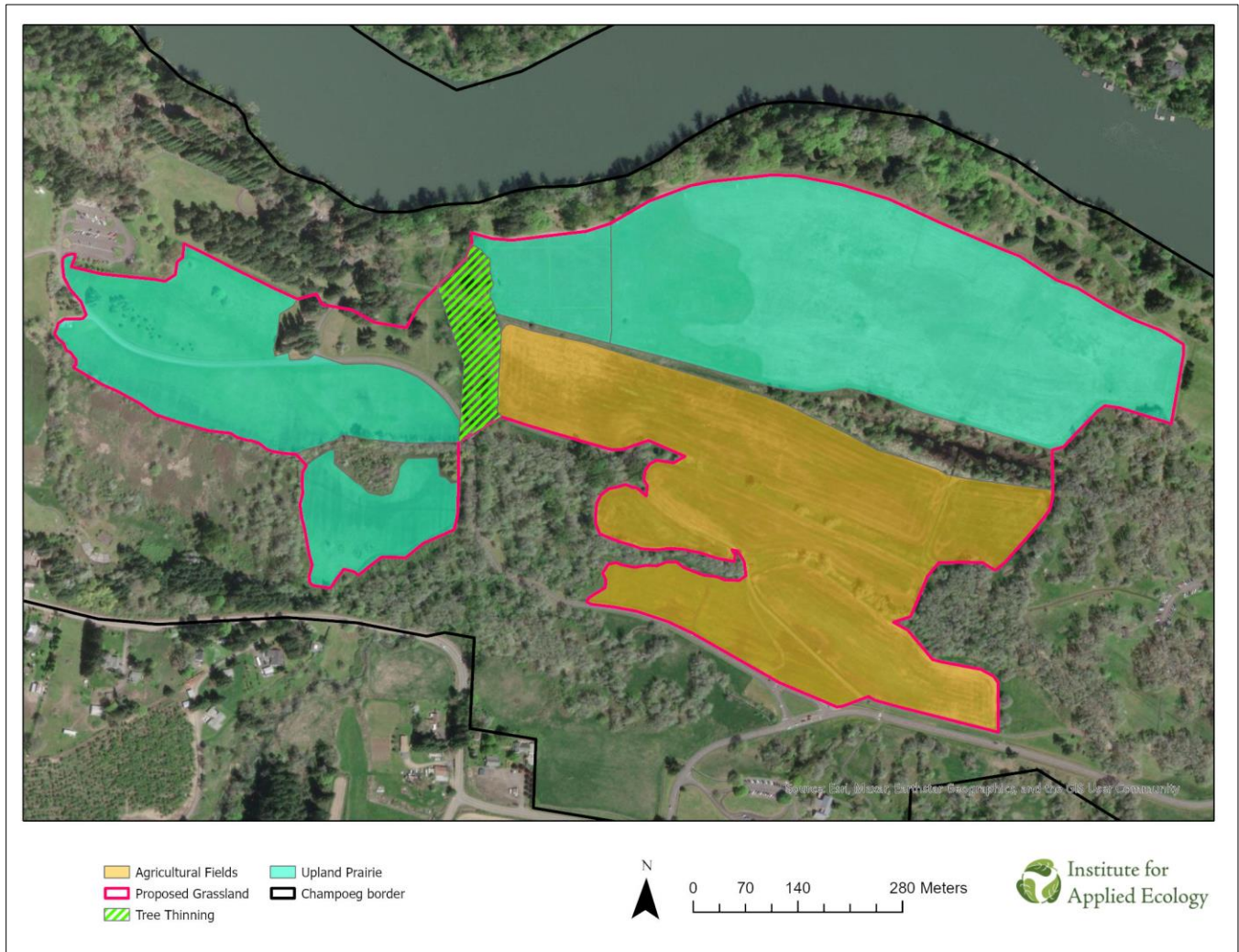


Figure 44. Proposed 136-acre grassland at Champoeg State Heritage after transitioning agricultural fields to native prairie.

5.4 Gathering opportunities

Goal 4: Improve gathering opportunities for tribal members by increasing access and augmenting and reintroducing culturally significant plant species.

There is currently one three-acre area in the restoration prairie (Figure 11; PR) set aside for gathering culturally significant first foods by tribal members. To increase availability of first foods, OPRD should expand upon the current area and set aside additional areas for gathering.

Designated gathering areas are important because tribal members are wary about collecting where herbicides have been used. Roots and bulbs in particular store chemicals after they have broken down in the surrounding soil. In gathering areas, invasive species management should be restricted to hand weeding, and plants should be tested for herbicide residue at regular intervals. IAE conducted herbicide testing on soil and plants in the existing harvest area (Table 12. Herbicide test results from Matrix

Sciences. All results are in mg/kg.). Results show that herbicides were present in the soil but were inert and were not being actively taken up by the plants.

Table 12. Herbicide test results from Matrix Sciences. All results are in mg/kg.

Type	Year	Area	DDT	DDE	Diuron	DCPMU	Glyphosate	AMPA	Triclopyr
Soil	2018	Harvest area	0.012	nd	.022	.036	.081	0.61	.033
Soil	2023	Harvest area	0.013	nd	.006	.015	.12	0.94	nd
Soil	2023	Non-harvest area	0.048	.018	.006	.014	6.8	1.4	nd
Bulb	2023	Harvest area	nd	nd	nd	nd	nd	nd	nd

Objective 4.1: Expand three-acre harvest area in restoration prairie to 15 acres of culturally significant prairie and riparian species.

Currently the only designated gathering area at Champoeg is the 2.9 acres in the restoration prairie (Figure 45). In 2022, this grew by 31% when the 0.7 acres directly south was incorporated into the herbicide-free gathering area. Once the area is set aside for gathering, monthly hand weeding events during the growing season are necessary for weed control. Tribal members would like to continue increasing the footprint of the gathering area and do additional plantings of culturally significant foods (see species list in Appendix A), particularly of camas, which is a high-priority species.

Other high priority gathering species include the aquatic wapato (*Sagittaria latifolia*), and riparian species used for basketry material such as rushes (*Juncus spp.*) and willow (*Salix spp.*) (Appendix A). Wapato is currently not found at Champoeg, however suitable habitat for reintroduction may occur in the wetland directly south of the gathering area where there is standing water throughout the year (Figure 45; 2030). Wapato germinates while fully submerged and can be sown into the wetland soils in fall. Other culturally significant riparian shrubs such as osoberry (*Oemleria cerasiformis*) and pacific ninebark (*Physocarpus capitatus*) would add additional harvesting opportunities and act as an herbicide-free control against reed canary grass. Once established with culturally significant species, the wetland could be folded into the larger gathering area in the restoration prairie (Figure 45).

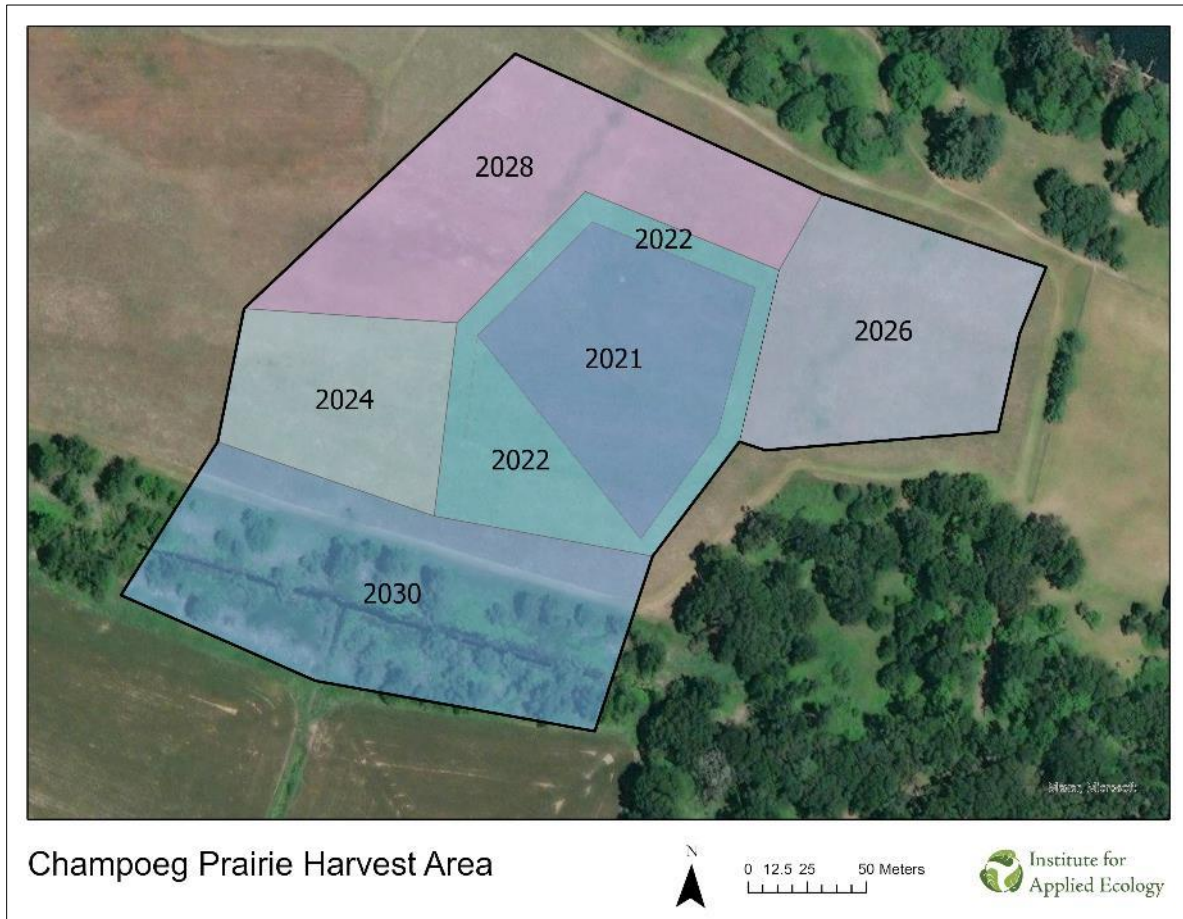


Figure 45. Champoeg’s current and suggested harvest area extent. The numbers represent the year the area was, or is, suggested to be converted into a non-herbicide use gathering area.

Objective 4.2: Create an additional eight-acre herbicide-free gathering area to increase diversity of available habitat for culturally significant plant species.

In addition to growing the existing area in the restoration prairie, tribal members would like to expand gathering opportunities into forested habitat suitable for collecting berries such as serviceberry and salmonberry (*Rubus spectabilis*), and acorns from Oregon white oak. These and many other culturally significant trees and shrubs are already found at Champoeg (Appendix A). However, these species are often in inaccessible habitat on La Butte, or close to trails that are managed with herbicide to limit the introduction and spread of invasive weeds.

A suitable location for an additional gathering area is the approximately eight-acre forested parcel at the far east end of Champoeg (Figure 12; FM11). This parcel has remained undeveloped since acquisition, so it is relatively free from herbicide contaminants, is on flat ground accessible to those with a range of mobilities, and can be reached via a paved walkway. Many of the culturally-significant species are already present here, such as osoberry, Oregon grape, red-osier dogwood (*Cornus sericea*), beaked hazelnut, Oregon ash, and western redcedar (*Thuja plicata*) (Appendix A). The predominant invasive species in this parcel is hedgeparsley (*Torilis arvensis*), which can be effectively managed using mowing and hand weeding (DiTomaso et al. 2013).

Since the eight-acre parcel is adjacent to the Willamette River and is composed of hydric soils (Figure 4), there may also be future opportunities for creating off-channel habitat for salmonids and wetlands for western pond turtles, both of which are species of interest for tribal members.

Objective 4.3: Support tribal gathering events at Champoeg through permitting and the installation of permanent event structures.

There is interest in holding more frequent tribal gathering events at Champoeg, particularly if there were additional gathering areas outside the restoration prairie.

For one event at Champoeg's restoration prairie, CTGR staff and tribal members installed a temporary camas oven to roast the bulbs using traditional techniques. A traditional camas oven is dug into the ground and stacked with rocks that retain heat for slow cooking. Installing a permanent structure adjacent to the restoration prairie would allow for more cultural events to take place where camas is being harvested.

6. MONITORING

Goal 5: Protect existing populations of documented rare plants and/or wildlife species (2)

Regular monitoring of vegetative and wildlife communities is crucial in evaluating the success of restoration actions and identifying issues early on so they can be managed in a timely manner. For non-native species, it is significantly more cost-effective to control species if they are identified in the early stages of invasion. Similarly, identifying a declining trend in desirable species can allow time for intervention before a species become extirpated and costly reintroductions are required.

6.1 Vegetation monitoring

Objective 5.1: Conduct annual surveys to capture population changes over time of rare plants peacock larkspur and tall bugbane to capture opportunities for intervention.

Photopoints are the simplest way to track changes over time. The restoration prairie has been monitored for a ten-year period, making it easy to see the transition of the site from a grass field to a native prairie full of forbs (Figure 46). Photopoints are particularly useful for forested sites, as tree loss and English ivy encroachment are readily visible from photographs. Twelve strategically placed photopoints should be established across Champoeg and monitored annually in the four cardinal directions at the same time of year (Figure 47).



Figure 46. Restoration prairie at photopoint B on May 20, 2014 (L), and May 7, 2022 (R).

The 12 suggested photopoints cover each of Champoeg’s primary habitat types: mixed forest, upland and wet prairie, oak woodland, and riparian. Photopoints are also located in the restoration prairie and the oak woodland disk golf course as they are conservation priorities.

Additional plant surveys conducted by a botanist for the restoration prairie, the peacock larkspur, and the tall bugbane populations is also recommended. One of the goals for the restoration prairie is to increase native plant diversity, including introducing culturally significant species (Appendix A), therefore, a relevé plant survey is recommended as it can provide data on specific species and their percent cover. Additional plant surveys should be added to this list as active restoration takes place in new areas across the park.

Table 13. Recommended monitoring protocols at Champoeg State Heritage Area.

Area	Survey type	Frequency
Restoration prairie	Relevé plant survey	Annually
Peacock larkspur (<i>Delphinium pavonaceum</i>) and tall bugbane (<i>Actaea elata</i>) populations	Individual plants, identified based on growth form of stems and generally plants ≥ 10 cm apart are considered separate individuals.	Annually

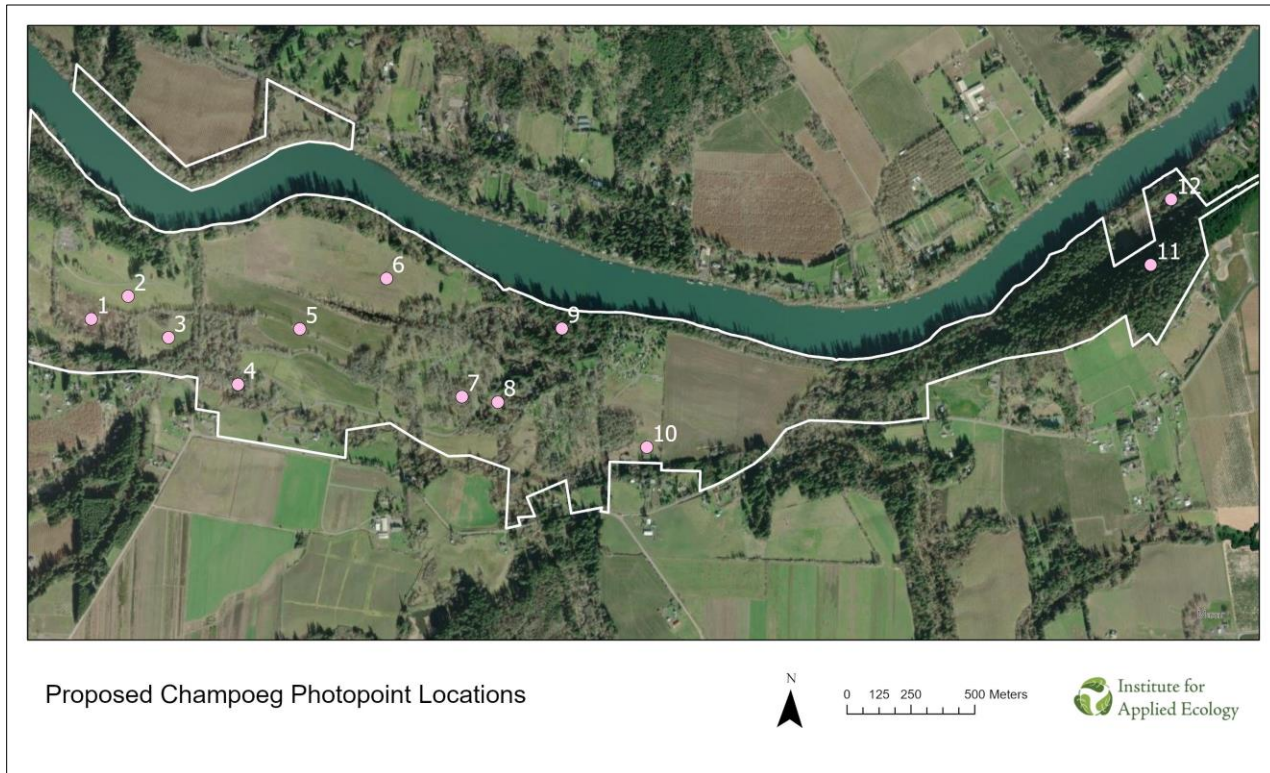


Figure 47. Map of suggested photopoint locations.

6.2 Wildlife monitoring

Objective 5.2: Collect baseline data for wildlife species likely to be present at Champoeg.

In his assessment of Champoeg, Newhouse points out that providing recommendations for wildlife is hindered by the lack of up-to-date data on current populations (Appendix C: Wildlife Habitat Assessment). He recommends a series of wildlife surveys to establish baseline data to better understand wildlife distributions at Champoeg (**Table 14**. Recommended wildlife surveys at Champoeg State Heritage Area, adapted from Newhouse). Frequency of ongoing surveys will depend on the results: if sensitive species are found, then annual monitoring will allow OPRD to calculate trends in population distributions.

Table 14. Recommended wildlife surveys at Champoeg State Heritage Area, adapted from Newhouse (Appendix C: Wildlife Habitat Assessment).

Species Type	Survey Type	Frequency
Birds	Fixed walking survey routes	Annually
	Point count monitoring stations	Every five years
Reptiles	eDNA presence/absence	

Mammals	Wildlife cameras	Create baseline then set frequency based on results
	Acoustic bat surveys	
Invertebrates	Mussel snorkel surveys	
	Butterfly Pollard transects	
	Bee surveys	

7. IMPLEMENTATION PLAN

The implementation plan in Table 15 collates all the recommendations included in this report, organized by management area and time of year. With the wide array of habitats and conservation priorities at Champoeg, the table is designed to be a resource for land managers to quickly assess seasonal actions and plan for upcoming needs.

Table 15. Implementation plan for management recommendations at Champoeg State Heritage Area. The codes correspond to locations in Figure 11 and Figure 12.

Management Area	Timing	Goal	Action
MIXED FOREST (FM1-10)	Spring	Manage invasive species	Spot spray St. Johnswort
		Create new gathering area	Mow and hand weed hedge parsley
	Summer	Monitor vegetation	Monitor population of tall bugbane; biennial invasive species monitoring; photopoints; wildlife surveys
		Manage invasive species	Volunteer English ivy removal
	Fall	Manage invasive species	Cut and spray English holly, oneseed hawthorn, Scotch broom
		Create new gathering area	Plant culturally significant foods in new gathering area
	Winter	Manage invasive species	Spray English ivy; fell sweet cherry and pear trees
AGRICULTURE	Spring	Create native diversity	Chemically fallow agricultural fields for a period of two years; ongoing spot spray treatments

Management Area	Timing	Goal	Action
(A1-8)	Fall	Create native diversity	Seed a mix of native prairie species
UPLAND PRAIRIE (PU1-10)	Spring	Manage invasive species	Spot spray Canada thistle and tansy ragwort; volunteer hand weeding of restoration prairie
		Increase size of gathering area	Restrict herbicide surrounding harvest area
	Summer	Manage invasive species	Volunteer hand weeding of restoration prairie
		Monitor vegetation	Annual invasive species monitoring, particularly day use areas; photopoints; wildlife surveys
	Fall	Prevent woody encroachment	Mow prairies biennially after August 15; conduct prescribed burns on a four-year rotation
OAK WOODLAND (O2)	Spring	Manage invasive species	Spot spray Canada thistle and tansy ragwort;
		Protect mature oaks	Install protective sheaths over largest oaks
	Summer	Manage invasive species	Hand pull Scotch broom
		Monitor vegetation	Annual invasive species monitoring, particularly disc golf course; photopoints; wildlife surveys
		Investigate tree loss	Commission research study to investigate reasons for mature tree loss
	Fall	Manage invasive species	Cut and spray oneseed hawthorn
		Increase tree to sapling ratio	Plant 300 saplings over ten years
	Winter	Protect mature oaks	Reposition disc golf course holes 1, 4, and 9

Management Area	Timing	Goal	Action
RIPARIAN (R1-8)	Spring	Manage invasive species	Spot spray reed canary grass
	Summer	Monitor vegetation	Annual invasive species monitoring, particularly boat dock; monitor peacock larkspur; photopoints; wildlife surveys
		Manage invasive species	Spot spray Himalayan blackberry; spray purple loosestrife monthly
		Increase habitat complexity	Install large woody debris along Champoeg Creek
	Fall	Increase native diversity	Plant native shrubs along Champoeg Creek; install willow stakes; plant culturally significant species for harvesting
		Manage invasive species	Mow treated Himalayan blackberry and reed canary grass; cut purple loosestrife heads
MANAGED GRASSLAND (G1-7)	Fall	Prevent woody encroachment	Mow annually
WET PRAIRIE (PW1-5)	Spring	Manage invasive species	Spot spray reed canary grass; chemically fallow prairie for two years
	Summer	Monitor vegetation	Biennial invasive species monitoring; photopoints; wildlife surveys
		Increase habitat complexity	Build vernal pools

Management Area	Timing	Goal	Action
ALL	Fall	Increase native diversity	Seed a diverse mix of native species; plant shrubs
		Manage invasive species	Mow treated reed canary grass
	Any	Improve gathering access	Loosen restrictions around permits for cultural harvesting
			Install traditional camas oven
		Manage invasive species	Engage volunteers to track invasives
			Install educational signage on threats of invasive species

8. REFERENCES

- Arguez A, Durre I, Applequist S, Vose R, Squires M, Yin X, Heim R, Owen T. 2012. NOAA's 1981-2010 climate normals: an overview. *Bulletin of the American Meteorological Society* 93: 1687-1697.
- Atherton J. 1973. "Archaeological investigations at Champoeg, Oregon, 1973," *Northwest Anthropological Research Notes* 9: 103-120
- Dalton M, Fleishman E, (Eds). 2021. Fifth Oregon Climate Assessment. Oregon Climate Change Research Institute, Oregon State University. Corvallis, Oregon.
- Dresner M. 2010. Unpublished report on research conducted at La Butte Submitted to Champoeg State Park. Portland State University. Portland, Oregon.
- Clements D, Luginbull S, Jordan D, Van Dragt R, Pelant R. 2011. Techniques to promote Garry oak seedling growth and survival in areas with high levels of herbivory and competition. *Northwest Science* 85(2): 172-181
- Descamp, W. 2004. "Collecting, Installing, Storing and Caring for Live Stakes." University of Washington Botanic Gardens.
- DiTomaso J, GB Kyser et al. 2013. Weed control in natural areas in the western United States. Weed Research and Information Center. University of California.
- Gilligan L, Muir P. 2011. Stand structures of Oregon white oak woodlands, regeneration, and their relationship to the environment in southwestern Oregon. *Northwest Science* 85: 141-158
- Giusti G, McCreary D, Standiford R. 2005. A planner's guide for oak woodlands. University of California Agriculture and Natural Resources. Davis, California.
- Harvey R, Mazzotti F. 2015. The invasion curve: a tool for understanding invasive species management in south Florida. *EDIS* 2015 1: 4
- Hill D, Prasad R, Leckie D. 2016. Mapping of Scotch broom (*Cytisus scoparius*) with Landsat imagery. *Weed Technology* 30: 539-558
- Himes G. 1915. Organizers of the First Government in Orgon. *The Washington Historical Quarterly* 6: 162-167
- Hulse D, Gregory S, Baker J (Eds). 2002. Willamette River Basin Planning Atlas: Trajectories of environmental and ecological change. Oregon State University Press. Corvallis, Oregon.
- Hussey J. 1962. Champoeg State Park, Oregon: a summary report of its history and a proposed plan for its development. Western Region, National Park Service for the Oregon State Highway Commission, State Parks Division. San Francisco, California.
- Hussey J. 1967. Champoeg: place of transition, a disputed history. Oregon Historical Society. Spray, Oregon.
- Institute for Applied Ecology. 2014. Champoeg Prairie Restoration Plan. 18 pp. plus appendices.

- Kagan J, Brunner R, Christy J. 2019. Classification of native vegetation of Oregon – 2019. Oregon Biodiversity Information Center. Portland, Oregon.
- Lieurance D, Kendig A, Romagosa C. 2022. The stages of invasion: how does a nonnative species transition to an invader? *EDIS* 2022 4: 1-10
- McClay A. 2002. Canada thistle. in Van Driesche R, et al (eds), Biological control of invasive plants in the eastern United States. USDA Forest Service publication.
- Moore P. 2020. Plants for People II: final report. Unpublished report for Oregon Watershed Enhancement Board, Salem, Oregon. Institute for Applied Ecology. Corvallis, Oregon.
- Moore P, Esterson A. 2022. Herbert Farm and Natural Area restoration – 2021 annual report. Unpublished report for the Willamette Wildlife Mitigation Program, Oregon Department of Fish and Wildlife. Institute for Applied Ecology, Corvallis, OR. 38 pp. plus appendices.
- Muick P, Bartolome J. 1987. Factors associated with oak regeneration in California. In Plumb T, Pillsbury N (Eds) Proceedings of the symposium on multiple-use management of California's hardwood resources. USDA Forest Service General Technical Report PSW-100. Southwest Forest and Range Experiment Station. Berkeley, CA.
- Okerman A (2000) Combating the “ivy desert”: the invasion of *Hedera helix* (English ivy) in the pacific northwest United States. *Restoration and Reclamation Review* 6: 1-10
- Oregon Conservation Strategy. 2016. Oregon Department of Fish and Wildlife. Salem, Oregon.
- Oregon Department of Environmental Quality. 2022. Water Quality Report and List of Water Quality Limited Waters. Portland, Oregon. Online at https://www.deq.state.or.us/psc/pdf/AssessmentSummaries/2022_IR_Assessment_Unit_report-OR_WS_170900070305_02_104416.html. Accessed on November 22, 2022.
- Oregon State Parks & Recreation Department. 1990. Champoeg State Park Master Plan.
- Oregon State Parks & Recreation Department. 2008. History of Champoeg State Heritage Area. Online at <https://stateparks.oregon.gov/index.cfm?do=main.loadFile&load=siteFiles%2Fpublications%2F%2Fchampoeg-flood---web.085455.pdf> Accessed on August 30, 2023.
- Oregon State Parks & Recreation Department. 2017. Natural resource function and value assessment of OPRD managed lands in the Willamette Basin.
- Pacific Northwest Climate Impacts Research Consortium. 2020. Integrating CIRC's efforts to aid climate adaption in the Pacific Northwest United States. CIRC 2.0 Year 5 Progress Report. Oregon State University. Corvallis, Oregon.
- City of Portland. 2023. No Ivy League. Online at <https://www.portland.gov/parks/nas/noivy>. Accessed on July 18, 2023.

- Roni P, Beechie T, Pess G, Hanson K. 2015. Wood placement in river restoration: fact, fiction, and future direction. *Canadian Journal of Fisheries and Aquatic Sciences* 72: 466-478
- United States Department of Agriculture. 2023. Natural Resources Conservation Services web soil survey. Available online. Accessed on November 22, 2023.
- Trendanfilova S, Waller S. 2011. Assessing the ecological impact due to disc golf. *International Journal of Sport Management, Recreation & Tourism* 8: 35-64
- Weilhoefer C, Williams D, Nguyen I, Jakstis K, Fischer C. 2017. The effects of reed canary grass (*Phalaris arundinacea*) on wetland habitat and arthropod community composition in an urban freshwater wetland. *Wetlands Ecology and Management* 25: 159-175

APPENDIX A. PLANT SPECIES LISTS

Table 16. Champoeeg species list. AG: Agriculture, FH: Forest – Hardwood, FM: Forest – Mixed, MG: Managed Grassland, OW: Oak woodland, PU: Prairie – Upland, PW: Prairie – Wet, RI: Riparian. Data collected from 2021-2023.

Scientific name	Common name	Functional Group	Origin	AG	FM	MG	OW	PU	PW	RI
<i>Abies grandis</i>	grand fir	tree	native		✓					
<i>Acer circinatum</i>	vine maple	shrub	native		✓					
<i>Acer macrophyllum</i>	bigleaf maple	tree	native		✓	✓	✓	✓		✓
<i>Acer platanoides</i>	Norway maple	tree	introduced				✓			
<i>Acer rubrum</i>	red maple	tree	native			✓				✓
<i>Adesmia bicolor</i>	Alverjilla	forb	introduced		✓					
<i>Agrostis stolonifera</i>	creeping bentgrass	grass	introduced		✓					
<i>Aira caryophyllea</i>	silver hairgrass	grass	introduced						✓	
<i>Alnus rubra</i>	red alder	tree	native		✓			✓		✓
<i>Alopecurus pratensis</i>	meadow foxtail	grass	introduced	✓	✓	✓	✓	✓	✓	✓
<i>Amelanchier alnifolia</i>	Serviceberry	shrub	native		✓		✓	✓		
<i>Anthoxanthum odoratum</i>	sweet vernalgrass	grass	introduced		✓	✓		✓		
<i>Apocynum cannabinum</i>	Hemp dogbane	forb	native	✓						
<i>Arbutus menziesii</i>	Pacific madrone	tree	native		✓					
<i>Arrhenatherum elatius</i>	tall oat grass	grass	introduced	✓	✓	✓	✓	✓	✓	
<i>Bromus carinatus</i>	California brome	grass	native		✓					
<i>Bromus hordeaceus</i>	soft brome	grass	introduced							✓
<i>Bromus sitchensis</i>	Alaska brome	grass	native				✓			
<i>Bromus vulgaris</i>	Columbia brome	grass	native		✓					
<i>Camassia leichtlinii</i>	large camas	forb	native				✓			
<i>Carex leptalea</i>	bristlystalked sedge	graminoid	native		✓		✓			

Scientific name	Common name	Functional Group	Origin	AG	FM	MG	OW	PU	PW	RI
<i>Carex obnupta</i>	slough sedge	graminoid	native							✓
<i>Carex spp.</i>	sedge	graminoid	unknown							✓
<i>Carex tumulicola</i>	splitawn sedge	graminoid	native					✓	✓	
<i>Centaureum erythraea</i>	European centaury	forb	introduced					✓	✓	
<i>Cicuta douglasii</i>	western water hemlock	forb	native							✓
<i>Cirsium arvense</i>	Canada thistle	forb	introduced	✓		✓		✓	✓	
<i>Cirsium vulgare</i>	bull thistle	forb	introduced				✓		✓	
<i>Claytonia sibirica</i>	Siberian miner's lettuce	forb	native		✓					
<i>Convolvulus arvensis</i>	field bindweed	forb	introduced			✓			✓	
<i>Cornus sericea</i>	redosier dogwood	tree	native		✓		✓		✓	✓
<i>Corylus cornuta</i>	beaked hazelnut	shrub	native		✓		✓			
<i>Crataegus douglasii</i>	black hawthorn	tree	native	✓					✓	
<i>Crataegus monogyna</i>	oneseed hawthorn	tree	introduced		✓	✓	✓	✓	✓	
<i>Dactylis glomerata</i>	orchardgrass	grass	introduced		✓	✓		✓		
<i>Daucus carota</i>	Queen Anne's lace	forb	introduced	✓	✓	✓	✓	✓		✓
<i>Deschampsia cespitosa</i>	tufted hairgrass	grass	native					✓		
<i>Dipsacus fullonum</i>	Fuller's teasel	forb	introduced			✓	✓		✓	✓
<i>Eleocharis palustris</i>	spreading spikerush	grass	native							✓
<i>Elymus glaucus</i>	blue wildrye	grass	native		✓		✓	✓		
<i>Equisetum telmateia</i>	giant horsetail	vascular plant	native				✓			
<i>Festuca roemerii</i>	Roemer's fescue	grass	native					✓		
<i>Frangula purshiana</i>	Cascara buckthorn	tree	native		✓					✓
<i>Fraxinus latifolia</i>	Oregon ash	tree	native	✓	✓	✓	✓	✓	✓	✓
<i>Galium aparine</i>	stickywilly	forb	native		✓		✓			

Scientific name	Common name	Functional Group	Origin	AG	FM	MG	OW	PU	PW	RI
<i>Gaultheria shallon</i>	salal	shrub	native		✓					
<i>Geranium lucidum</i>	shining geranium	forb	introduced		✓		✓			
<i>Hedera helix</i>	English ivy	vine	introduced		✓		✓			
<i>Heracleum maximum</i>	common cowparsnip	forb	native		✓					✓
<i>Holcus lanatus</i>	velvetgrass	grass	introduced	✓		✓		✓		
<i>Holodiscus discolor</i>	oceanspray	shrub	native				✓			
<i>Humulus lupulus</i>	common hop	forb	introduced			✓				
<i>Hydrophyllum tenuipes</i>	Pacific waterleaf	forb	native		✓					
<i>Hypericum perforatum</i>	St. John's wort	forb	introduced		✓		✓			
<i>Hypochaeris radicata</i>	hairy cat's tongue	forb	introduced	✓		✓				
<i>Ilex aquifolium</i>	English holly	shrub	introduced		✓					
<i>Impatiens capensis</i>	jewelweed	forb	introduced		✓					✓
<i>Juncus effusus</i>	common rush	graminoid	native						✓	✓
<i>Juncus patens</i>	spreading rush	graminoid	native				✓			
<i>Juncus tenuis</i>	poverty rush	graminoid	native							✓
<i>Lathyrus latifolius</i>	everlasting pea	forb	introduced			✓				
<i>Leucanthemum vulgare</i>	oxeye daisy	forb	introduced		✓		✓	✓	✓	
<i>Lupinus albicaulis</i>	sickle-keeled lupine	Forb	native					✓		
<i>Lupinus albus</i>	silver lupine	forb	native					✓		
<i>Lupinus polyphyllus</i>	bigleaf lupine	forb	native							✓
<i>Madia gracilis</i>	grassy tarweed	forb	native					✓		
<i>Madia sativa</i>	coast tarweed	forb	native					✓		✓
<i>Mahonia nervosa</i>	Cascade barberry	shrub	native		✓					
<i>Maianthemum dilatatum</i>	false lily of the valley	forb	native		✓					

Scientific name	Common name	Functional Group	Origin	AG	FM	MG	OW	PU	PW	RI
<i>Maianthemum racemosum</i>	feathery false lily of the valley	forb	native		✓					
<i>Malus domestica</i>	paradise apple	tree	introduced		✓			✓		✓
<i>Myrica californica</i>	Pacific wax myrtle	shrub	native		✓					
<i>Oemleria cerasiformis</i>	osoberry	shrub	native		✓		✓			
<i>Osmorhiza berteroi</i>	sweet cicely	forb	native		✓		✓			
<i>Panicum capillare</i>	witchgrass	grass	native	✓						
<i>Perideridia gairdneri</i>	Gardner's yampah	forb	native						✓	
<i>Persicaria spp.</i>	knotweed	forb	unknown	✓						
<i>Phalaris arundinacea</i>	reed canary grass	grass	introduced	✓	✓				✓	✓
<i>Physocarpus capitatus</i>	Pacific ninebark	shrub	native		✓				✓	✓
<i>Picea spp.</i>	spruce	tree	unknown		✓					
<i>Pinus contorta</i>	shore pine	tree	native		✓					
<i>Pinus jeffreyi</i>	Jeffrey pine	tree	native		✓					
<i>Pinus pinea</i>	Italian stone pine	tree	introduced			✓				
<i>Pinus ponderosa</i>	Ponderosa pine	tree	native		✓					✓
<i>Plantago lanceolata</i>	narrowleaf plantain	forb	introduced	✓		✓	✓	✓		
<i>Polystichum munitum</i>	western swordfern	fern	native		✓					
<i>Populus fremontii</i>	Fremont cottonwood	tree	native		✓					
<i>Populus trichocarpa</i>	black cottonwood	tree	native							✓
<i>Populus tristis</i>	Tristis poplar	tree	native		✓	✓	✓			✓
<i>Prunella vulgaris</i>	common selfheal	forb	native		✓			✓		
<i>Prunus avium</i>	sweet cherry	tree	introduced		✓	✓	✓	✓		
<i>Prunus domestica</i>	European plum	tree	introduced		✓					
<i>Prunus spp.</i>	cherry	tree	unknown						✓	

Scientific name	Common name	Functional Group	Origin	AG	FM	MG	OW	PU	PW	RI
<i>Pseudotsuga menziesii</i>	Douglas-fir	tree	native		✓	✓	✓	✓		✓
<i>Pyrus communis</i>	common pear	tree	introduced		✓					✓
<i>Quercus garryana</i>	Oregon white oak	tree	native		✓	✓	✓	✓	✓	✓
<i>Quercus rubra</i>	red oak	tree	native				✓			
<i>Rhododendron macrophyllum</i>	Pacific rhododendron	shrub	native		✓					
<i>Robinia pseudoacacia</i>	black locust	tree	introduced		✓		✓	✓		
<i>Rosa nutkana</i>	Nootka rose	shrub	native	✓	✓	✓	✓	✓	✓	✓
<i>Rosa pisocarpa</i>	cluster rose	shrub	native						✓	✓
<i>Rubus armeniacus</i>	Armenian blackberry	shrub	introduced	✓	✓	✓	✓	✓	✓	✓
<i>Rubus parviflorus</i>	thimbleberry	shrub	native		✓		✓			
<i>Rubus spectabilis</i>	salmonberry	shrub	native		✓					
<i>Rubus ursinus</i>	California blackberry	vine	native		✓		✓			✓
<i>Salix hookeriana</i>	Hooker's willow	tree	native		✓					
<i>Salix lasiolepis</i>	arroyo willow	shrub	native		✓	✓		✓		✓
<i>Sambucus racemosa</i>	red elderberry	shrub	native		✓					
<i>Schedonorus arundinaceus</i>	tall fescue	grass	introduced	✓	✓		✓	✓		✓
<i>Senecio jacobaeae</i>	tansy ragwort	forb	introduced	✓		✓		✓		
<i>Senecio sylvaticus</i>	woodland ragwort	forb	introduced			✓				
<i>Spiraea douglasii</i>	rose spirea	shrub	native				✓	✓	✓	✓
<i>Stachys mexicana</i>	Mexican hedgenettle	forb	native				✓			✓
<i>Symphoricarpos albus</i>	snowberry	shrub	native		✓		✓	✓	✓	✓
<i>Tanacetum vulgare</i>	common tansy	forb	introduced						✓	
<i>Tellima grandiflora</i>	bigflower tellima	forb	native		✓					✓
<i>Thuja plicata</i>	western redcedar	tree	native		✓			✓		

Scientific name	Common name	Functional Group	Origin	AG	FM	MG	OW	PU	PW	RI
<i>Torilis japonica</i>	erect hedgeparsley	forb	introduced		✓		✓			
<i>Toxicodendron diversilobum</i>	poison oak	shrub	native		✓		✓	✓	✓	✓
<i>Ulmus pumila</i>	Siberian elm	tree	introduced		✓					
<i>Urtica dioica</i>	stinging nettle	forb	unknown		✓					✓
<i>Vancouveria hexandra</i>	white insideout flower	forb	native		✓					
<i>Ventenata dubia</i>	wiregrass	grass	introduced					✓		
<i>Vicia americana</i>	American vetch	forb	native						✓	
<i>Vicia hirsuta</i>	tiny vetch	forb	introduced						✓	
<i>Vicia sativa</i>	garden vetch	forb	introduced						✓	
<i>Vicia spp.</i>	vetch	forb	unknown					✓		
<i>Vicia villosa</i>	hairy vetch	forb	introduced						✓	
<i>Vulpia myuros</i>	rattail fescue	grass	introduced			✓		✓		
Total species:				17	65	26	43	39	28	39
Native:				5	43	8	26	20	13	27
Non-native:				11	20	18	17	18	14	10

Table 17. Riparian shrub plantings species list

Scientific name	Common name	Growth form	Stems/acre
<i>Alnus rhombifolia</i>	White alder	Tree	200
<i>Alnus rubra</i>	Red alder	Tree	100
<i>Cornus sericea sericea</i>	Redosier dogwood	Shrub	150
<i>Holodiscus discolor</i>	Ocean spray	Shrub	100
<i>Oemleria cerasiformis</i>	Osoberry	Shrub	100
<i>Physocarpus capitatus</i>	Pacific ninebark	Shrub	125
<i>Populus trichocarpa</i>	Black cottonwood	Tree	100
<i>Rhamnus purshiana</i>	Cascara	Shrub	100
<i>Rosa nutkana</i>	Nootka rose	Shrub	50
<i>Salix lasiandra</i>	Pacific willow	Tree	200
<i>Salix scouleriana</i>	Scouler's willow	Tree	200
<i>Salix sitchensis</i>	Sitka willow	Tree	300
<i>Spiraea douglasii</i>	Rose spirea	Shrub	50
<i>Symphoricarpos albus</i>	Snowberry	Shrub	250
		Total	2,025

Table 18. Culturally significant plant species as provided by Confederated Tribes of Grand Ronde (CTGR)

Scientific name	Common name	Functional group	Habitat
<i>Achillea millefolium</i>	yarrow	forb	prairie
<i>Adiantum pedatum</i>	northern maidenhair	herb	mixed forest
<i>Allium amplexans</i>	narrowleaf onion	forb	prairie
<i>Amelanchier alnifolia</i>	serviceberry	shrub	mixed forest
<i>Apocynum cannabinum</i>	hemp dogbane	forb	mixed forest
<i>Arbutus menziesii</i>	Pacific madrone	tree	mixed forest
<i>Arctostaphylos columbiana</i>	hairy manzanita	shrub	mixed forest
<i>Arctostaphylos uva-ursi</i>	kinnikinnick	shrub	mixed forest
<i>Artemisia spp.</i>	mugwort	forb	prairie
<i>Asclepias spp.</i>	milkweed	forb	prairie
<i>Brodiaea elegans</i>	harvest brodiaea	forb	prairie
<i>Calochortus tolmiei</i>	Tolmie star-tulip	forb	prairie
<i>Camassia leichtlinii</i>	large camas	forb	prairie
<i>Camassia quamash</i>	small camas	forb	prairie
<i>Chamerion angustifolium</i>	fireweed	forb	prairie
<i>Clinopodium douglasii</i>	yerba buena	forb	mixed forest
<i>Cornus cornuta</i>	beaked hazel	shrub	mixed forest
<i>Cornus sericea</i>	red osier dogwood	shrub	riparian

Scientific name	Common name	Functional group	Habitat
<i>Dichelostemma congestum</i>	ookow	forb	prairie
<i>Equisetum spp.</i>	horsetail	graminoid	riparian
<i>Erythronium oregonum</i>	fawn lily	forb	mixed forest
<i>Fragaria virginiana</i>	Virginia strawberry	forb	prairie
<i>Frangula purshiana</i>	cascara buckthorn	shrub	mixed forest
<i>Fraxinus latifolia</i>	ash	tree	riparian
<i>Fritillaria affinis</i>	chocolate lily	forb	mixed forest
<i>Gaultheria shallon</i>	salal	shrub	mixed forest
<i>Grindelia integrifolia</i>	gumweed	forb	prairie
<i>Heracleum lanatum</i>	cowparsnip	forb	mixed forest
<i>Holodiscus discolor</i>	oceanspray	shrub	mixed forest
<i>Iris tenax</i>	toughleaf iris	forb	prairie
<i>Juncus spp.</i>	rushes	graminoid	riparian
<i>Lomatium dissectum</i>	fernleaf biscuitroot	forb	prairie
<i>Lomatium nudicaule</i>	barestem biscuitroot	forb	prairie
<i>Lonicera involucrata</i>	twinberry honeysuckle	forb	mixed forest
<i>Lysichiton americanus</i>	skunk cabbage	forb	riparian
<i>Madia sativa</i>	tarweed	forb	prairie
<i>Mahonia nervosa</i>	Cascade barberry	shrub	mixed forest
<i>Maianthemum racemosum</i>	feathery false lily of the valley	forb	mixed forest
<i>Malus fusca</i>	Oregon crab apple	tree	mixed forest
<i>Oemleria cerasiformis</i>	osoberry	shrub	riparian
<i>Oplopanax horridus</i>	devilsclub	forb	mixed forest
<i>Oxalis oregana</i>	redwood-sorrel	forb	mixed forest
<i>Perideridia gairdneri</i>	common yampah	forb	prairie
<i>Philadelphus lewisii</i>	Lewis' mock orange	shrub	mixed forest
<i>Physocarpus capitatus</i>	Pacific ninebark	shrub	riparian
<i>Polypodium glycyrrhiza</i>	licorice root fern	herb	mixed forest
<i>Prunella vulgaris</i>	common selfheal	forb	prairie
<i>Prunus virginiana</i>	chokecherry	shrub	mixed forest
<i>Pteridium aquilinum</i>	Western brackenfern	herb	mixed forest
<i>Quercus garryana</i>	Oregon white oak	tree	mixed forest
<i>Ribes divaricatum</i>	spreading gooseberry	shrub	mixed forest
<i>Ribes laxiflorum</i>	trailing black currant	shrub	mixed forest
<i>Rosa nutkana</i>	Nootka rose	shrub	mixed forest
<i>Rubus parviflorus</i>	thimbleberry	shrub	mixed forest
<i>Rubus spectabilis</i>	salmonberry	shrub	mixed forest
<i>Rubus ursinus</i>	California blackberry	shrub	mixed forest

Scientific name	Common name	Functional group	Habitat
<i>Sagittaria latifolia</i>	wapato	forb	riparian
<i>Salix spp.</i>	willow	tree	riparian
<i>Sambucus nigra</i>	blue elderberry	shrub	mixed forest
<i>Schoenoplectus acutus</i>	tule	graminoid	riparian
<i>Streptopus amplexifolius</i>	claspleaf twistedstalk	forb	mixed forest
<i>Thuja plicata</i>	Western red cedar	tree	mixed forest
<i>Triteleia hyacinthina</i>	white brodiaea	forb	prairie
<i>Typha latifolia</i>	cattail	graminoid	riparian
<i>Urtica dioica</i>	stinging nettle	forb	riparian
<i>Vaccinium membranaceum</i>	thinleaf huckleberry	shrub	mixed forest
<i>Wyethia angustifolia</i>	California compassplant	forb	prairie

Table 19. Wet prairie and vernal pool species list

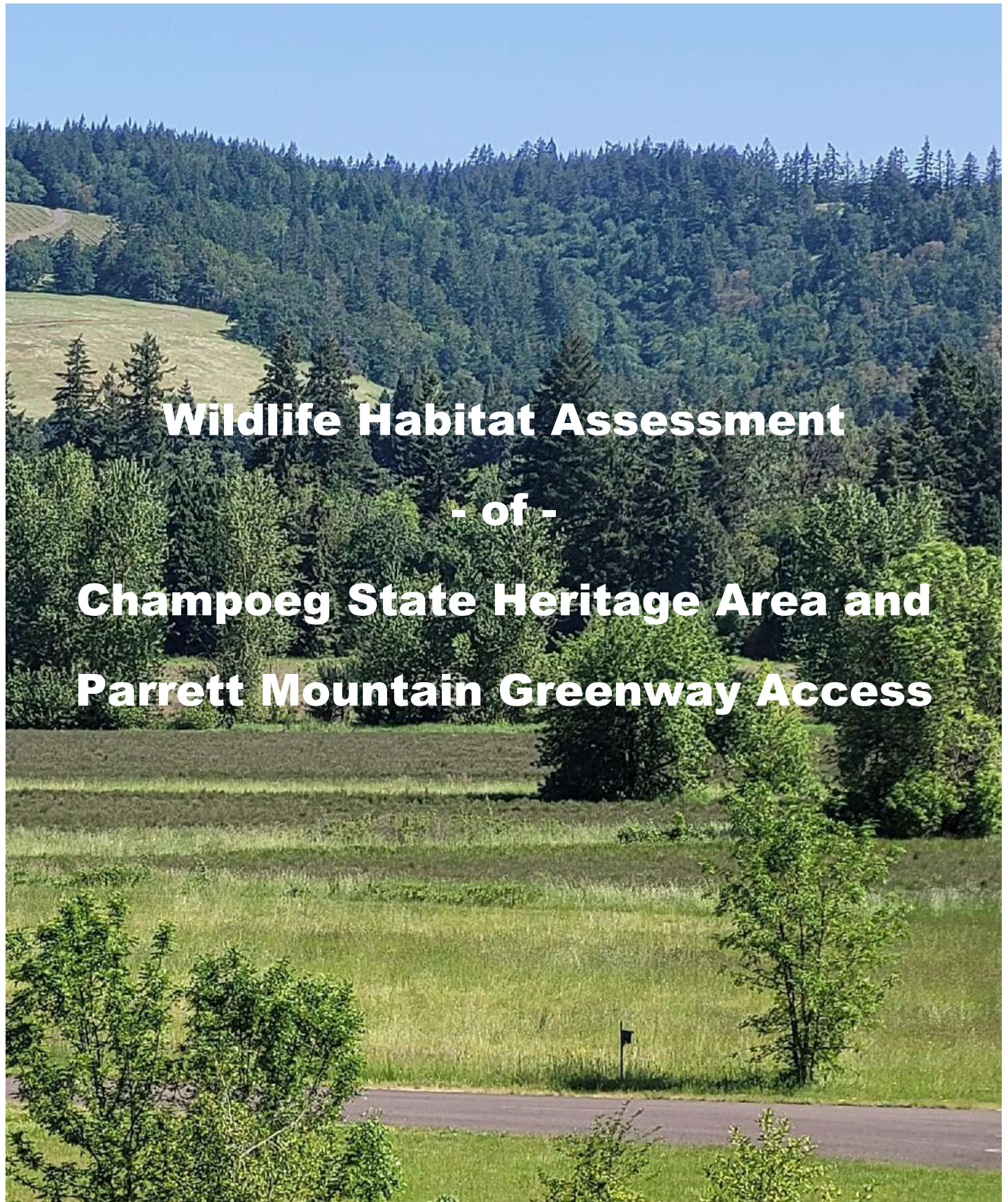
Scientific name	Common name	Functional group	VP	PW
<i>Agrostis microphylla</i>	Awned spike bentgrass	graminoid	✓	✓
<i>Allium amplexans</i>	Narrowleaf wild onion	forb	✓	✓
<i>Alopecurus carolinianus</i>	Tufted foxtail	graminoid	✓	
<i>Asclepias fascicularis</i>	Narrowleaf milkweed	forb	✓	✓
<i>Beckmannia syzigachne</i>	Sloughgrass	graminoid	✓	✓
<i>Brodiaea coronaria</i>	Harvest brodiaea	forb	✓	✓
<i>Calochortus uniflorus</i>	Large flowered startulip	forb		✓
<i>Camassia leichtlinii</i>	Large camas	forb		✓
<i>Camassia quamash</i>	Small camas	forb		✓
<i>Carex aurea</i>	Golden fruited sedge	graminoid		✓
<i>Carex densa</i>	Dense sedge	graminoid	✓	✓
<i>Carex tumulicola</i>	Foothill sedge	graminoid		✓
<i>Centaureum muehlenbergii</i>	Muehlenberg's centaury	forb	✓	✓
<i>Crocium multicaule</i>	Spring gold	forb	✓	
<i>Danthonia californica</i>	Umbrella plant	graminoid		✓
<i>Deschampsia cespitosa</i>	Tufted hairgrass	graminoid	✓	✓
<i>Downingia elegans</i>	Elegant downingia	forb	✓	✓
<i>Epilobium densiflorum</i>	Denseflower willowherb	forb	✓	✓
<i>Eriophyllum lanatum</i>	Wooly sunflower	forb		✓
<i>Erythranthe guttata</i>	Yellow monkeyflower	forb	✓	✓

Scientific name	Common name	Functional group	VP	PW
<i>Fragaria virginiana</i>	Prairie strawberry	forb		✓
<i>Geranium oreganum</i>	Western geranium	forb		✓
<i>Grindelia integrifolia</i>	Gumweed	forb	✓	✓
<i>Heterocodon rariflorum</i>	Western pearlflower	forb	✓	
<i>Juncus confusus</i>	Colorado rush	graminoid		✓
<i>Juncus hemiendytus</i>	Dwarf rush	graminoid	✓	
<i>Juncus nevadensis</i>	Sierra rush	graminoid	✓	✓
<i>Koeleria macrantha</i>	Junegrass	graminoid		✓
<i>Lasthenia glaberrima</i>	Smooth goldfields	forb	✓	✓
<i>Lomatium nudicaule</i>	Barestem biscuitroot	forb		✓
<i>Madia elegans</i>	Showy tarweed	forb		✓
<i>Madia glomerata</i>	Mountain tarweed	forb	✓	✓
<i>Madia sativa</i>	Coast tarweed	forb		✓
<i>Perideridia oregana</i>	Yampah	forb		✓
<i>Plagiobothrys scouleri</i>	Fragrant popcorn flower	forb	✓	✓
<i>Plectritis congesta</i>	Rosy plectritis	forb		✓
<i>Poa secunda</i>	Sandberg bluegrass	graminoid	✓	✓
<i>Potentilla gracilis</i>	Graceful cinquefoil	forb		✓
<i>Ranunculus occidentalis</i>	Western buttercup	forb		✓
<i>Sidalcea campestris</i>	Meadow checkermallow	forb		✓
<i>Spiranthes romanzoffiana</i>	Hooded ladies' tresses	forb	✓	✓
<i>Trichostema oblongum</i>	Downy blue curls	forb	✓	✓
<i>Wyethia angustifolia</i>	Narrowleaf mule's ears	forb		✓

APPENDIX B: NATURAL RESOURCE FUNCTION & VALUE ASSESSMENT

	Mixed Forest	Agriculture	Upland Prairie	Oak Woodland	Riparian	Managed Grassland	Wet Prairie	Average
Quantity and quality of native vegetation	1	0	4	2	2	0	2	2
Human-caused disturbance factors	3	0	3	0	3	1	3	2
Presence of habitat altering non-native invasive plant species	1	3	3	3	3	3	3	3
Presence of rare plant and/or wildlife species	1	0	0	0	1	0	0	0
Presence of specialized habitat or unique habitat features	3	0	1	2	0	0	1	1
Total	9	3	11	7	9	4	9	8

APPENDIX C: WILDLIFE HABITAT ASSESSMENT



CONTENTS

1.0 Summary	3
2.0 Introduction and Background	4
3.0 HABITATS	5
3.1 General Habitat Descriptions	5
3.2 Habitat types	6
3.21 Aquatic Habitats	8
3.22 Riparian habitats	9
3.23 Other terrestrial habitats	11
3.24 Parrett Mountain Greenway Access (PMGA)	16
3.3 Planning treatment by state agencies and others	18
4.0 SPECIES	20
4.1 Common and expected species	20
4.2 Uncommon and at-risk species	24
4.3 Non-native and non-native invasive species	45
4.4 Post-restoration changes in uncommon species	46
5.0 Threats	47
6.0 Restoration and Management Recommendations	50
Bibliography	53
Personal Communications	55
Attachments	56

1.0 Summary

The Champoeg State Heritage Area and Parrett Mountain Greenway Access are the subjects of this wildlife habitat assessment. The assessment is intended to be used by the Institute of Applied Ecology in developing a natural resources management plan for the two sites.

The Oregon Conservation Strategy identifies Strategy Habitats (mostly prairie, oak and wetlands) and Strategy Species which are most at-risk in the ecoregion. Some of these are found or expected within the boundaries of the two sites. A few additional at-risk species (identified as rare or uncommon by the Oregon Biodiversity Information Center) are examined in this assessment in addition to the Strategy Species.

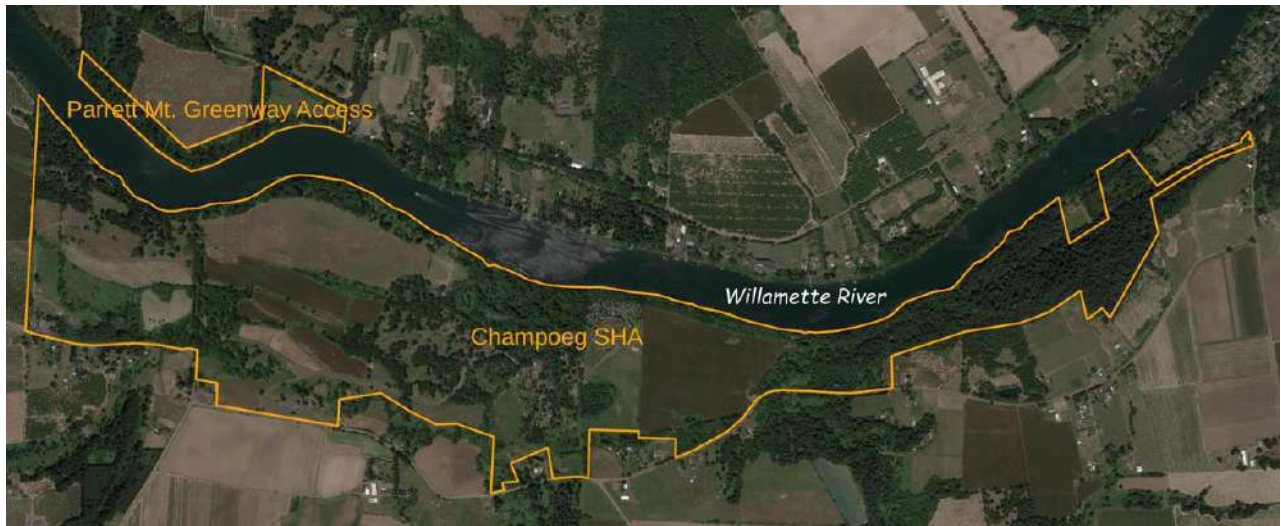
The Champoeg site is nearly 20 times larger than the Greenway Access site and has a much more diverse array of habitat types. Because of these two factors (size and habitat diversity), it has a wider variety of wildlife species, however, suitability for habitat use by wildlife is tempered by intensive human use, invasive species, small patch size and lack of connectivity. This disturbance interferes with wildlife reproduction and feeding and other essential activities.

Nonetheless, there are some significant wildlife uses of the park, particularly by several at-risk grassland and oak-associated bird species (e.g., Acorn Woodpecker, Chipping Sparrow, Western Bluebird, Slender-billed White-breasted Nuthatch), and several amphibian species - although little is known about the latter. Protection of known populations should be paramount as more species of interest are discovered and habitats are slowly restored.

Both terrestrial and aquatic (creek) surveys are needed to identify presence and status of species and populations in the area, and monitoring is needed to identify trends. Current management of the habitats seems to be compatible with many wildlife species, however, without baseline information, actual increases or decreases in populations are not possible to determine. Because site visits were conducted during a period of transition of management personnel some current management considerations may not be included here.

The top four actions that should be undertaken to maximize available and suitable habitat for use by *all* uncommon and rare species are:

1. Conduct surveys of all wildlife groups to determine species presence and absence,
2. Restore and maintain OCS-identified Strategy Habitats,
3. Control invasive species, and
4. Limit human impacts.



Map 1-1. Champoege SHA and Parrett MGA boundaries.

2.0 Introduction and Background

The purpose of this report is to assess present and potential wildlife use of the Champoege State Heritage Area (CSHA) and Parrett Mountain Willamette River Greenway Access (PMGA). This assessment is intended for reference and/or inclusion as needed to complement vegetation information and other materials assembled by the Institute of Applied Ecology (IAE) to prepare a natural resources management plan for these two areas for the Oregon Parks and Recreation Department (OPRD).

Surveys for wildlife were not a part of this project. Baseline data is lacking for most species present or assumed to be present.

Both subject sites are west of Interstate 5 to the southeast of Newberg and southwest of Wilsonville. The CHSA site is on the south side of the Willamette River and the PMGA site is on the north side, across from the west end of the CSHA site. Residences, many with private boat ramps, line the shore opposite the remainder of the CSHA.

The CSHA is approximately 675 acres in size, and the PMGA is about 35 acres, totaling about 710 acres addressed in this assessment. These sites primarily are terrestrial but contain some small creeks and wetlands and Willamette River shorelines. For purposes of this study, the Willamette River boundaries are assumed to be the “ordinary high-water line”.

The two sites are not linked directly by a bridge or other terrestrial connection. River boaters occasionally beach temporarily or camp (often in summer, rarely in winter) in portions of both sites where a dock (CSHA) and primitive landings (PMGA) are part of the Willamette River Greenway route. There is no boat ramp access at either site and motorized (or larger non-motorized) watercraft likely visit Parrett even less than the dock at Champoege. Motorized watercraft in the Willamette frequently pass both sites, sometimes at high speeds, during warm days of spring, summer and fall.

Human use at PMGA is relatively low, but there are many activities and users at CSHA including bicyclers, hikers/walkers, runners, campers, historic appreciation tourists, birders, boaters, and disc golfers. As with boating, heaviest use tends to be sunny, weekend days. A recreational drone pilot used the PMGA at the time of the visit for this assessment.

Additional information about site backgrounds is plentiful in the existing management plan (OPRD 1990), many documents in the bibliography, and in the subcontracted bird and turtle assessments attached here.

3.0 HABITATS

A pertinent referenced document contains a thorough and accurate description of historic prairie and oak habitats, current habitats, and the management changes which have occurred resulting in those current habitats (Vesely and Rosenberg 2010). The overall assessment contained in that document explains well why there are relatively few prairie and oak habitats today. And not coincidentally, these habitats are the rarest in the Valley and at-risk species overwhelmingly are users of these habitats.

3.1 General Habitat Descriptions

Five terrestrial habitat types are mapped in the study area, and both study sites are adjacent to the aquatic habitat of the Willamette River. Terrestrial habitats are comprised of Riparian, Forest, Woodland and Prairie types, further subdivided in the next section. Forests have nearly complete tree cover (branch tips sometimes touching or overlapping), and often have small openings – in the typical case of the Champoeg SHA and Parrett MGA, the openings are dominated with Armenian Blackberry. Woodlands have less complete tree cover with many canopy gaps; savannas have scattered and occasionally clumped trees; and prairies have widely scattered to no trees. These habitat types are based on structure regardless of native species composition. That is, they are defined by humans – and often used by wildlife – depending on whether their tallest vegetation is predominantly trees or shrubs or herbaceous plants, or some combination of those and the habitat type names generally do not indicate nativeness of the habitat. Trees and shrubs provide vertical structure, which some wildlife species require.

There is little to no regeneration of tree species in forested habitats of the CSHA and PMGA sites. This likely is due to the dense shrub layer (often invasive blackberry species) inhibiting germination in forest gaps and on edges and to mowing in areas with open understories. Mowing may have both good and bad impacts on wildlife mostly depending on timing. For example, it may keep habitats from being invaded by blackberries and woody vegetation, but it can destroy nests.

In addition to blackberries, which are widespread on both sites, Irish (Atlantic) and English ivy and other non-native, invasive species now occupy space historically occupied by native plants.

Vegetation in many habitats at the CSHA and PMGA sites is increasing in height over time, such as where existing forests continue to grow taller, or where Oregon Ash seedlings are encroaching into wetland prairies.

The native encroaching trees and shrubs are associated with a lack of fire which historically prevented native tree encroachment in much or most of the two sites

Besides vegetation, other special features of habitat affect usage by wildlife: proximity to water (or small water features within a habitat patch), snags and logs, and rarely, cliffs, talus and mineral springs. The latter three are almost absent on the Willamette Valley floor (and completely absent at the two study areas), but water (particularly the adjacent Willamette River, but also the small onsite streams) is a major feature of some habitats at the CSHA and the PMGA. Large snags occur regularly in some habitats near the Willamette, and some large logs are present. Snags may crumble in place or fall and become logs. Although cliffs are used by some animals, such as cliff-nesting birds and some bats for roosting, no cliffs were noted during site visits by the contractor or subcontractors for this project, nor mentioned in written material about the sites. Mineral springs are used by at least one at-risk bird species (Band-tailed Pigeon), but again, none were observed and likely are not present.

Presence of humans and their pets, presence of vehicles and roads, airplane noise, river power boat noise and speed, water quality, habitat isolation and other factors discussed under Threats likely degrade habitat quality of both sites.

Connectivity and proximity also can greatly affect habitat value. In particular, land animals need suitable habitat in proximity or accessible through connection for foraging and predation, dispersal, finding mates, avoiding predators, and sustaining populations through genetic exchange. Different species need different habitat patch sizes, and this may vary over the course of their lifetimes. Configuration of primary habitat and connected habitats also varies and may affect which species can pursue the needs listed above, and which cannot.

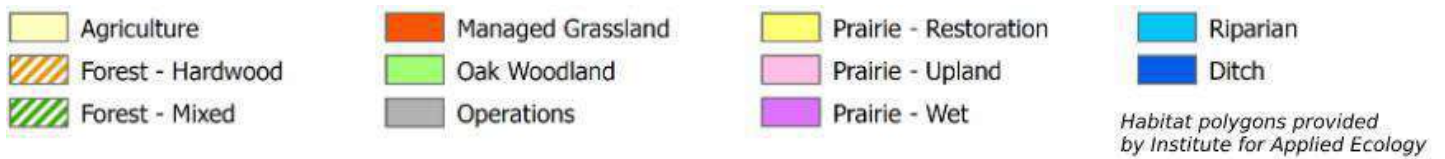
A variety of forest, woodland, prairie and agricultural habitats comprise the CSHA but only forest and grassland habitats comprise the much smaller PMGA site.

3.2 Habitat types

Boundaries of habitat polygons shown and discussed here follow as closely as possible those provided on a map obtained from the Institute of Applied Ecology on 6 December 2022.

Riparian sites include terrestrial areas adjacent to the river, and creeks and habitats bordering them, and wetland areas (excluding wet prairie).

Within the general terrestrial types are more specific types, such as hardwood forest and mixed forest within the broader category of forests. Sometimes there are sharp boundaries between different habitat types on the ground, but often there are not. Therefore, such mapping done for management planning purposes necessarily produces a map with lines that are not always evident on the ground, but either are close to actual changes in habitats or represent the approximate centers of wider areas of transition. Also, because of the practical need to achieve significant size patches for planning and management, small habitat areas sometimes are “lumped” into surrounding and/or adjacent habitat patches of larger size.



The following table shows the acreages of each mapped habitat type for the Champoeg SHA and Parrett Mountain GA sites.

Mapped Habitat Type	Champoeg SHA		Parrett Mt. GA	
	# of Polygons	Acreage	# of Polygons	Acreage
Agriculture	9	100		
Ditch	3	4		
Forest - Hardwood	6	30		
Forest - Mixed	13	246	1	28
Managed Grassland	10	36	1	2
Oak Woodland	5	64		
Prairie - Restoration	1	43		
Prairie- Upland	10	31	1	5
Prairie - Wetland	5	28		
Riparian	8	51		
Operations	9	43		
TOTAL	79	676	3	35

Table 3-1. Number and acreage of each mapped polygon type for Champoeg SHA and Parrett MGA sites.

3.21 Aquatic Habitats

The Willamette River lies between the two subject areas of this assessment. It borders the north side of the CSHA site and the south side of the PMGA site. The shorelines are steep and often undercut and the River bed appears muddy and deepens rapidly away from shore in most places. It is perennial, and likely maintains connections to at least the larger creeks on the Champoeg sites perennially, with possible exception of during extreme droughts.

No Willamette River sloughs or backwaters were detected during field visits, and none are mentioned in written materials or shown on imagery reviewed for this project. Review of numerous aerial images revealed that a small rock ledge often is visible north of the Restoration Prairie when water level lowers in mid to late summer. Small creek mouths may be used by small fish and salmon smolts as refugia during periods of winter and spring high water. In a recent electrofishing sampling of a small creek outlet into the Willamette River in the Eugene area (Univ. of Oregon 2022), several species of native fish in the Willamette were found using a small creek mouth in this way. Some may have been resident in the creek, and some non-native fish also were present. It is possible, also, that substrates at these mouths are used by freshwater mussels and lamprey ammocoetes (young form).

Several bat species of conservation concern may feed on insects over the river, and if so, they might roost and breed in snags in the riparian area and the nearby bat boxes installed in the Champoeg SHA.

Because the aquatic habitats are adjacent to the site boundaries and not included in the study area, they are not discussed further here.



Photo 3-1. Kneeboarding on Willamette River at Champoeg State Heritage Area.

3.22 Riparian habitats

In this report, “riparian” means “near water” and does not necessarily connote a specific ecological distinction. Riparian habitats include the creeks and wetlands in mapping and are next to (Willamette River) or are next to and include the small water areas on the site (creeks and wetlands). They express some influence of water in landform and/or vegetation. It is important to note that there is a gradual transition between riparian and non-riparian plant communities and habitats. As this influence is usually subtle, variable and transitional, Willamette River riparian forests have been included within the Mixed Forest habitat designations discussed below. The Mixed Forest habitats along the Willamette should be considered as “riparian” for the portions that have river or other water influence.

Adjacent to the River’s edge is a narrow band of Hooker’s Willow and a few other wet site species such as Creek Dogwood and Oregon Ash. Other species of willow may be present as well. Willows, in particular, are sought as host and nectar and pollen plants by many invertebrates.

Four northward-flowing creeks enter the Champoeg site and are listed here from west to east: Mission, Champoeg, Case and Ryan. Mission and Case flow into Champoeg Creek, and Champoeg and Ryan each flow into the Willamette River.

The creeks and their associated riparian corridors extend southward (upstream) from CSHA but have poor to no lateral, terrestrial habitat connectivity there – they are surrounded by the intensively-used agricultural lands of French Prairie. Typically, such uses might result in chemical runoff into the adjacent waters, but it is not possible to know without water testing and knowing the methods of the adjacent agricultural users.

The corridors along the creeks are dominated by invasive blackberries (primarily Armenian) and Reed Canarygrass – determined by viewing similar areas both within the park and from road crossings, by reviewing aerial imagery, and from knowledge of similar habitat in other areas of the Willamette Valley.



Photo 3-2. (Left) Champoeg Creek viewing south (upstream) onto private land from Champoeg Road, and (middle) viewing north (downstream) near mouth. (Right) Ryan Creek mouth at Willamette River.

Habitat polygons R1 and R2 are wet areas that capture moisture from the southwest corner of the park and convey it to Mission Creek. R3 is a moist forest where two forks of Mission Creek merge.

R4 is on the southeast and central edge of the Restoration Prairie and is larger and holds water longer than other wetland areas on the site (Klug, pers. comm.). It also is used by several amphibian species (Rombough, pers. comm.) such as Northern Red-legged Frogs, Pacific Treefrogs, Roughskin Newts, and Long-toed and Northwestern salamanders. Additional photos of this wetland are in Attachment B. R5 is the Ryan Creek riparian area.

The trees in these small riparian areas likely are used as perches and cover for all birds accessing water daily. They also likely are used by riparian species for nesting (e.g., Yellow Warbler). The shrubs in these areas are suitable nesting habitat for Common Yellowthroats. Little Willow Flycatchers and Yellow-breasted Chats may also use these habitats.

The creeks in the corridors are likely used by turtles for movement between other habitat areas, and dense vegetation in riparian corridors may be used as cover by aestivating or hibernating turtles (Attachment B and ODFW 2015) and for invertebrates.

There are several wetland areas on the CSHA site that mostly have hydrologic connections to the small creeks and/or the Willamette. The largest wetland may be the wetland between the Restoration Prairie and A1/A2.

It is flooded seasonally (Klug, pers, comm.; Rombough 2022) and drains eastward into Champoeg Creek. Reed Canarygrass, a non-native, invasive species, dominates the understory.

A second wetland is along the northern base of La Butte (Polygon R8), on the south side of the paved trail, which is mostly shaded by LaButte and trees on it as well as trees in the wetland. It likely has some standing water in the wettest parts of the year, and probably is used by at least some amphibians. Similarly, there is a third wetland farther east on the north side of the trail, mostly on adjacent private land. (Where the CSHA abuts the southwest corner of private land indenting the northern boundary of FM10. This private land “indentation” borders on the southwest side of FM11.)

The two, small, unnamed drainages that flow southward in and adjacent to the PMGA site do have limited connectivity uphill to forest areas across Wilsonville Road, but that area appears to be in transition to vineyard use – and thus more limited in potential wildlife usage. Both cross under Wilsonville Road in culverts.

3.23 Other terrestrial habitats

Areas adjacent to the Willamette River in the CSHA generally slope moderately to steeply towards it (northward), and farther back from the river and to the south, there is a subtle crest and a gentle southward slope. Most of the steeper slopes nearer the River and the crests are within the Forest-Mixed mapping designation. Areas farther from the River also are mapped with this designation but lack a riparian component for the most part – they are less influenced by the moister microclimate of the River. Much of the area in forest polygons is difficult to access and assess because of non-native blackberry invasion.

Mixed Forest (Forest-Mixed = FM polygons)

The sections of Mixed Forest west to east (upstream to downstream: FM 1, 2, 4, 7, 9, 10 (part) and 11), along the Willamette River have Douglas-fir, Oregon Ash, Black Cottonwood and Red Alder as major components in the overstory (tree layer). Some of these trees are very large in size and those large ones which are standing dead as snags create outstanding habitat for cavity-nesting birds, roosting bats, and other wildlife. When they fall they are good habitat as large logs for amphibians, invertebrates and small mammals.



Photo 3-3: Large-diameter Red Alder in Polygon FM1.

Large portions of the FM habitat have herbaceous layers dominated by Irish (and some English) Ivy, and in gaps and along trails, Armenian Blackberry and mostly other non-native and non-native invasive species dominate in some areas. A few natives such as Bristly Phacelia occur regularly along trails.

The remaining Mixed Forest areas (i.e., non-riparian areas farther south of the river; FM 1 (south part), 1.5, south parts of 2, 3, south part of 4, 5, 6 and 8) generally are comprised of a higher percentage of non-natives and non-native invasives in the tree (occasionally), shrub and herb layers. Some are mowed seasonally, and some have moist areas within them not large enough to map separately. Polygon FM1.5 has mature oaks over the picnic area on the north side of the Riverside parking area, and they co-dominate with Douglas-fir throughout the remainder of the polygon. Much of the understory is mowed, and much has very sparse vegetation because of shade from the dense canopy and in some areas and heavy human use.

The south portion of the west end of FM2 is dominated by Black Locust and a few other non-natives planted as part of an early Arboretum. The Black Locust has reproduced with vigor, and it now is invading the riparian area to the north. A line of large Giant Sequoia to the west (in FM1, north side of G4) does not appear to be reproducing.

LaButte Mixed Forest (FM 10, southern part)

This is the largest forested habitat area in the Champoeg SHA, and because there are no trails across the butte face or to the top, it receives lower human impacts than other areas. The overstory is comprised mostly of Douglas Fir, Grand Fir, Bigleaf Maple and Oregon Ash (lower areas). Some Black Cottonwood is near the river. The shrub layer near the paved trail is commonly comprised of Creek Dogwood, California Hazel, Snowberry, Thimbleberry, Trailing Blackberry, and in many edges and gaps by Armenian (Himalayan) Blackberry. Many species dominate or co-dominate in patches in the herbaceous layer, while many areas are heavily populated

by Irish Ivy. (English Ivy appears to be uncommon, but there is no known difference between them from a management perspective.) Grand Fir is regular in the overstory but is not common in the region.

Hardwood Forest (Forest – Hardwood = FH polygons)

These mapped polygons include both native- and non-native-dominated habitat patches. Polygon FH1 is damp and dominated in the overstory by Oregon Ash – with some openings between. FH1.5 is narrow stringers of hardwood trees between grassland patches. FH2 and 4 are very small. FH3 is the largest mapped hardwood forest polygon, and is a mosaic of Oregon White Oak, Oregon Ash, Black Cottonwood and Bigleaf Maple. It has varying subsurface hydrology, as evident in the array of trees present.

FU5 has many of the same tree species and transitions to a wetter north edge where Oregon Ash is encroaching into the adjacent habitat. See PW5, below.

Oak Woodland (Oak Woodland = O polygons)

Polygon O1 has only a few oaks and contains mostly other species of trees. It is a small polygon mostly off the east end of the Riverside parking area. O2 is the large Oregon Oak woodland near the center of the park that is used as a disc golf area. It is a mixture of different densities of oaks, from prairie to woodland to forest, but these all were mapped as a woodland for practicality. Compatibility of management and human use with the Acorn Woodpecker population also using the area is unknown. Specifically, it is not known if the woodpecker population is declining, increasing or remaining static in number. The woodpeckers were not detected in 2007 during point count surveys there (Geier 2023), however it is not known exactly how long they have been present nor how long the disc golf course has been in use. Chipping Sparrows also are present in the area (audial and visual detection, and Geier 2023).



Photo 3-4: Polygon O2, the central oak woodland, and: group picnic area in left photo, disc golf in right photo.

Prairie (PU – Prairie Upland, PW – Prairie Wetland and Prairie Restoration polygons)

The prairie areas with the “largest” native component (although it is small) are probably the closest to “pre-EuroAmerican settlement” conditions as any habitat present. Indigenous people throughout the Willamette Valley brought fire regularly to the landscape to manage for favored food and utility plants, and likely (according to various indigenous speakers) also to improve hunting, travel and visibility, and perhaps other reasons. Without such cultural burning in the last 150 years or so, open habitat that is not farmed is now

forested (or becoming so). The fire that formerly kept the trees (particularly conifers) at bay does not happen - except for occasional prescribed burns in the Restoration Prairie (IAE 2018, 2019, 2020). The present remaining prairies are likely the result of livestock grazing, mowing or possibly, unique limiting conditions in the soil (e.g., excessive drainage). These remnants are mostly comprised of non-native pasture grasses and weeds. These mapped polygons include PU1-8, PW1-5 and the Restoration Prairie.

Several of these grasslands and prairies (G5, A7, PR1, PU3, A5, A6, etc.) have nest boxes installed for Western Bluebirds. The boxes are monitored annually by the Prescott Bluebird Recovery Project (<https://prescottbluebird.com/>). The Project was contacted through their web site as a part of this project and project members responded with helpful information (Fratt, L. and Hyink, C. pers. comms.).

The portions of these habitats near creeks and ditches potentially could be Western Pond Turtle nesting areas if human and pet impacts were greatly lowered, if ponds with basking areas were present, and if predator threats were reduced (including California Ground Squirrels). As this is unlikely, alternative turtle habitat recommendations made later in this report and in Attachment B may be more feasible.

PW1 is a large, off leash dog area, which greatly reduces wildlife values of that polygon (and adjacent areas). PW5 is a wet prairie in transition to wet hardwood forest. Oregon Ash are moving out (northward) from the adjacent FH5 forest.



Photo 3-5. View southeast to PW5 invasion of Oregon Ash into wet prairie.

Managed Grasslands (Managed Grasslands = G)

These generally are mowed and kept as lawn areas for recreation. Habitat values would greatly increase if any unused lawns were restored to native-dominated prairies and allowed to cycle through a natural growing season. This would improve diversity of plants, invertebrates and vertebrates in these areas and nearby.

Agriculture

These areas primarily are farmed for Tall Fescue. Because they are monocultures of a non-native grass (limited appeal to herbivores and unattractive to most pollinators) and subject to agricultural management (potential application of fertilizer and/or pesticide, unfavorable mowing times, and possibly other incompatible activities), they have relatively low wildlife habitat values. As with Managed Grasslands,

restoration to native-dominated prairie would likely improve habitat for native wildlife – certainly pollinators and likely other groups. An exception to this is the apparent successful use of these areas by Western Bluebirds as measured in fledgling success. No information is available regarding any potential impacts on the nest boxes of agricultural activities occurring near those boxes.

A1-A7 (all) have some ditch or wetland or creek borders, increasing their potential value to amphibians, birds, invertebrates, mammals and reptiles. Other complicating factors such as disturbance or threats may preclude these potential values for some species.



Photo 3-6. Tall Fescue field, polygon A1, viewing north.

Polygon A8 is an open area bordered by the Ryan Creek riparian area (R8) on the east and is large enough in size to attract some target prairie bird species if it were restored. But, according to an Acting Park Supervisor in mid-2022 (Sparks pers. comm.), the north part of that polygon is planned for campground expansion. Decreased habitat area and increased human and pet use in the area likely will lower its wildlife habitat values from the present, and very much lower than without the increased use.



Photo 3-7. Polygon A8, viewing west at area of potential campground development.

Operations

These are human-dominated areas that are occupied by pavement, buildings or other structures. Some that are entirely pavement have little habitat value other than occasional insects feeding or feeding on insects by songbirds. Some structures, such as the barn-like portion of the visitor's center, offer preferred habitat – such as nesting areas for Barn Swallows. Some of the oaks in Camping Loop A, in spite of significant human disturbance, are likely used by Slender-billed Nuthatches, Acorn Woodpeckers and other birds, and some of

the landscape plantings and unpaved, open areas in all operations zones offer limited habitat to some species of wildlife.

3.24 Parrett Mountain Greenway Access (PMGA)

The PMGA site consists of only three habitat polygons:

G11 – grassland (mowed lawn),
PU11 – upland prairie, and
FM12 – mixed forest.

These habitat polygons all are similar to the polygons with the same prefixes in the Champoeg SHA. Wetlands have not been noted in any of these habitats. One small creek crosses the site, and one lies adjacent to it on the east end.

Invasive species are common in all three polygons, decreasing some wildlife values.

G11 Grassland

The mowed grassland area receives the most human use. It abuts the parking area and is moderately difficult to access from the river bank. Improvised (user) trails created by boaters/rafters lead through the riparian forest up the fairly steep banks and dropoffs to the upper terrace with the lawn and restrooms. Little camping space is available between the river and the lawn terrace, so it is likely that boat campers using the Greenway pitch tents in this polygon: a flatter, grassy area with restrooms. A drone operator was using this space and the adjacent airspace over the next polygon to the west at the time of the summer 2022 visit. Although the time was after eagle fledging, the drone was flown towards the area of the nest, and drones possibly are perceived as a disturbance by raptors and other birds.

PU11 Prairie Upland

The unmowed grassland is undergoing invasion by non-native, invasive blackberry, hawthorn, grasses and other non-native herbaceous plants. It occasionally is colonized by both non-native and native woody plants encroaching (mostly) from the perimeter. Institute for Applied Ecology staff found some native herbaceous vegetation in the prairie on some previous visits, but very little was evident at the time of the field survey for this project. The blackberry and other invasives likely are kept mostly at bay by occasional mowing. The upland prairie habitat values are reduced by invasion from blackberry and other non-native species. A suburban -rural road with moderate traffic borders the north edge of the site.



Photo 3-8: Parrett Mtn. Greenway Access, viewing east from west edge of PU11. Rest room in distance (G11). FM12 at right.

FM12 Forest Mixed

A trail is present through the FM12, a riparian forest habitat polygon – except for the narrow portion that rings the grassland and prairie polygons. This trail markedly decreases in width and use in the western half. It is accessed in one or two places from private property to the north, especially at a small beach near the center. Slopes down to the River are moderate to steep in most places. Some damage occurs with climbers ascending or descending in user trails accessing the River. A Bald Eagle nest is present near the west end of the polygon. The nest is in good condition, and it is possible that the young fledged before the visit for this report occurred (see Photo 9). Woodland Phacelia is present in several gaps along the trail, providing a pollinator resource to bumble bees. Much of the understory is dense and invasive species (such as Irish Ivy) are often present and occasionally dominate.

The riparian forest is compromised by invasion of Black Walnut and a few other non-native trees. Most of the invasive Black Walnut trees are quite young and small and have not yet altered the quality of the habitat. This species produces juglone, which is toxic to some species (Morton Arboretum 2023).



Photo 3-9. Black Walnut to left, right, above and below Greenway sign at Parrett MGA.

3.3 Planning treatment by state agencies and others

Numerous agencies and nonprofits have recognized the high value habitats of the Champoeg SHA (less so the Parrett MGA, primarily because of small size).

In the Oregon Conservation Strategy (OCS)(ODFW 2016), ODFW recognizes some habitats as especially valuable for wildlife. Strategy Habitats and Specialized Habitats for the Willamette Valley are shown in the following table. All Strategy Habitats are shown, but the only Specialized Habitats shown are those which occur in one or both of the sites.

OCS: Willamette Valley Ecoregion	
STRATEGY HABITAT	Habitats on Champoeg SHA and Parrett MGA
Flowing Water & Riparian	Creeks and other Riparian polygons; riparian portion of polygons adjacent to Willamette River (FM); see Wetlands, below
Grasslands	Restoration Prairie (Champoeg SHA); PU and PW habitats (both sites); possibly portions of G5, G8, G9 and A8
Natural Lakes	None on either site
Oak Woodlands	Especially O2-O4; O1 and O5 are small.
Wetlands	Wet prairie (PW) polygons. Polygons R2-5 and R8. Smaller R polygons, and wetlands embedded in large forest (FM and FH) polygons and upland prairie polygons
SPECIALIZED HABITAT	
Aquatic Vegetation Beds	Portions of lower reaches of two creeks, R5 and R8 (unknown)

Forest Openings (BN comment: Should include WV; important biodiversity elements.)	Wherever they occur. Evaluate new openings, considering weeds, pathogens, potential effects to species of conservation concern, etc.
---	--

Table 3-2 Excerpt of Strategy and Specialized habitats for Willamette Valley from Oregon Conservation Strategy (ODFW 2016) and applicability to Champoeg SHA and Parrett MGA.

ODFW maps the CSHA and PMGA habitats within the Middle Willamette River Floodplain Conservation Opportunity Area (COA) 60 (see: <https://compass.dfw.state.or.us/>). They provide the following eleven recommendations for the COA:

1. *Focus invasive species education at public access areas.*
2. *Improve in-stream channel complexity.*
3. *Manage public access and recreation to minimize conflict with habitat restoration goals.*
4. *Protect amphibian breeding sites.*
5. *Protect and create suitable turtle nesting and rearing habitat.*
6. *Protect and enhance off-channel and backwater sloughs habitats for both fish and wildlife.*
7. *Protect, restore and expand Oregon white oak habitats.*
8. *Reconnect mainstem to floodplain through removal of levees and dikes.*
9. *Reduce water temperatures, run-off from agricultural fields, and inputs of chemical contaminants.*
10. *Restore riparian habitat; expand where feasible.*
11. *Restore wet prairie and grassland habitats.*

Using the more local ODFW Compass mapping technology, a list of observed and modeled species was generated for the area (Attachment K). Due to the “hexagon mapping” nature of the system, additional observations and modeled habitat of surrounding lands are included with any site. That is, the lists generated are not specific to the site.

The Nature Conservancy mapped the area in the Willamette Valley Synthesis V2.0 project as the “Champoeg” site. It is included here as Attachment N. No links to supporting information were located.

The Oregon Department of State Lands (ODSL) updated their Essential Salmonid Habitat map and released it to the public in February of 2023: <https://maps.dsl.state.or.us/esh/>. Only the Willamette River is mapped in the vicinity of the CSHA and PMGA. No creeks in those two areas (or adjacent) are included. The Willamette River also is mapped by NOAA as critical habitat for salmon and steelhead here: <https://www.fisheries.noaa.gov/national/endangered-species-conservation/critical-habitat#critical-habitat-designations,-maps,-and-gis-data>. In both cases, the River is recognized as critically important for salmonid life cycles.

ODSL also administers Statewide Planning Goal 15, the Willamette River Greenway (WRG): <https://www.oregon.gov/lcd/OP/Pages/Goal-15.aspx>. The WRG is adopted by each county through which the River flows, and generally includes all parks touching the river (and more). Although county maps showing the

WRG boundaries were not found in internet searches, it is assumed that both study areas are within the Greenway and likely have a local comprehensive plan and zoning code section addressing protection of public values within the WRG.

The OPRD produced a Natural Resources Assessment and Strategic Action Plan (OPRD 2017a and 2017b) evaluating habitat and other functions and values. Champoeg SHA rated 9th (tied) for habitat and 10th overall. Parrett MGA rated 65th overall, with more than 100 sites examined and ranked.

No critical habitat for any terrestrial species is designated by US FWS in or within 20 miles of either study area. See: <https://fws.maps.arcgis.com/apps/mapviewer/index.html> (search on “critical habitat” layer)

In the CSHA, the National Wetlands Inventory map of the US Fish and Wildlife Service shows wetlands mapped only on or adjacent to the creeks and the Willamette River: <https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/>. It shows wetlands immediately west of the main portion of the PMGA site, and a small creek draining them that passes a short distance through the site.

4.0 SPECIES

There is some dated inventory information from a Bioblitz in 2000-2001 (Attachment E), and a site-specific avian point count effort in 2007 (Polygon O2, the disc golf area; see Attachment A) and ongoing bluebird nest monitoring, but no other wildlife survey information previously was available for these two sites. Both iNaturalist and eBird have some newer records, but the former is only for species that were incidentally recorded with a camera and/or microphone (see “detectability” below), and the latter includes only birds and lacks geographic precision. Nonetheless, an iNaturalist species list and eBird bird list are included here as attachments G and H. Both iNat and eBird are digital community science platforms that need careful quality evaluation of records to ascertain their validity, and both sites need many more records entered and verified to document presence of more species.

“Detectability” is a term describing why some wildlife species are observed more often than others that may be equally or more common. Quietness, body size, coloration, habitat used, alone vs. grouping habit, amount of time spent on site, species “active time” correspondence with human “observation time” (daytime), and other reasons besides simply quantity, affect whether some species are observed more often than others. It is expected that species with easier and higher detectability would be most likely to be observed and to show more regularly on all existing lists. It is presumed, often incorrectly, that the most observed species are the most common – but they might only be the species that are most easily (and therefore most often) detected.

The following sections address Amphibians, Birds, Fish, Invertebrates, Mammals and Reptiles – following categories used by the Oregon Biodiversity Information Center.

4.1 Common and expected species

Most of the wildlife species documented using the CSHA and PMGA sites are common and expected.

AMPHIBIANS

Amphibians which may use the site consist of frogs, salamanders and one species of newt. Native species present include Pacific Tree Frogs, Long-toed Salamanders, Northwestern Salamanders, Rough-skin Newts, Northern Red-legged Frogs and Ensatinas (Rombough, pers. comm.; Bioblitz 2000, 2001). Most amphibians are aquatic breeders, but some species (e.g., Ensatina) breed in moist terrestrial habitats such as large, old logs – therefore, moist terrestrial microhabitats are most valuable to them. One or more American Bullfrogs (*Lithobates catesbeianus*; introduced from eastern North America) was observed in the Bioblitz in Champoege SHA in 2000 and again in 2001 (Attachment E) and once more in 2023 (Attachment F). To establish a population, this species needs ponds with longer hydroperiods - generally, 2 years or more for larval development to adult stage. It likely eats native amphibians and other species and may replace them in ponds (Corkran & Thoms 1996). Nussbaum et al. (1983) attribute much of the decline of Red-legged Frogs to American Bullfrogs. The same is mentioned in the Oregon Conservation Strategy excerpt following in the next section. Present periods of standing water on the CSHA may not be long enough to support the long-term establishment of this species. Individuals may move onto or through the site from nearby breeding areas.

BIRDS

Birds are probably the most visible and audible species group in the two study areas, and the bird lists for the sites are lengthy (Attachments E, F and H). The wide variety of habitat types and large sizes of some patches and the area in general, combined with accommodating management, the presence of the Willamette River, and other variables, result in a plethora of avian species. It is not known, however, if diversity and number of natives is increasing, decreasing or stable. Non-native European Starlings seem well-established on the site but are not numerous and use some cavities (pers. obsv.) that otherwise probably would provide suitable habitat for other birds or bats. Other non-native birds present, such as House Sparrows and Eurasian Collared-doves, likely do not have major impacts on native bird use.

A consultant specializing in oak and prairie birds prepared an analysis as part of this study (Attachment A) targeting Strategy Species listed in the Oregon Conservation Strategy.



Photo 4-1. Bald Eagle nest in PMGA riparian forest, viewed from CSHA across Willamette.

FISH

The creeks on the CSHA site are much larger than the PMGA creek. No survey information was found for any fish or invertebrate inventories for any of these creeks. Some species of fish inadvertently transport certain species of glochidia (larvae) of freshwater mussels on their gills, so presence and absence of some species of fish *might* correlate to mussel presence and absence if substrate and water conditions are favorable. Whether or not brook or Pacific (rare) or lamprey young (ammocoetes) use the lower reaches of the creeks also is not known.

There are many potential native (e.g. Cutthroat Trout, Stickleback and Red Shiner) and introduced (e.g., Mosquitofish and Yellow Perch) transient and resident fish (Williams et al. 2014) and two native lamprey species that could use the creeks at least seasonally.

INVERTEBRATES

Invertebrates occur by far the most frequently of the species categories and are the least studied and protected under rare species programs. One of the showiest and iconic invertebrates, the Monarch (butterfly) is a federal candidate for listing and was spotted in the park during the Bioblitz (Attachment E). Many other insects, spiders, slugs and snails use the sites. Insects include two categories that have received recent interest and attention in multiple projects and agency efforts: 1) butterflies and moths, and 2) bees. The Bioblitz and iNaturalist contain the only invertebrate observations available for the site other than incidental observations made during this study (Attachment F) and one from ORBIC records (Attachment D). New scientific surveys are needed in these subgroups.

Butterfly and bee diversity seemed quite low during brief visits to the CSHA in the summer of 2022 for this project, but again, no actual data is available. It is likely that efforts to establish more native plants in the Restoration Prairie could provide needed invertebrate food (especially for specialists) and cover. Restoration of native plants, particularly native prairie species in appropriate areas, could help partly restore lost invertebrate populations that associate with those plants. Generalist-feeding invertebrates are more adaptable and are easiest to restore. Specialist species that need one (or a small number of) native plant species to survive are often more difficult. Lacking any baseline information, it is not possible to know what species may have been lost from the site.

Nectaring by the introduced European Honey Bee is frequent in the park (pers. obsv.). Its use of resources may compete with use by native bees (The Xerces Society 2018). It is a common species in urban and agricultural areas and is expanding its range as an escapee into other habitats.

The small creeks in the CSHA also may be good habitat for aquatic invertebrates. No survey information was mentioned or located while conducting this assessment. One freshwater mussel, an Oregon Floater (Anodonta Clade 2; Attachment D and Nedeau et al. 2009) is in the ORBIC data base for Mission Creek, and one Oregon Giant Earthworm observation. Other ORBIC occurrences are noted for the Willamette River. And several (mostly old) Western Pond and Western Painted turtle sightings are noted in the general area.

Bioblitz sightings (Attachment E) include several slug and snail species, and dozens of arthropods.

MAMMALS

Mammals which have been observed or are likely present include both terrestrial and volant (flying) species. Terrestrial mammal species groups could include small, mostly fossorial animals such as voles, shrews, and the larger moles and gophers. (One species could be largely aquatic.) Above-ground (and sometimes partly below-ground) small mammals include some of those same species or species groups, mice, and slightly larger rats, woodrats, chipmunks and squirrels, and weasels.



Photo 4-2: Townsend's Chipmunk near River trail.

Chipmunks and squirrels often are observed by humans during daylight hours. In particular, California Ground Squirrels appear to be plentiful in the Champoeg SHA. They were similarly noted in Bush's Pasture Park in downtown Salem last year (pers. obsv. during brief survey). Maser (1998) mentions that they tend to consume large amounts in preparation for winter, and Rombough (2023) specifically identifies them as predators of aestivating turtles.

Whereas habitat elements appear favorable for Western Gray Squirrels (oaks and conifers proximate and sometimes mixed), they are apparently uncommon or rare in the two study areas. Surveys specifically targeting them could reveal their frequency of occurrence and limiting factors.

Expected medium-sized mammals include rabbits, raccoon, skunk, opossum (introduced), and possibly porcupine, fox and bobcat. They likely also include muskrats, beaver and otter, which are partly aquatic and partly terrestrial, and occasionally are seen by attentive humans – but most activity is nocturnal. Raccoons and opossums are tolerant of human activity and may be more visible than other mammals in their size class.



Photo 4-3: Raccoon in Champoeg SHA beside River trail.

Larger mammals likely include coyote, black-tailed deer, mountain lion and black bear. The latter two likely do not reside in the park, but young animals (most likely males) probably move through riparian areas with cover and may linger only a short time. They also tend to be most active at night.

Six bat boxes on six tall posts were noted in site visits to the Champoeg SHA. They are in two installations of 3 bat boxes each and are present in two central portions of the park in areas mowed occasionally. No record could be obtained of when the boxes were installed or if they have been monitored, or if they have been used. Bats could feed in almost any habitat in the park but might be most drawn to the River or over the prairies depending on the species of bat and of food availability. Because of this probable food availability and the significant number of large snags in the riparian forest – providing excellent bat roosting habitat – and nearby sampling, it is very likely that bats do use the site. Surveys could be done using aural detection equipment. See Attachment J for a list of bat species that might occur in the park, as observed a few miles away on a monitoring site on the east side of I-5.

REPTILES

No reptiles were observed incidentally during site visits for this project. During the Bioblitz in 2000 and 2001, the Common Garter Snake was reported both years and a third species. One observation each of the two other potentially-occurring species of garter snakes was reported. Several other species of snake, lizard and skink (one species) also are expected, but not reported.

4.2 Uncommon and at-risk species

Because development, farming and tree encroachment all have reduced – and continue to reduce – native prairie, savanna and woodland habitats in the Willamette Valley, species of conservation concern (at-risk species) tend to be those which are most dependent on those habitats.

Some of the wildlife species documented at the CSHA and PMGA sites are uncommon or rare. Rare wildlife (animal) species are designated by several agencies using different standards and definitions. There are separate federal and state listing processes under federal and state endangered species act laws, additional

state designations by ODFW through the Oregon Conservation Strategy and the Sensitive Species program, and designations through heritage programs such as those administered by ORBIC and Nature Serve. The former designations carry the most legal authority whereas the latter mostly lack it. Many are recognized as such by all programs, but some programs distinguish between ranges (rare in some places, not rare in others) or utilize additional priorities and contingencies. Few lists include invertebrates. The designation with the highest legal (and perhaps actual) recognition is “federally listed endangered” followed by “federally listed threatened”.

A table of species of conservation concern is in Attachment C, synthesized from the Oregon Conservation Strategy and the Oregon Biodiversity Information Center. The following sections address rare and uncommon species from that table in the same groupings as the previous section. Regional OCS tabular information is extracted for each section, and it is then followed by additional at-risk species if there are any in that group. Some of that tabular information would be better in the recommendations section of this report, but as it often is species specific, it was left mostly intact here.

Electronic maps illustrating known and potential habitat of the most at-risk species are included as Attachment O.

AMPHIBIANS

Two amphibian species of conservation concern could occur on the CSHA: the Clouded Salamander and the Northern Red-legged Frog.

Species Common Name	<i>C or L suitable habitat on/near ODFW Compass Map?</i>	Special Needs	Limiting Factors	Data Gaps	Conservation Actions
Clouded Salamander	<i>Most forested areas in PMGA and west half of CSHA</i>	Clouded salamanders prefer forest habitat or burned areas. They are often found among talus, debris, or in large, decaying logs.	Clouded salamanders have a restricted range, occurring primarily in Oregon. The availability of microhabitat features, namely large logs, that meet temperature and moisture requirements is believed to be a key limiting factor.	Assess distribution and abundance. Develop methods to survey this species in a variety of habitat types and features (logs, talus, etc.). Examine habitat associations in forests, including the effects of fires on this species. Assess sensitivity to herbicides and other chemical contaminants. Investigate dispersal capabilities, factors promoting movement, and home range size. Increase knowledge of reproductive habits, longevity, and overwintering behavior.	Retain patches of intact habitat, including large logs, during forest management activities. Identify areas of high salamander density and leave them undisturbed as 'seed populations' from which remaining habitat can be recolonized as it recovers from alteration. Provide adequate riparian buffer strips (see Partners in Amphibian and Reptile Conservation recommendations) and downed wood.
Northern Red-legged Frog	<i>Most forested areas, both sites</i>	Northern red-legged frogs are typically associated with shallow-water ponds and wetlands with emergent vegetation. For breeding, they require forested sites with exposed	Loss of egg-laying habitat is widely cited as a key limiting factor, though impacts to active-season habitat may have more direct effects on populations. Hydrologic modifications, fragmentation	Increase knowledge of basic life history, including habitat use, phenology, and relationships to hydrology. Clarify impacts of pollutants and parasites on this species. Identify seasonally important habitat components and overwintering areas. Conduct baseline monitoring	Revise wetland hydroperiod requirements for mitigation and other created wetlands in occupied areas to reduce 'population sinks'. Create upland buffer and aquatic habitat retention requirements for housing developments to minimize local extirpations in the Willamette Valley.

Species Common Name	C or L suitable habitat on/near ODFW Compass Map?	Special Needs	Limiting Factors	Data Gaps	Conservation Actions
		(sunny), still-water habitat. Breeding habitat may be seasonal or permanent, provided the water persists at least 5 months in duration. Adults and juveniles also use moist riparian and upland forests.	by roads, suburban development, and other land use changes are among these impacts. Predation and competition by invasive fish and bullfrogs present further threats.	across a range of reference and other sites to gauge habitat quality and associated carrying capacity of different habitat types and conditions. Understand how this species responds to restoration activities and how riparian buffer widths affect population parameters.	Identify regionally important sites to the species and maintain connectivity between them. Maintain wetland habitat with emergent plants and adjacent forest. Address barriers and/or culverts at key road crossings to reduce mortality of lowland (Willamette Valley and Coast Range) frogs. Control bullfrogs and invasive fish at priority sites.

Table 4-1. Strategy Species: Amphibians. Compass mapping, needs, limits, data gaps and needed conservation actions mostly excerpted from ODFW 2016 (updated Dec. 2021). Compass mapping is suitable habitat, not occupied habitat. C = Confirmed, L = Likely, on CSHA and/or PMGA.

Additional at-risk amphibians potentially occurring at Champoege SHA and/or Parrett MGA: None identified.

BIRDS

Suitable nesting habitat is the most important for birds, as they are “anchored” to the nest site and need specific types of cover and enough suitable food nearby to raise young. During other times, most birds are more mobile and less specifically tied to a single place.

The previously-mentioned document assessing oak- and prairie-associated birds and habitats was commissioned to address this section. It was prepared by Joel Geier, and is included with this report as Attachment A. It contains a tabular excerpt from the Oregon Conservation Strategy (as below) addressing birds of conservation concern. Because his assessment includes only prairie and oak-associated species (and three extra species), additional at-risk species are listed below. That attachment provides many detailed assessments by polygon.



Photo 4-4: Acorn Woodpecker in Polygon O2.

Additional species of forest habitat birds not included in the above-mentioned assessment (some from Marshall et al. 2003):

Band-tailed Pigeon

Several Band-tailed Pigeons were seen flying northward across the open center of the Champoeg SHA site at low elevation, probably moving from one local foraging habitat to another. Based on their conifer forest nesting habitat preferences, LaButte would be the most suitable nesting location at Champoeg, followed by portions of the mixed forest along the Willamette of either site.

Golden-crowned Kinglet

These small birds are most often associated with conifer forests, and like the previous species, might be expected most to nest in and use the forests on and around LaButte, and in the Mixed Forest polygons. On the eBird list and on other site lists. A fairly-regularly-occurring species in the Willamette Valley in conifer or mixed forest patches.

Lewis's Woodpecker

This woodpecker is an uncommon visitor to oak and mixed forest habitats in the Willamette Valley. It is not known to nest on the Champoeg or Parrett sites, nor anywhere else in the Valley. At this time, it probably should be considered as an uncommon visitor. There is one eBird record for this species.

Long-eared Owl

Nests almost exclusively east of the Cascades. Rare on the West side of the Cascades. Roosts in dense forest vegetation, hunts small mammals in open areas. Nesting on Champoeg SHA or Parrett MGA sites unlikely. No eBird record on the site.

Mountain Quail

They prefer brushy slopes at higher elevations and are unlikely to nest at either site. No eBird records on either site.

Northern Spotted Owl

Prefers older stands at higher elevations, but possible at LaButte or other mature conifer forest along the Willamette, and then, probably only as a temporary visitor. Unlikely, and less so if there are Barred Owls present, which are more aggressive, and usually drive out the smaller Northern Spotted Owl. A Barred Owl photograph was taken north of Champoeg SHA Campground A in 2018 (see iNaturalist record, Attachment G.) It is not known if Barred Owls are regular visitors or residents.

FISH

Salmonids have received some monitoring attention in the Willamette River adjacent to the sites. Of particular significance are the Chinook Salmon and Steelhead migrants. Pacific Lamprey also use the River in the Champoeg-Parrett area. Willamette River “only” species are not discussed further here. Included are those which do or reasonably could use the study sites.

Species Common Name	<i>C or L suitable habitat on/near ODFW Compass Map?</i>	Special Needs	Limiting Factors	Data Gaps	Conservation Actions
Coastal Cutthroat Trout	<i>Willamette & CSHA creeks (Champoeg, Case, Ryan) & PMGA creek</i>	Large woody debris, in-stream structures, and vegetation important for protection while in freshwater. Juveniles prefer side channels, backwaters, or pools for rearing. Clean gravel for spawning and rearing. Migratory corridors.	Habitat fragmentation or actions that increase population isolation. Water quality. Alterations of hydrology and watershed function. Loss of estuarine habitat for rearing. Ocean productivity.	Breeding and genetic relationships among different life history types. Abundance. Distribution. Population age composition, estimates, and trends.	Maintain or restore aquatic, estuarine, and riparian habitat, providing suitable water quality and habitat complexity. Continue ongoing restoration efforts involving landowners, tribes, and agency partners (NOAA, NMFS, ODFW, OWEB). Reduce localized impacts where populations could become increasingly fragmented.
Oregon Chub	<i>Not listed in Compass</i>	Off-channel habitat (low flow, silty organic substrate, abundant vegetation and cover).	Predation by and competition with invasive species. Passage	Impacts of non-native species. Relationship between flow management	Implement invasive species removal programs. Remove passage barriers or mitigate for effects. Reduce pollution.

Species Common Name	<i>C or L suitable habitat on/near ODFW Compass Map?</i>	Special Needs	Limiting Factors	Data Gaps	Conservation Actions
			barriers. Channelization . Nonpoint source pollution. Drainage of key off-channel habitat.	and population fitness.	Restore floodplain processes.
Western Brook Lamprey	<i>Not listed in Compass</i>	May aggregate in high densities. Requires fine gravel beds for spawning. Larvae burrow in fine sediment. Timing of development closely linked to water temperature. May interbreed with Pacific Brook Lamprey and Western River Lamprey.	Habitat access (artificial obstructions), water quantity (reduced flows, flow management), water quality, physical habitat (stream and floodplain degradation), and predation by other species.	Distribution; passage and screening requirements; biology; amount of scientific take; nature and extent of complex, large-scale threats; within-species diversity.	Education and outreach; improve passage and screening; protect and restore habitat; water conservation; establish Best Management Practices for in-water work; modify non-native angling regulations. See ODFW's Conservation Plan for Lampreys for strategies.
Western River Lamprey	<i>Not listed in Compass</i>	In some basins, Western River Lamprey, Western Brook Lamprey, and potentially Pacific Brook Lamprey may function as a species complex that interbreeds. Therefore, access for this anadromous species to the ocean and to the resident Western Brook Lamprey and Pacific Brook	Habitat access (artificial obstructions), water quantity (reduced flows, flow management), water quality, physical habitat (stream and floodplain degradation), and predation	Distribution; passage and screening requirements; biology; amount of take; nature and extent of complex, large-scale threats; within-species diversity.	Education and outreach; improve passage and screening; protect and restore habitat; water conservation; establish Best Management Practices for in-water work; modify non-native angling regulations; pinniped management. See

Species Common Name	<i>C or L suitable habitat on/near ODFW Compass Map?</i>	Special Needs	Limiting Factors	Data Gaps	Conservation Actions
		Lamprey may be important. May aggregate in high densities. Requires fine gravel beds for spawning. Larvae burrow in fine sediment. Timing of development closely linked to water temperature. Adequate food availability during juvenile stage (marine feeding stage). Migration to ocean may depend on sustained inflow from flooding or snowmelt.	by other species.		ODFW's Conservation Plan for Lampreys for strategies.

Table 4-2. Strategy Species: Fish. Compass mapping, needs, limits, data gaps and needed conservation actions mostly excerpted from ODFW 2016 (updated Dec. 2021). Compass mapping is suitable habitat, not occupied habitat. C = Confirmed, L = Likely, on CSHA and/or PMGA.

Some of these species need the silty bottoms that appear to be in the CSHA creeks. The PMGA creek is a steeper gradient, smaller, and likely not used by any of these species. Cutthroat Trout move up small creeks and even into small ditches to feed during spring high water, then return to more permanent water downstream as waters recede.

Oregon Chub would most likely use floodplain ponds or quieter off-channel habitats but might use sections of the small creeks that have slow-moving water.

Lamprey ammocoetes use silty creek bed and river bed habitat, so may possibly utilize Willamette River shorelines or the mouths of the small creeks if they are wet perennially.

Additional at-risk fish potentially occurring at Champoeg SHA and/or Parrett MGA: None identified.

INVERTEBRATES

Invertebrates are not included in Compass, so that column below is blank.

Species Common Name	<i>C or L suitable habitat on/near ODFW Compass Map?</i>	Special Needs	Limiting Factors	Data Gaps	Conservation Actions
California Floater Fresh- water Mussel		In Oregon, California floater freshwater mussels use speckled dace as a primary host (and likely many other fish species as well). These mussels occur in lakes, slow rivers, and some reservoirs with mud or sand substrates. They are sedentary filter feeders that consume plankton and other particulate matter suspended in the water column, thereby contributing to nutrient cycling. California floater freshwater mussels may prefer higher reaches of streams with high water quality.	California floater freshwater mussels are threatened by loss of host fish and other anthropogenic impacts, including channel modifications, dredging and mining, contamination, sedimentation, nutrient enrichment, water withdrawal and diversion, poorly-managed livestock grazing in riparian areas, and the introduction of non-native fish and invertebrate species.	Assess distribution. Identify specific host fish species. Determine whether populations represent distinct species or subspecies. Describe taxonomic relationship with <i>A. nuttalliana</i> .	Protect known populations of host fish. Maintain water quality.
Fender's Blue Butterfly		Fender's blue butterflies inhabit native prairie and oak savannah. They require Kincaid's lupine as a host plant.	Principal threats to Fender's blue butterfly are habitat loss and degradation. Invasive vegetation can displace Kincaid's lupine, the primary	Continue surveys and consider for down-listing at a future time. [NOTE: Has been downlisted since this was written.]	Maintain and restore wet prairie habitat and populations of Kincaid's lupine. Use caution when

Species Common Name	C or L suitable habitat on/near ODFW Compass Map?	Special Needs	Limiting Factors	Data Gaps	Conservation Actions
			larval host plant, and other native plants upon which the butterfly depends.		implementing gypsy moth control in nearby forests.
Great Spangled Fritillary		Great spangled fritillaries feed strictly on violets (mostly on <i>Viola glabella</i> in western Oregon).	A primary threat to these butterflies is loss of suitable habitat and associated host plants.	Assess distribution and determine range throughout Oregon.	Protect locations of preferred host plants. Manage meadows to reduce conifer encroachment. Maintain hydrology at known sites of occurrence.
Monarch Butterfly		Caterpillars feed almost exclusively on milkweed (<i>Asclepias</i> spp.). Adults require nectar from flowering plants blooming in the spring and fall to fuel migrations.	Availability of milkweed and nectar plants is an important limiting factor for monarch butterflies. Mowing of milkweed from roadsides before caterpillars have developed and pesticides can be harmful to monarchs.	Determine breeding locations. Investigate seasonal migration routes.	Plant milkweed and nectar plants. Avoid mowing during critical development periods.
Western Bumble Bee		Western bumble bees use a wide variety of natural, agricultural, urban, and rural habitat types. They are now largely confined to high-elevation sites and areas east of the Cascade Crest. Western bumble	Western bumble bees are vulnerable to reduced genetic diversity and pathogens from commercial bumble bees and other sources. Conifer encroachment, habitat conversion, and habitat loss due	Investigate causes and extent of population declines. Conduct surveys throughout Oregon at historical and potentially-occupied sites. Conduct	Plant and protect bumble bee habitat so that suitable nest sites, nectar, pollen, and overwintering areas are provided.

Species Common Name	<i>C or L suitable habitat on/near ODFW Compass Map?</i>	Special Needs	Limiting Factors	Data Gaps	Conservation Actions
		bees require suitable nesting sites, overwintering sites for the queens, and nectar and pollen resources throughout the spring, summer, and fall.	to development are also serious threats.	taxonomic studies to distinguish between subspecies of <i>B. occidentalis</i> .	
Western Ridged Mussel		Western ridged mussels are found in cold creeks and streams. They are filter-feeders with long lifespans.	Water withdrawal, diversion, and changes in hydrological regimes can adversely affect western ridged mussels. Contamination, sedimentation, nutrient enrichment, and other impacts to water quality also threaten this species.	Assess distribution. Describe population structure. Identify specific fish species that serve as hosts.	Maintain water quality and availability.
Winged Floater Fresh-water Mussel		Winged floater freshwater mussels require a fish host. They occur in lakes, slow rivers, and some reservoirs with mud or sand substrates. They are sedentary filter feeders that consume plankton and other particulate matter suspended in the water column, and thereby contribute	Winged floater freshwater mussels are threatened by loss of host fish and other anthropogenic impacts, including channel modifications, dredging and mining, contamination, sedimentation, nutrient enrichment, water withdrawal and diversion, poorly-managed livestock grazing in	Assess distribution. Identify specific host fish species. Determine whether populations represent distinct species or subspecies. Describe taxonomic relationship with <i>A. californiensis</i> .	Protect known populations of host fish. Maintain water quality.

Species Common Name	<i>C or L suitable habitat on/near ODFW Compass Map?</i>	Special Needs	Limiting Factors	Data Gaps	Conservation Actions
		to nutrient cycling. These mussels may prefer higher reaches of streams with high water quality.	riparian areas, and the introduction of non-native fish and invertebrate species.		

Table 4-3. Strategy Species: Invertebrates. Compass mapping, needs, limits, data gaps and needed conservation actions mostly excerpted from ODFW 2016 (updated Dec. 2021). Compass mapping is suitable habitat, not occupied habitat. C = Confirmed, L = Likely, on CSHA and/or PMGA.

Additional at-risk invertebrates potentially occurring at Champoeg SHA and/or Parrett MGA:

1. *Anodonta oregonensis* (Oregon Floater mussel)
Similar habitats and threats as California Floater (see table).
2. *Bombus fervidus* (Yellow Bumble Bee)
3. *Bombus suckleyi* (Suckley's Cuckoo Bumble Bee)
Both are generally grassland species. A variety of bumble bee nectar plants are used and needed. *B. fervidus* needs wood or underground cavities for nesting. *B. suckleyi* is a social parasite, probably on *B. fervidus* as well as other species but there is no confirming data.
4. *Cicindela purpurea hatchi* (Hatch's Tiger Beetle)
Little data was found about this tiger beetle. It has been found rarely on paths in grassy areas or forests.
5. *Derephysia foliacea* (Foliaceous Leaf Bug)
It needs a host plant (unknown) in meadow habitat, probably at higher elevations. Unlikely this low.
6. *Driloleirus macelfreshi* (Oregon Giant Earthworm)
Occasionally found in deep, moist soils of mixed and conifer forest soils (The Xerces Society 2023).

7. *Margarita falcata* (Western Pearlshell Mussel)

Generally inhabits rivers but should be surveyed for in creeks as well.

8. *Megomphix hemphilli* (Oregon Megomphix Snail)

Most likely would be found in riparian zone in mixed forests (Applegarth 1995). The 2000/2001 Bioblitz has a record of observation for Champoege by the cited author, John Applegarth.

Little is known in the Champoege area about habitat preference and use by freshwater mussels. They may be present but undetected. It also could be that they are scattered along the shallows of the Willamette – perhaps below the low water line – outside the boundary of the two sites in this assessment. One individual was observed during the Bioblitz, but the recorded information was not specific about what it was and where it was seen. There is a 2001 observation of an Oregon Floater in ORBIC records from Mission Creek in the CSHA. Because the California Floater and Winged Floater both use muddy bottoms in areas of slow water (Nedeau et al. 2009), they could occur in the CSHA and possibly in the adjacent Willamette. (They are in the same clade, and very difficult to distinguish (Nedeau et al. 2009; Blevens et al. 2018). The Western Ridged Mussel is more likely to occur in the main stem, if it occurs in the area at all. It does, however, occur in a variety of substrates and is not well documented - so is included here. Many native fish are confirmed as hosts for freshwater mussels (Blevins et al. 2018).

Fender's Blue, Great Spangled Fritillary and Monarch butterflies are on the above list, but only Monarchs have been documented in the CSHA and no documentation of any butterflies (other than the Bioblitz Monarch) has occurred in the PMGA until 2022 (Attachment F). One or more Monarchs was documented during both years of the Bioblitz (no details recorded, Attachment E). Fender's Blue butterflies are dependent on Kincaid's, Spurred and Sickel-keeled lupine as host plants, which have not previously been present. Sickel-keeled has been planted in the Restoration Prairie. (Alaica, pers. comm.). Great Spangled Fritillaries are dependent on violets and Monarchs are well known for using only milkweeds as a host. They may recently have been – or soon might be – introduced during restoration of the Restoration Prairie. Likely, they all would benefit from limited controlled burning to stimulate prairie habitats and keep woody and taller plants in check.

MAMMALS

Species Common Name	<i>C or L suitable habitat on/near ODFW Compass Map?</i>	Special Needs	Limiting Factors	Data Gaps	Conservation Actions
California Myotis	<i>Entire area</i>	This species is generally associated with forests. California myotis use large snags for day roosts. They are occasionally found night-roosting under bridges.	California myotis are patchily distributed and have low reproductive rates. Availability of large snags for roosting may be a limiting factor.	Describe seasonal movements. Identify winter roost locations and associated microclimate conditions. Assess distribution, abundance, and trends. Investigate differences between this species and the closely-related western small-footed bat.	Maintain and create large snags during forest management activities. Complete bridge replacement and maintenance when bats are absent.
Fringed Myotis	<i>Some forested portions, incl. all Willamette</i>	Fringed myotis require forest habitat. They use large snags and rock features for day, night, and maternity roosts, and caves and mines for hibernacula. They feed primarily on beetles. They occasionally use bridges for night-roosting.	Fringed myotis are patchily distributed and locally uncommon. They are vulnerable to disturbance at roosts. Reduction of large snags and low reproductive rates may also be limiting.	Assess distribution, abundance, and trends. Describe seasonal movements. Identify maternity and winter roost locations and associated characteristics. Identify limiting factors, including the extent and importance of habitat loss and degradation.	Use gates and seasonal closures to protect known hibernacula. Retain and create large-diameter hollow trees and large-diameter, tall, newly-dead snags during forest management activities.

Species Common Name	<i>C or L suitable habitat on/near ODFW Compass Map?</i>	Special Needs	Limiting Factors	Data Gaps	Conservation Actions
Columbian White-tailed Deer	<i>Habitats shown in north and south Willamette Valley, but not shown on or near site.</i>	The Columbia River DPS is strongly associated with riparian habitat along the lower Columbia River. The Umpqua population is also found in riparian areas and may use lower-elevation oak woodlands as well.	Though historically more abundant in the Willamette Valley, this species is being managed primarily on island refuges in Columbia River bottomlands. Fluctuations in numbers seem to be driven primarily by carrying capacity of remaining habitat in these refuges. Habitat loss and fragmentation due to agricultural and residential development and flooding impacts on island-dwelling and low-elevation mainland deer have contributed to declines of the Columbia River DPS. Disease, collisions with vehicles, and habitat loss due to development may limit the Umpqua population.	For the Columbia River DPS, investigate predator-prey interactions with coyotes and agricultural land use impacts on habitat. For both Columbia River and Umpqua populations, investigate susceptibility to disease (e.g., deer hair loss).	For the Columbia River DPS, continue to implement conservation actions identified in the Columbian white-tailed deer recovery plan. For the Umpqua population, continue to monitor population status, ... and evaluate translocation issues and priorities.

Species Common Name	C or L suitable habitat on/near ODFW Compass Map?	Special Needs	Limiting Factors	Data Gaps	Conservation Actions
Hoary Bat	<i>Entire, excluding Willamette</i>	Hoary bats are generally associated with forest habitat. They use late-successional conifer forests for roosting. They require abundant insect prey.	Hoary bats have low reproductive rates and are threatened by habitat loss. Migratory behavior increases this species' vulnerability to habitat changes and wind turbine-related mortality.	Assess distribution, abundance, and trends. Describe population dynamics. Increase understanding of ecology, including migratory patterns and habitat use. Evaluate the impacts of wind facilities on migratory bats.	Investigate data gaps and use results to guide management actions. Implement impact reduction strategies (e.g., operational minimization) at wind energy facilities to reduce fatalities.
Silver-haired Bat	<i>Forested portions, excludes Willamette</i>	Silver-haired bats inhabit late-successional conifer forests. They use large snags and hollow trees for day, night, and maternity roosts. They may be found in other habitat types during migration.	Silver-haired bats have low reproductive rates. They are vulnerable to habitat loss, including reductions in late-successional conifer forests and their components (e.g., hollow trees and large, newly-dead snags). Migratory behavior increases vulnerability of this species to habitat changes ... in the spring and fall. Mortality of mature females in the spring may be particularly problematic.	Assess distribution, abundance, and trends. Describe population dynamics. Improve understanding of migration patterns and habitat use. Evaluate the impacts of wind facilities on migratory bats.	Maintain late-successional conifer habitat. Maintain and create large-diameter hollow trees and snags....

Species Common Name	C or L suitable habitat on/near ODFW Compass Map?	Special Needs	Limiting Factors	Data Gaps	Conservation Actions
Townsend's Big-eared Bat	<i>Large portions, includes Willamette</i>	Townsend's big-eared bats use caves, mines, and isolated buildings for day and night roosting, maternity roosts, and hibernacula. They may gather in large concentrations. Occasionally, this species uses hollow trees and bridges for day or night roosting. Townsend's big-eared bats feed primarily on moths.	This species has highly specific roost requirements (dependence on uncommon or at-risk structures for habitat) and is very sensitive to disturbance at roost sites. Reductions in their insect prey base and low reproductive rates may be further limiting factors.	Assess abundance, distribution, and trends. Identify winter roost locations and describe seasonal movements. Evaluate the effects of insect control on prey base (e.g., gypsy moth).	Use gates and seasonal closures to protect known roost sites during sensitive times (raising young and hibernation). Maintain buildings used as roosts. Retain and create large-diameter hollow trees during forest management activities. Monitor roosts.
Western Gray Squirrel	<i>Large portions of forested habitats, esp. La Butte</i>	Western gray squirrels occupy oak woodlands, oak savannas, and mixed oak-pine-fir woodlands. They prefer older oak trees with large limbs and continuous canopy cover	Major threats include habitat loss, alteration, and fragmentation. Vegetation changes due to fire suppression and residential and urban development are among these impacts. Populations may	Assess distribution and trends. Increase understanding of general ecology. Evaluate competition and other impacts from non-native squirrels. Assess dispersal patterns and the need for canopy travel corridors. Evaluate	Work with private landowners to maintain and restore oak and mixed oak-pine-fir woodlands, especially large patches. Work with landowners experiencing damage to trap/relocate squirrels. Maintain continuous canopy within 200 feet of nest sites. Maintain or plant

Species Common Name	<i>C or L suitable habitat on/near ODFW Compass Map?</i>	Special Needs	Limiting Factors	Data Gaps	Conservation Actions
		to facilitate movement.	also be adversely affected by road mortality and damage control efforts.	potential for reintroduction into unoccupied sites.	most species, such as Oregon white oak and California hazel. Maintain older trees with large limbs.

Table 4-4. Strategy Species: Mammals. Compass mapping, needs, limits, data gaps and needed conservation actions mostly excerpted from ODFW 2016 (updated Dec. 2021). Compass mapping is suitable habitat, not occupied habitat. C = Confirmed, L = Likely, on CSHA and/or PMGA.

Most mammal species of conservation concern are bats, but little is known about them in the immediate area. Some bat information consulted for this section is from Northwest Bat Hub. Although they have a monitoring station a few miles to the east (results in Attachment X), it is not on the Willamette River.

No Western Gray Squirrel observations exist in the area according to iNaturalist. The species was observed in both years of the 2000-2001 Boblitz. It has either not been recorded yet in iNaturalist (doubtful, as there are lots of records there in other areas, and Champoeg receives a lot of naturalist/photographer visitors), or they may have disappeared from the CSHA. Perhaps there was not a viable population there, but lacking baseline data, it is not possible to know. The most suitable habitats on the two sites are where Oregon White Oak and conifers are in proximity.

Additional at-risk mammals potentially occurring at Champoeg SHA and/or Parrett MGA: Columbian White-tailed Deer could turn up in Willamette Valley far from mapped locations in north and south, so should probably be considered as possible but highly unlikely.

REPTILES

Species Common Name	<i>C or L suitable habitat on/near ODFW Compass Map?</i>	Special Needs	Limiting Factors	Data Gaps	Conservation Actions
Western Painted Turtle	<i>Scattered, all creeks and Willamette shorelines</i>	Western painted turtles inhabit marshy ponds, small lakes, slow-moving streams, and quiet off-channel portions of rivers. They prefer waters with muddy bottoms and aquatic vegetation. Western painted turtles use open, sparsely-vegetated and sunny ground for nesting. They require sunny logs/vegetation for basking and safe movement corridors between aquatic and terrestrial habitat.	Loss, fragmentation, and alteration (conversion, dominance by invasive plants) of aquatic and nesting habitat are likely the main limiting factors for most populations. Road mortality, predation by bullfrogs, fish, and raccoons, competition with invasive turtles, and human disturbance may be locally important.	Gather basic life history information (e.g., growth rate, age at first reproduction). Investigate impacts from disease introduced and/or spread by non-native turtles. Describe population dynamics. Evaluate genetics. Assess the impacts of raccoons and invasive species (turtles, fish, and bullfrogs) on western painted turtles. Evaluate the effects of herbicides, fertilizers, and other chemicals on eggs and hatchlings. Improve understanding of hatchling ecology.	Provide basking structures and nesting habitat. Control invasive plants and animals. Protect important nesting sites from disturbance. Use wire cages to protect nests from raccoons at key sites in the short-term where this is a problem. Implement the Oregon Department of Fish and Wildlife's Turtle Best Management Practices. Prevent illegal collection. Prevent release of pet turtles. Reduce risk of mortality from roads.

Species Common Name	<i>C or L suitable habitat on/near ODFW Compass Map?</i>	Special Needs	Limiting Factors	Data Gaps	Conservation Actions
North-western Pond Turtle	<i>Willamette, Case and Champoege creeks S of Champoege SHA</i>	Northwestern pond turtles are found in marshes, streams, rivers, ponds, and lakes. They use sparsely-vegetated ground nearby for digging nests and moist, shrubby or forested areas for aestivation and over-wintering. They require sunny logs/vegetation for basking and safe movement corridors between aquatic and terrestrial habitat.	Life history traits make this species vulnerable to habitat loss and alteration of potential nesting sites (e.g., conversion, invasive plants). Road mortality, predation by raccoons, fish, and bullfrogs, and competition with invasive turtles are further risk factors.	Gather basic life history information. Describe population dynamics. Evaluate genetics. Assess the impacts of raccoons and invasive species (turtles, fish, and bullfrogs) on northwestern pond turtles. Evaluate the effects of herbicides, fertilizers, and other chemicals on eggs and hatchlings. Improve understanding of hatchling ecology.	Identify population centers. Use distribution data to establish priority areas for protection and management. Provide basking structures and nesting habitat. Control invasive plants and animals. Minimize disturbance in nesting areas. Protect adjacent upland habitat. Implement the Oregon Department of Fish and Wildlife's Turtle Best Management Practices. Prevent illegal collection. Prevent release of pet turtles. Reduce risk of mortality from roads.
Western Rattlesnake	<i>Non-forest habitats, except largest Champoege prairie</i>	Western rattlesnakes are found in dry areas with low or sparse vegetation. They often use rocky areas for basking, cover, and den sites/hibernacula.	Widespread habitat loss represents a significant and broad threat to this species. Lack of exposed bedrock may be limiting in some areas. Persecution of rattlesnakes by	Identify locations of remnant western rattlesnake populations and hibernacula. Determine phenology and habitat requirements.	Maintain or restore low grassland habitat near rocky areas. Minimize disturbance at key den and hibernacula sites.

Species Common Name	<i>C or L suitable habitat on/near ODFW Compass Map?</i>	Special Needs	Limiting Factors	Data Gaps	Conservation Actions
			humans can deplete or eliminate populations locally.		

Table 4-5. Strategy Species: Reptiles. Compass mapping, needs, limits, data gaps and needed conservation actions mostly excerpted from ODFW 2016 (updated Dec. 2021). Compass mapping is suitable habitat, not occupied habitat. C = Confirmed, L = Likely, on CSHA and/or PMGA.

Turtle sightings for Champoeg SHA (except for those mentioned in Attachment B) are several decades old. Lack of wetlands, predation and high human and pet use may limit suitability for turtle use (Attachment B).

The previously-mentioned attachment addressing turtles was commissioned to address a portion of this section. It was prepared by Chris Rombough, and is included with this report as Attachment B. The conclusions of that report are:

1. The Parrett MGA likely has no suitable habitat for resident turtles.
2. The Champoeg SHA lacks sufficient wetlands and has too many predators and human impacts for supporting resident turtles.
3. The difficulties of creating wetlands and attracting and managing a resident turtle population at the Champoeg SHA are substantial, and resources might better be directed at habitat restoration on private lands.
4. The Champoeg SHA highest value for turtles is as a movement corridor to connect the Willamette River and habitats upstream from the Champoeg SHA.
5. Local populations of both species are slowly declining.

If Western Rattlesnakes ever use the site, it likely would be transitory. There are no records of observation on either site.

Additional at-risk reptiles potentially occurring at Champoeg SHA and/or Parrett MGA: none identified.

4.3 Non-native and non-native invasive species

Many non-native species have been introduced to the area deliberately or accidentally, and this should be expected to continue. A small number of these non-native species reproduce well, and have no enemies to limit them, and they can alter habitat. Non-native plants may occupy space once occupied by native vegetation, and may be allelopathic, producing chemicals in the soil reducing or eliminating the growth of native plants. If they become invasive, they can replace populations of native plants – also resulting in extirpation of some dependent wildlife species. Sometimes this is noted by scientists or others, but often it is subtle and not observed or noted – particularly for invertebrates and other wildlife species which are not obvious and for which little data is available.

One Eastern Gray Squirrel observation from May of 2022 in the Champoeg SHA is in iNaturalist. If Western Gray Squirrels are present in areas into which invading Eastern Gray Squirrels are allowed to expand their range, competition for food and nest sites can be very detrimental for the native Western Grays.

Feral European Honey Bees, observed commonly during field visits for this report, may compete for cavities with cavity-nesting or roosting birds, squirrels or bats, but there is no data available addressing this phenomenon. They can compete with native bees for nectar and may spread disease to native bee populations as described below.

“Public lands and natural areas are essential for our native pollinator and plant populations as they serve as important refugia from ongoing threats in more populated and manipulated landscapes. Evidence exists to suggest that through competition, disease transmission, and foraging habits (e.g., preference for invasive plant species) that honey bees have the potential to negatively affect native bee and plant populations in these habitats, particularly under certain environmental conditions and at high densities. The degree of these effects is variable, and certainly warrants further investigation. Yet, while some counter examples are available, the majority of studies show negative effects and the threats from these effects have the potential to alter native bee populations.” (Excerpt from The Xerces Society 2018.)

Virginia Opossums may eat native snakes, nestlings and bird eggs as part of their varied diet. European Starlings compete with cavity-nesting birds for cavities, and with most birds for food. House Sparrows generally are viewed as non-competitive, most often using building cavity nesting sites, although they may be in a few instances.

Feral dogs and cats in the study areas would eat smaller species of (or young) mammals, birds, and possibly reptiles and amphibians.

Introduced earthworms may change plant communities, however, this has not been studied in this region. Many other non-native invertebrates (Attachment F) were observed casually while assessing habitat for this report, but little is known of their ecological impacts.

4.4 Post-restoration changes in uncommon species

Native species associated with or dependent on a particular habitat may benefit if the habitat is enhanced or restored. Even if a habitat patch is created or restored, variables such as patch size, connectivity, species range, location of nearest existing population, adjacent habitats, food availability and so on may limit initial occupancy, individual fitness and ultimately population sizes. The Institute for Applied Ecology has undertaken a multi-year effort to restore native plant species to the Restoration Prairie (IAE 2014). It is the only known restoration proceeding at the site.

In general, it is difficult to predict effects of restoration on wildlife species and is more difficult when little baseline information is available.

AMPHIBIANS

Generally, high water quality in the creeks and variable water depths with ample vegetation cover in and near water will benefit aquatic-breeding amphibians. Large logs and stumps will benefit terrestrial-breeding amphibians, and more may need to be added occasionally as they degrade unless natural recruitment continues. On the CSHA site, protecting existing wetlands is the single, best method of sustaining existing amphibian populations, and limiting human-related threats might be the single-most important action. The larger wetlands in R4 and R8 and portions of FM10 should be prioritized for protection, followed by smaller wetlands, creeks, ditches and other small wetlands.

Although other aquatic and semi-aquatic amphibians use mostly tree- and shrub-shaded habitats, the Long-toed Salamander and the Pacific Treefrog use nearby grassy habitats as well (Nussbaum et al. 1983). Shrub plantings along unshaded sections of ditches near forested habitats would benefit amphibians. Small, wet “alcoves” also could be constructed off ditch channels to increase aquatic habitat for amphibians. These could be sited and designed by a herpetologist.

BIRDS

The oak and prairie bird report by Geier (Attachment A) should be consulted for potential restoration actions that could increase habitat suitability for target bird species. Any restoration activities near the bluebird boxes should be done in coordination with the Prescott BRP and done gradually and monitored for potential effects on the bluebirds.

FISH

Channel complexity provides cover and different pool and riffle habitats for creek-dwelling fish. They also require good water quality. Creeks first should be surveyed for existing features and for invertebrate and fish species, and a list of potentially-occurring species and their needs could then be developed. Working with agricultural neighbors to limit and sensitively apply pesticides could benefit water quality. Similarly, on-site practices, where not already doing so, could follow these guidelines.

INVERTEBRATES

Natural area restoration and management seldom is done specifically to benefit invertebrates. Only two rare butterfly species (and to a small degree, one bumble bee species) have been targeted in this region specifically

for habitat restoration and management. Native terrestrial invertebrates often are dependent on native plant species and/or on a variety of natural special habitat features (e.g., large, woody debris). The invertebrate-plant connection is often biochemical (adults or larvae may eat only certain plant species), but also can be phenology-related, or both. Overall, increasing the diversity and amount of native plant populations throughout both sites, and decreasing invasive species cover, will provide more habitat for native invertebrate herbivore specialists. Native detritivore invertebrates also may be chemically repelled by non-native plant species, and therefore would benefit by more native plants and fewer non-natives.

Aquatic macroinvertebrates also need a variety of habitats and good water quality. Stream surveys are needed to determine detailed qualities of the habitats and identity of existing resident species.

MAMMALS

Protection of the large snags may be the best single action for protecting and enhancing bat populations which probably use the sites. If use of the existing bat boxes can be verified by monitoring, additional boxes should be considered for both Champoeg SHA and Parrett MGA, and human uses (including mowing?) could be discouraged near the boxes. Replacement of invasive plant monocultures with diverse, native plant species would likely maximize diverse insect populations – which are the primary food of bats in this region.

For enhancement of any Western Gray Squirrel populations and habitat, any confirmed Eastern Gray Squirrels in either area should be removed immediately. Actions to support long-term sustenance of Oregon White Oak near conifers also would provide key elements of Western Gray Squirrel habitat.

REPTILES

Attachment B is a report entitled Assessment of Potential Turtle Habitat: Champoeg SHA and Parrett Mountain Greenway (Rombough 2022). That report recommends pursuing restoration of turtle habitat upstream (south) of the Champoeg SHA on private lands rather than within it, and maintaining safe, enclosed (heavily vegetated) creek corridors to promote safe travel of turtles through the CHSA to reach existing and potentially-restored or enhanced areas.

Western Rattlesnake is an at-risk species which may pass through either site on occasion but is unlikely to use the site for hibernacula or reproduction because of a lack of rock features. If there is any exposed rock on LaButte, particularly on the south side, enhancement of that area could be explored. It is probable that high human use and enhancement of rattlesnake habitat at this site are not compatible.

5.0 Threats

Wildlife habitat areas regionally have been on declining trajectories of quantity and quality for many decades. The following table identifies some of the major causes.

Threat	Impacts	Effects
Conversion to other land uses	Loss of native habitat	Less habitat, smaller habitat patches and less connectivity between habitats.

Domestic and feral cats and domestic dogs	Wildlife harassment and mortality	Predation and/or breeding cycle disruption (harassment) by domestic animals can result in decline of native birds, mammals, reptiles.
Cessation of historic burning regime	Reduction of prairie and savanna habitats; increase of conifer-dominated forest lands	Reduction and loss of species dependent on open habitats, both of which are considered uncommon and rare.
Human recreation: trail biking, hiking, drone operation, activity areas	Removal or crushing of native vegetation or wildlife; soil compaction & disturbance; noise incursion, human presence increase, weed seed transport	Decrease of native vegetation and associated wildlife, increase of invasive, exotic vegetation; soil erosion; decline of wildlife populations (including invertebrates) from mortality (e.g., snakes being crushed on paved bike paths) or disruption of breeding cycles (see next section).
Non-native plant species	Competition with native plants for light, water, nutrients and space; can replace native vegetation	Conversion of habitats from native-dominated to exotic-dominated; loss of native biodiversity: both the native plants and the wildlife that depend on them.
Non-native animal species	Habitat alteration, competition with native species	Many effects, but poorly studied in Willamette Valley; some documentation of competition for breeding and feeding areas (European starling, nutria, etc.)
Vegetation management (broadcast herbicide spraying, mowing, fertilizing, etc.)	Variable, depending on circumstances; can negatively or positively impact rare habitats and species	Potential loss or reduction of uncommon and rare, native vegetation species; potential impact to non-target plant or animal species; potential contamination of waterways. Sensitive management of invasives can produce positive impacts.

Table 5-1. Threats to wildlife and wildlife habitat in the Champoege SHA and Parrett MGA areas.

Human use of the habitats in the Champoege SHA ranges widely from none to somewhat intense both over time and place. Areas used less by humans include unmowed expanses, areas of invasive blackberry and other dense brush, areas lacking trails and steep areas. The least used areas include the forests in the eastern portion of the park (except for the paved path), and densely vegetated areas in the riparian zone. The most intensively used habitats include developed and/or designated recreation areas such as the campground loops, disc golf course and picnic and dog run areas. Paved paths are heavily used and are present in many of the habitats.

The heaviest human use times are weekend daylight hours during the summer, and conversely, the least used times are the dark hours during winter nights. Therefore, diurnal wildlife in and near high use areas would stand to be the most frequently and/or most significantly disturbed by human use. Noise or visual disturbance

likely are the most significant, including yelling and fireworks (usually associated with 4th of July festivities). Where pets are present, they likely would be an additional source of disturbance.

High visitation by travelers (campers, drive-in bicyclists and disc golfers, etc.) are and will continue to be a source of non-native species introductions. Especially problematic is the introduction of insect eggs on firewood or autos (or other sources) normally associated with campers and other visitors. Insect eggs (and to a lesser degree, larvae and adults) tend to be difficult to see and can result in new introductions of species that may cause harm to an ecosystem. Adult insects that fly also can move in. Fungal spores and hyphae and other microscopic pathogens also may be introduced, but they are not as easily checked for as insect eggs – which can be difficult to find.

The recent discovery of the Emerald Ash Borer in Oregon is a compelling reason to immediately begin participation in informational meetings and follow recommendations of the Oregon Department of Agriculture and other scientific researchers to attempt protection of existing ash and potential replanting of resistant ash. Loss of Oregon Ash trees in the park could negatively affect songbirds, bats, invertebrates (many of which are food for songbirds) and other wildlife.

Increasing cover by non-native plant species (trees, shrubs and herbaceous plants) results from both accidental and intentional introduction of those species to the area by humans. Some plants escape landscaped areas where they are intentionally planted, others spread from areas where they were introduced for livestock grazing, and some come as unintentional “hitchhikers”. If reproduction and/or growth of a non-native plant species in an otherwise native plant community is rapid and unchecked, it can result in the non-native plant dominating in the community and being termed an invasive. Only some introduced plants become invasive. Few to almost no prairies or oak savannas in the Willamette Valley remain dominated by natives in the herbaceous layer, yet many foothill conifer forests have native tree, shrub and herbaceous layers. Forests are changing in recent decades as False Brome (*Brachypodium sylvaticum*) and Shining Geranium (*Geranium lucidum*) move into and dominate forest herbaceous layers.



Photo 5-1: Spotted Jewelweed invasion of wetland. North side of LaButte.

The “invasion” of non-native plant species changes the vegetative composition of a habitat (in any of the three layers: tree, shrub, herbaceous), primarily by reducing the space used by (and available for) native species.

Secondarily, this can then affect the populations of native invertebrate species which feed on native plants, which can then impact predators (larger invertebrates, birds, mammals, etc.) which feed on those invertebrates. (This is termed a “trophic cascade”.) Large infestations of non-native plants can result in local extirpation of some native species of plants and wildlife. (Species that survive elsewhere but can no longer survive on a site are referred to as “extirpated” from that site.) Plants and wildlife that can tolerate these changes are termed “generalists” and adapt – at least somewhat. Wildlife species that are dependent on a single native species or small native group of similar species are termed “specialists” and may become scarce or extirpated if native plant communities undergo significant change.

Many of the non-native trees are not invasive (e.g., Giant Sequoia), but at least three (Black Locust and Norway Maple at Champoeg SHA and Black Walnut at Parrett MGA) are becoming so. Some of the original invasives listed here were deliberately planted, without the knowledge that they could become invasive.

Non-native birds can interfere greatly with native bird populations. For example, European Starlings can occupy and defend cavities – thereby eliminating some cavities for use by native species – and invade and take over cavities already containing other eggs or nestlings. Starlings were seen utilizing a woodpecker-constructed nest hole in a large, riparian snag in the Champoeg SHA. House Sparrows, Ring-necked Pheasants (declining) and Eurasian Collared-doves are present in at least the Champoeg SHA (and some in the PMGA) but are not considered by ornithologists as having significant impacts on native species.

It is difficult to keep all non-natives and potential invasives out of the study areas because of the high rate of people “coming and going”. In addition to accidental introductions, deliberate introduction of unwanted pets such as cats (dumped or otherwise gone feral), turtles and aquarium fish and plants dumped into natural systems is an ongoing issue that creates myriad problems for land managers. The only partial solutions known for these widespread problems are increased education, monitoring and enforcement.

It is also possible that occasional flooding would disturb wildlife in vulnerable areas and occasional windstorms could affect almost any area. Because much of the flow in the Willamette River is regulated by dams, flooding is rare, and windstorms have always been rare in the area. These natural disturbances likely do little harm to wildlife currently.

6.0 Restoration and Management Recommendations

Attachment A (birds) provides many detailed assessments by polygon, and concludes the following as overall recommendations for the site:

1. In the “west central” area [generally, the Restoration Meadow and large fields to the south of it], enhance native prairie (especially forbs), expand native prairie restoration onto agricultural lands, and enhance connectivity by creating openings in tree rows between large habitat patches.
2. Retain existing large oaks and improve understory conditions
3. Establish avian point monitoring stations and revisit at least once every 5 years. Use the two old stations if possible.

Attachment B (turtles) provides many detailed assessment and recommendations as well, with the following overall recommendations:

1. Large aquatic habitats suitable for turtle use are lacking in the Champoeg SHA. Creation of a large enough feature of this sort that turtles might use would be difficult, and probably not be a good investment considering high human use levels, off-leash dogs, and several potential predators. Consider turtle habitat enhancement, instead, on nearby private land.
2. Retain Champoeg as a valuable “pass-through” habitat by keeping dense vegetation (native and non-native, if existing) along creek corridors
3. Turtles probably do not use terrestrial habitats at Parrett Mountain Greenway Access, and no restoration or enhancement is needed.

As invasive vegetation continues to expand, the non-native vegetation used by turtles currently could probably be replaced in phases with native vegetation.

The Conservation Actions columns in the species tables in Section 4.2 provides numerous species-specific actions, most of which apply to Champoeg SHA and Parrett MGA.

Some of the surveying techniques that can be used in meeting the above recommendation are as follows:

1. Establish avian point count monitoring stations (perhaps monitored by professionals every 5 years) and consider supplementing with fixed walking survey routes (monitored annually by volunteers).
2. Explore using eDNA (environmental DNA) to determine presence/absence of Western Pond and Western Painted turtles and freshwater mussel species in Champoeg, Mission and Ryan creeks.
3. Snorkel for native mussels (data sheet in appendix of Blevins et al. 2018) and ammocoetes near shorelines of Willamette River and in the two creek mouths.
4. Use wildlife cameras to determine presence and use by meso- and large mammals.
5. Involve NWBat Hub in design and implementation of bat surveys. Acoustic methods are often used.
6. Establish repeatable Pollard transects for butterfly surveys.
7. Bee surveys could be designed and arranged through the Oregon Bee Atlas project.
8. ODFW should be consulted and if interested, involved, in all survey activities.
9. Encourage use of iNaturalist to stimulate community science interest and increase knowledge base.

Partnerships could improve habitat and public involvement, including these recommendations:

1. Involve Indigenous people and Traditional Ecological and Cultural Knowledge and expertise in planning, direction and participation in burning and planting projects.
2. Explore using Conservation Easements on nearby lands to the south to enhance prospects for native turtle populations. Investigate private lands participation in the Oregon Agricultural Trust program toward this end.
3. Sample and evaluate quality of creek water, and work with neighbors to improve if needed.

4. Other wildlife groups, for butterflies or other birds, could “adopt” species as the Prescott Bluebird Recovery Project has done for Western Bluebirds. Powell Butte Park in Portland has established standardized bird observation routes for trained volunteers, as another example.
5. Conduct annual EDRR weed surveys using trained volunteers annually, and professional botanists approximately once every 5 years. Explore how iNaturalist photo records could become part of this process.
6. OSU, UO and Willamette University could be partners in longer term monitoring projects.

General management and maintenance recommendations to protect and enhance wildlife habitat:

1. Minimize future conversion of natural areas to other uses.
2. Restore as much degraded area as possible to native habitats.
3. Minimize area occupied by invasive plant species; replace with native species.
4. Minimize or avoid use of chemicals: pesticides, fertilizers, additives, etc.
5. Time mowing and other vegetation maintenance activities to minimize impacts on native habitats and species during sensitive times (e.g., diurnal bee nectaring, spring-summer bird nesting April 15 – July 15).
6. Avoid tidiness: leave native habitats naturally unkempt where possible.
7. Continue efforts to restore “good fire” to the landscape in the Restoration Meadow, and possibly later, other upland and wet prairies and savannas.
8. Explore possible understory burning in woodlands.
9. Explore mechanical burning where broadcast burning is not possible.
10. Explore practicability of small burns to achieve larger burning goals while minimizing impacts. Not burning entire large areas may allow for better survival of invertebrates, which can then repopulate burned areas. Explore limited use of hand torch burning of smaller areas to produce habitat mosaics and minimize impacts.
11. Continue planting Oregon White Oak near existing stands to ensure a future, sustained cohort.
12. Add signage to educate about resources and explain restoration purposes wherever possible.

And finally, the top four actions that should be undertaken to maximize available and suitable habitat for use by *all* uncommon and rare species are:

1. Conduct surveys of all wildlife groups to determine species presence and absence,
2. Restore and maintain OCS-identified Strategy Habitats,
3. Control invasive species, and
4. Limit human impacts.

Bibliography

- Applegarth, J. 1995. Invertebrates of Special Status or Special Concern in the Eugene District BLM. USDI. BLM. Eugene, OR
- BAMONA. 2023. Web site consulted several times through 2023-02-03. Butterflies and Moths of North America. <https://www.butterfliesandmoths.org/>
- Blevins, Emily, and L. McMullen, S. Jepson, M. Blackburn, A. Code, S. Black. 2018. Conserving the Gems of our Waters. The Xerces Society. Portland, OR.
- Corkran, C. and C. Thoms. 1996. Amphibians of Oregon, Washington and British Columbia. Lone Pine Publishing.
- Geier, Joel. 2022. Grassland and Oak-associated Bird Species Assessment for Champoeg SHA and Parrett Mountain Greenway Access. Report to Salix Associates.
- IAE. 2014. Champoeg Prairie Restoration Plan. Institute for Applied Ecology. Corvallis, OR. Prepared for Oregon Department of Parks and Recreation. Salem, OR.
- IAE. 2018. Champoeg Prairie Restoration 2018. Institute for Applied Ecology. Corvallis, OR. Prepared for Oregon Department of Parks and Recreation. Salem, OR.
- IAE. 2019. Champoeg Prairie Restoration 2019. Institute for Applied Ecology. Corvallis, OR. Prepared for Oregon Department of Parks and Recreation. Salem, OR.
- IAE. 2020. Champoeg Prairie Restoration 2020 Annual Report. Institute for Applied Ecology. Corvallis, OR. Prepared for Oregon Department of Parks and Recreation. Salem, OR.
- Marshall, David B., Hunter, M. and Contreras, A. (eds.) 2003. Birds of Oregon: A General Reference. OSU Press. Corvallis, OR.
- Maser, Chris. 1998. Mammals of the Pacific Northwest. OSU Press. Corvallis, OR.
- Morton Arboretum. 2023. (Website viewed 2023-01-20). <https://mortonarb.org/plant-and-protect/tree-plant-care/plant-care-resources/black-walnut-toxicity/#sensitive-plants>
- NatureServe. 2022. Status of at-risk species, viewed online at <https://www.natureserve.org/access-data>
- Nedeau, E.J., A.K. Smith, J. Stone and S. Jepson. 2009. Freshwater Mussels of the Pacific Northwest (2nd ed.). The Xerces Society. https://pnwmussels.org/wp-content/uploads/2016/07/pnw_mussel_guide_2nd_edition.pdf
- Neill, A. 2018. Champoeg Prairie restoration 2018 Annual Report. Unpublished report for Oregon Parks and Recreation Department, Salem, OR. Institute for Applied Ecology. Corvallis, OR.
- Nussbaum, R. A., E.D. Brodie, Jr., and R.M. Storm. 1983. Amphibians and Reptiles of the Pacific Northwest. Univ. of Idaho Press. Moscow, ID.
- Pyle, R. and C. LaBar. 2018. Butterflies of the Pacific Northwest. Timber Press. Portland, OR

- ORBIC. 2022. Rare species data: site report received and viewed online data. Oregon Biodiversity Information Center, Institute for Natural Resources. OSU, Corvallis, OR.
- ODFW. 2015. Guidelines for Conserving Oregon's Native Turtles including Best Management Practices. Oregon Department of Fish and Wildlife. Salem, OR.
- ODFW. 2016 (and 2021 updates). Oregon Conservation Strategy. Oregon Department of Fish and Wildlife. Salem, OR. <https://oregonconservationstrategy.org/>
- ODFW. 2021. Oregon Sensitive Species List. Viewed at: https://www.dfw.state.or.us/wildlife/diversity/species/docs/Sensitive_Species_List.pdf
- ODFW. 2022. Compass, viewed online at <https://www.dfw.state.or.us/maps/compass/> Oregon Department of Fish and Wildlife. Salem, OR.
- OPRD. 1990. Champoeg State Heritage Area Master Plan. Oregon Parks and Recreation Department. Summary. <https://www.oregon.gov/oprd/PRP/Documents/PLA-Adopted-Champoeg-1990.pdf>
- OPRD. 2010. Bioblitz summary. Provided as Excel file from Oregon Parks and Recreation Department. Included here as Attachment X.
- OPRD. 2013. Draft Champoeg State Heritage Area 2013 Natural Resources Management Plan. Oregon Parks and Recreation Department. Provided by Inst. for Applied Ecology.
- OPRD. 2017a. Natural Resources Assessment and Strategic Management Plan - Willamette Basin. Oregon Parks and Recreation Department. Available at: <https://www.oregon.gov/oprd/PRP/Pages/PLA-natural-resource.aspx>
- OPRD. 2017b. Natural Resources Function and Value Assessment - Willamette Basin. (Appendix A to Strategic Management Plan). Oregon Parks and Recreation Department. Available at: <https://www.oregon.gov/oprd/PRP/Pages/PLA-natural-resource.aspx>
- Rombough, Chris. 2022. Turtle Habitat Assessment for Champoeg SHA and Parrett Mtn. Greenway Access. Report to Salix Associates.
- The Nature Conservancy. 2009. Willamette Valley Synthesis Project V2.0. https://s3-us-west-1.amazonaws.com/orfo/WV/Synth_V2_DataPackage.zip
- The Xerces Society. 2018. An Overview of the Potential Impacts of Honey Bees to Native Bees, Plant Communities and Ecosystems in Wild Landscapes: Recommendations for Land Managers. The Xerces Society. Portland, OR. https://xerces.org/sites/default/files/2018-06/16-067_02_Overview%20of%20the%20Potential%20Impacts%20of%20Honey%20Bees_web.pdf
- The Xerces Society. 2023. Web site for at-risk invertebrates: <https://xerces.org/endangered-species/species-profiles/other>
- Univ. of Oregon. 2022a. Little fish help gauge success of millrace restoration plan. Around the O (magazine): <https://around.uoregon.edu/content/little-fish-help-gauge-success-millrace-restoration-plan>

- Univ. of Oregon. 2022b. Willamette River Landscape Management Plan. Available at contractor JKENvironments web site: <http://www.jkenvironments.com/projects.html>
- Verts, B.J and Carraway, L.N. 1998. Land Mammals of Oregon. Univ. of California Press. Berkeley, CA.
- Vesely, D.G. and D.J. Rosenberg. 2010. Wildlife Conservation in the Willamette Valley's Remnant Prairie and Oak Habitats: a Research Synthesis. Oregon Wildlife Institute. Corvallis, OR. Submitted to Interagency Special Status Sensitive Species Program. USDI/USDA. Portland, OR
<https://www.fs.usda.gov/r6/issssp/downloads/planning/cpt-wildlifeconservation-willamette-valley-oak-prairie-synthesis-v1-202001.pdf>
- Western Oregon University et al. 2022-11-09 accessed. Oregon Native Turtles web site:
<https://www.oregonturtles.org/>
- Williams J.E., G.R. Giannico and B. Withrow-Robinson. 2014. Field Guide to Common Fish of the Willamette Valley Floodplain. Oregon State Univ. Ext. Service. Corvallis, OR.
<https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/em9091.pdf>

Personal Communications

- Alaica, Sarah. Institute for Applied Ecology
- Berkley, Andrea. Metro, formerly Natural Resources Specialist, Valleys Region, OPRD
- Figgins, Dave. Park Manager, OPRD
- Fratt, Lisa. Prescott Bluebird Recovery Project
- Geier, Joel. Contracting Ornithologist
- Hyink, Carolyn. Prescott Bluebird Recovery Project
- Klug, Daniel. Champoeg State Heritage Area (now promoted to a regional position), OPRD
- Land, Janet. Champoeg State Heritage Area, OPRD
- Niemela, Steve. North Willamette Watershed District Office, ODFW
- Rodenhouse, Tom. National Park Service
- Rombough, Chris. Contracting Wildlife Biologist (and lifetime Champoeg area resident)
- Sevey, Ryan. Natural Resources Specialist, Valleys Region, OPRD
- Sparks, Ryan. Acting Manager (2022), Champoeg State Heritage Area. OPRD
- Stewart, Sean. Natural Resources Specialist, Valleys Region, OPRD

Attachments

- A – Assessment of Existing and Potential Habitat for Grassland and Oak-Associated Bird Species at Champoeg State Heritage Area and Parrett Mountain Greenway. J. Geier.
- B – Assessment of Potential Turtle Habitat: Champoeg SHA and Parrett Mountain Greenway. C. Rombough.
- C – At-risk species for the Champoeg SHA and Parrett Mountain GA, with occurrence and conservation rankings. Salix Associates, based on data from ORBIC, and ODFW Conservation Strategy and Compass.
- D – Oregon Biodiversity Information Center rare species elements of occurrence for the Champoeg / Parrett area.
- E – Champoeg SHA Bioblitz 2000 and 2001 species lists by category. Spreadsheet file.
- F – Biodiversity list of Champoeg SHA and Parrett MGA by B. Newhouse, Salix Associates, 2022. Includes incidental observations of vascular plants, birds, butterflies, some other insects.
- G – iNaturalist species list downloaded 2022-12-22 for Champoeg SHA and Parrett MGA.
- H – eBird species list downloaded 2022-10-21 for Champoeg and Parrett.
- I – Salem Audubon Society field trip bird list 2023 Jan 23. Central portion of Champoeg SHA.
- J – NWBat Hub list for area, downloaded 2022 Dec. 19.
- K – “Compass” mapping tool download, 2022 Dec. 1 from Oregon Department of Fish and Wildlife. List of confirmed and modeled possible species for general area of Champoeg SHA and Parrett MGA
- L – Report on Research Conducted at LaButte, Submitted to Champoeg State Park. M. Dresner, PhD.
- M – Willamette Basin Natural Resources Functions and Values Assessment (excerpt for Champoeg SHA and Parrett MGA). Oregon Parks and Recreation Department.
- N – Synthesis 2.0 map. The Nature Conservancy.
- O – Digital maps of rare species actual and potential occurrence.

Species included are ranked S1, S2 or S3 by NatureServe, or ranked listed, proposed, candidate or species of concern under state or federal endangered species acts.

Assessment of Existing and Potential Habitat for Grassland and Oak-Associated Bird Species at Champoeg State Heritage Area and Parrett Mountain Greenway

Joel Geier
November 25, 2022

Scope

The aim of this work is to produce a wildlife habitat assessment for Champoeg State Natural Area (SHA) and the nearby Parrett Mtn Greenway, focusing on potential use by existing and potential grassland and oak-associated avifauna listed in the Oregon Conservation Strategy (ODFW, 2016) as Strategy Species for the Willamette Valley ecoregion.

The assessment is based on a field visit on October 21, 2022 to examine each of 27 polygons (see Figure 1) that delineate areas of open or woodland (i.e. non-closed canopy) habitat types, including:

- Agriculture (9 units, A1 - A9)
- Prairie - Wet (3 units, W1 - W3)
- Prairie - Upland (3 units, U1 - U6)
- Prairie - Restoration (2 units, P1 & P2)
- Managed Grassland (5 units, G1 - G5)
- Oak Woodland (4 units, O1 - O4)
- Oak Savanna (1 unit, OS1)

During the field visit, photographs were taken to document habitat structure and landscape scale factors to aid in drafting findings. Findings are presented here for each habitat unit, in terms of habitat potential, threats and recommendations for habitat enhancement and monitoring.

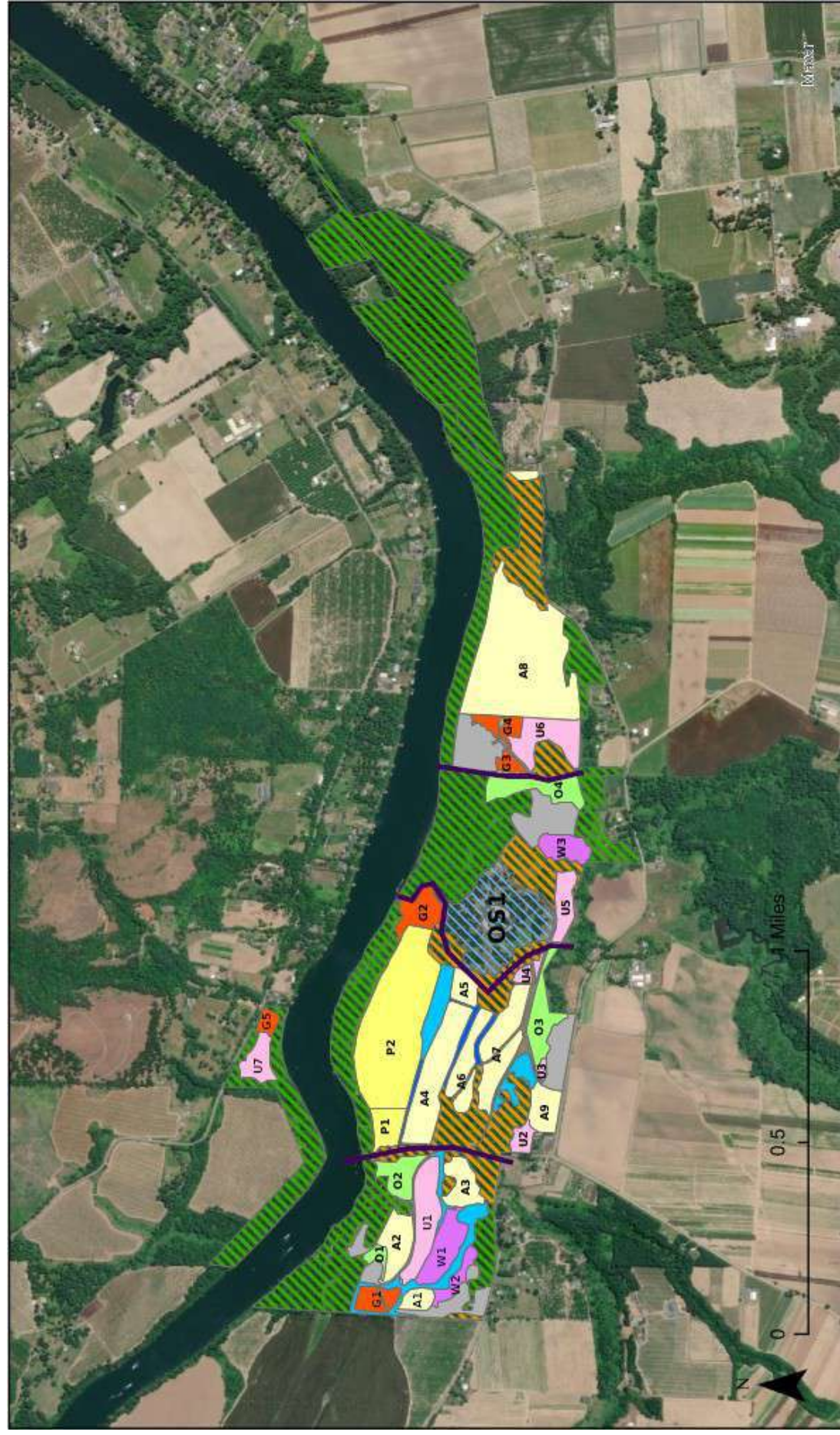


Figure 1. Champoege State Heritage Area Habitat Types

Species considered

This evaluation primarily considers as *focal species* the following grassland and oak-associated avifauna that are listed in the Oregon Conservation Strategy as Strategy Species for the ecoregion:

Dusky Canada Goose (*Branta canadensis occidentalis*)
Short-eared Owl (*Asio flammeus*)
Common Nighthawk (*Chordeiles minor*)
Acorn Woodpecker (*Melanerpes formicivorus*)
Streaked Horned Lark (*Eremophila alpestris strigata*)
Purple Martin (*Progne subis*)
Slender-billed White-breasted Nuthatch (*Sitta carolinensis aculeata*)
Western Bluebird (*Sialia mexicana*)
Chipping Sparrow (*Spizella passerina*)
Oregon Vesper Sparrow (*Pooecetes gramineus affinis*)
Grasshopper Sparrow (*Ammodramus savannarum*)
Western Meadowlark (*Sturnella neglecta*)

Three more species are identified as Strategy Species for Oregon, including for the Willamette Valley, but are associated with forests or early seral / shrub-dominated habitats:

Olive-sided Flycatcher (*Contopus cooperi*)
Willow Flycatcher (*Empidonax traillii*)
Yellow-breasted Chat (*Icteria virens*)

These are also listed in discussed as potential target species for restoration in a few units.

Table 1 summarizes the main needs of these focal species, limiting factors affecting their populations, and recommended conservation actions as identified in the Oregon Conservation Strategy.

Table 1. *Special needs, limiting factors affecting their populations, and recommended conservation actions as identified in the Oregon Conservation Strategy (ODFW 2016) for each the focal species considered in this assessment.*

Species	Special needs	Limiting factors	Conservation actions
Dusky Canada Goose	Require adequate food resources (high-quality, high-protein herbaceous plants) in sufficient spatial and temporal distribution to sustain migratory and wintering populations.	Decline of Dusky Canada Geese is primarily due to poor reproduction in their breeding range in Alaska. Currently, wintering habitat in Oregon is being lost due to conversions from agricultural pastures and grass seed crops to other uses (other crops, urban development, etc.). Use of private lands limits management options.	Information on conservation strategies is available in the Pacific Flyway Management Plan for the Dusky Canada Goose (2015): Maintain open grassland areas, limit hazing if Dusky Canada Geese are present,
Short-eared Owl	Require large expanses of marshes and wet prairies for foraging and nesting.	Short-eared Owls persist in small numbers in Oregon. Loss of extensive wetland (marsh and wet prairie) habitat is a key limiting factor. These owls nest and communally roost on the ground, which makes them particularly vulnerable to disturbance.	Maintain and restore wetland habitat, with an emphasis on maintaining large patches and/or expanding smaller ones. Minimize disturbance at communal roost sites.
Common Nighthawk	Use gravel bars and other sparsely-vegetated grasslands or forest clearings for nesting. As aerial insectivores, they require an adequate prey base.	Loss and degradation of nesting habitat are primary threats to Common Nighthawks. Changes in hydrology due to hydro-power dams and wildfire suppression have contributed to habitat losses. Increased predation pressure by corvids, gulls, and house cats as well as reductions in aerial insect abundance have also adversely affected this species.	Maintain sparsely-vegetated grassland patches. Restore natural disturbance regimes. Restore riparian and wetland habitat to support the insect prey base of nighthawks.
Acorn Woodpecker	Prefer oak woodlands with high canopies and relatively open understories. They are dependent upon dead limbs or snags for storing acorns.	Loss of oak woodlands, particularly in the Willamette Valley, poses a major threat to Acorn Woodpeckers and other oak habitat specialists. Remaining birds persist locally and in small numbers. Acorn Woodpeckers also compete with European Starlings (<i>Sturnus vulgaris</i>) for nesting cavities in some areas.	Work with private landowners to maintain and restore oak woodlands with open understories, especially in large patches. Maintain snags and older trees with dead limbs.
Purple Martin	Require abundant cavities for colonial nesting. They prefer sites with close proximity to water and large, open areas for foraging.	Purple Martins face threats on their wintering grounds in South America. Availability of suitable nesting sites remains an important limiting factor in North America due to reductions of natural cavities from human activities and competition from European Starlings (<i>Sturnus vulgaris</i>).	Retain and promote natural cavities/snags.
Streaked Horned Lark	Use open, treeless expanses of bare ground or sparsely-vegetated grassland for nesting and foraging.	Streaked Horned Larks have large area requirements. Loss and degradation of grassland habitat are key limiting factors. Nesting failure due to agricultural practices (e.g., mowing, haying, spraying) and predation at nest sites contributes to low reproductive success. Rodenticides (zinc phosphide) can also cause mortality.	Manage habitat by maintaining or restoring large, sparsely-vegetated grasslands, creating protected nesting areas, increasing plant diversity to promote greater insect diversity, and controlling key non-native plants. Designate areas to be managed for core population centers. Minimize disturbance during the breeding and fledging period (mid-April through mid-August). Improving nesting habitat away from active runways may reduce collisions and improve adult survival, if enough suitable habitat exists away from the runway.
Slender-billed (White-breasted) Nuthatch	Use mature, large-diameter oak trees for foraging and nesting cavities. They require high canopy cover in connected patches.	Availability of mature oaks and cavities for nesting may limit distribution. Nuthatches are susceptible to nest predation and competition from European Starlings (<i>Sturnus vulgaris</i>) and other cavity-nesters.	Maintain large oaks. Preserve trees containing cavities whenever possible. Promote development of larger oaks. Where possible, implement controlled burns to maintain oak tree dominance and prevent conifer encroachment.
Western Bluebird	Use grasslands and oak savannas for foraging. They rely on cavities in oaks for nesting and scattered trees or shrubs as hunting perches.	This species is threatened by habitat loss and degradation. Invasive, non-native plants and lack of fire have adversely affected habitat in many areas. Bluebirds face competition for cavities from non-native birds. Heavy predation by house cats, raccoons, and rodents is a further stressor. Western Bluebirds are sensitive to disease and parasites.	Maintain or restore grassland and oak savanna habitat. Maintain oaks >22 inches diameter at breast height. Retain snags and live trees with large, dead branches to improve availability of nest cavities. Maintain nest box programs for cavity habitat in the short-term; design and place nest boxes to minimize use by starlings. Brush/slash piles created as a result of management activities may provide limited, temporary habitat in young conifer forests. Maintain >20% combination of short, herbaceous vegetation and/or bare ground in breeding areas. Monitor and manage for understory vegetation diversity to support an abundance of invertebrate prey.
Chipping Sparrow	Typically found in open forests and drier woodland edges. They prefer areas with sparse, herbaceous understories for foraging.	Loss and degradation of habitat are key limiting factors. Loss of oak woodlands, in particular, due to development, fire suppression, and invasive plant encroachment is of particular concern. Known nest predators include snakes, American Crow (<i>Corvus brachyrhynchos</i>), and domestic cat (<i>Felis catus</i>).	Maintain areas of open, herbaceous native plant understory in oak woodlands. Control key invasive plants.

Grasshopper Sparrow	Use dry grassland habitat, generally with low to moderate grass height and low percent shrub cover. They have large habitat area requirements.	Grasshopper Sparrows are uncommon and locally distributed in Oregon. Loss of grasslands due to conversion and shrub/tree encroachment is a key limiting factor. Nesting failure due to timing of land use practices (e.g., mowing, haying, spraying) also impacts this species.	Maintain or restore grassland habitat. Increase plant diversity to promote greater insect diversity. Maintain high percent native grass cover and <10% shrub cover in patches >20 acres. Delay mowing and other field management until after July 15 at known nesting areas. Control key invasive plants.
Oregon Vesper Sparrow	Use grasslands with high structural diversity for foraging and nesting. These typically include grassy areas interspersed with trees and shrubs and some bare ground.	Declines of Oregon Vesper Sparrows have been linked to loss of grassland habitat. Infestation by invasive plants and lack of fire have degraded many remaining grasslands. Agricultural practices (timing of mowing) also threaten this species. Oregon Vesper Sparrows are susceptible to predation by cats, ground squirrels, skunks, and raccoons.	Maintain or restore grassland habitat. Increase plant diversity for greater insect diversity. Control key invasive plants. In the Willamette Valley, reduce or avoid mechanical operations during nesting (mid-May to mid-July).
Western Meadowlark	Require expansive grasslands for foraging and nesting. They may also use pastures or other open areas with low-lying vegetation. They prefer sites with high structural diversity, a mix of grasses and forbs, and vegetative cover <25 cm in height. Males commonly use scattered shrubs, trees, or fence posts as singing perches.	Western Meadowlarks have large home ranges and are sensitive to loss, degradation, and fragmentation of grasslands. Meadowlarks are vulnerable to nest predation from raccoons, cats, and dogs. Adult meadowlarks are hunted by raptors. Human disturbance and activities (e.g., mowing) can cause meadowlarks to abandon nests.	Maintain and/or restore grassland habitat, especially large expanses (e.g., >100 acres). Promote overall structural diversity in grasslands: limit the cover of trees and shrubs (<10%), ensure a relatively high percent cover of native forbs (>10%) and bare ground (>5%), and provide good representation of all height classes. Increase plant diversity to promote greater insect diversity. Control key non-native plants, including reed canarygrass. Minimize disturbance during the breeding season (April 15-July 15).
Olive-sided Flycatcher	Generally associated with open forests, often near water and with tall, prominent trees and/or snags. They may use open, mature coniferous forest, forested riparian areas, forest openings (e.g., burns, harvested forest), and forest edges. They prefer hemlocks or true firs for nesting and require abundant insects for prey.	Olive-sided Flycatchers have relatively large area requirements (compared to other songbirds). They may experience increased predation rates in harvest units within a landscape of mature or highly-fragmented forests.	Maintain scattered, large, dead trees in patchy wildfire zones. Maintain natural openings, but minimize harvested forest openings within mature forest landscapes.
Willow Flycatcher	Dependent upon riparian shrub habitat. They require a dense, continuous or near-continuous shrub layer, especially of willows.	Willow Flycatchers have experienced declines. Loss and degradation of riparian shrub habitat, in part due to altered hydrological regimes and invasive species, have contributed to these declines. Brown-headed Cowbird (<i>Molothrus ater</i>) parasitism may also adversely affect breeding success.	Restore brushy patches of willow and other native shrubby habitat near water. Control non-native plants to maintain native shrub communities. Discourage Brown-headed Cowbird use of riparian areas through seasonal grazing and/or maintaining high grass heights in priority areas. Restore riparian and early seral/montane meadow habitat in the West Cascades.
Yellow-breasted Chat	Found in dense, brushy thickets, especially near streams.	Loss of larger patches of dense, riparian shrublands, as well as altered disturbance regimes that produce needed ephemeral habitat, pose threats to this species. Changes in ground or surface water and livestock grazing in riparian areas can also adversely affect Yellow-breasted Chats.	Restore large, dense thickets of native shrub-dominated riparian habitat.

Preferred habitats in Willamette Valley and local status of focal species

The habitat preferences and local status of the focal species are summarized here briefly for reference in the discussion of potential occurrence in the individual habitat units. Reports from eBird mentioned here refer to the crowd-sourced database www.ebird.org.

Dusky Canada Goose Wintering flocks may join flocks of other geese throughout the Willamette Valley, often foraging in grass-seed fields; may also use native prairie restorations where available. Tend to favor open landscapes away from wooded or brushy edges. *Local status:* One report of a flock of 26 birds at Champoeg SHA in 2018, per eBird.

Short-eared Owl: Ground-nesting species. Requires large expanses of marshes or wet prairie with minimal disturbance for nesting and roosting. Nearly vanished as a nesting species in the Willamette Valley, but recent years have yielded a few breeding records from the southern and mid-Willamette Valley. *Local status:* No recent breeding-season reports from the northern valley (per eBird). Potential to use restoration areas in winter even if not as a nesting species.

Common Nighthawk: Ground-nesting species. Nests on gravel bars or sparsely-vegetated areas of grasslands; may forage for aerial insects over prairies, forests, or water. *Local status:* Very few local reports in recent years; eBird shows several reports from Newberg in the 1980s but none in past 20 years.

Acorn Woodpecker: Cavity-nesting species. Prefers oak woodlands with high canopies and relatively open understories. Dependent upon dead limbs or snags for storing acorns. *Local status:* Reported regularly at Champoeg SHA since 2010; eBird shows a few earlier records dating back to 1979 indicating at least intermittent presence prior to 2010, but not detected during 2007 surveys.

Streaked Horned Lark: Ground-nesting species. Listed as *Threatened* under the Endangered Species Act. This is the endemic subspecies of Horned Lark that occurs year-round in the Willamette Valley; other subspecies may occur as migrants in winter. Requires large areas of open landscape dominated by short grasses (0 to 6 inches) with substantial areas of bare ground for nesting and foraging (Altman, 1999). *Local status:* A 2008 ODFW grassland bird survey (Myers & Kreager, 2010) included 29 survey points in French Prairie within 10 km of Champoeg SHA but found no larks. There have been no breeding season (May-Aug) reports within 10 km in last 10 years per eBird. A small population nests at McMinnville Airport and farther north in the Dayton Prairie Area (Myers & Kreager, 2010).

Purple Martin: Requires suitable cavities for nesting (either natural cavities or artificial cavities) with close proximity to water and large, open areas for foraging. Species may respond to placement of artificial nesting gourds (Vesely, 2014) as well as increasing forb diversity to bolster aerial insect supply. *Local status:* Just one report from Champoeg SHA or nearby in recent years per eBird, despite suitable open foraging habitat.

White-breasted Nuthatch (Slender-billed): Closely associated with large oaks with suitable cavities for nesting; may use large cottonwood snags as secondary habitat when near oak

woodlands extensive enough to maintain local population. *Local status*: Reported regularly from Champoege SHA, and thus a key focal species to sustain.

Western Bluebird: An oak savanna or very open woodland specialist associated with limited shrub cover and ground cover dominated by short grasses, close to suitable nesting cavities or nest boxes (Altman and Stephens, 2012). *Local status*: Reported regularly from Champoege SHA, and thus a key focal species to sustain.

Chipping Sparrow: An understory species that may respond quickly to restoration that opens up closed canopy and reduces understory shrub cover, provided that grass/forb ground cover is kept short either by grazing, mowing, or natural characteristics of the substrate such as gravelly soils (Altman and Stephens, 2012). *Local status*: Reported regularly from Champoege SHA, and thus a key focal species to sustain. One reported from the Parrett Mountain Access in early April of 1995 (eBird) may have been a migrant.

Grasshopper Sparrow: Ground-nesting species. In the Willamette Valley, this species nests in forb-rich prairies, including both wet prairie and upland prairie. Although the largest known population is in the southern valley west of Eugene, breeding birds have shown up in recent prairie restorations in Benton, Polk, Linn and Marion County (Bob Altman, Nate Richardson, Jared Jebousek, Christopher Adlam, Roy Gerig, personal communications). *Local status*: No nearby reports, but in Washington County, a singing male was at Quamash Prairie near Scholls in May of 2021, and two singing males turned up in Penstemon Prairie north of Gaston in 2022. These reports indicate good potential for this species to respond to enhancement of prairie habitat at Champoege SHA.

Oregon Vesper Sparrow: Ground-nesting species. Proposed for Endangered/Threatened listing based on a petition to the USFWS by the American Bird Conservancy (2016), still under review. Nests in pastures with widely spaced oaks or some upland prairie that include ample areas of bare ground and scattered shrubs.

This species is noted for very high site fidelity, which means that reestablishment can be very difficult once a local nesting population has been lost. Notably absent from prairie restorations at the three mid-Willamette Valley national wildlife refuges (Finley, Ankeny, and Baskett Slough NWR) where they occurred historically (Altman, 2015), but a robust prior population at Bald Hill Farm (Greenbelt Land Trust property) near Corvallis has continued to nest in more recent prairie restorations. Conspecific species attraction efforts using playback of song recordings and painted decoys were successful in inducing this species to nest in a natural prairie site near Wren, Oregon (east of Philomath), but that site is within 2-3 km of grazing land where larger numbers nest annually.

Local status: The nearest detections during the 2008 ODFW grassland bird surveys were 10 to 15 km away from Champoege SHA (Myers and Kreager, 2010). Only 1 out of 45 points surveyed in the North Willamette Valley in 2013 yielded a detection (Altman, 2015). Per eBird there are no breeding season reports from Champoege SHA since 1995, and only one breeding-season (May-Aug) report within 10 km in the past 10 years.

Thus there is not a robust population nearby that could be expected to find and populate this site, even if habitat is enhanced and conspecific attraction methods are employed. For this reason, Oregon Vesper Sparrows are noted here as "unlikely" to respond even if suitable steps are taken to improve habitat in a particular unit. However in a longer-range perspective, habitat enhancements for other, more likely oak savanna species could provide future habitat for Oregon Vesper Sparrows if regional populations begin to recover.

Western Meadowlark: Ground-nesting species. Landscape scale is critical for this species, which favors expansive grasslands (100+ acres) for foraging and nesting, preferably with mixed grasses and forbs, mostly low vegetative cover, and widely scattered shrubs or trees for males to use as singing perches.

Local status: The nesting population in the the northern Willamette Valley is very small with clusters of just 1 to 4 pairs in scattered locations (Altman, 1999). The nearest such cluster is at McMinnville Airport, about 20 km west of Champoeg SHA. Young birds dispersing from that cluster after successful breeding years could potentially be source for expansion if appropriate habitat. Meadowlark flocks seen between September and April are likely to be birds that nest east of the Cascades or farther north, and migrate to the Willamette Valley for the winter months.

Olive-sided Flycatcher: Nests mainly in conifer forests, particularly with tall, prominent trees and/or snags, used as foraging perches from which they fly out to catch insects above the main canopy. May use other habitats with similar vertical structure in migration. *Local status:* Regular as a spring migrant at Champoeg SHA and Parrett Mtn Access (eBird); occasional reports during breeding-season suggest possibility of local nesting.

Willow Flycatcher: Nests in riparian or shrub-swamp habitat with dense shrubs, especially willows. *Local status:* Fairly regular at Champoeg SHA in breeding season, has also been reported from Parrett Mtn Access.

Yellow-breasted Chat: Uses edges of large, dense thickets in riparian areas and swales. *Local status:* Uncommon to rare in northern Willamette Valley. No eBird reports from Champoeg SHA; one 2018 report from 5 km northeast of site.

Additional species listed as Strategy Species for other ecoregions

Six additional species are identified as Strategy Species for Oregon, for regions other than the Willamette Valley, but are either known to occur in Champoeg SHA or could plausibly occur:

Trumpeter Swan: flocks winter in Willamette Valley grasslands; small numbers have occurred within 5 km in recent years per eBird.

Black-necked Stilt: occurs as migrant in wetlands and wet prairie, nests annually at Baskett Slough NWR in Polk County.

Burrowing Owl: May have nested in the Willamette Valley until around 1950 (Altman, 2011) but now occurs only as a very sparse wintering species, favoring wide-open habitats with culverts or similar structures to use as winter dens. No nearby reports per eBird.

Pileated Woodpecker: Frequent reports, year-round resident that nests in the Willamette Valley, favoring forested habitats with large-diameter trees, including stands of older black cottonwood, big-leaf maple and Douglas-fir along the Willamette River.

Lewis's Woodpecker: Nested historically in the Willamette Valley but no records of nesting since the early 1970s (Altman, 2011). Still occurs as fall/spring migrant, and may winter in stands of older oaks. Has occurred at Champoeg SHA at least twice in recent years per eBird.

Loggerhead Shrike: Occurs in Willamette Valley as rare wintering species or migrant, favoring grassy habitats with scattered brush. No nearby reports per eBird.

These additional species are not discussed systematically but may be mentioned in relation to particular habitat units where they could benefit from habitat enhancements for the primary species.

Previous avian surveys and nesting data

Avian point counts were conducted at Champoeg SHA were conducted during May and June of 2007, and were later used as input to an American Bird Conservancy (ABC) study of oak-associated bird habitats in western Oregon and Washington (Altman and Stephens, 2012).

Data for two of these point count stations were obtained in November 2022 (personal communication, Bob Altman). Both stations were located in the unit labeled OS1, and were assessed as "oak woodland - closed," meaning oak-dominant woodlands with 50% to 75% canopy cover.

Results of these counts are summarized in Table 2. Two focal species (Slender-billed Nuthatch and Chipping Sparrow) were detected but neither Acorn Woodpeckers nor Western Bluebirds were detected. This indicates that Acorn Woodpeckers were either not established in this unit in 2007 or were present at best in small numbers. The absence of Western Bluebirds was likely due to habitat structure (mostly closed-canopy) in this unit.

Additional data may exist from two other point-count stations in open habitats farther west in Champoeg SHA, but those data were not used by Altman and Stephens (2012) and were not relocated in time for this report.

Table 2. Detections of oak-associated bird species during May-June 2007 avian point counts (unpublished data furnished by Bob Altman, November 2022). Totals are taken over results of three five-minute point counts at each station on three separate days (May 31st, June 12th, and June 27th of 2007) for detections of (i) birds within a radius of 50 m of the station and (ii) birds within a radius 100 m of the station. Note that total detections within a 100 m radius include detections within a 50 m radius. Focal species for this habitat assessment are highlighted by yellow shading.

Species	Champoeg Station 1 N 45° 14.988', W 122° 53.091'		Champoeg Station 2 N 45° 15.142', W 122° 53.085'	
	Total detections within 50 m	Total detections within 100 m	Total detections within 50 m	Total detections within 100 m
Black-capped Chickadee	2	2	1	1
Bullock's Oriole	0	1	0	0
Bushtit	0	0	1	1
Chipping Sparrow	0	1	1	2
Downy Woodpecker	0	0	0	2
Lesser Goldfinch	1	1	1	2
Purple Finch	0	2	0	1
California Scrub-Jay	0	1	0	0
White-breasted (Slender-billed) Nuthatch	1	2	1	3
Western Wood-Pewee	2	3	2	2

Additional data specifically on Western Bluebirds may be available from the Prescott Bluebird Recovery Project (PBRP), which has maintained and monitored bluebird nest boxes at Champoeg SHA at least since 2005, when their newsletter included an announcement for the Champoeg Bluebird Festival, noting the presence of several nesting pairs.

Per information on the PBRP website at <https://prescottbluebird.com>:

Volunteers monitor each nest box during the nesting season and gather valuable nesting information. Data collected by the volunteers is included in a database and reported to the Bird Banding Laboratory of the USGS. Banders under the direction of a Master Bander, band the nestlings along with any unbanded adults. Banding adult birds and nestlings and recapturing adult birds to check their band numbers are an important part of the recovery effort. This allows PBRP researchers to determine the life span and reproductive success of specific birds and to track the dispersal of fledgling young to other nesting locations. This, in turn, guides decisions about where to put up additional nest boxes.

During November 2022, Champoeg SHA staff were unable to locate nest-box records from this project in the park office, but presumably such records could be obtained either from PBRP or from the Bird Banding Laboratory.

Main habitat types in Champoeg SHA

The map of "Champoeg State Heritage Area Habitat Types" (April 2022) includes the following categories of open or woodland habitat with characteristics noted by brief visual assessment in late October of 2022:

Agriculture (A) This includes both active cropland (mainly grass-seed farming with perennial grasses) and what appears to be fallow land or old fields/pastures. 9 units (A1 - A9)

Prairie - Wet (W) Seasonal wetlands mainly with dense slough-type grasses (locally rushes or sedges) and sometimes dense brush, with *Rosa* sp. appearing to be dominant. 3 units (W1 - W3).

Prairie - Upland (U) Grassy areas of a more upland character, possibly with some native grasses and forbs including *Prunella*. 3 units (U1 - U6)

Prairie - Restoration (P) Grassy floodplain areas which have been partly seeded with native grasses, mainly *Deschampsia* (tufted hairgrass, (blue wild-rye), and possibly *Festuca* (Roemer's fescue), some native forbs (tarweed) and ruderal annuals. 2 units (P1 and P2).

Managed Grassland (G) Open areas with turf grasses that are kept mowed short as lawns, used for tent camping, dog exercise, overflow parking, or other recreation. 5 units (G1 - G5).

Oak Woodland (O) Areas with large hardwood trees including oaks, variable canopy closure ranging from mostly closed to mostly open, approaching savanna-type densities. 4 units (O1 - O4).

Oak Savanna (OS) Area with many large oaks, variable canopy closure, understory mainly kept mowed, used as disc golf course (20+ disc-golfers on the course during a late October visit), with a few small, widely scattered patches of understory shrubs. One unit (OS1).

The map also identifies three types of *forest* (*conifer*, *hardwood*, and *mixed*) as well as *riparian* (mainly ash swales with shrub and herbaceous understory), and *operations* areas (maintenance areas, paved parking areas, RV campgrounds, and other visitor facilities). These areas have not been evaluated as potential primary habitat for oak/grassland bird species, in this assessment, although their potential role as edge habitat is discussed where relevant.

Assessments by unit and zone

The habitat assessment is discussed here in terms of four "zones" of Champoeg SHA:

- West zone: Riverside Day-Use and Townsite Area
- West-central grassland zone
- East-central woodland zone: Oak Grove Day Use Area
- East zone: campgrounds and field

plus the Parrett Mountain Access which is treated separately.

West Zone: Riverside Day-Use and Townsite Area

This zone contains about 60 acres of open or mostly open-canopy areas, including units mapped as Praire-Upland (U1), Prairie-Wet (W1, W2), Agriculture (A1, A2, A3), Oak Woodland (O1, O2), Managed Grassland (G1), and a 2-acre asphalt-surfaced parking area for a pavilion. The open areas are partly broken up by thin strips of riparian growth (mainly ash swales) and two larger patches of hardwood or mixed forest, each about an acre in size. A paved 2-lane road used by park visitors and staff runs through the area.



Figure 2. Representative habitat units in West Zone including (clockwise from top left) Units U1, A2, O2, and W1.

Observations from field visit in October 2022

U1 (Prairie - Upland) had been mowed so the habitat structure that would have been effective during nesting season was difficult to judge. The grass appears to be dense with little bare ground, except for small areas with recent gopher activity. The few forbs evident were mainly non-native. Many native forbs could be senescent at this stage of the season, but there was no indication of native prairie forbs that typically have green leaves in late summer such as *Sidalcea*, *Eriophyllum*, or *Madia*. The west end of the unit is signed as a dog exercise area and was being used as such during the visit.

A1 (Agriculture) was not accessed due to signage indicating no public access. From a distance, this small area appears to be kept mowed as a lawn or hay field. It is separated from the larger open areas by a dense riparian strip.

A2 (Agriculture) had also been mowed but appeared to have grasses similar to *U1* and similarly few forbs. A row of 15 to 20 ft tall valley ponderosa pines has been planted along the south edge. The southeast corner adjoins a stand of older pines 1 ft dbh or larger, so approaching a size suitable for cavity-nesting birds. Maples are also present. A Great Blue Heron and American Kestrel were hunting the open grassy areas, which are bordered to the north by 50+ ft tall Douglas firs with a few red-cedars. These conifers have a very open understory that is kept mowed as lawn.

A3 (Agriculture) had also been mowed but appeared to have pasture-type grasses coarser than the grasses in the preceding units. A few asters (perhaps Hall's aster) were blooming, indicating persistence of a native forb component. This small (6 acres) kidney-shaped field is nearly entirely ringed by trees (mainly ash with some willows along the south edge), which limits its functionality as grassland bird habitat. The elevation of this unit is several feet lower than the other open units in this zone, so it may have more of a wetland character than *A1* or *A2*. The only birds observed during the visit were forest-associated species, using the riparian forest edges.

W1 (Prairie - Wet) is a seasonal wetland with dense slough-type grass on tussocks, with a few rushes (*Juncus* sp.) and European teasel in places. Most of the area is overgrown with very dense thickets of wild rose (appeared to be the non-native *Rosa multiflora*).

W2 (Prairie - Wet) was not accessed for the same reason as *A1*. From satellite images including historical images on Google-Earth, this appears to be narrow strip more grassy and less brush-dominated than *W1*.

O1 (Oak Woodland) is a small unit with mainly maples bordering the edges of the paved parking area. No oaks were noted in this unit, but a few large oaks are present in the mixed forest along the north edge of the parking lot.

O2 (Oak Woodland) likewise has very few oaks except close to the parking area for the Townsite Trail. Most deciduous trees appear to be locusts. The structure is open woodland to savanna in terms of degree of canopy closure. A cluster of Oregon-ash in the southeast corner has six trees 14-22 in dbh. Oak woodland/savanna associated species noted during

the site visit included Western Bluebird, California Scrub-Jay, Acorn Woodpecker and American Kestrel.

G1 (Managed Grassland) is a mowed-lawn area, heavily impacted in middle which apparently has been used for brush piles and perhaps burning. Signs indicate that this area may also be used for overflow parking during events in the nearby pavilion.

Habitat potential and threats

The upland portions of this zone (particularly, O2, U1 and A2) already appear favorable for open-canopy woodland/savanna species, particularly Western Bluebird and Chipping Sparrow. The mostly low-stature ground cover with perches along woodland edges or scattered trees provides suitable foraging conditions for these species. These species could also use A1 and G1 as secondary foraging habitat.

Acorn Woodpeckers already use the wooded portions despite a minimal oak component in O1 and O2. Likely they rely on oaks in the adjacent mixed-forest units for acorns as their staple food source, but may use other types of trees for supplementary foraging and/or acorn storage. Slender-billed Nuthatches could also use these areas as secondary habitat.

The overall small scale of the open habitats in this zone (60 acres) and fragmentation by strips of woody riparian growth limits the potential for grassland species that favor large areas of open landscape for nesting, including Western Meadowlark, Grasshopper Sparrow, and Streaked Horned Lark. Meadowlarks nesting in the west-central zone could potentially use U1 or A3 as secondary habitat for foraging.

Disturbance by dogs and pedestrians will likely limit the potential for Oregon Vesper Sparrow and other ground-nesting species to nest in this area. Depending on the timing of annual mowing, this could also be a threat to ground-nesting birds.

Vehicle traffic along the park roads could be potentially be a source of mortality for birds foraging along roadside. However there appears to be good compliance with the posted 25 mph speed limit, which limits this risk.

In their current condition, largely covered by dense shrub thickets and dissected by riparian corridors, the wetland units W2 and W1 do not provide significant habitat for any of the focal species that favor oak/grassland habitat. Willow Flycatchers and/or Yellow-breasted Chats might use these units, along with the willow-shrub habitat at the south edge of A3.

Recommendations for habitat enhancement and monitoring

The following recommendations are suggested to enhance habitat for the focal species in the west zone:

- Reseed or interseed units U1, A2 and A3 with low-stature native prairie forbs, and minimize pesticide use in the more intensively managed areas (G1 and A1) to promote

robust populations of insects that provide forage for Western Bluebird, Chipping Sparrow, and potentially Western Meadowlark.

- Selectively thin conifers that are crowding or over-topping legacy oaks in the mixed-forest units adjacent to O1 and O2, to preserve and enhance the value of these oaks as habitat for Acorn Woodpecker and Slender-billed Nuthatch.
- Gradually replace locusts and maples in O2 and A2 with open-grown oaks and/or scattered clusters of native prairie shrubs such as western serviceberry or Oregon-grape, to maintain an open savanna habitat structure and provide nesting sites for Chipping Sparrows.
- Replace non-native rose thickets in W2 and W1 and blackberry thickets along the edges of A3 with either (a) native herbaceous wetland and wet-prairie vegetation or (b) dense plantings of native shrubs such as willows, mock-orange, and red-osier dogwood. The former option could be more beneficial to grassland birds, but may be challenging to maintain. The latter option would provide improved habitat for Willow Flycatcher and Yellow-breasted Chat.
- Selectively create openings in narrow riparian strip separating U1 from A3 and W2 by removing trees and brush, replacing with native grasses, sedges, and forbs, to enhance connectivity of open habitats and reduce wooded-edge impacts on grassland habitat.
- Consider thinning the ponderosa pines in and adjoining A2 to maintain a more savanna-type structure.
- Trim lower branches of the one very large large Douglas-fir in the middle of O2, which currently has lower branches over 20 ft from the trunk, to enhance savanna structure and reduce cover for mammalian nest predators such as raccoon.
- Minimize use of pesticides (especially insecticides) in managed grassland areas where focal species may forage.

Monitoring of avian species response to habitat improvements in this zone should be conducted by systematic point counts during breeding season (May-June), repeated at least once per five years. If data from one station in this zone 2007 (reportedly near the day use area restrooms) can be relocated, that station should be replicated. An additional station could be located in or near unit A3.

West-central Grassland Zone

This zone contains the largest contiguous areas of open habitat in Champoeeg SHA, comprising close to 100 acres including units mapped as Prairie-Restoration (P1, P2), Agriculture (A4 through A7 and A9, A3), Prairie-Upland (U2, U3, U4), Oak Woodland (O3), and Managed Grassland (G2). The largest open areas in the north part of this zone are partly dissected by thin strips of riparian growth (mainly ash swales), and partly separated from open habitats to the south by riparian and mixed forest. A paved 2-lane road used by park visitors and staff runs between the northern and southern areas, with a junction to the main park entrance road. A hiking trail (the Townsite Trail) skirts the northern edge and a multi-use hiking/biking trail runs ESE-WSW through the northern area. An "operations" area around the visitor center is mostly open, with lawn around a paved parking area and a small orchard to the east.

These mostly open habitats are bordered to the west by hardwood forest, to the north by mixed forest along the south bank of the Willamette River, to the east by extensive oak woodlands, and to the south by private lands which are partly forested but connect to open agricultural fields south and west of the Visitor Center.



Figure 3. Representative habitat units in West-central Grassland Zone including (clockwise from top left) Units P2, A4, A7, and O3.

Observations from field visit in October 2022

P1 (Prairie - Restoration) was mostly unmowed except for strips that are mowed along the street grid of the historic town site. The native prairie plant component in the unmowed areas was minimal, with mainly dense European grasses, but some Lupine (*rivularis*?). No woody shrubs or trees were present except along the edges of the unit. Birds using the area during the field visit included Savannah Sparrow (a common grassland species that could nest here), Lincoln's Sparrow (occurs as a winter migrant in grassy habitats) and American Kestrel.

P2 (Prairie - Restoration) has two main types of vegetation. In the larger, mostly lower-lying eastern part, *Deschampsia* (tufted hairgrass) is established as a dominant species, with some *Elymus* (blue wild-rye) also present. Forbs appeared to be mostly weedy composites such as hawkweed, but some *Madia elegans* (elegant tarweed) was noted. The western part is mostly higher than the eastern part, and appears to have been tilled in recent years, with areas of bare, silty soil and mostly ruderal forbs. No woody brush was noted except around the edges of the unit, but tall weeds in the hairgrass area could serve as singing perches for grassland sparrows.

Birds present during the field visit included Savannah Sparrow, Lincoln's Sparrow, Oregon Junco (around the edges), Golden-crowned Sparrow (using blackberry clumps along the edge with U4), and American Kestrel. Three Western Meadowlarks flew into this area after flushing from A4.

A4, A5 and A6 (Agriculture) all are planted with perennial grass in rows for commercial seed production, possibly tall fescue or another coarse-leaved European grass. Other introduced weedy grasses and forbs were noted in places. Three Western Meadowlarks flushed from the west end of A4 and flew to P2.

G2 (Managed Grassland) is an area of mowed lawn area used as group tent-camping site during summer. The lawn grasses appear to be heavily impacted by foot traffic and possibly some vehicle traffic. The unit is partly separated from P2 by single row of Douglas-firs. The north edge of the unit, leading down to a boat landing on the river, has big-leaf maples and cottonwoods, dense blackberry thickets on the bank, and some willows, elderberry, tall cottonwood snag. Bat boxes have been placed near the restrooms.

A7 (Agriculture) appears to be no longer entirely in agricultural production. The west portion (west and south of the multi-use path) has a grassland structure to similar to U1, with relatively dense, fine-leaved grasses and few forbs evident after mowing. A few patches of bare ground are present due to recent gopher activity. Near the west end of the unit, a few widely scattered Oregon-ash seedlings were noted in low-lying areas. The eastern portion appears to have been kept in grass-seed production at least through 2021, and is more similar to units A4-A6 to the north.

U4 (Prairie - Upland) is a small area (about 1 acre) just east of A7, separated from the latter by a discontinuous row of savanna-grown oaks that have well-developed lateral branches. The ground vegetation is similar to U1.

O3 (Oak Woodland) is a mostly narrow strip of oaks, dense grasses and brush between the internal park road and private lands and the visitor center uphill to the south. The oaks in the lower part of this area also appear to be savanna-grown. The density of woody brush and trees increases higher up the slope.

U3 (Prairie - Upland) is a tiny patch of grassy habitat just below the parking area for the visitor center, less than 30 m wide by about 85 m long in the east-west direction. It was unmowed during the field visit and did not to be actively managed as native prairie habitat, with dense non-native grasses and tansy ragweed noted.

A9 (Agriculture) appears to be an old pasture which currently has tall, dense grass but may harbor some forb diversity. Open fields across the county road to the south may make this area sufficiently functional in terms of landscape scale to function as habitat for Savannah Sparrow or (much less likely) Oregon Vesper Sparrow.

U2 (Prairie - Upland) adjoins A9 to the northwest and has similar character. A brushy area between this and A9 breaks up the grassland habitat. The forested edge to the north has some willows.

Habitat potential and threats

Due to its significant scale, this zone has the highest potential for true grassland species including Western Meadowlark, Grasshopper Sparrow, Northern Harrier, and possibly even Streaked Horned Lark (unlikely) or Short-eared Owl (very unlikely as nesting species but possible as wintering species).

Unit P2 is already in a condition that could attract focal grassland species, if agricultural fields to the south are kept open to preserve landscape scale. Conversion of these fields to native prairie vegetation would further increase suitability for Western Meadowlark and Grasshopper Sparrow.

This entire zone provides open area suitable for foraging by Common Nighthawk and Purple Martin as well as other aerial insectivores.

And emergent gravel bar/shoal on the south bank of the Willamette River just north of P2 appears to have developed since 2020, and is visible in 6/18/2021 satellite images on Google Earth. This is still small (less than 100 ft long) but potentially could provide a nesting area for Common Nighthawk and/or Spotted Sandpiper, if disturbance by pedestrians and boaters is minimized. There are few other gravel bars in this reach of the Willamette River.

Savanna-like portions adjacent to woodland edges, particularly U4, are already functional as habitat for Western Bluebird and Chipping Sparrow, and could even host Oregon Vesper Sparrow in small numbers (unlikely due to scant population in region and difficulty of maintaining habitat structure unless grazing is an option). O3 also has potential focal species favoring oak savanna, if the brush component can be reduced and tall grasses are managed by grazing.

The smaller units in the southern part of this zone have less potential for focal species with large area requirements, but may function as secondary foraging areas and to preserve overall landscape scale. Willows on the north edge of U2 could host Willow Flycatcher.

Most of the area is away from vehicle traffic, so mortality from this cause is unlikely to be a significant threat. Pedestrian traffic appears to be limited to two trail corridors, leaving most of the habitat free from disturbance. Dogs wandering off trail could be a threat to ground-nesting birds if leash laws are not enforced.

The fields still in grass-seed production are beneficial in terms of maintaining the overall scale of the open landscape, and as secondary foraging and even nesting habitat. However depending on the timing of agricultural operations, nests could be destroyed by spray buggies early in the season, or during harvest by swathers (windrowers) and combines. Pesticide use could also adversely affect insect populations and nesting birds that depend on this food source.

If annual mowing is used for management of the prairie restoration areas, this could also be a threat to ground-nesting birds depending on the timing. So far as possible, use of mechanized equipment in these areas should be limited to before April 1st or after July 15th.

Invasion of grassland habitat by trees, blackberries thickets, or continuous corridors of shrubs could lead to increased nest predation, whether by avian predators that use these as hunting perches, or mammalian predators that use these as cover.

In the south areas of this zone, house cats from private residences could impact songbird populations. Fast traffic along the county road to the south could be a source of mortality for birds nesting A9.

Recommendations for habitat enhancement and monitoring

The following recommendations are suggested to enhance habitat for the focal species in the west-central grassland zone:

- Enhance landscape-scale connectivity of open habitat by selective thinning to create wider gaps in the brushy or riparian strips between units P1/P2 and A4/A5, and between units A6 and A7.
- Enhance P1 by reseeding or interseeding with native prairie forbs and grasses.
- Enhance eastern tufted hairgrass area of P2 by interseeding with native prairie forbs and (if possible) use controlled burns to continue restoration to historic prairie conditions.
- Reseed remaining areas of P2 with upland forbs and grasses, but consider maintaining disturbance regime.
- Enhance prairie vegetation in unfarmed area of A7, and consider converting the remaining grass-seed fields to native upland prairie.
- Consider use of grazing livestock in southern units (particularly U2, O3, and A9) as a historically appropriate method for maintaining a more complex grassland structure such as would have been maintained by 19th century farming practices, compatible with focal species including Oregon Vesper Sparrow and Chipping Sparrow.

- Consider installing nest gourds for Purple Martins, preferably with a suitable plan for monitoring and maintenance.
- If the emergent gravel bar in the Willamette River north of P2 continues to expand, limit pedestrian and boater access to this area so far as possible during May through July, to limit disturbance to nesting birds.
- Minimize use of pesticides (especially insecticides) in managed grassland areas where focal species may forage.

Monitoring of avian species response to habitat improvements in this zone should be conducted by systematic point counts during breeding season (May-June), repeated at least once per five years. If data from one station in this zone 2007 (reportedly near the entrance road) can be relocated, that station should be replicated. An additional station could be located in unit P2.

East-central Woodland Zone: Oak Grove Day Use Area

This zone contains about 70 acres of mostly wooded areas (including OS1 and O4) with many large oaks, as well as developed RV and yurt camping areas, plus a few relatively small grassy areas (U5 and W3). A paved 2-lane road used by park visitors and staff winds through the area, providing vehicle access to a day use area and the campgrounds.



Figure 4. Representative habitat units in East-central Woodland Zone including (clockwise from top left) Units OS1 (west part), O4, W3, and OS1 (south part). The photo of O4 is blurred in spots due to raindrops on the camera lens.

Observations from field visit in October 2022

OS1 (Oak Savanna) is more of a woodland than savanna, with about 50% canopy closure overall. The oaks are concentrated mainly in closed-canopy stands with grassy glades in between, generally less than 50 m wide. This unit has minimal understory development. The main herbaceous cover is grass which is kept mowed as a lawn in most parts of the unit. A disc-golf course winds through most of the unit and appears to be quite popular, with at least twenty people using the course on a Friday morning with rain forecast. Acorn Woodpecker and Slender-billed Nuthatch were present during the field visit. Some young oaks have been planted in one of the open glades toward the west, otherwise minimal recruitment.

O4 (*Oak Woodland*) includes a group RV camping site and wooded areas adjacent to another RV camping loop. There are numerous large (>1 ft dbh) oaks especially in the southern half of the unit, with a variety of other deciduous trees in the north end. Most understory areas are kept mowed particularly at the north end and middle portion; the south end appears to be less intensively managed

U5 (*Prairie - Upland*) was unmowed at the time of the field visit, with dense grass including velvetgrass appearing to be dominant in some areas, and minimal native component in evidence. This is a small area of about 3 acres, only 80 m to 100 m wide, but is adjacent to oak woodland to the north.

W3 (*Prairie - Wet*) was also unmowed, with dense slough-type grasses dominating the area, surrounded by blackberry thickets and forest.

Habitat potential and threats

The presence of many mature oaks, including some that appear to have grown in open-canopy conditions, makes this a valuable area for Slender-billed Nuthatch and Acorn Woodpecker.

The mostly low-stature vegetation in the understory (particularly in OS1) provides suitable foraging areas for Western Bluebird and Chipping Sparrow. Unit U5 could also support these species if the grass height is managed.

The mostly high canopy park-like nature of the understory in the main OS1 unit provides few places where Chipping Sparrows could nest at their preferred height of 1 to 4 m.

Brushy edges around W3 could host Willow Flycatcher or Yellow-breasted Chat. Olive-sided Flycatcher could use the area in migration.

The relatively high degree of canopy closure over most of this area, and small dimensions of the grassy areas, make it unlikely that other focal species would use the area.

Much of the area is subject to a high level of disturbance by camping vehicles, pedestrian traffic (both campers and day-users) and maintenance activities such as mowing. This leaves little potential for ground-nesting species to nest successfully.

Acorn Woodpeckers may also be impacted by activity on the disc-golf course, especially during fall mast (acorn crop) when these birds spend more time close to the ground while gathering acorns.

Recommendations for habitat enhancement and monitoring

The following recommendations are suggested to enhance habitat for the focal species in the east-central woodland zone:

- Retain older oaks in OS1, O4, and adjoining hardwood forest, including trees with dead limbs that could provide suitable cavities for woodpeckers and nuthatches, wherever possible.
- Add small patches of native understory shrubs or small trees around the edges of the area (or between "fairways" of the disc-golf course), to provide more possible nest sites for Chipping Sparrow.
- To reduce risk to foraging Acorn Woodpeckers from the disc-golf course, especially during fall mast (acorn crop) when these birds may spend more time close to the ground while gathering acorns, consider educational signage to promote awareness and remind disc-golfers to wait until the fairway is clear.
- Monitor disk damage to the bark of oaks along the fairways, and consider "armoring" trees in positions that are frequently impacted (see for example the disc-golf course in Adair County Park, Benton County, where some trees have been "armored" with boards to protect the bark).

Monitoring of avian species response to habitat improvements in this zone should be conducted by systematic point counts during breeding season (May-June), repeated at least once per five years, replicating the stations from the 2007 surveys.

East Zone: Campgrounds and Field

This zone includes the remaining open habitats that are east of the main oak woodland zone, covering about 70 acres total, of which 50 acres is in agricultural production (A8) while most of the remainder is occupied by a year-round RV campground loop and adjacent lawn areas (G3, G4) north of a less intensively managed grassy area (U6).



Figure 5. Representative habitat units in East Zone including (left) Unit A8 and (right) Unit U6 with mowed areas mapped as Unit G4 also visible in the foreground and at left.

Observations from field visit in October 2022

U6 (Prairie - Upland) was unmowed with dense grass left standing, with some *Prunella* noted. The area has been extensively invaded by woody shrub growth, including English hawthorns and young ash trees especially on the west side which borders ash forest.

G3 and G4 (Managed Grassland) are mowed lawn areas adjacent to the RV camping area. G3 has several bat boxes. G4 is signed as a dog exercise area.

A8 (Agriculture) is a large field that appears to be in grass-seed (fescue) production. A power line crossing N-S provides potential perches for kestrels hunting the grass field. The field is bordered by a dense blackberry hedge along most of the side toward the campground and U6. The other sides are bordered by forest.

Habitat potential and threats

This zone has more limited potential for most focal species than the other zones of Champoeg SHA, due to high impacts of campground-adjacent activities in some units (G3 and G4), and limited landscape scale in relation to habitat potential for the remaining units.

The agricultural field (A8) is the largest unit in this zone, but even if converted to native prairie habitat, at 50 acres and bordered by forest on three sides, it is still small in relation to landscape scales typically used by Streaked Horned Lark, Western Meadowlark, Grasshopper Sparrow or Short-eared Owl.

In its current status, unit A8 does not provide habitat for most other focal species, except as potential aerial foraging habitat for Purple Martin or Common Nighthawk, and perhaps as secondary foraging habitat for species nesting in other areas of Champoeeg SHA, or as fall/winter habitat after harvest operations.

Conversion of the agricultural field (A8) to native prairie restoration could be significant for other species (such as pollinators) but is unlikely to directly produce significant benefit for the focal species, except as secondary foraging areas. Therefore this is suggested as lower-priority in comparison for potential restoration of agricultural units in the east-central grassland zone.

Potential for unit U6 is limited both by scale and succession by woody vegetation. In its current state, the habitat structure is not conducive to most of the focal species discussed here. Proximity of this unit to a year-round campground limits the possibilities for controlled burns as a way to manage woody vegetation.

Use of adjacent areas for recreation including dog exercise could increase risk of disturbance.

Recommendations for habitat enhancement and monitoring

The following recommendations are suggested to enhance habitat for the focal species in the east zone:

- Manage encroaching woody species in U6 to maintain potential for this area to be used by Western Bluebird and Chipping Sparrow which may nest in nearby areas.
- Minimize use of pesticides (especially insecticides) in managed grassland areas where focal species may forage.

Monitoring of avian species response to habitat improvements in this zone is lower priority, due to the limited potential unless restoration of the agricultural field (A8) to native habitat is planned. In such case, a point count station could usefully be located in that unit, and surveyed in conjunction with survey stations established in other zones to the west.

Parrett Mountain Access

This small (<20 acre) unit is managed separately as part of the Willamette Greenway, but is less than 200 m away from the east-central grassland zone, across the Willamette River. It includes two units of mostly open habitat, including a unit mapped as prairie-upland (U7) and a managed grassland unit (G5) adjacent to paved parking area, plus forested habitat around the edges and extending westward along a narrow strip on the north bank of the Willamette River.



Figure 6. Representative habitat units at Parrett Mountain Access greenway including (left) Unit G5 and (right) Unit U7.

Observations from field visit in October 2022

G5 (Managed Grassland) is a mowed lawn area around the parking lot and vault toilets, leading down to river where there are bare areas due to trampling. Black walnut trees were noted as one of the main hardwood trees, which appear to be spreading along river frontage. English ivy is present among other invasive species, but could still be controlled with prompt action. Eastern fox squirrels were also observed using the black walnut trees. Tall conifers (mostly not species native to the area) are around the parking area.

U7 (Prairie - Upland) is a grassy unit which was unmowed at the time of the field visit, except for a path around the perimeter of the unit. The grasses observed were mostly dense and non-native with *Daucus carota* (Queen Anne's lace) as the most prominent forb, though some *Prunella* suggests possibility for native forb component. A few oak saplings (now 5 to 6 ft high) appear to have been planted along a lower bench, but no older oaks were noted. This area is surrounded by mixed forest, with willow and red-osier dogwood thickets on the north side, an ash/big-leaf maple swale at west end, and tall cottonwoods and many black walnut trees along the river's edge to the south. The walnuts appear to be spreading with a range of ages.

Acorn Woodpeckers were present during the site visit. One was observed storing a small nut (hazelnut or acorn) in a cottonwood snag along the river's edge. A hazelnut orchard on private

land just west of this site could be a seasonal source of food for this species. Slender-billed Nuthatches were also heard in the cottonwoods.

Habitat potential and threats

The small size of these units and surrounding trees limit potential for grassland species that require larger tracts of open habitat. Most focal species are thus unlikely to use this area.

A few Acorn Woodpeckers and Slender-billed Nuthatches were found at this site despite an apparent lack of mature oaks. The presence of these species is likely sustained by populations in nearby oak woodlands, either across the river in Champoege SHA or on private land higher on Parrett Mountain.

The willows/dogwood thickets along the north edge of U7 could host Willow Flycatcher and/or Yellow-breasted Chat.

Chipping Sparrow and Western Bluebird may occur as visitors from more suitable habitat on private woodland pastures to the north or from Champoege SHA to the south. These species could potentially nest in small numbers (1 or 2 pairs) if open areas in G5 and U7 are maintained and (in the case of bluebirds) nest boxes are provided.

Private land on Parrett Mountain to the north appears to have potential for other oak savanna species including Oregon Vesper Sparrow, but these would be unlikely to use such an enclosed area except as visitors.

English ivy invading the forest edge along the river, if it continues to spread, could further reduce the already limited foraging areas for species that require a sparsely vegetated understory.

Armenian blackberries along the north edge of U7 could degrade the potential habitat for Willow Flycatcher, if allowed to spread into the native shrubs.

Eastern fox squirrels are known to be nest predators, eating both bird eggs and nestlings (Csuti et al., 1997), and thus could be a threat to non-cavity-nesting species such as Chipping Sparrow or Willow Flycatcher.

Off-leash dogs would be a likely source of disturbance for any ground-nesting species, due to the relatively isolated location of this site which makes it unlikely that the leash rules posted can be consistently enforced.

Recommendations for habitat enhancement and monitoring

Due to the limited potential of the Parrett Mountain Greenway site for oak/grassland bird species, habitat enhancements here are less likely to be effective than at areas of Champoege SHA with greater potential, across the river. Control of invasive species including English ivy and Armenian blackberry would be beneficial to maintain the existing riparian and forest edge habitats. A point count station centered in this unit would be useful to track riparian species.

Conclusions and overall recommendations

Of the four zones considered in Champoeg SHA, together with the Parrett Mountain Greenway, the greatest potential for grassland bird species is in the west-central zone of Champoeg SHA, where landscape scale of the existing open habitats is favorable for multiple Strategy species. In this zone, the recommended priority actions are (1) to enhance the native prairie restorations, particularly the native forb component, (2) to expand restoration efforts into adjacent agricultural areas where possible, and (3) to enhance connectivity of open landscapes by creating openings in thin strips of trees and brush that currently divide the largest units.

Significant opportunities also exist in the west zone near the Riverside and Townsite day use areas. Elsewhere the main recommended actions are to retain existing large oaks and improve understory conditions wherever this is compatible with established recreational uses.

Monitoring of bird species response to habitat restoration should be carried out by systematic point count surveys, at least once per five years. For maximum utility in assessing local population trends for the focal species, these surveys should replicate stations from the 2007 American Bird Conservancy surveys so far as possible, with 3 to 4 new stations added to increase coverage of the priority habitats in Champoeg SHA, and an additional station in the Parrett Mountain Access to track potential use by riparian species including Willow Flycatcher and Yellow-breasted Chat.

References

- Altman, B. 1999. Status and conservation of grassland birds in the Willamette Valley. Unpublished report submitted to Oregon Dept. Fish and Wildlife, Corvallis.
- Altman, B. 2000. Conservation strategy for landbirds in the lowlands and valleys of western Oregon and Washington. Version 1.0. Oregon-Washington Partners in Flight.
- Altman, B., 2011. Historical and Current Distribution and Populations of Bird Species in Prairie-Oak Habitats in the Pacific Northwest. Northwest Science, 85(2):194-222.
<http://www.bioone.org/doi/full/10.3955/046.085.0210>
- Altman, B. and J. L. Stephens. 2012. Land Managers Guide to Bird Habitat and Populations in Oak Ecosystems of the Pacific Northwest. American Bird Conservancy and Klamath Bird Observatory. 82 pp.
- Altman, B., 2015. Oregon Vesper Sparrow Range-wide Inventory and Habitat Assessment. Final Report, State Wildlife Grant G1024-06, Center for Natural Lands Management, Sub-award Grant Number WA-S-2013-001-0, American Bird Conservancy.
- American Bird Conservancy, 2016. Petition to List Oregon Vesper Sparrow (*Pooecetes gramineus affinis*) as Endangered or Threatened Under the U.S. Endangered Species Act.
- Csuti, B., A.J. Kimerling, T.A. O'Neil, M.M. Shaughnessy, E.P. Gaines, and M.M.P. Huso, 1997. Atlas of Oregon Wildlife: Distribution, Habitat, and Natural History. Oregon State University Press.
- Myers, A.M. and Kreager, D.A. 2010. Declining and State Sensitive Bird Species Breeding in Willamette Valley Grasslands: 2008/09 Status Update. Oregon Department of Fish and Wildlife.
- ODFW (The Willamette Valley Landowner's Guide to Creating Habitat for Grassland Birds: The Oregon Conservation Strategy. Oregon Department of Fish and Wildlife
- Oregon Conservation Strategy. 2016. Oregon Department of Fish and Wildlife, Salem, Oregon.
- Pacific Flyway Management Plan for the Dusky Canada Goose. Prepared for the Pacific Flyway Council, U.S. Fish and Wildlife Service by the Dusky Canada Goose Subcommittee of the Pacific Flyway Study Committee, as revised July 2015.
https://pacificflyway.gov/Documents/Dcg_plan.pdf
- Vesely, D. 2014. Conserving Purple Martins in OSU's McDonald-Dunn Research Forest: Final Project Report. See also <https://cf.forestry.oregonstate.edu/research/purple-martin-study>

Assessment of Potential Turtle Habitat: Champoeg SHA and Parrett Mountain Greenway

Summary

My overall assessment of the area is as follows: The habitat within the survey areas appears insufficient to support a population of either native turtle species, primarily due to a lack of suitable wetland habitat (*see below*). Based on prior (1996-present) observations, the habitat at Champoeg SHA probably has value as a movement corridor connecting a number of separate local turtle populations with dispersal habitat, and, at higher population densities, with each other. The value of this habitat is highly dependent on its physical and vegetative condition – in other words, it is good *right now*, but if land use/park use changes, its value to turtles will too. It is highly susceptible to changes in park management. The habitat within Champoeg also supports a community of native amphibians (five pond-breeding and one terrestrial species). The persistence of this community is very closely tied to patterns of park management. Logistically, it would not be difficult to create good wetland habitat for native turtles within the boundaries of the survey areas, but an attempt to do it on public property would probably be very expensive and difficult due to the complex regulatory situation attending such efforts. My experience with creating wetland habitats for turtles (both species) and other native wildlife suggests that an attempt at habitat creation would probably be more successful if it were attempted on adjacent private land.

1. Description of Work

Per contract (#2022-10-05) with Salix Associates, 1) assess Champoeg SHA (hereafter, Champoeg or Champoeg Park) and Parrett Mountain Greenway for potential use by western painted (*Chrysemys picta bellii*) and western pond (*Actinemys marmorata*) turtles; and 2) Make management recommendations specific to previously assigned habitat polygons.

2. Existing Information

When commissioning this report, Bruce Newhouse provided me with readily available information on the presence of native turtles within or nearby the survey area. His sources included data from a 2000 BioBlitz conducted at Champoeg, iNaturalist, the Oregon Department of Fish and Wildlife (ODFW), and ORBIC. No records were found on iNaturalist, ODFW did not provide information, and ORBIC records contained two unspecified observations (one for each species) in drainages south of Champoeg. As these were less specific than records I already had, I used my information in preference (*below*).

Turtle habitat needs

For the purposes of understanding the recommendations in this report, a brief discussion of each turtle species' *general* habitat needs is in order¹. Both species are geologically recent invaders of the Pacific Northwest region, but from different directions, and their respective distributions reflect that.

Aquatic habitat

Western painted turtles require lentic (still-water wetlands) with a permanent hydroperiod and which do not experience prolonged winter hypoxia (*i.e.*, they are deep enough to avoid freezing solid

and/or have oxygenated inputs during winter). Western painted turtles prefer still water bodies with abundant aquatic vegetation and full or nearly full sun exposure. They do not use shaded wetlands. They will occasionally use riverine habitats, if such habitats are slow and deep. They are typically associated with silt or mud/muck substrates and do not use swiftly flowing, shallow, or rocky-bottomed streams.

Western pond turtles are more flexible in their habitat requirements, and can use the aquatic habitat described for painted turtles, as well as rocky-bottomed streams which have sufficiently deep (≥ 1 m during low flows) and slow-moving sections. However, the streams must be warm – at least seasonally. Historic flow regimes in Pacific slope drainages of the Cascade and Sierra Mountains, as well as those streams draining the eastern side of the Oregon Coast Range, included many streams with water temperatures – at least in margins – of ≥ 70 F seasonally, and these streams are suitable for supporting pond turtle populations. North of central California, heavily forested or higher gradient portions of streams are generally unsuitable for pond turtles. Streams which have been modified by impoundments are also typically unsuitable below the impoundment due in large part to cold water releases from dams. Several Willamette tributaries historically supported mainstem pond turtle populations which largely disappeared following construction of flood control dams (the Willamette Project dams; C. Rombough, *unpubl. data*). Pond turtles are also able to use seasonal wetlands in certain circumstances. In these cases, the turtles typically burrow into dense vegetation and aestivate during dry periods. Seasonal wetlands that typically refill in fall (as opposed to late winter) are typically more likely to support pond turtle populations. However, it should be noted that while pond turtles can use long-hydroperiod seasonal wetlands, this is not necessarily a preferred or optimal habitat, and populations are often lower in such habitats than in permanent wetlands (C. Rombough, *unpubl. data*). Furthermore, aestivating turtles are particularly vulnerable to mammal predators such as coyotes, raccoons, domestic dogs, and California ground squirrels.

Nesting habitat

One of the most important, and most poorly understood, aspects of turtle life history are the requirements of their reproductive habitat. Both turtles are tied to disturbed habitats, as they need essentially bare soil with full sun for successful incubation of eggs. Most moderately to heavily vegetated habitats, even those found in managed 'grasslands' or savanna, do not permit successful development of eggs and/or emergence of hatchlings at the scale required for maintenance of a viable population. There are between-species differences. Western painted turtles are more flexible in their nesting requirements, and can nest in a variety of soil types, from loam to sand/aggregate, and even nearly pure gravel. Western pond turtles are generally much more specific, and typically prefer clay soils or silt soils with a high clay fraction. Both species need good drainage of nest sites during the incubation period – inundation or frequent saturation will usually result in embryo mortality (C. Rombough, *unpubl. data*).

Summary

In the vicinity of Champoeg SHA and Parrett Mountain Greenway, both turtle species are confined to permanent lentic wetlands or the slowest, deepest sections of permanent valley floor streams. All occupied sites are in full sun; the turtles do not use shaded riparian habitats. They generally require open, sunny sites with bare soil or extremely sparse vegetation for successful incubation of eggs.

3. Site Assessment

Site visits

I made visits to the areas described on October 17, 25, 30, 31, and November 06, 08, and 09, 2022, for the purpose of assessing habitat. During these visits, I made observations of current habitat condition and hydrology of water bodies present. The latter half of October and early November 2022 were especially informative hydrologically, as dry summer conditions came to an end following a period of heavy rains.

Additional visits

Between 1994 and the present (November 2022), I visited Champoeg intermittently (<20 to >200 days/year)². During many of these visits, I made observations (usually opportunistic, but during some periods systematic) of the flora, fauna, and general habitat condition of Champoeg, with special attention to amphibians, reptiles, and hydroperiod of park wetlands, among other things. I collected both qualitative and quantitative data on these parameters. Parrett Mountain was visited much less frequently (on average, less than 1 day/year during the same interval), but similar observations were made.

Other surveys

From 1995 to the present (November 2022), I conducted turtle surveys and monitored selected turtle populations in the vicinity of Champoeg³; some of my observations from these are included in this assessment.



Willamette River at Champoeg SHA, showing south bank just upstream of the old steamboat landing. View from Parrett Mountain Greenway.

4. Findings

4.a. Champoeg SHA

Description of Habitat

Champoeg SHA (= Champoeg Park) is located on the south bank of the Willamette River in western Marion County, Oregon. It contains a mosaic of habitats. In general, the highest elevations occur along the south side of the park; from there, the land slopes down toward the Willamette River on the park's north side. Three small permanent streams cross the park on their way to the Willamette River: Mission Creek, Champoeg Creek, and Ryan Creek.

The vicinity of the old Champoeg town site consists primarily of open fields which are currently maintained by haying and mowing. Previously, some of this area was maintained by grazing, mostly by sheep⁴. The legacy of this grazing is the presence of fairly open, oak-dominated habitat in the southwest portion of the park, in the vicinity of the visitor center. This habitat is in the process of undergoing vegetative succession; without maintenance, it will probably become dominated by shrubs (*e.g.*, *Toxicodendron diversilobum* and *Rubus armeniacus*) within a period of years. Around the townsite area, stands of ash (*Fraxinus latifolia*) dominated woods have developed in lower, seasonally saturated areas, such as along the overflow channels of Mission Creek (*see below*). Riparian forest habitat, containing black cottonwood (*Populus trichocarpa*) in the lower areas and Douglas-fir (*Pseudotsuga menziesii*) and bigleaf maple (*Acer macrophyllum*) in the higher portions, stretches along the north edge of the park, bordering the Willamette River. The understory of this community consists of a mix of both native (*e.g.*, *Polystichum*, *Symphoricarpos*, *Urtica*) and introduced (*e.g.*, *Hedera*, *Vinca*) plant species. A mix of other tree and shrub species may be found in these communities and in other places, especially along the west end of the park.

Examination of historic photos suggests that, with the exception of the strip of riparian forest, most of Champoeg was more open historically; much vegetative succession appears to have taken place within the last 50-70 years.



Figure 1. Location of Parrett Mountain Greenway (north bank) and Champoeg SHA (south bank)



TOP: Vegetative succession along main channel of Mission Creek, northeast of the Champoeg visitor center. View looking southeast.

BOTTOM: Mowed area along Mission Creek, north of the Champoeg visitor center. View looking southeast.

Champoeg Wetlands

Wetland habitats at Champoeg consist of three permanent streams and several seasonal wetlands.

Mission Creek, the westernmost of the three streams, enters at the park's southwest corner. From there, the main channel of the creek flows east along the south edge of the park, entering

Champoeg Creek just south of the park boundary. Mission Creek has been partly diverted into channels which flow south, then east, through ash woodland and open field habitat. These channels are essentially seasonal; they capture stream overflow during high flows⁵. In the lowest areas, they also overflow and/or saturate the ground extensively during wet winter weather (leading to the development of the ash-dominated woodland). Small portions of these channels retain pools of water into late spring or early summer, depending on the amount and timing of precipitation in a given year. In a very wet year, a few isolated pools will persist into or through mid-summer. Most of these are small, fairly shallow (<2 feet maximum depth), and partly or entirely shaded by overhanging vegetation. The main channel of Mission Creek generally retains water all summer, although it becomes quite shallow in places and the flow slows considerably. It is partly to mostly shaded by bordering shrubs and trees for most of its length through the park.

Champoeg Creek crosses center of the park, just downstream of its confluence with Mission Creek. The last 3,900 feet or so of the stream flow north through the park to the Willamette River. Over this length, it is a permanent stream, flowing through progressively more forested habitat (which shades the stream) and entering the Willamette River downstream of the boat dock. Most of Champoeg Creek is quite shallow during the summer months when flow declines. Ryan Creek flows through forested habitat (and is in shade) for essentially its entire length through the park. Over this reach, it is also a shallow, silt-bottomed stream.

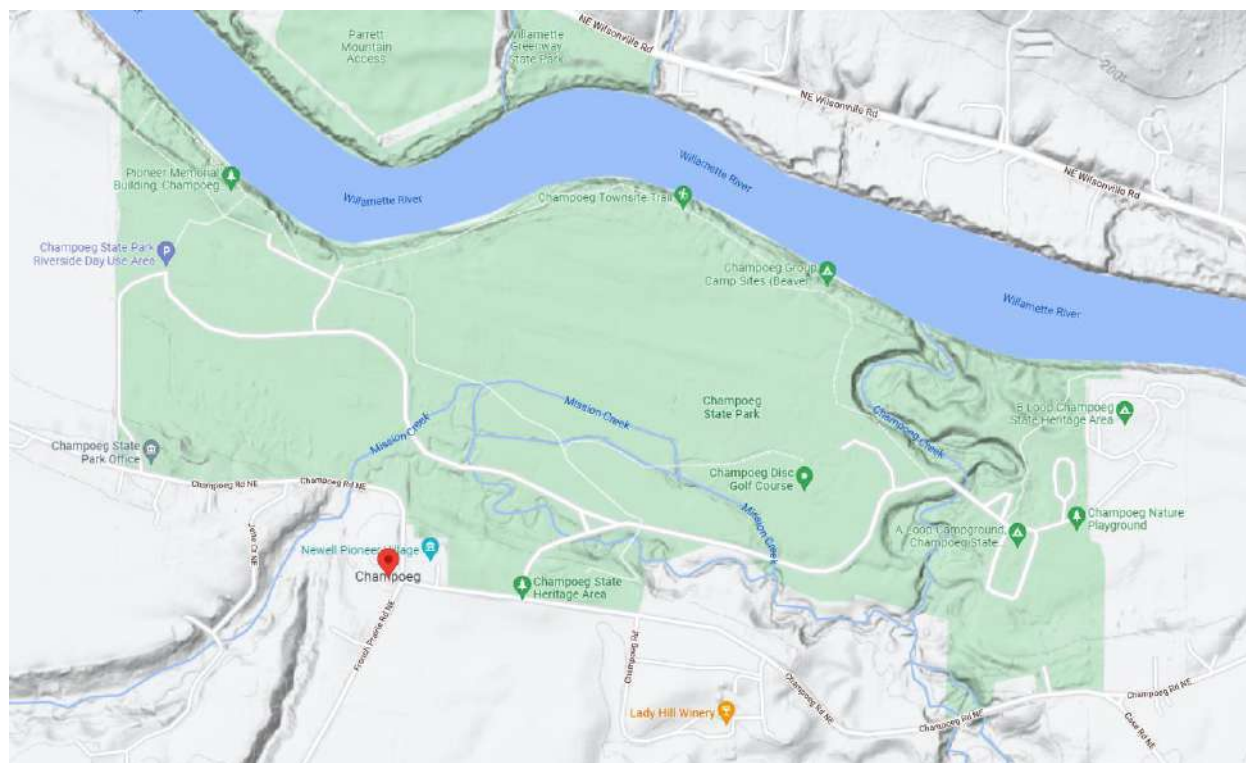


Figure 2. Location of Mission and Champoeg Creeks in Champoeg SHA

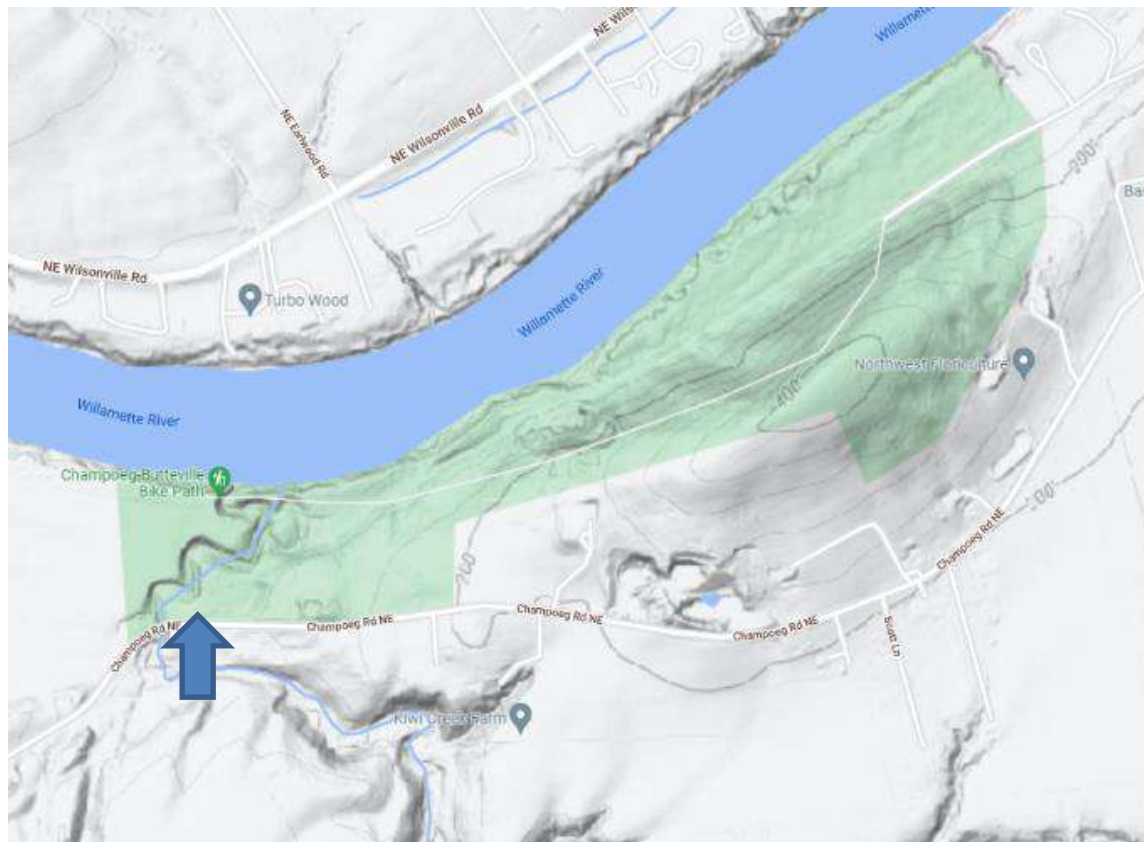


Figure 3.
Location of
Ryan Creek
(arrow) in
Champoeg
SHA.



LEFT: Main channel of Mission Creek, northeast of the Champoeg visitor center. Flow has begun to increase with fall rains.

ABOVE: Riparian habitat along Mission Creek, north of the Champoeg visitor center. View looking southeast.



TOP LEFT: Ash woodland habitat along overflow channel of Mission Creek. Note relatively open understory.

TOP RIGHT: Ash woodland habitat along overflow channel of Mission Creek. Understory dominated by trailing blackberry (*Rubus ursinus*).

BELOW: Lower channel of Champoeg Creek, just downstream of confluence with Mission Creek. Flow has increased following recent rain. October 2022.





ABOVE: Open field habitat (cultivated fescue), Champoeg SHA. View looking west. Townsite Pond on right.



LEFT: Riparian corridor, Champoeg SHA. View looking north across historic town site.

BELOW (left and right): Townsite Pond, Champoeg SHA. View of east end. October 2022.



The primary seasonal wetlands at Champoeg Park are two ponds: one (hereafter, the “Townsite Pond”) is a large, shallow wetland in the town site field west of the Oak Grove Day Use Area. Maximum depth in late winter is just over three feet (just over four through the narrow center channel); the pond usually goes dry by mid-summer (typically during July), sometimes retaining a small amount of water for slightly longer in a wet year. In recent years, it has begun to re-fill in late fall or early winter, but this typically consists of a small amount of water (≤ 12 to about 20 inches depth) in the lowest parts of the pond bottom; it usually does not fill completely (*i.e.*, reach its “bank-full height”) until heavy rains of late winter. The deepest part of the pond is a narrow channel running down the center, and this is where the last water is held and the first water accumulates. The pond is densely vegetated with both native (*Cicuta douglasii*, *Polygonum hydropiperoides*) and introduced (*Phalaris arundinacea*) plant species. It serves as breeding habitat for multiple species of native amphibians; I have never observed turtles there.

The second wetland of note is a shallow “duck donut” type farm pond located at the far east end of Champoeg, next to the town of Butteville. The majority of this pond is actually located on private property, but it is important wetland habitat and supports a community of pond-breeding amphibian species which inhabit the park. The borders of this pond are also heavily vegetated with native (*Carex obnupta*) and introduced (*Phalaris arundinacea*) plants. The hydroperiod is strongly seasonal: in wet years it may retain a small amount of water into late summer; in dry years it goes dry completely. The portion of the pond on park property goes dry every year. The amphibian use of this pond is complex and interesting and deserves further treatment, but it is outside the scope of this report. The pond is partially shaded and does not really support any use by turtles.

Turtle Occurrence and Use of Champoeg SHA

Over the years 1996-2018, I observed turtles within or at the boundary of Champoeg SHA fewer than 10 times⁶. Nearly all of these sightings were of adult *Chrysemys*, with the exception of two possibly immature *Chrysemys*⁷ and a single adult *Actinemys*. These observations included two adult *Chrysemys* moving overland⁸, one dead on the road near the park, and two in lower Champoeg Creek. The remainder of the observations were made in the Willamette River along the north side of the park, most between the boat dock and Butteville. Most of these observations were not repeated more than a few days after the initial observation; they may have represented animals ‘moving through’ (see the Parrett Mountain account, below)⁹.

Outside of these few observations (made over a nearly three-decade period), I have not seen turtles at Champoeg. While this may be at least partly an artifact of where in the park I have spent the most time, it also suggests that there is little if any turtle use of the majority of the area¹⁰. In addition to this, the condition of the habitat present (lacking suitable water bodies) and the extremely high level of human use indicates that the habitat at Champoeg does not have the ability to support any populations of native turtles, at least not currently.

That said, there are several local populations of turtles¹¹ in the immediate vicinity of Champoeg SHA, several along the Willamette mainstem a short distance upstream, and a number of populations in the upstream portions of Champoeg’s drainages (Case, Champoeg, and Mission Creeks)¹². The presence of these populations, coupled with the observation of turtles in the mainstem Willamette (both along Champoeg/Parrett Mountain and downstream) suggests the possibility that Champoeg – especially the streams which pass through it – serves as a movement/dispersal corridor connecting populations (or it

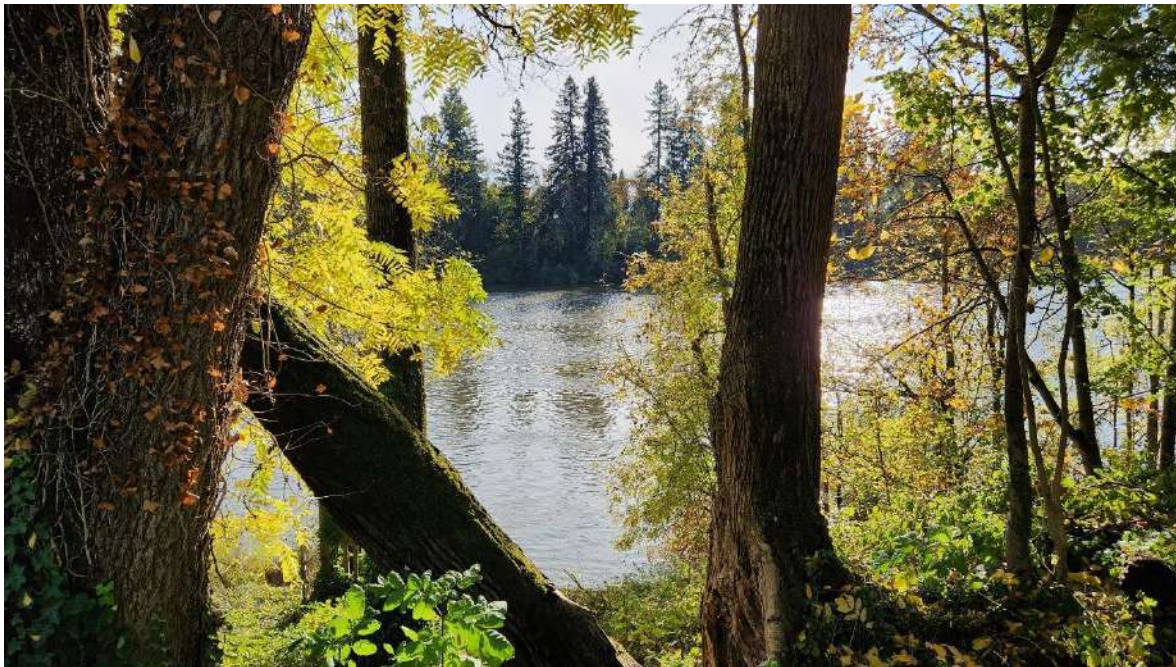
did historically, at higher population densities). That in itself gives importance to the habitat, though management of the habitat to maintain this (potential) value is certainly different than management of habitat containing a resident turtle population. Most of the turtle populations described here appear to be undergoing a steady decline, and have been since at least the late 1990's¹³. Therefore, it is increasingly less likely that turtles will be encountered at Champoeg.

4.b. Parrett Mountain Greenway

Description of Habitat

Parrett Mountain Greenway is located on the north bank of the Willamette River in eastern Yamhill County, Oregon. It is more or less on the opposite side of the river from Champoeg SHA. It consists primarily of a large open field, sloping down toward the Willamette River on the south, and a narrow strip of riparian forest on the bank of the Willamette.

The large open field is dominated by introduced pasture grasses (*Dactylis*, *Holcus*, etc.) interspersed with large clumps of blackberries (*Rubus armeniacus*); field boundaries are dominated by a mix of native and introduced trees and shrubs. The riparian forest consists primarily of black cottonwood and Oregon ash, with a sprinkling of black walnut (*Juglans nigra*) trees in some places. The understory of this forest contains both native (e.g., *Rubus ursinus*, *Symphoricarpos*, *Urtica*) and introduced (e.g., *Hedera*, *Phalaris*) plant species. The bank of the Willamette River here is fairly steep and composed largely of silt. The west side of the greenway parcel is bordered by Parrett Mountain Access, which is essentially a large filbert plantation with little wildlife value of any kind.



ABOVE: Riparian habitat, Parrett Mountain Greenway. View to southwest (Champoeg SHA is across river).



LEFT: Open field, Parrett Mountain Greenway.

Parrett Mountain Greenway Wetlands

Two small streams occur within the survey area. One borders the east edge of the greenway parcel and is essentially all on private property. It is heavily overgrown with *Rubus armeniacus*, its course is completely shaded, and it passes under Wilsonville Road in a culvert. It has little if any value to turtles. The second stream flows along the west side of the large open field. Its course takes it through native mixed and then riparian forest, but it is tiny, shallow, and completely shaded. It passes through a culvert under Wilsonville Road and again just before entering the Willamette River. It has little if any value to native turtles due to its small size and completely shaded nature.



Figure 4. Location of streams at Parrett Mountain Greenway



LEFT: Stream at west side of Parrett Mountain Greenway. View looking upstream (=facing north), in woods.

RIGHT: Same stream, but view looking downstream (=south) toward Willamette River from trail crossing.

Turtle Occurrence and Use of Parrett Mountain Greenway

During the years 1999-2017, the author observed turtles at Parrett Mountain Greenway. Fewer than 12 observations of turtles¹⁴ were made during that time; all were adults, emergent basking on logs in the Willamette River. All but one were *Chrysemys*; a single adult male *Actinemys* was observed. Most of these animals were observed during spring and early summer; very few repeat observations were made, even shortly after the initial observation (*i.e.*, within a week to 10 days). This may indicate that use was of a transitory nature (*i.e.*, the turtles were just moving through). The most likely explanation for this pattern is that the turtles came from one of several source populations a short distance upstream, which have connectivity to the Willamette River.

The majority of turtle use was observed in the late 90s and early 2000s (*e.g.*, 1999-2004); sightings dropped off sharply in subsequent years. One potentially contributing factor may have been the tremendous increase in ski boat traffic during that time - in itself disruptive, but which also resulted in the continuous pounding of the shoreline with large, high-energy waves during much of the summer (May-September). No observations have been made in recent years (2018 to present), which may reflect a decrease in effort, but which may also result from an incredible increase in human use of Parrett Mountain Greenway during the summer months.

5. Conclusions and Recommendations

5.a. Champoege SHA

In its present state, the habitat at Champoege does not appear sufficient to support viable resident populations of either native turtle species. Its primary value to local turtle populations appears to be as a movement corridor connecting populations (in the small local drainages) to the south with the larger movement corridor of the Willamette River. This role does not currently appear to be a large one due to the recent decrease in these local populations. It was probably much greater historically, and

should local populations rebound in the future, it will be a feature critical to maintaining the larger metapopulation of turtles.

At Champoeg, creating habitat to support a population of one or both native turtle species would not be very difficult from a logistic standpoint. Furthermore, the proximity of native turtles suggests that such habitat, if properly created, would probably be colonized without assistance. Unfortunately, my experience with wetland habitat creation and restoration suggests that any such attempt at Champoeg would be a bureaucratic and permitting nightmare, or at the least prohibitively expensive. In addition, the extremely high level of human use, with its attendant traffic and large numbers of off-leash dogs¹⁵, make maintenance of a viable turtle population challenging, to say the least. If recovery of local turtle populations is desired, I strongly recommend that it be attempted on private land in the area, or land acquired specifically for the purpose.

One last consideration is that the aquatic and upland habitats present at Champoeg are currently used by a number of other native amphibian and reptile species. While these species are not turtles, they are an important part of the larger biotic community and deserve consideration when conducting management, as well. In particular, the amphibian situation at Champoeg is complex, interesting, and a unique reflection of the park's heritage. I recommend it be evaluated sometime. Especially before any dramatic changes to habitat or park management are made.

5.b. Parrett Mountain Greenway

With the exception of logs along the shoreline of the Willamette River, there is no habitat capable of supporting turtles at Parrett Mountain Greenway.





LAST PAGE and LEFT: Turtle habitat, Willamette River at Parrett Mountain Greenway.

6. Habitat Management Recommendations by Polygon

For convenience, I refer to the habitat polygons with the numbering system used in the grassland bird evaluation. Please see the habitat map associated with the grassland bird evaluation for polygon numbers and locations.

6.a. Champoege SHA

The management recommendations made here reflect the assessment of primary habitat value outlined in the text; in other words, recommended management is based on the conclusion that the primary value of Champoege SHA habitat to native turtles is as a movement corridor linking local populations. Should management goals change (*e.g.*, wetland creation be attempted at Champoege SHA), the polygon-specific recommendations would change. The main goals in maintaining a movement corridor are: 1) to retain conditions that allow and encourage movement through the area, while 2) reducing “wandering” out of the stream channel during such movements. The second goal is intended to minimize the mortality that turtles traveling overland face – from roads, humans, dogs, and native terrestrial predators like raccoons and coyotes (Champoege SHA has considerable populations of both the latter species).

It is important to understand the factors which encourage turtles to leave the stream channel. Biological requirements (*e.g.*, nesting) aside, the tendency of either native species to leave a stream habitat has an inverse relationship with bank gradient: turtles are more likely to leave when banks are gently sloping (low gradient), and less likely when they are steep and incised (high gradient). In addition, turtles of both species have a general tendency to move toward more open landscapes¹⁶. Therefore, maintaining a densely vegetated bank appears to help keep turtles confined to the stream channel, in many cases. In this case, a combination of shrubs and herbaceous vegetation, 1-2 meters in height, appear to be the optimal condition. The presence of overhanging trees which shade the stream channel (at least in small streams) often appear to reduce turtle use of a reach.

In summary, the following recommendations are intended to maintain the value of Champoege streams as a movement corridor for native turtles¹⁷.

Mission Creek

Mission Creek main channel – Polygons A3, U2, A9, U3, O3, and adjacent non-numbered “hardwood forest” habitat units: Maintain current condition. The main channel of Mission Creek (along the south border of the park) currently flows through open or semi-open areas interspersed with small patches of trees and brush. This current mosaic of habitats appears to function well as a movement corridor: it is open enough to allow and encourage turtles to move through, but also has enough adjacent (shoreline) brush to discourage leaving the stream channel. Note that certain types of thick shoreline brush makes it difficult for terrestrial predators to attack turtles and consequently increases their survival. This includes *Rubus armeniacus*; dense riparian thickets (mounds) of this species are actually beneficial to both turtle species and appear to enhance survival in certain situations¹¹. The entry of Mission Creek onto Champoeg SHA deserves special attention. Care should be taken to maintain an open aquatic corridor onto Champoeg SHA (under the Champoeg Road bridge), to reduce the tendency for turtles to attempt crossing the road.

Mission Creek “side” channels – all other Mission Creek polygons: Encourage thick growth of vegetated buffers and/or woodland for as wide as possible bordering the ditches. This is most important near the point where the channels diverge from the ‘mainstem’ of Mission Creek. Doing this will maintain shaded conditions which reduce the channels’ attractiveness to moving turtles, and avoid luring them into a ‘dead-end’ situation where they are less likely to make it out of the park (*i.e.*, a turtle traveling down these channels will eventually have to move overland and risk encountering vehicles, people, predators, dogs, etc.). In addition, dense vegetation along these channels will benefit the native amphibian community of Champoeg SHA.

Champoeg Creek

Champoeg Creek main channel – Polygons O3, U5, adjacent forested habitat (‘hardwood’ and ‘mixed’ forest): Maintain current condition. Area along Champoeg Creek main channel (bottomlands south of park road/Oak Grove Day Use Area) is mostly open habitat with densely vegetated, moderately incised streambanks. Current condition supports turtle use as movement corridor (see comments about Mission Creek, above). Champoeg Creek main channel north of park road flows through a wide gully that is sufficiently forested and vegetated to discourage off-channel ‘wandering’. This is a satisfactory condition in its current state, and I recommend no changes.

Ryan Creek

Ryan Creek main channel – bordered by forested habitat (‘hardwood’ and ‘mixed’ forest through Champoeg SHA): No change recommended. See comments for lower Champoeg Creek.

Additional Recommendations

Given the extremely high level of human use at Champoeg SHA, the large number of dogs that are brought to Champoeg, and the high percentage of those dogs that are off-leash, I strongly recommend that no additional trails be developed. More specifically, I recommend keeping the riparian and wetland areas described here as inaccessible as possible. Because Champoeg SHA currently suffers a very high level of off-trail use, especially by dog walkers, care should be given when doing restoration, *especially* restoration that involves vegetation removal (*e.g.*, removal of ivy or mowing), to NOT open up any off-trail areas or make them more accessible.

6.b. Parrett Mountain Greenway

The management recommendations made here reflect the assessment of primary habitat value outlined in the text; in other words, recommended management is based on the conclusion that the habitat at Parrett Mountain Greenway is currently of limited value to turtles. Short of constructing a large, permanent wetland in the open field at the Greenway (polygon U7) or eliminating water traffic in the adjacent Willamette River, there is relatively little that can be done to improve turtle habitat conditions at Parrett Mountain Greenway.

Footnotes

1. A detailed life history of each species is beyond the scope of this report, and I refer the reader to any one of a number of publications, including:
 - a. Nussbaum, R.A., E.D. Brodie, and R.M. Storm. 1983. Amphibians and Reptiles of the Pacific Northwest. University of Idaho Press, Moscow, ID. 332 pp.
 - b. St. John, A. 2002. Reptiles of the Northwest. Lone Pine Publishing, Auburn, WA. 272 pp.
 - c. Stebbins, R.C. 2003. Western Reptiles and Amphibians, 3rd Edition. Peterson Field Guides. Houghton Mifflin, New York. 533 pp.
2. I grew up less than 10 miles from Champoeg. Between 1994 and the present, I made frequent visits to the park during all seasons of the year. The *approximate* number of visits per year during this time period are as follows:

Year	Days per year (range)	Notes
1996-2000	40-50	
2000-2006	<20-50+	
2007-2009	18-30	
2009-2011	30-50+	
2012-2014	20-35	
2015-2019*	130-200+	*exclusive of park closure
2021-2022*	80-100	*exclusive of park closure

3. From 1995 through 2006, I conducted extensive surveys of the area between Molalla (Clackamas County) and Dayton (Yamhill County) for turtles and noted distribution and abundance of both native species. Of the populations identified, I selected a subset for long-term monitoring and collection of data on change in habitat condition. This monitoring was most intensive up through 2006; after 2006, the frequency of monitoring was decreased across most sites. This monitoring included Champoeg and the immediate vicinity; a brief summary of some of my observations is included in this assessment.
4. The grazing mentioned may have been restricted to the private property; I didn't pay much attention to property boundaries at the time.
5. These channels receive water from other sources, as well, but Mission Creek appears to be the primary source for the ones I am referring to (at least in terms of volume).

6. This number is approximate; going through all my records (which are not in electronic format) to find them all is beyond the scope of this report.
7. They could have been small adults (estimated 120 to ≤ 150 mm carapace length); they were not caught for verification. However, they appeared to be immature animals.
8. These were unlikely to have been nesting females.
9. My observations of turtles in the lower Willamette River here and in habitats outside of the river suggest that the mainstem Willamette from Newberg through Wilsonville really is not preferred habitat for turtles, for a number of reasons (described in section 4b, above). The most important of these are: steep banks, little or no shallow-water habitats, no real aquatic vegetation, introduced predatory fishes, many predatory birds, and very high levels of boat traffic which constantly disrupt the shoreline and littoral areas with high-energy waves from late spring through early fall (the turtles' 'active season'). This boat traffic has existed for a long time and is steadily increasing.
10. In comparison, at other occupied sites in the region, I have seen hundreds of turtles over the same time period. For example, at Willamette Mission State Park, on the Willamette River south of Champoeg in rural Marion County, I could easily see ≥ 30 turtles per visit during the same time period, with an equivalent amount of effort.
11. C. Rombough, *unpublished data*
12. In the area described, many populations are largely (sometimes entirely) composed of *Chrysemys*, probably due to several factors, including: the type and condition of local habitat, the likely avenues of colonization, and the legacy of human use/habitat alteration in the area.
13. C. Rombough, *unpublished data*
14. This number is approximate; see footnote #6. Also, in this case, the 12 observations may not represent 12 separate individual turtles, as several were made sequentially and could have been the same few individuals coming out after they were scared off of logs by passing boats.
15. There are currently a lot of off-leash dogs at Champoeg SHA, especially in the townsite field and the trail along the river (on the field's north side). In the year preceding this report, I encountered off-leash dogs nearly every visit in the summer, less frequently during other times, for an average of about 1 off-leash dog observed every 2 visits. Off-leash dogs are particularly hard on turtles moving over land (*e.g.*, during nesting).
16. This statement is a general one, and is here applied to adult turtles undergoing dispersal movements "wandering", and not to animals moving within a regularly inhabited area (a "home range") to complete a seasonal component of their annual life cycle (*e.g.*, nesting). In the latter case, many individuals display a remarkable sense of direction and will, for example, navigate through thick brush to reach a previously used nesting area.

- 17.** These recommendations are based on the local observations of turtles described above, as well as >20 years of observation of turtles in similar riparian habitat in the lowland portions of the north and central Willamette Valley (>1,000 hours of direct observation of turtles *in situ* in similar habitats).

2023 Listing Status and Occurrence for Species of Conservation Concern of the Champoeg State Heritage Area and Parrett Mt. Greenway Access sites

The original source of this table is the online Oregon Biodiversity Information Center 2019 list. The original table was sorted for Marion County and the Willamette Valley ecoregion, and a few species were deleted (e.g., Grizzly Bears, which have been extinct in the Valley for many decades, and some birds which might fly over the site and would not use habitat for other than brief foraging or resting). The above sites do not include the Willamette River, so species recorded there (e.g., salmon and steelhead) are not included here.

Key:

O = Occurrence: **C = Confirmed* (species in bold font)**, L = Likely, U = Unlikely but possible, ? = Unknown

G and S Ranks: Global and State Ranks from NatureServe

Fed: ESA ranking, E = Endangered, T = Threatened

State: ESA (same as Fed) or ODFW Sensitive Species ranking (S = Sensitive, SC = Sensitive Critical)

OCS = Oregon Conservation Strategy

HP = Oregon Natural Heritage Program list, administered by Oregon Biodiversity Information Center

* Confirmed includes B. Altman, C. Rombough, B. Newhouse, eBird (if "verified") unless otherwise specified

VERTEBRATES

O	Scientific Name	Common Name	G_RANK	S_RANK	FED	STATE	OCS	HP	Notes
		AMPHIBIANS							
U	<i>Aneides ferreus</i>	Clouded salamander	G3G4	S3S4		S	Y	4	LaButte area, perhaps
C	<i>Rana aurora</i>	Northern red-legged frog	G4	S3S4		S	Y	4	
		BIRDS							
C	<i>Melanerpes formicivorus</i>	Acorn woodpecker	G5	S3		S	Y	4	Resident colony.
C	<i>Patagioenas fasciata</i>	Band-tailed pigeon	G4	S3B				4	
C	<i>Spizella passerina</i>	Chipping sparrow	G5	S4B		S	Y	4	Savanna, edges of openings
L?	<i>Chordeiles minor</i>	Common nighthawk	G5	S5B		SC	Y	4	
L?	<i>Branta canadensis occidentalis</i>	Dusky Canada goose	G5T3	S3N		S	Y	2	Winter, fields.
C	<i>Regulus satrapa</i>	Golden-crowned kinglet	G5	S3				4	
U	<i>Ammodramus savannarum</i>	Grasshopper Sparrow	G5	S2B		SC	Y	2	
C	<i>Melanerpes lewis</i>	Lewis's woodpecker	G4	S2B,S2?N				2	1 - 2 vagrants/year not unusual
C	<i>Empidonax traillii brewsteri</i>	Little willow flycatcher	G5T3T4	S3B		SC	Y	4	Thickets

O	Scientific Name	Common Name	G_RANK	S_RANK	FED	STATE	OCS	HP	Notes
U	Asio otus	Long-eared owl	G5	S3S4				3	
U	Oreortyx pictus	Mountain quail	G5	S3S4				4	
U	Strix occidentalis caurina	Northern spotted owl	G3G4T3	S1S2	LT	LT	Y	1	
U	Contopus cooperi	Olive-sided flycatcher	G4	S2S3B		S	Y	4	
U	Poocetes gramineus affinis	Oregon vesper sparrow	G5T3?	S2B,S2N	P	SC	Y	2	
C	Progne subis	Purple martin	G5	S2B		SC	Y	2	
U	Asio flammeus	Short-eared owl	G5	S3		S	Y	3	
C	Sitta carolinensis aculeata	Slender-billed nuthatch	G5TU	S3		S	Y	3	
U	Eremophila alpestris strigata	Streaked horned lark	G5T2	S2B	LT	SC	Y	1	
C	Sialia mexicana	Western bluebird	G5	S4B,S4N		S	Y	4	Boxes maintained & monitored
C	Sturnella neglecta	Western meadowlark	G5	S4		SC	Y	4	
L	Icteria virens	Yellow-breasted chat	G5	S4B		SC	Y	4	
		FISH							
?	Oregonichthys crameri	Oregon chub	G3	S3		S	Y	1	
	Entosphenus tridentatus	Pacific lamprey	G4	S1S2	SoC	S	Y	2	
	Lampetra richardsoni	Western brook lamprey	G4G5	S4	SoC	S	Y	4	
		MAMMALS							
?	Myotis californicus	California myotis	G5	S3		S	Y	4	
?	Thomomys bulbivorus	Camas pocket gopher	G3G4	S3S4				4	
?	Erethizon dorsatum	Common porcupine	G5	S3S4				3	
?	Myotis thysanodes	Fringed Myotis	G4	S2	SoC	S	Y	2	
?	Lasiurus cinereus	Hoary bat	G3G4	S3		S	Y	3	
?	Myotis lucifugus	Little brown myotis	G3	S3				4	
?	Myotis evotis	Long-eared myotis	G5	S4				4	
?	Myotis volans	Long-legged myotis	G4G5	S3				4	
C	Arborimus longicaudus	Red tree vole	G3G4	S3	PS:C			4	C. Rombough observation
?	Lasionycteris noctivagans	Silver-haired bat	G3G4	S3S4		S	Y	4	
?	Corynorhinus townsendii	Townsend's big-eared bat	G4	S2		SC	Y	2	
L	Sciurus griseus	Western gray squirrel	G5	S4		S	Y	4	
?	Myotis yumanensis	Yuma myotis	G5	S3				4	
		REPTILES							
C	Actinemys marmorata	Western pond turtle	G3G4	S2	SOC	SC	Y	2	Old ORBIC records
C	Chrysemys picta	Painted turtle	G5	S2		SC	Y	2	Old ORBIC records

INTERTEBRATES

<i>O</i>	<i>Scientific Name</i>	<i>Common Name</i>	G_RANK	S_RANK	FED	STATE	OCS	HP	Notes
		BEES							
C	Bombus fervidus	Yellow bumblebee	G3G4	S3S4				3	Bioblitz, as B. californicus
?	Bombus suckleyi	Suckley's cuckoo bumblebee	G1	S1?				1	
		BEETLES							
?	Cicindela purpurea hatchi	A tiger beetle	G5T3T4	S2S3				3	
		BUTTERFLIES							
C	Danaus plexippus pop. 1	Monarch - California overwintering population	G4T2T3	S1S2B			Y	1	Bioblitz
U	Plebejus icarioides fenderi	Fender's blue (butterfly)	G5T1	S1	LT		Y	1	Not known in area.
?	Polites sonora siris	Sonora skipper (butterfly)	G4T3	S3?				3	
U	Speyeria cybele pugetensis	Puget Sound (Great Spangled) fritillary	G5TU	S3?			Y	3	No records, but a large and showy butterfly.
		EARTHWORMS							
C	Driloleirus macelfreshi	Oregon giant earthworm	G1	S1	SOC			1	ORBIC record
		FRESHWATER MUSSELS							
?	Anodonta californiensis	California floater (mussel)	G3	S2			Y		
C	Anodonta oregonensis	Oregon floater (mussel)	G5	S3?				2	ORBIC record
?	Gonidea angulata	Western ridged mussel	G3	S2S3			Y	1	
?	Margaritifera falcata	Western pearlshell (mussel)	G5	S3				2	
		SNAILS & SLUGS							
?	Hemphillia malonei	Malone jumping-slug	G3	S3				4	
C	Megomphix hemphilli	Oregon megomphix (snail)	G3	S3				4	Bioblitz
		TRUE BUGS							
?	Derephysia foliacea	Foliaceous lace bug	G5	S2				3	

Oregon Biodiversity Information Center rare species records dated May 2022

Champoeg area (includes adjacent Willamette River)

#	Common Name	Latin Name	Most recent date	Champoeg SHA		Parrett
				In	Near	In
1	W. Pond Turtle	<i>Actinemys marmorata</i>	Not specified; before 2003		X	
2	Oregon Floater	<i>Anodonta oregonensis</i>	2008-06-30	Mission Cr.		
3	Painted Turtle	<i>Chrysemeys picta</i>	Not specified; before 1994		X	
4	Painted Turtle	<i>Chrysemeys picta</i>	1993-08-19		X	
5	Painted Turtle	<i>Chrysemeys picta</i>	1941-11-06		Champoeg Lake, exact loc. unk.	
6	OR Giant Earthworm	<i>Driloleirus macelfreshi</i>	1985 and before	X		X
7	Pacific Lamprey	<i>Entosphenus tridentatus</i>	2011-00-00		WR	
8	Olympia Pebblesnail	<i>Fluminicola virens</i>	Before 1996		WR	
9	Olympia Pebblesnail	<i>Fluminicola virens</i>	1993 multiple		WR	
10	Bald Eagle	<i>Haliaeetus leucocephalus</i>	2007-00-00		?	
11	Steelhead (UW winter)	<i>Oncorhynchus mykiss</i> pop. 33	2009-00-00		WR & tribs	
12	Chinook Salmon pop. 23	<i>Oncorhynchus tshawytscha</i>	2009-00-00		WR & tribs	

: Mtn.

Near	EO ID	Notes
	25528	1 adult basking; Champoeg Cr. pond ~1/4 mile south of park
	30364	
	1690	
	13872	1993 n=33; 1991 n=1; Aurora Airport Rd.
	23916	1941 n=1; 1938 n=4
	5307	
WR	39459	Habitat, from 2012 ODFW pub, Corvallis to Willamette mouth
WR	32254	1993: 500 collected
WR	35215	1996: 5 collected
	26111	Ash Island, Spring Brook; nest monitored; 2001-07 2 fledged per year; nest gone?
WR & tribs	7547	Pot. habitat; Willamette River & tribs
WR & tribs	8126	Mid-Willamette & tribs

Champoeg State Park Bioblitz 2000

Category	Total Species Count
Amphibia	7
Arachnida	34
Aves	70
Caudata	4
Chilopoda	4
Diplapoda	5
Gastropoda	15
Insecta	262
Lichens	46
Fungi/Moss	28
Mammalia	21
Reptilia	1
Misc.	49
Flora	293
Grand Total	839

DRAFT Biodiversity List for Champoeg State Heritage Area (CSHA) and Parrett Mountain Greenway Access (PMGA)

Bruce Newhouse (Salix Associates) 2022

Site Information

CSHA	31 May – 20 Aug. 2022, 4 visits		PMGA	23 July 2022	
Approx. acres	675		Approx. acres	32	
County	Marion		County	Yamhill	
Approx. LatLong centroid	45.251591	-122.874307	Approx. LatLong centroid	45.258271	-122.897294
Elevation	60 feet – 435 feet (approximate)		Elevation	65 feet – 100 feet (approximate)	
Search radius	8000 ft. E-W, 1500 ft. N-S		Search radius	2000 ft. E-W, 1600 ft. N-S	
Access	Public, paved, signed entrance		Access	Public, paved, signed entrance	

Almost all observations noted herein occurred on or near trails or roads. Incidental observations only, made during habitat assessment.

KEY to following table:

C P: Champoeg - Parrett Mountain Greenway Access

N/E: Native/*Exotic* (from Oregon Flora Project)

R/I: Rare/*Invasive* - Rare are **bold font** (from Fed/State ESA, ORBIC, and Emerald Chapter NPSO); Invasive species are from somewhat (I) to extremely II, (from ODA, Emerald Chapter NPSO and local field experience)

Vascular Plant List (Incidental observations)

C	P	Latin Name	Common Name	N/E	R/I	Notes
		TREES				
C		<i>Abies grandis</i>	Grand Fir	N		Occasional in Mixed Forest habitats.
C		<i>Acer macrophyllum</i>	Bigleaf Maple	N		
C		<i>Acer platanoides</i>	Norway Maple	E	I	Escaping into riparian and other forest areas from plantings.
C	P	<i>Alnus rubra</i>	Red Alder	N		Some unusually large ones in NW CSHA riparian
C		<i>Arbutus menziesii</i>	Pacific Madrone	N		Uncommon; less frequent than expected.
C		<i>Betula pendula</i>	European Birch	E		May be other <i>Betula</i> species present.
	P	<i>Cedrus deodara</i>	Himalayan Cedar	E		Planted on west side of Parrett Mtn. Greenway Access pkg. lot.

C	P	Latin Name	Common Name	N/E	R/I	Notes
C		<i>Chamaecyparis lawsoniana</i>	Port-Orford-Cedar	E		Planted at north edge Restoration Prairie, at townsite and near E end.
C		<i>Chrysolepis chrysophylla</i>	Golden Chinkapin	N		Low elevation for this species. One plant observed. Probably planted.
C		<i>Cornus nuttallii</i>	Pacific Dogwood	N		
C	P	<i>Fraxinus latifolia</i>	Oregon Ash	N		
C	P	<i>Juglans nigra</i>	Black Walnut	E	I	Escaping into riparian forests.
C	P	<i>Malus x domestica</i>	Domestic Apple	E		
C		<i>Picea sitchensis</i>	Sitka Spruce	E		Native to Oregon coast.
C		<i>Pinus contorta</i>	Lodgepole/Shore Pine	E		Native to Oregon, but not to site or ecoregion. Or may be <i>P. pinea</i> ? Or?
C		<i>Pinus ponderosa</i>	Ponderosa Pine	N		Likely the Willamette Valley var. <i>benthiana</i> , but unknown
C		<i>Populus</i>	Cottonwood or Poplar	E		Only one seen, just W of top of trail to dock
C	P	<i>Populus trichocarpa</i>	Black Cottonwood	N		
C	P	<i>Prunus avium</i>	Sweet or Bird Cherry	E	II	
C		<i>Prunus cerasifera</i>	Cherry Plum	E		
C	P	<i>Prunus emarginata</i> var. <i>mollis</i>	Bitter Cherry	N		Significant native host plant.
	P	<i>Prunus</i> sp.	Cherry	E		
C	P	<i>Prunus virginiana</i> var. <i>demissa</i>	Chokecherry	N		Significant native host plant.
C		<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	Douglas Fir	N		
C		<i>Pyrus communis</i>	Feral Pear	E	II	Most common in moist areas
C		<i>Quercus</i> cf. <i>chrysolepis</i>	Canyon Live Oak	E		Native to Klamath Ecoregion, planted here
C	P	<i>Quercus garryana</i> var. <i>garryana</i>	Oregon White Oak	N		Significant native host plant. Significant cavity nesting bird plant.
	P	<i>Quercus palustris</i>	Pin Oak	E	(I)	Planted and escaping.
C		<i>Quercus robur</i>	English Oak	E	(I)	
C		<i>Quercus</i> cf. <i>rubra</i>	Red Oak	E	(I)	
C		<i>Robinia pseudoacacia</i>	Black Locust	E	I	Commonly escaping in western portions of park; originally planted.
C	P	<i>Salix lasiandra</i> var. <i>lasiandra</i>	Pacific Willow	N		Near river and some creeks. Significant native host plant.
C	P	<i>Sequoiadendron giganteum</i>	Giant Sequoia	E		Planted, maturing, not escaping
C		<i>Thuja plicata</i>	Western Redcedar	N		Mostly along riparian fringes, occ. in riparian forest
	P	<i>Tilia</i> sp.	Linden or Basswood	E		
		SHRUBS, SMALL TREES, MOUNDING VINES				
C	P	<i>Acer circinatum</i>	Vine Maple	N		
C	P	<i>Berberis aquifolium</i>	Tall Oregongrape	N		Good early season nectar plant.
C		<i>Berberis nervosa</i>	Dwarf Oregongrape	N		Native area along River trail
C	P	<i>Cornus sericea</i>	Creek Dogwood	N		Especially near River and in moist areas
C		<i>Corylus avellana</i>	European Hazelnut	E		
C	P	<i>Corylus cornuta</i> var. <i>californica</i>	California Hazel	N		

C	P	Latin Name	Common Name	N/E	R/I	Notes
C		<i>Crataegus gaylussacia</i>	Suksdorf's Hawthorn	N		Nomenclatural confusion exists.
C	P	<i>Crataegus monogyna</i>	English Hawthorn	E		
C	P	<i>Crataegus × cogswellii</i>	Cogswell Hybrid Hawthorn	E		<i>C. gaylussacia</i> × <i>C. monogyna</i>
C		<i>Cytisus scoparius</i>	Scot's Broom	E	!!	
C		<i>Deutzia</i> sp.	Deutzia	E		Planted in old townsite area.
C		<i>Euonymus alatus</i>	Burning Bush	E		Planted.
C		<i>Euonymus occidentalis</i>	Western Wahoo	N		Only one patch observed but may be elsewhere as it is difficult to see.
C		<i>Gaultheria shallon</i>	Salal	N		
C		<i>Holodiscus discolor</i>	Oceanspray	N		Host plant.
C		<i>Ilex aquifolium</i>	English Holly	E	I	
C		<i>Malus fusca</i>	Oregon Crabapple	N		Only one plant observed, likes moist areas.
C		<i>Myrica californica</i>	Pacific Wax Myrtle	E		Native to Coast. Planted in campground.
C		<i>Oemleria cerasiformis</i>	Osoberry	N		
C		<i>Philadelphus lewisii</i>	Lewis' Mockorange	N		
C		<i>Physocarpus capitatus</i>	Ninebark	N		
C	P	<i>Rhamnus purshiana</i>	Cascara	N		Good nectar and bird food plant.
C		<i>Rosa gymnocarpa</i>	Baldhip Rose	N		
C		<i>Rosa multiflora</i>	Multiflowered Rose	E	(I)	
C	P	<i>Rosa nutkana</i> var. <i>nutkana</i>	Nootka Rose	N		Excellent bumble bee plant.
C	P	<i>Rubus armeniacus</i>	Himalayan/Armenian Blackberry	E	!!	Used by bees and butterflies for nectar, birds and mammals for fruit and cover.
C	P	<i>Rubus parviflorus</i>	Thimbleberry	N		Excellent bumble bee plant.
C		<i>Rubus spectabilis</i>	Salmonberry	N		Early pollinators?
C		<i>Rubus vestitus</i>	European Blackberry	E	!!	Common in shady understories
C	P	<i>Salix hookeriana</i>	Hooker's Willow	N		River and creek edges. Host and nectar plant.
C	P	<i>Sambucus cerulea</i>	Blue Elderberry	N		Excellent bird fruit plant.
C		<i>Sambucus racemosa</i> var. <i>arborescens</i>	Red Elderberry	N		Excellent bird fruit plant.
C	P	<i>Symphoricarpos albus</i> var. <i>laevigatus</i>	Snowberry	N		Good bumble bee plant. OK late winter bird plant.
C	P	<i>Toxicodendron diversilobum</i>	Poison-Oak	N		OK pollinator plant.
C		<i>Vaccinium ovatum</i>	Evergreen Huckleberry	E		Native to coast, often planted in W. Valley
		FORBS				
C		<i>Achillea millefolium</i>	Yarrow	N		Good pollinator plant.
C		<i>Adenocaulon bicolor</i>	Pathfinder	N		
C		<i>Alchemilla</i> sp.	Lady's Tresses	N?		
C		<i>Alisma triviale</i>	American Water Plantain	N		
C		<i>Anthemis cotula</i>	Dog-Fennel	E		

C	P	Latin Name	Common Name	N/E	R/I	Notes
C		<i>Anthriscus caucalis</i>	Bur Chervil	E		
C		<i>Apocynum androsaemifolium</i>	Spreading Dogbane	N		Seen in one location. Some populations are good pollinator plants.
C		<i>Aquilegia formosa</i>	Red & Yellow Columbine	N		Good pollinator plant.
C		<i>Arctium minus</i>	Burdock	E		
C		<i>Artemisia douglasiana</i>	Douglas Sagewort	N		Host plant.
C		<i>Asarum caudatum</i>	Wild Ginger	N		
C	P	<i>Bellis perennis</i>	English Daisy	E	(I)	
C		<i>Bidens frondosa</i>	Beggar's Ticks	N		One plant observed, likely more present in park.
	P	<i>Brassica nigra</i>	Black Mustard	E		
C		<i>Brassica rapa</i>	Rapeseed	E		
C		<i>Callitriche stagnalis</i>	Pond Water-starwort	E		
C		<i>Calystegia sylvatica ssp. disjuncta</i>	Hedge Bindweed	E	(I)	
C		<i>Centaurea cyanus</i>	Bachelor's Buttons	E	I	Planted near white lupines to attract bumble bees? Dry site invasive.
C		<i>Cerastium glomeratum</i>	Sticky Chickweed			
C		<i>Cimicifuga elata</i> var. <i>elata</i>	Tall Bugbane	N	R	La Butte area, a few on either side of trail.
C		<i>Cirsium arvense</i>	Canada Thistle	E	!!	
C	P	<i>Cirsium vulgare</i>	Bull Thistle	E	(I)	
C		<i>Claytonia perfoliata</i>	Miner's Lettuce	N		
C		<i>Claytonia sibirica</i>	Candyflower	N		Specialist bee uses this plant. Good overall for small pollinators.
C	P	<i>Clematis</i> sp.	(Depends on species)	?		Only a few non-flowering stems
C		<i>Conyza canadensis</i>	Horseweed	N		Weedy
C		<i>Crassula tillaea</i>	Moss Pygmyweed	E		
C		<i>Crepis capillaris</i>	Smooth Hawksbeard	E	(I)	
C		<i>Crepis setosa</i>	Bristly Hawksbeard	E	(I)	
C	P	<i>Daucus carota</i>	Wild Carrot; Queen Anne's Lace	E	I	
C		<i>Dianthus armeria</i>	Deptford Pink	E		
C		<i>Dichelostemma congestum</i>	Ookow	N		
C		<i>Epilobium paniculatum</i>	Tall Annual Willowherb	N		
C		<i>Eriophyllum lanatum</i>	Oregon Sunshine	N		Good pollinator plant.
C		<i>Erodium cicutarium</i>	African Filaree	E	(I)	
C		<i>Erythronium oregonum</i>	Oregon Fawn Lily	N		
	P	<i>Galium aparine</i>	Cleavers	N		
C		<i>Galium triflorum</i>	Sweetscented Bedstraw	N		
	P	<i>Geranium columbinum</i>	Long-stalked Geranium	E		

C	P	Latin Name	Common Name	N/E	R/I	Notes
C		<i>Geranium dissectum</i>	Cut-leaf Geranium	E		
C	P	<i>Geranium lucidum</i>	Shining Geranium	E	!!	
C		<i>Geranium molle</i>	Soft Geranium	E	(I)	
C		<i>Geranium robertianum</i>	Herb-Robert; Stinky Bob	E	!!	
C		<i>Geum macrophyllum</i>	Large Leaved Avens	N		
C	P	<i>Geum urbanum</i>	Herb Bennett	E	!!	S edge of riverside trail N of Restoration Prairie, other areas in NW
C	P	<i>Hedera helix</i>	English Ivy	E	!!	Infrequent.
C	P	<i>Hedera hibernica</i>	Irish or Atlantic Ivy	E	!!	Widespread and dominant in the herb layer in many areas.
C	P	<i>Heracleum maximum</i>	Cow Parsnip	N		Good pollinator plant.
C		<i>Humulus lupulus</i>	Common Hop	E		
C	P	<i>Hydrophyllum tenuipes</i>	Pacific Waterleaf	N		Great bee nectar plant.
C	P	<i>Hypericum perforatum</i>	St. John's-wort	E	I	
C	P	<i>Hypochaeris radicata</i>	Cat's-ear; False Dandelion	E	I	
C		<i>Impatiens capensis</i>	Spotted Jewelweed	I	I	In wetland on N side of La Butte
C		<i>Kickxia elatine</i>	Sharp-leaved Fluellin	E		
C		<i>Lactuca serriola</i>	Prickly Lettuce	E		
C		<i>Lamium purpureum</i>	Red Dead Nettle	E		
C		<i>Lapsana communis</i>	Nipplewort	E	I	
C		<i>Lonicera</i> sp.	Honeysuckle	N		L. hispidula or L. ciliosa. Either is a good hummingbird plant
C		<i>Lunaria annua</i>	Money Plant	E	(I)	
C		<i>Lupinus albicaulis</i> var. <i>albicaulis</i>	Pine Lupine	N		Very uncommon. Planted? Good pollinator plant
C		<i>Lupinus bicolor</i>	Two-color Lupine	N		
C		<i>Lysichiton americanus</i>	Skunk Cabbage	N		Forested wetlands. One plant observed; likely more in park. Visited by flies.
C		<i>Lysimachia latifolia</i>	Western Starflower	N		
C		<i>Lythrum hyssopifolium</i>	Hyssop Loosestrife	E		Moist areas
C	P	<i>Marah oregana</i>	Wild Cucumber	N		
C		<i>Matricaria discoidea</i>	Pineapple Weed	N		
C	P	<i>Maianthemum racemosa</i> var. <i>amplexicaule</i>	False Solomon's Seal	N		
C	P	<i>Maianthemum stellatum</i>	Star-flowered Solomon's Seal	N		
C		<i>Melissa officinalis</i>	Lemon Balm	E	I	
C		<i>Mycelis muralis</i>	Wall Lettuce	E		
C		<i>Oenanthe sarmentosa</i>	Water Parsley	N		Marshy areas, wet ditches
C		<i>Osmorhiza berteroi</i>	Sweet Cicely	N		
C		<i>Persicaria hydropiperoides</i>	Waterpepper	N		Marshy areas

C	P	Latin Name	Common Name	N/E	R/I	Notes
	P	Persicaria sp.	Smartweed	?		
C	P	Phacelia nemoralis ssp. oregonensis	Bristly Phacelia	N		Common trailside plant in places. Popular with bumble bees.
C	P	<i>Plantago lanceolata</i>	English Plantain	E		
C		<i>Plantago major</i>	Common Plantain	E		
C		Prosartes hookeri	Hooker's Fairy Bells	N		
C	P	Prunella vulgaris var. lanceolata	Native Self-heal	N		Attracts bumblebees and other pollinators
C	P	<i>Prunella vulgaris</i> var. <i>vulgaris</i>	European Self-heal	E		
C		<i>Ranunculus parviflorus</i>	Small-flowered Buttercup	E		
C		<i>Ranunculus occidentalis</i>	Western Buttercup	N		
C		<i>Ranunculus repens</i>	Creeping Buttercup	E	I	
C		<i>Ranunculus uncinatus</i>	Disappointing Buttercup	N		
C	P	Rorippa curvisiliqua	Curvepod Yellowcress	N		
C		Rubus leucodermis	Blackcap Raspberry	N		
C	P	Rubus ursinus	Dewberry	N		
C		<i>Rumex acetosella</i>	Sheep or Red Sorrel	E		
C		<i>Rumex conglomeratus</i>	Clustered Dock	E		
C	P	<i>Rumex obtusifolius</i>	Bitter Dock	E		
C		<i>Sagina apetala</i>	Common Pearlwort	E		
C		Sanicula crassicaulis var. crassicaulis	Pacific Sanicle	N		
C		Scutellaria lateriflora	Mad Dog Skullcap	N		Good bumble bee plant.
C		<i>Senecio jacobaea</i>	Tansy Ragwort	E	(I)	
	P	Scrophularia lanceolata	Lanceleaf Figwort	N		Excellent pollinator plant.
	P	<i>Sisymbrium</i> sp.	(Likely) Hedge Mustard	E		
C		<i>Solanum dulcamara</i>	Bittersweet Nightshade	E		
C		<i>Soliva sessilis</i>	Field Burrweed	E		
C		<i>Sonchus asper</i>	Prickly Sow Thistle	E		
C	P	Stachys mexicana	Great Betony	N		
C		Stellaria borealis ssp. sitchana	Few-Flowered Northern Starwort	N		
C		Symphyotrichum subspicatum	Douglas' Aster	N		Popular with late season pollinators
C	P	<i>Tanacetum vulgare</i>	Common Tansy	E		
C		<i>Taraxacum officinale</i>	Common Dandelion	E		
C	P	Tellima grandiflora	Fringecups	N		
C		Tolmiea menziesii	Piggy-back Plant	N		Based on range. T. diplomenziesii is farther south, indistinguishable.
	P	<i>Torilis japonica</i>	Japanese Hedge Parsley	E	(I)	
	P	<i>Trifolium campestre</i>	Hop Clover	E		
C	P	<i>Trifolium dubium</i>	Least Hop Clover	E	I	

C	P	Latin Name	Common Name	N/E	R/I	Notes
	P	<i>Trifolium pratense</i>	Red Clover	E		
C	P	<i>Trifolium repens</i>	White Clover	E	(I)	
C		<i>Trillium albidum</i>	Giant Trillium	N		Ssp. not known, as plants were vegetative at time of observation.
C		<i>Trillium ovatum</i> ssp. <i>ovatum</i>	Pacific Trillium	N		
C		<i>Typha latifolia</i>	Cattails	N		
C		<i>Urtica gracilis</i>	Stinging Nettles	N		Host plant for Red Admiral and other butterflies.
C		<i>Vancouveria hexandra</i>	Inside-Out Flower	N		
C	P	<i>Verbascum blattaria</i>	Moth Mullein	E		
C	P	<i>Verbascum thapsus</i>	Mullein	E		
C		<i>Veronica</i> cf. <i>americana</i>	American Brooklime	N		
		<i>Veronica peregrina</i> (var. ____)	Purslane Speedwell	N?		
C		<i>Veronica</i> cf. <i>persica</i>	Persian Speedwell	E		
C		<i>Vicia americana</i>	American Vetch	N		Excellent pollinator plant
C	P	<i>Vicia hirsuta</i>	Hairy Vetch	E		
C	P	<i>Vicia sativa</i>	Common Vetch	E	(I)	
C		<i>Vinca major</i>	Periwinkle	E	(I)	
C		<i>Vinca minor</i>	Common Periwinkle	E		
C		<i>Viola glabra</i>	Stream Violet	N		
C		<i>Viola odora</i>	European Garden Violet	I		
		GRASSES, RUSHES & SEDGES				
C	P	<i>Agrostis</i> spp.	Bentgrass	E	(I)	Likely <i>gigantea</i> , possibly <i>capillaris</i>
C		<i>Aira caryophyllea</i>	Silver Hairgrass	E	(I)	
C	P	<i>Alopecurus pratensis</i>	Meadow Foxtail	E	I	
	P	<i>Anthoxanthum odoratum</i>	Sweet Vernalgrass	E	(I)	
C	P	<i>Arrhenatherum elatius</i>	Tall Oatgrass	E	I	
C		<i>Briza minor</i>	Little Quakinggrass	E		
C		<i>Bromus diandrus</i>	Ripgut	E	I	
C		<i>Bromus hordeaceus</i>	Soft Chess	E	(I)	
C		<i>Bromus sterilis</i>	Poverty Brome	E	(I)	
C	P	<i>Bromus sitchensis</i> var. <i>sitchensis</i>	Sitka Brome	N		Likely intergrades with BROSITCAR
C		<i>Bromus vulgaris</i>	Columbia Brome	N		
C		<i>Carex hendersonii</i>	Henderson's Sedge	N		
C	P	<i>Carex leptopoda</i>	Slender-Footed Sedge	N		
C		<i>Carex obnupta</i>	Slough Sedge	N		
C		<i>Carex pachystachya</i>	Thick-headed Sedge	N		
C		<i>Carex tumulicola</i>	Foothill Sedge	N		

C	P	Latin Name	Common Name	N/E	R/I	Notes
C		<i>Carex unilateralis</i>	One-sided Sedge	N		
	P	<i>Cynosurus echinatus</i>	Hedgehog Dogtail	E	I	
C		<i>Danthonia californica</i>	California Oatgrass	N		Present in several open areas.
C	P	<i>Dactylis glomerata</i>	Orchard Grass	E	I	
C		<i>Deschampsia cespitosa</i>	Tufted Hairgrass	N		Planted as part of restoration effort.
C		<i>Dichanthelium oligosanthos</i> ssp. <i>scribnerianum</i>	Scribner's Panic Grass	N		Possibly planted?
C	P	<i>Elymus glaucus</i>	Blue Wildrye	N		
C		<i>Festuca roemerii</i> var. <i>roemerii</i>	Roemer's Fescue	N		Likely planted as part of restoration effort.
C	P	<i>Festuca rubra</i>	Red Fescue	E		
C	P	<i>Holcus lanatus</i>	Velvetgrass	E	I	
C		<i>Hordeum marinum</i> ssp. <i>gussoneanum</i>	Geniculate Barley	E		
C		<i>Hordeum murinum</i>	Hare Barley	E		
C		<i>Juncus bufonius</i>	Toad Rush	N		
C		<i>Juncus effusus</i> ssp. <i>solutus</i>	Eastern Soft Rush	E		
C		<i>Juncus patens</i>	Spreading Rush	N		
C		<i>Juncus tenuis</i>	Slender Rush	N		
C		<i>Melica subulata</i>	Alaska Oniongrass	N		
C	P	<i>Poa annua</i>	Annual Bluegrass	E		
C	P	<i>Poa pratensis</i>	Kentucky Bluegrass	E		
C		<i>Poa trivialis</i>	Rough Bluegrass	E		
C	P	<i>Phalaris arundinacea</i>	Reed Canarygrass	E	II	
C	P	<i>Schedonorus arundinaceus</i>	Tall Fescue	E	I	Probably the most numerous plant in the Willamette Valley.
C		<i>Torreyochloa pallida</i> var. <i>pauciflora</i>	Pale False Mannagrass	N		
C	P	<i>Vulpia</i> sp.	Annual Fescue	E	I	
		FERNS & ALLIES				
C		<i>Athyrium filix-femina</i>	Lady Fern	N		Uncommon
C		<i>Equisetum arvense</i>	Field Horsetail	N		
	P	<i>Equisetum hyemale</i>	Scouring Rush	N		Uncommon
C		<i>Equisetum telmateia</i> ssp. <i>braunii</i>	Giant Horsetail	N		
C		<i>Polypodium glycyrrhiza</i>	Licorice Fern	N		
C		<i>Polystichum munitum</i>	Sword Fern	N		
C		<i>Pteridium aquilinum</i> var. <i>pubescens</i>	Bracken	N		

Birds

(Incidental observations)

C	P	Common Name	N/E	R/I	Notes
C		Acorn Woodpecker	N		Year-round resident
C		American Crow	N		Year-round resident
C		American Goldfinch	N		Year-round resident
C	P	American Robin	N		Year-round resident
C	P	Anna's Hummingbird	N		Year-round resident
C	P	Band-tailed Pigeon	N	R	Migrant and some in summer
C		Barn Swallow	N		Summer resident/breeder
C		Bewick's Wren	N		Year-round resident
C		Black-capped Chickadee	N		Year-round resident
C	P	Black-headed Grosbeak	N		Summer resident/breeder
C		Brewer's Blackbird	N		Year-round resident
C		Brown Creeper	N		Year-round resident
C		Brown-headed Cowbird	N		Summer resident/breeder
C		Bullock's Oriole	N		Summer resident/breeder
C		Bushtit	N		Year-round resident
C		California Scrub-jay	N		Year-round resident
C	P	Chipping Sparrow	N	R	Summer resident/breeder
C		Cedar Waxwing	N		Summer breeder, irregular in winter
C	P	Common Yellowthroat	N		Summer resident/breeder
C		Cooper's Hawk	N		Year-round resident
C		Dark-eyed Junco	N		<i>Year-round resident but some migrate to higher elevations to breed. Common breeder in Park.</i>
C		Downy Woodpecker	N		<i>Year-round resident</i>
C		<i>European Starling</i>	E		<i>Year-round resident</i>
C		Lazuli Bunting	N		Summer resident/breeder
C		Lesser Goldfinch	N		Year-round resident
C		Mourning Dove	N		Spring-summer-fall resident
C	P	Northern Flicker	N		Year-round resident
C		Orange-crowned Warbler	N		Summer resident/breeder. (Overwintering rare.)
C		Osprey	N		Summer resident breeder. Most migrate far south in winter.
C		Purple Finch	N		Mostly a spring migrant but may be present any time of year.
C	P	Red-breasted Sapsucker	N		Year-round resident
C		Red-tailed Hawk	N		Summer resident/breeder; northern birds winter here

C	P	Common Name	N/E	R/I	Notes
C		Red-winged Blackbird	N		Year-round resident
C		Savannah Sparrow	N		A few overwinter
C	P	Song Sparrow	N		Year-round resident
C	P	Spotted Towhee	N		Year-round resident
C	P	Steller's Jay	N		Year-round resident
C	P	Swainson's Thrush	N		Summer resident/breeder
C		Tree Swallow	N		Summer resident/breeder. A few may stay over a warm winter.
C	P	Turkey Vulture	N		Summer resident/breeder. Flyovers, only.
C		Violet-green Swallow	N		Summer resident/breeder
C		Warbling Vireo	N		Summer resident/breeder
C		Western Bluebird	N	R	Year-round resident
C		Western Tanager	N		Summer resident/breeder
C	P	Western Wood-pewee	N		Summer resident/breeder
C		White-breasted (Slender-billed) Nuthatch	N	R	Year-round resident
C		Wilson's Warbler	N		Summer resident/breeder
C		Yellow Warbler	N		Summer resident/breeder

Other Wildlife

(Incidental observations)

C	P	Common Name	N/E	R/I	Notes
		AMPHIBIA			
C		<i>American Bullfrog</i>	E		
		COLEOPTERA			
C		Coniontis sp.	N?		iNat community ID.
C		Chrysolina quadrigemina	E		Klamath Weed Beetle
C		Diabrotica undecimpunctata	E		Spotted Cucumber Beetle
		HYMENOPTERA			
C	P	<i>Apis mellifera</i>	E		European Honey Bee. Appears to be common and widespread in area.
C	P	Bombus subgen. Pyrobombus	N		Likely B. vosnesenskii, but could be a look-alike
C		Ceratina sp.	N?		On SYMSUB
C		Epifamily Anthophila unid.	N?		On SYMSUB
C		<i>Eristalis tenax</i>	E		

C	P	Common Name	N/E	R/I	Notes
C		<i>European Paper Wasp</i>	E		
		LEPIDOPTERA			
C		Red Admiral	N		
C	P	Western Tiger Swallowtail	N		
		MAMMALIA			
C		Black-tailed Deer	N		
C		California Ground Squirrel	N		Appear to be regular on the CSHA site.
C		Douglas Squirrel	N		
C		Townsend's Chipmunk	N		
		ODONATA			
C		River Jewelwing	N		

iNaturalist Observations in Champoeg State Heritage Area and Parrett Mountain Greenway Access

Downloaded 2022-12-06, 12 noon; sorted alphabetically by Kingdom-Phylum-Class-Genus-species

Note: This list contains many multiple sightings of the same species.

Champoeg State Heritage Area

Kingdom	Phylum	Class	scientific_name	common_name	observed_on	user_login
Animalia	Arthropoda	Arachnida	Argiope trifasciata	Banded Garden Spider	9/11/2021	davidpcraig
Animalia	Arthropoda	Arachnida	Parasteatoda tepidarium	Common House Spider	6/5/2019	matt227
Animalia	Arthropoda	Insecta	Andricus quercuscalifornicus	California Gall Wasp	11/11/2017	lesfreck
Animalia	Arthropoda	Insecta	Andricus quercuscalifornicus	California Gall Wasp	7/5/2020	ramona27
Animalia	Arthropoda	Insecta	Andricus quercuscalifornicus	California Gall Wasp	6/10/2021	l-k
Animalia	Arthropoda	Insecta	Andricus quercuscalifornicus	California Gall Wasp	6/20/2021	yetiwheel
Animalia	Arthropoda	Insecta	Apis mellifera	Western Honey Bee	5/1/2021	georver
Animalia	Arthropoda	Insecta	Apis mellifera	Western Honey Bee	7/12/2021	jamesjarrett00
Animalia	Arthropoda	Insecta	Apis mellifera	Western Honey Bee	5/31/2022	brucen
Animalia	Arthropoda	Insecta	Apis mellifera	Western Honey Bee	8/19/2022	brucen
Animalia	Arthropoda	Insecta	Archilestes californicus	California Spreadwing	10/6/2020	insectology
Animalia	Arthropoda	Insecta	Boisea rubrolineata	Western Boxelder Bug	4/6/2018	rangerbee
Animalia	Arthropoda	Insecta	Boisea rubrolineata	Western Boxelder Bug	7/22/2021	nature-trackers
Animalia	Arthropoda	Insecta	Bombus vosnesenskii	Yellow-faced Bumble Bee	7/12/2021	jamesjarrett00
Animalia	Arthropoda	Insecta	Bombus vosnesenskii	Yellow-faced Bumble Bee	7/12/2021	jamesjarrett00
Animalia	Arthropoda	Insecta	Coccinella septempunctata	Seven-spotted Lady Beetle	12/27/2020	susankirkbride
Animalia	Arthropoda	Insecta	Cynips mirabilis	Speckled Gall Wasp	7/5/2020	ramona27
Animalia	Arthropoda	Insecta	Cynips mirabilis	Speckled Gall Wasp	9/19/2020	ae-johnson
Animalia	Arthropoda	Insecta	Cynips mirabilis	Speckled Gall Wasp	11/20/2022	andrea97202
Animalia	Arthropoda	Insecta	Cynips mirabilis	Speckled Gall Wasp	11/20/2022	kbrizgys
Animalia	Arthropoda	Insecta	Eristalis tenax	Common Drone Fly	5/31/2022	brucen
Animalia	Arthropoda	Insecta	Eupeodes fumipennis	Western Aphideater	4/6/2022	jensanford
Animalia	Arthropoda	Insecta	Eupithecia subapicata		3/29/2018	jimjohnson
Animalia	Arthropoda	Insecta	Halyomorpha halys	Brown Marmorated Stink Bug	4/6/2018	rangerbee
Animalia	Arthropoda	Insecta	Hydriomena nubilofasciata	Oak Winter Highflyer	2/11/2018	jimjohnson
Animalia	Arthropoda	Insecta	Hydriomena nubilofasciata	Oak Winter Highflyer	2/11/2018	jimjohnson
Animalia	Arthropoda	Insecta	Hydriomena nubilofasciata	Oak Winter Highflyer	2/17/2018	jimjohnson
Animalia	Arthropoda	Insecta	Hydriomena nubilofasciata	Oak Winter Highflyer	2/17/2018	jimjohnson

Kingdom	Phylum	Class	scientific_name	common_name	observed_on	user_login
Animalia	Arthropoda	Insecta	Orthosia hibisci	Speckled Green Fruitworm Moth	3/18/2018	jimjohnson
Animalia	Arthropoda	Insecta	Orthosia praeses		2/11/2018	jimjohnson
Animalia	Arthropoda	Insecta	Orthosia praeses		3/18/2018	jimjohnson
Animalia	Arthropoda	Insecta	Papilio rutulus	Western Tiger Swallowtail	7/12/2021	jamesjarrett00
Animalia	Arthropoda	Insecta	Phigalia plumogeraria	Walnut Spanworm Moth	2/17/2018	jimjohnson
Animalia	Arthropoda	Insecta	Phigalia plumogeraria	Walnut Spanworm Moth	3/18/2018	jimjohnson
Animalia	Arthropoda	Insecta	Pieris rapae	Cabbage White	9/3/2021	nature-trackers
Animalia	Arthropoda	Insecta	Psyllobora vigintimaculata	Twenty-spotted Lady Beetle	8/9/2018	willowg235
Animalia	Arthropoda	Insecta	Pyrrharctia isabella	Isabella Tiger Moth	10/11/2022	lattedray
Animalia	Arthropoda	Insecta	Rosalia funebris	Banded Alder Borer	7/8/2019	erika264
Animalia	Arthropoda	Insecta	Sympetrum pallipes	Striped Meadowhawk	10/6/2020	insectology
Animalia	Arthropoda	Insecta	Thalophaga hyperborea	Northern Thalophaga (moth)	2/11/2018	jimjohnson
Animalia	Arthropoda	Insecta	Tyria jacobaeae	Cinnabar moth	6/5/2019	matt227
Animalia	Arthropoda	Insecta	Tyria jacobaeae	Cinnabar moth	5/6/2021	andyneill
Animalia	Arthropoda	Insecta	Tyria jacobaeae	Cinnabar moth	5/9/2021	georver
Animalia	Arthropoda	Insecta	Ufeus satyricus	Brown Satyr Moth	2/17/2018	jimjohnson
Animalia	Arthropoda	Insecta	Vanessa atalanta	Red Admiral	7/12/2021	jamesjarrett00
Animalia	Chordata	Amphibia	Ambystoma macrodactylum macrodactylum	Western Long-toed Salamander	1/5/2018	jmaughn
Animalia	Chordata	Amphibia	Ensatina eschscholtzii oregonensis	Oregon Ensatina	1/5/2018	jmaughn
Animalia	Chordata	Amphibia	Pseudacris regilla	Northern Pacific Tree Frog	6/1/2021	mcrose
Animalia	Chordata	Amphibia	Taricha granulosa	Rough-skinned Newt	1/5/2018	jmaughn
Animalia	Chordata	Amphibia	Taricha granulosa	Rough-skinned Newt	1/1/2020	e1m2silva
Animalia	Chordata	Amphibia	Taricha granulosa	Rough-skinned Newt	11/30/2016	jensanford
Animalia	Chordata	Aves	Aphelocoma californica	California Scrub-Jay	8/10/2014	buck_fievre
Animalia	Chordata	Aves	Aphelocoma californica	California Scrub-Jay	7/12/2021	jamesjarrett00
Animalia	Chordata	Aves	Aphelocoma californica	California Scrub-Jay	11/23/2022	insectology
Animalia	Chordata	Aves	Ardea alba	Great Egret	5/1/2021	georver
Animalia	Chordata	Aves	Ardea herodias	Great Blue Heron	9/13/2020	insectology
Animalia	Chordata	Aves	Ardea herodias	Great Blue Heron	10/7/2020	insectology
Animalia	Chordata	Aves	Bombycilla cedrorum	Cedar Waxwing	7/12/2021	jamesjarrett00
Animalia	Chordata	Aves	Bubo virginianus	Great Horned Owl	5/1/2021	georver
Animalia	Chordata	Aves	Bubo virginianus	Great Horned Owl	8/20/2021	andyneill
Animalia	Chordata	Aves	Buteo jamaicensis	Red-tailed Hawk	9/13/2020	insectology
Animalia	Chordata	Aves	Buteo jamaicensis	Red-tailed Hawk	7/12/2021	jamesjarrett00
Animalia	Chordata	Aves	Buteo jamaicensis	Red-tailed Hawk	1/4/2022	jmaughn
Animalia	Chordata	Aves	Buteo jamaicensis	Red-tailed Hawk	4/1/2022	insectology
Animalia	Chordata	Aves	Calypte anna	Anna's Hummingbird	5/1/2021	georver
Animalia	Chordata	Aves	Calypte anna	Anna's Hummingbird	4/1/2022	insectology
Animalia	Chordata	Aves	Cardellina pusilla	Wilson's Warbler	5/16/2022	insectology

Kingdom	Phylum	Class	scientific_name	common_name	observed_on	user_login
Animalia	Chordata	Aves	Cathartes aura	Turkey Vulture	8/7/2016	suzanne22
Animalia	Chordata	Aves	Catharus ustulatus	Swainson's Thrush	5/9/2022	insectology
Animalia	Chordata	Aves	Catharus ustulatus	Swainson's Thrush	5/16/2022	insectology
Animalia	Chordata	Aves	Certhia americana	Brown Creeper	3/3/2020	lesfreck
Animalia	Chordata	Aves	Charadrius vociferus	Killdeer	7/9/2020	chriseearm
Animalia	Chordata	Aves	Colaptes auratus	Northern Flicker	9/13/2020	insectology
Animalia	Chordata	Aves	Colaptes auratus	Northern Flicker	9/24/2020	insectology
Animalia	Chordata	Aves	Colaptes auratus	Northern Flicker	9/24/2020	insectology
Animalia	Chordata	Aves	Colaptes auratus	Northern Flicker	9/24/2020	insectology
Animalia	Chordata	Aves	Colaptes auratus	Northern Flicker	3/28/2019	insectology
Animalia	Chordata	Aves	Colaptes auratus	Northern Flicker	5/1/2021	georver
Animalia	Chordata	Aves	Colaptes auratus	Northern Flicker	1/4/2022	jmaughn
Animalia	Chordata	Aves	Colaptes auratus	Northern Flicker	5/9/2022	insectology
Animalia	Chordata	Aves	Contopus sordidulus	Western Wood-Pewee	8/15/2018	jmaughn
Animalia	Chordata	Aves	Contopus sordidulus	Western Wood-Pewee	8/10/2014	buck_fievre
Animalia	Chordata	Aves	Contopus sordidulus	Western Wood-Pewee	7/6/2022	insectology
Animalia	Chordata	Aves	Corvus corax	Common Raven	9/13/2020	insectology
Animalia	Chordata	Aves	Cyanocitta stelleri	Steller's Jay	1/5/2018	jmaughn
Animalia	Chordata	Aves	Cyanocitta stelleri	Steller's Jay	5/1/2021	georver
Animalia	Chordata	Aves	Cyanocitta stelleri	Steller's Jay	7/12/2021	jamesjarrett00
Animalia	Chordata	Aves	Cyanocitta stelleri	Steller's Jay	5/31/2022	brucen
Animalia	Chordata	Aves	Dryobates pubescens	Downy Woodpecker	8/10/2014	buck_fievre
Animalia	Chordata	Aves	Dryobates villosus	Hairy Woodpecker	11/9/2019	shaymas_macamus
Animalia	Chordata	Aves	Dryobates villosus	Hairy Woodpecker	12/27/2020	susankirkbride
Animalia	Chordata	Aves	Dryocopus pileatus	Pileated Woodpecker	11/9/2019	shaymas_macamus
Animalia	Chordata	Aves	Empidonax oberholseri	Dusky Flycatcher	4/30/2022	dan564
Animalia	Chordata	Aves	Falco sparverius	American Kestrel	1/5/2018	jmaughn
Animalia	Chordata	Aves	Falco sparverius	American Kestrel	3/10/2018	dnewberry
Animalia	Chordata	Aves	Falco sparverius	American Kestrel	9/13/2020	insectology
Animalia	Chordata	Aves	Falco sparverius	American Kestrel	9/13/2020	insectology
Animalia	Chordata	Aves	Falco sparverius	American Kestrel	9/13/2020	insectology
Animalia	Chordata	Aves	Falco sparverius	American Kestrel	12/21/2020	insectology
Animalia	Chordata	Aves	Haemorhous mexicanus	House Finch	3/28/2019	insectology
Animalia	Chordata	Aves	Haliaeetus leucocephalus	Bald Eagle	10/18/2020	insectology
Animalia	Chordata	Aves	Haliaeetus leucocephalus	Bald Eagle	5/12/2021	nature-trackers
Animalia	Chordata	Aves	Haliaeetus leucocephalus	Bald Eagle	7/12/2021	jamesjarrett00
Animalia	Chordata	Aves	Hirundo rustica	Barn Swallow	8/15/2018	jmaughn
Animalia	Chordata	Aves	Hirundo rustica	Barn Swallow	8/15/2018	jmaughn
Animalia	Chordata	Aves	Hirundo rustica	Barn Swallow	6/7/2019	oakashandthorn

Kingdom	Phylum	Class	scientific_name	common_name	observed_on	user_login
Animalia	Chordata	Aves	Hirundo rustica	Barn Swallow	7/9/2020	chrisleearm
Animalia	Chordata	Aves	Hirundo rustica	Barn Swallow	7/9/2020	chrisleearm
Animalia	Chordata	Aves	Hirundo rustica	Barn Swallow	7/12/2021	jamesjarrett00
Animalia	Chordata	Aves	Hirundo rustica	Barn Swallow	9/2/2021	nature-trackers
Animalia	Chordata	Aves	Hirundo rustica	Barn Swallow	5/9/2022	insectology
Animalia	Chordata	Aves	Ixoreus naevius	Varied Thrush	1/4/2022	jmaughn
Animalia	Chordata	Aves	Junco hyemalis	Dark-eyed Junco	3/3/2022	insectology
Animalia	Chordata	Aves	Loxia curvirostra	Red Crossbill	12/27/2020	susankirkbride
Animalia	Chordata	Aves	Loxia curvirostra	Red Crossbill	12/27/2020	susankirkbride
Animalia	Chordata	Aves	Loxia curvirostra	Red Crossbill	5/9/2021	georver
Animalia	Chordata	Aves	Melanerpes formicivorus	Acorn Woodpecker	12/30/2016	kenchamberlain
Animalia	Chordata	Aves	Melanerpes formicivorus	Acorn Woodpecker	1/5/2018	jmaughn
Animalia	Chordata	Aves	Melanerpes formicivorus	Acorn Woodpecker	3/10/2018	dnewberry
Animalia	Chordata	Aves	Melanerpes formicivorus	Acorn Woodpecker	12/27/2020	susankirkbride
Animalia	Chordata	Aves	Melanerpes formicivorus	Acorn Woodpecker	2/3/2021	insectology
Animalia	Chordata	Aves	Melanerpes formicivorus	Acorn Woodpecker	3/3/2020	lesfreck
Animalia	Chordata	Aves	Melanerpes formicivorus	Acorn Woodpecker	7/12/2021	jamesjarrett00
Animalia	Chordata	Aves	Melanerpes formicivorus	Acorn Woodpecker	5/31/2022	brucen
Animalia	Chordata	Aves	Melospiza melodia	Song Sparrow	1/5/2018	jmaughn
Animalia	Chordata	Aves	Passer domesticus	House Sparrow	7/9/2020	chrisleearm
Animalia	Chordata	Aves	Passer domesticus	House Sparrow	7/12/2021	jamesjarrett00
Animalia	Chordata	Aves	Passerculus sandwichensis	Savannah Sparrow	5/1/2021	georver
Animalia	Chordata	Aves	Passerella iliaca	Fox Sparrow	12/30/2016	kenchamberlain
Animalia	Chordata	Aves	Passerina amoena	Lazuli Bunting	5/1/2021	georver
Animalia	Chordata	Aves	Patagioenas fasciata	Band-tailed Pigeon	7/6/2022	insectology
Animalia	Chordata	Aves	Pipilo maculatus	Spotted Towhee	12/30/2016	kenchamberlain
Animalia	Chordata	Aves	Pipilo maculatus	Spotted Towhee	3/3/2020	lesfreck
Animalia	Chordata	Aves	Pipilo maculatus	Spotted Towhee	1/4/2022	jmaughn
Animalia	Chordata	Aves	Pipilo maculatus	Spotted Towhee	7/6/2022	insectology
Animalia	Chordata	Aves	Piranga ludoviciana	Western Tanager	5/9/2022	insectology
Animalia	Chordata	Aves	Piranga ludoviciana	Western Tanager	5/9/2022	insectology
Animalia	Chordata	Aves	Piranga ludoviciana	Western Tanager	5/16/2022	insectology
Animalia	Chordata	Aves	Piranga ludoviciana	Western Tanager	5/16/2022	insectology
Animalia	Chordata	Aves	Poecile atricapillus	Black-capped Chickadee	7/12/2021	jamesjarrett00
Animalia	Chordata	Aves	Poecile rufescens	Chestnut-backed Chickadee	12/27/2020	susankirkbride
Animalia	Chordata	Aves	Setophaga coronata	Yellow-rumped Warbler	10/7/2020	insectology
Animalia	Chordata	Aves	Setophaga coronata	Yellow-rumped Warbler	10/7/2020	insectology
Animalia	Chordata	Aves	Setophaga coronata	Yellow-rumped Warbler	10/7/2020	insectology
Animalia	Chordata	Aves	Setophaga coronata	Yellow-rumped Warbler	12/21/2020	insectology

Kingdom	Phylum	Class	scientific_name	common_name	observed_on	user_login
Animalia	Chordata	Aves	Setophaga coronata	Yellow-rumped Warbler	3/3/2022	insectology
Animalia	Chordata	Aves	Setophaga coronata	Yellow-rumped Warbler	3/3/2022	insectology
Animalia	Chordata	Aves	Setophaga coronata	Yellow-rumped Warbler	3/3/2022	insectology
Animalia	Chordata	Aves	Setophaga petechia	Yellow Warbler	5/9/2022	insectology
Animalia	Chordata	Aves	Setophaga townsendi	Townsend's Warbler	12/27/2020	susankirkbride
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	1/5/2018	jmaughn
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	8/15/2018	jmaughn
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	5/4/2019	shaymas_macamus
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	6/5/2019	matt227
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	10/7/2020	insectology
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	10/7/2020	insectology
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	12/21/2020	insectology
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	5/1/2021	georver
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	5/28/2021	wintersdoor
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	7/12/2021	jamesjarrett00
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	3/3/2022	insectology
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	3/3/2022	insectology
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	3/3/2022	insectology
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	4/1/2022	insectology
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	4/1/2022	insectology
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	4/1/2022	insectology
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	4/1/2022	insectology
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	4/1/2022	insectology
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	4/1/2022	insectology
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	5/9/2022	insectology
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	5/9/2022	insectology
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	5/16/2022	insectology
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	5/16/2022	insectology
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	5/16/2022	insectology
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	5/30/2022	insectology
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	5/30/2022	insectology
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	7/7/2022	insectology
Animalia	Chordata	Aves	Sialia mexicana	Western Bluebird	7/7/2022	insectology
Animalia	Chordata	Aves	Sitta canadensis	Red-breasted Nuthatch	3/28/2019	rogersteeb
Animalia	Chordata	Aves	Sitta carolinensis	White-breasted Nuthatch	3/3/2020	lesfreck
Animalia	Chordata	Aves	Sitta carolinensis	White-breasted Nuthatch	7/12/2021	jamesjarrett00
Animalia	Chordata	Aves	Sitta carolinensis	White-breasted Nuthatch	3/3/2022	insectology
Animalia	Chordata	Aves	Sphyrapicus ruber	Red-breasted Sapsucker	5/1/2021	georver
Animalia	Chordata	Aves	Sphyrapicus ruber	Red-breasted Sapsucker	7/12/2021	jamesjarrett00
Animalia	Chordata	Aves	Spizella passerina	Chipping Sparrow	5/1/2021	georver

Kingdom	Phylum	Class	scientific_name	common_name	observed_on	user_login
Animalia	Chordata	Aves	Streptopelia decaocto	Eurasian Collared-Dove	9/13/2020	insectology
Animalia	Chordata	Aves	Strix varia	Barred Owl	5/24/2018	certified_dendrophile
Animalia	Chordata	Aves	Sturnella neglecta	Western Meadowlark	1/5/2018	jmaughn
Animalia	Chordata	Aves	Sturnus vulgaris	European Starling	1/5/2018	jmaughn
Animalia	Chordata	Aves	Tachycineta bicolor	Tree Swallow	4/1/2022	insectology
Animalia	Chordata	Aves	Thryomanes bewickii	Bewick's Wren	7/12/2021	jamesjarrett00
Animalia	Chordata	Aves	Thryomanes bewickii	Bewick's Wren	5/9/2022	insectology
Animalia	Chordata	Aves	Turdus migratorius	American Robin	3/28/2019	insectology
Animalia	Chordata	Aves	Turdus migratorius	American Robin	7/12/2021	jamesjarrett00
Animalia	Chordata	Aves	Turdus migratorius	American Robin	1/4/2022	jmaughn
Animalia	Chordata	Aves	Turdus migratorius	American Robin	4/1/2022	insectology
Animalia	Chordata	Aves	Turdus migratorius	American Robin	5/9/2022	insectology
Animalia	Chordata	Aves	Turdus migratorius	American Robin	7/2/2022	curiouscormorant
Animalia	Chordata	Aves	Zenaida macroura	Mourning Dove	9/13/2020	insectology
Animalia	Chordata	Aves	Zonotrichia atricapilla	Golden-crowned Sparrow	1/4/2022	jmaughn
Animalia	Chordata	Aves	Zonotrichia leucophrys	White-crowned Sparrow	3/28/2019	insectology
Animalia	Chordata	Aves	Zonotrichia leucophrys	White-crowned Sparrow	5/1/2021	georver
Animalia	Chordata	Mammalia	Canis latrans	Coyote	5/9/2022	insectology
Animalia	Chordata	Mammalia	Felis catus	Domestic Cat	9/13/2020	insectology
Animalia	Chordata	Mammalia	Mephitis mephitis	Striped Skunk	9/13/2020	insectology
Animalia	Chordata	Mammalia	Neotamias townsendii	Townsend's Chipmunk	10/8/2019	insectology
Animalia	Chordata	Mammalia	Neotamias townsendii	Townsend's Chipmunk	4/6/2022	jensanford
Animalia	Chordata	Mammalia	Neurotrichus gibbsii	American Shrewmole	9/13/2020	insectology
Animalia	Chordata	Mammalia	Odocoileus hemionus columbianus	Columbian Black-tailed Deer	12/27/2020	amy1507
Animalia	Chordata	Mammalia	Odocoileus hemionus columbianus	Columbian Black-tailed Deer	7/7/2021	leahpdx
Animalia	Chordata	Mammalia	Otospermophilus beecheyi	California Ground Squirrel	8/8/2018	willowg235
Animalia	Chordata	Mammalia	Otospermophilus beecheyi	California Ground Squirrel	3/22/2019	insectology
Animalia	Chordata	Mammalia	Otospermophilus beecheyi	California Ground Squirrel	3/3/2020	lesfreck
Animalia	Chordata	Mammalia	Otospermophilus beecheyi	California Ground Squirrel	6/14/2020	pacmath
Animalia	Chordata	Mammalia	Otospermophilus beecheyi	California Ground Squirrel	7/9/2020	chrisleearm
Animalia	Chordata	Mammalia	Otospermophilus beecheyi	California Ground Squirrel	9/13/2020	insectology
Animalia	Chordata	Mammalia	Otospermophilus beecheyi	California Ground Squirrel	9/13/2020	insectology
Animalia	Chordata	Mammalia	Otospermophilus beecheyi	California Ground Squirrel	5/1/2021	georver
Animalia	Chordata	Mammalia	Otospermophilus beecheyi	California Ground Squirrel	7/2/2021	sabersthe dragon
Animalia	Chordata	Mammalia	Otospermophilus beecheyi	California Ground Squirrel	5/31/2022	brucen
Animalia	Chordata	Mammalia	Otospermophilus beecheyi	California Ground Squirrel	6/22/2022	brucen
Animalia	Chordata	Mammalia	Otospermophilus beecheyi	California Ground Squirrel	7/10/2022	sophiafeathers
Animalia	Chordata	Mammalia	Otospermophilus beecheyi douglasii	Douglas' Ground Squirrel	7/12/2021	jamesjarrett00
Animalia	Chordata	Mammalia	Otospermophilus beecheyi douglasii	Douglas' Ground Squirrel	7/12/2021	jamesjarrett00

Kingdom	Phylum	Class	scientific_name	common_name	observed_on	user_login
Animalia	Chordata	Mammalia	Otospermophilus beecheyi douglasii	Douglas' Ground Squirrel	7/12/2021	jamesjarrett00
Animalia	Chordata	Mammalia	Otospermophilus beecheyi douglasii	Douglas' Ground Squirrel	5/9/2022	insectology
Animalia	Chordata	Mammalia	Otospermophilus beecheyi douglasii	Douglas' Ground Squirrel	5/16/2022	insectology
Animalia	Chordata	Mammalia	Procyon lotor	Common Raccoon	10/7/2020	insectology
Animalia	Chordata	Mammalia	Procyon lotor	Common Raccoon	6/24/2022	brucen
Animalia	Chordata	Mammalia	Sciurus carolinensis	Eastern Gray Squirrel	5/16/2022	insectology
Animalia	Chordata	Mammalia	Sciurus niger	Fox Squirrel	3/3/2020	lesfreck
Animalia	Chordata	Mammalia	Sciurus niger	Fox Squirrel	1/4/2022	jmaughn
Animalia	Chordata	Mammalia	Sciurus niger	Fox Squirrel	5/21/2022	andrea97202
Animalia	Chordata	Mammalia	Sciurus niger	Fox Squirrel	11/23/2022	insectology
Animalia	Chordata	Mammalia	Sylvilagus bachmani	Brush Rabbit	7/12/2021	jamesjarrett00
Animalia	Chordata	Mammalia	Sylvilagus bachmani	Brush Rabbit	5/16/2022	insectology
Animalia	Chordata	Mammalia	Tamiasciurus douglasii	Douglas' Squirrel	12/30/2016	kenchamberlain
Animalia	Chordata	Mammalia	Tamiasciurus douglasii	Douglas' Squirrel	6/22/2022	brucen
Animalia	Chordata	Reptilia	Thamnophis sirtalis	Common Garter Snake	9/7/2020	psimonb
Animalia	Mollusca	Gastropoda	Ariolimax columbianus	Pacific Banana Slug	5/1/2021	georver
Animalia	Mollusca	Gastropoda	Monadenia fidelis	Pacific Sideband	5/1/2021	georver

Parrett Mountain Greenway Access

Kingdom	Phylum	Class	Scientific Name	Common Name	Date	User
Animalia	Arthropoda	Insecta	Closterotomus norwegicus	Potato Mirid	6/23/2022	brucen
Animalia	Chordata	Aves	Patagioenas fasciata	Band-tailed Pigeon	6/23/2022	brucen
Animalia	Mollusca	Gastropoda	Monadenia fidelis	Pacific Sideband	6/23/2022	brucen
Animalia	Mollusca	Gastropoda	Monadenia fidelis	Pacific Sideband	6/23/2022	brucen

Champoeg State Heritage Area

eBird List: 146 species

downloaded 19 October 2022

Bold font = conservation concern in WV; *italic = introduced*

Alphabetic Order	Phylogenetic Order
Acorn Woodpecker	Snow Goose
American Crow	Greater White-fronted Goose
American Goldfinch	Cackling Goose
American Kestrel	Canada Goose
American White Pelican	Cackling/Canada Goose
American Wigeon	Tundra Swan
Anna's Hummingbird	Wood Duck
Bald Eagle	Cinnamon Teal
Band-tailed Pigeon	Northern Shoveler
Bank Swallow	Gadwall
Barn Swallow	Eurasian Wigeon
Barred Owl	American Wigeon
Belted Kingfisher	Mallard
Bewick's Wren	Northern Pintail
Black Phoebe	Green-winged Teal
Black-billed Magpie	Ring-necked Duck
Black-capped Chickadee	Bufflehead
Black-headed Grosbeak	Hooded Merganser
Brown Creeper	Common Merganser
Brown-headed Cowbird	California Quail
Bufflehead	Ruffed Grouse
Bullock's Oriole	<i>Ring-necked Pheasant</i>
Bushtit	Pied-billed Grebe
Cackling Goose	Red-necked Grebe
Cackling/Canada Goose	Eared Grebe
California Quail	Western Grebe
California Scrub-Jay	<i>Rock Pigeon</i>
Canada Goose	Band-tailed Pigeon
Cassin's Finch	<i>Eurasian Collared-Dove</i>
Cassin's Vireo	Mourning Dove
Chestnut-backed Chickadee	Vaux's Swift
Chipping Sparrow	Anna's Hummingbird
Cinnamon Teal	Rufous Hummingbird
Cliff Swallow	Virginia Rail
Common Merganser	Sora
Common Raven	Sandhill Crane
Common Yellowthroat	Killdeer
Cooper's Hawk	Dunlin
Dark-eyed Junco	Western Sandpiper

Double-crested Cormorant	Long-billed Dowitcher
Downy Woodpecker	Wilson's Snipe
Dunlin	Red-necked Phalarope
Eared Grebe	Spotted Sandpiper
<i>Eurasian Collared-Dove</i>	Greater Yellowlegs
Eurasian Wigeon	Lesser Yellowlegs
<i>European Starling</i>	Ring-billed Gull
Fox Sparrow	Glaucous-winged Gull
Gadwall	Double-crested Cormorant
Glaucous-winged Gull	American White Pelican
Golden-crowned Kinglet	Great Blue Heron
Grasshopper Sparrow	Great Egret
Great Blue Heron	Green Heron
Great Egret	Turkey Vulture
Great Horned Owl	Osprey
Greater White-fronted Goose	Northern Harrier
Greater Yellowlegs	Sharp-shinned Hawk
Green Heron	Cooper's Hawk
Green-winged Teal	Northern Goshawk
Hairy Woodpecker	Bald Eagle
Hammond's Flycatcher	Red-shouldered Hawk
Hermit Thrush	Red-tailed Hawk
Hooded Merganser	Rough-legged Hawk
House Finch	Great Horned Owl
House Wren	Northern Pygmy-Owl
Hutton's Vireo	Barred Owl
Killdeer	Belted Kingfisher
Lazuli Bunting	Red-breasted Sapsucker
Lesser Goldfinch	Lewis's Woodpecker
Lesser Yellowlegs	Acorn Woodpecker
Lewis's Woodpecker	Downy Woodpecker
Lincoln's Sparrow	Hairy Woodpecker
Long-billed Dowitcher	Pileated Woodpecker
MacGillivray's Warbler	Northern Flicker
Mallard	American Kestrel
Marsh Wren	Merlin
Merlin	Peregrine Falcon
Mourning Dove	Prairie Falcon
Nashville Warbler	Olive-sided Flycatcher
Northern Flicker	Western Wood-Pewee
Northern Goshawk	Willow Flycatcher
Northern Harrier	Hammond's Flycatcher
Northern Pintail	Pacific-slope Flycatcher
Northern Pygmy-Owl	Black Phoebe

Northern Rough-winged Swallow	Western Kingbird
Northern Shoveler	Hutton's Vireo
Olive-sided Flycatcher	Cassin's Vireo
Orange-crowned Warbler	Warbling Vireo
Osprey	Steller's Jay
Pacific Wren	California Scrub-Jay
Pacific-slope Flycatcher	Black-billed Magpie
Peregrine Falcon	American Crow
Pied-billed Grebe	Common Raven
Pileated Woodpecker	Black-capped Chickadee
Pine Siskin	Chestnut-backed Chickadee
Prairie Falcon	Northern Rough-winged Swallow
Purple Martin	Purple Martin
Red Crossbill	Tree Swallow
Red-breasted Nuthatch	Violet-green Swallow
Red-breasted Sapsucker	Bank Swallow
Red-necked Grebe	Barn Swallow
Red-necked Phalarope	Cliff Swallow
Red-shouldered Hawk	Bushtit
Red-tailed Hawk	Ruby-crowned Kinglet
Red-winged Blackbird	Golden-crowned Kinglet
Ring-billed Gull	Red-breasted Nuthatch
Ring-necked Duck	White-breasted Nuthatch
<i>Ring-necked Pheasant</i>	Brown Creeper
<i>Rock Pigeon</i>	House Wren
Rough-legged Hawk	Pacific Wren
Ruby-crowned Kinglet	Marsh Wren
Ruffed Grouse	Bewick's Wren
Rufous Hummingbird	<i>European Starling</i>
Sandhill Crane	Western Bluebird
Savannah Sparrow	Varied Thrush
Sharp-shinned Hawk	Swainson's Thrush
Snow Goose	Hermit Thrush
Sora	House Finch
Spotted Sandpiper	Cassin's Finch
Spotted Towhee	Red Crossbill
Steller's Jay	Pine Siskin
Swainson's Thrush	Lesser Goldfinch
Townsend's Warbler	American Goldfinch
Tree Swallow	Grasshopper Sparrow
Tundra Swan	Chipping Sparrow
Turkey Vulture	Fox Sparrow
Varied Thrush	Dark-eyed Junco
Vaux's Swift	White-crowned Sparrow

Vesper Sparrow	White-throated Sparrow
Violet-green Swallow	Vesper Sparrow
Virginia Rail	Savannah Sparrow
Warbling Vireo	Lincoln's Sparrow
Western Bluebird	Spotted Towhee
Western Grebe	Western Meadowlark
Western Kingbird	Bullock's Oriole
Western Meadowlark	Red-winged Blackbird
Western Sandpiper	Brown-headed Cowbird
Western Tanager	Orange-crowned Warbler
Western Wood-Pewee	Nashville Warbler
White-breasted Nuthatch	MacGillivray's Warbler
White-crowned Sparrow	Common Yellowthroat
Willow Flycatcher	Townsend's Warbler
Wilson's Snipe	Wilson's Warbler
Wilson's Warbler	Western Tanager
Wood Duck	Black-headed Grosbeak
Yellow-rumped Warbler	Lazuli Bunting

145 spp.

Parrett Mountain Greenway Access

eBird List: 62 species

downloaded 18 October 2022

Alphabetic Order	Phylogenetic Order
Acorn Woodpecker	Cackling Goose
American Crow	Canada Goose
American Goldfinch	Northern Pintail
American Kestrel	<i>Rock Pigeon</i>
American Robin	Mourning Dove
Anna's Hummingbird	Vaux's Swift
Bald Eagle	Anna's Hummingbird
Barn Swallow	Rufous Hummingbird
Belted Kingfisher	shorebird sp.
Bewick's Wren	Double-crested Cormorant
Black-capped Chickadee	Great Blue Heron
Black-headed Grosbeak	Turkey Vulture
Brown Creeper	Osprey
Bullock's Oriole	Northern Harrier
Bushtit	Bald Eagle
Cackling Goose	Red-tailed Hawk
California Scrub-Jay	Western Screech-Owl
Canada Goose	Belted Kingfisher
Cedar Waxwing	Red-breasted Sapsucker
Chestnut-backed Chickadee	Acorn Woodpecker
Common Raven	Downy Woodpecker

Common Yellowthroat	Hairy Woodpecker
Dark-eyed Junco	Pileated Woodpecker
Double-crested Cormorant	Northern Flicker
Downy Woodpecker	American Kestrel
<i>European Starling</i>	Olive-sided Flycatcher
Fox Sparrow	Western Wood-Pewee
Golden-crowned Kinglet	Willow Flycatcher
Great Blue Heron	Steller's Jay
Hairy Woodpecker	California Scrub-Jay
House Finch	American Crow
MacGillivray's Warbler	Common Raven
Mourning Dove	Black-capped Chickadee
Northern Flicker	Chestnut-backed Chickadee
Northern Harrier	Northern Rough-winged Swallow
Northern Pintail	Violet-green Swallow
Northern Rough-winged Swallow	Barn Swallow
Olive-sided Flycatcher	Bushtit
Orange-crowned Warbler	Ruby-crowned Kinglet
Osprey	Golden-crowned Kinglet
Pileated Woodpecker	Red-breasted Nuthatch
Purple Finch	White-breasted Nuthatch
Red Crossbill	Brown Creeper
Red-breasted Nuthatch	Bewick's Wren
Red-breasted Sapsucker	<i>European Starling</i>
Red-tailed Hawk	Western Bluebird
Red-winged Blackbird	Swainson's Thrush
<i>Rock Pigeon</i>	American Robin
Ruby-crowned Kinglet	Cedar Waxwing
Rufous Hummingbird	House Finch
shorebird sp.	Purple Finch
Song Sparrow	Red Crossbill
Spotted Towhee	American Goldfinch
Steller's Jay	Fox Sparrow
Swainson's Thrush	Dark-eyed Junco
Turkey Vulture	Song Sparrow
Vaux's Swift	Spotted Towhee
Violet-green Swallow	Bullock's Oriole
Western Bluebird	Red-winged Blackbird
Western Screech-Owl	Orange-crowned Warbler
Western Wood-Pewee	MacGillivray's Warbler
White-breasted Nuthatch	Common Yellowthroat
Willow Flycatcher	Black-headed Grosbeak

From: "Salem Audubon Society" <salemaudubonsociety@gmail.com>

Sent: Monday, January 23, 2023 4:38:10 PM

Subject: SAS Champoeg State Park Bird Walk

Champoeg State Park Bird Walk Report January 23, 2023

Generally, I do not send out a report on some of these walks but this one was so nice I decided to do a report. The bird walk was led by Dom Valenti who was joined by 10 other birders. The temperature ranged from 38 to 43 degrees. We were met with cloudy skies and some higher-level fog. Toward the end of the walk the wind picked up a little and it felt cooler. However, the conditions at the park were a lot better than those in the Salem area. We walked 2.13 miles while walking through the Oak Grove Day-Use area, through the campground and along the Willamette River. The bird activity was incredibly good given the conditions with a total of 35 species identified (seen and/or heard).

The highlights were as follows:

- One of the highlights was a **Hermit Thrush** in the campground area. Everyone got good looks at the thrush. Nearby was another thrush, the **Varied Thrush**. As we went through the campground, we saw a flock of **Golden-crowned Sparrows** along with two **Spotted Towhees** and a **Song Sparrow**. There also was an **Anna's Hummingbird**.
- Along the Willamette River we saw six **Double-crested Cormorants** including two juveniles and five **Common Mergansers**. In addition, we heard a **Belted Kingfisher**. There were two **Chestnut-backed Chickadees** in a tree near the river too.
- Near the parking lot we saw several **Acorn Woodpeckers** and a pair of **Red-breasted Sapsuckers**. We also saw a **Downy Woodpecker** and heard a couple of **Northern Flickers** as we walked from the parking lot to the bridge.
- As we continued to walk toward the bridge we had six **Western Bluebirds** fly over us.
- In the park there is a possibility of observing six woodpecker species. We observed five of the six species. Besides the woodpeckers noted above we heard a **Pileated Woodpecker**. The only woodpecker we did not observe was the Hairy Woodpecker.
- On our way back to the parking lot near the bridge we hit the mother lode of birds. There were numerous Black-capped Chickadees, several Ruby-crowned and Golden-crowned Kinglets, Bushtits, nuthatches and two Bewick's Wrens singing back and forth. It prolonged the walk by 20 minutes or so, but it was well worth it.

The next Salem Audubon bird walk is at Minto-Brown Island Park on Thursday, February 2, 2023 at 9:00 AM. Meet in parking lot #3 (the last parking lot). Hope to see you there.

Champoeg State Park Checklist Summary for January 23, 2023

Identified Species: 35

Checklist:

Champoeg State Park (Oak Grove area)

25 Cackling Goose
2 Canada Goose
5 Common Merganser
2 Anna's Hummingbird
6 Double-crested Cormorant -- 2 juveniles
1 Great Blue Heron
1 Red-tailed Hawk
1 Belted Kingfisher
2 Red-breasted Sapsucker
6 **Acorn Woodpecker**
2 Downy Woodpecker
1 Pileated Woodpecker
4 Northern Flicker
1 American Kestrel
2 Steller's Jay
4 California Scrub-Jay
3 American Crow
18 Black-capped Chickadee
2 Chestnut-backed Chickadee
6 Bushtit
4 Ruby-crowned Kinglet
6 **Golden-crowned Kinglet**
3 Red-breasted Nuthatch
3 **White-breasted Nuthatch**
2 Brown Creeper
6 Bewick's Wren
3 European Starling
7 **Western Bluebird**
1 Varied Thrush
1 Hermit Thrush
9 American Robin
20 Golden-crowned Sparrow
5 Song Sparrow
3 Spotted Towhee
3 Yellow-rumped Warbler

eBird checklist link: <https://ebird.org/checklist/S126801371>

At-risk species in list **bolded** by BN

NW Bat Hub download for Champoeg SHA (CSHA) and Parrett Mtn. Greenway Access (PMGA) area

“2016-21 NW NABat Acoustic Records” and “Occurrence Prediction” (ordered most likely to least likely)

Downloaded 2022-06-20; Sampling site is east of I-5, about same latitude as CSHA

Species richness (detected species) at sampling site = 7

	Area ID:	114854: Sampling site SE of CSHA	115316: SCHA and PMGA	
Common name	Latin name	Detected?	Predicted occurrence	Error (SD)
Yuma Bat	Myotis yumaensis	Yes	.99	.01
California Bat	Myotis californicus	Yes	.97	.03
Silver-haired Bat	Lasionycteris noctivagans	Yes	.93	.07
Big Brown Bat	Eptesicus fuscus	Yes	.92	.09
Little Brown Bat	Myotis lucifugus	Yes	.92	.18
Hoary Bat	Lasiurus cinereus	Yes	.87	.23
Fringed Myotis	Myotis thysanodes	No	.63	.33
Long-legged Bat	Myotis volans	No	.38	.23
Long-eared Bat	Myotis evotis	Yes	.30	.28
Pallid Bat		No		
Townsend's Big-eared Bat		No		
Spotted Bat		No		
Western Small-footed Bat		No		
Canyon Bat		No		
Mexican Free-tailed Bat		No		

Actual aural detection of a species is noted above for the sampling site (identified by its assigned hexagon number) which is the closest one to the CSHA-PMGA study area. The second hexagon number shown contains the study area, but shows predictions of occurrence only, not actual detections, as no sampling has been done in that area.

ODFW Compass 12/01/22

Formatted by B. Newhouse

Name Champoeg SHA & Parrett Mt. Grnwy. Access area

Area sq. mi. 8 (Compilation of larger hexagons including above areas.)

Ecoregions Willamette Valley

Conservation Opportunity Areas Middle Willamette River Floodplain, COA 060

Strategy Habitats Oak Woodlands

Flowing Water and Riparian Habitats

Wetlands

Documented Strategy Fish	Modeled Strategy Wildlife Habitat
Chinook Salmon - Spring Run	Acorn Woodpecker
Oregon Chub	California Myotis
Pacific Lamprey	Chipping Sparrow
Winter Steelhead / Coastal Rainbow Trout	Clouded Salamander
Western Brook Lamprey	Common Nighthawk
	Fringed Myotis
Observed Strategy Wildlife	Hoary Bat
Acorn Woodpecker	Northern Spotted Owl
California Myotis	Olive-sided Flycatcher
Chipping Sparrow	Short-Eared Owl
Northern Spotted Owl	Silver-haired Bat
Olive-sided Flycatcher	Townsend's Big-eared Bat
Oregon Vesper Sparrow	Western Bluebird
Peacock Larkspur	Western Gray Squirrel
Silver-haired Bat	Western Meadowlark
White-breasted Nuthatch (Slender-billed)	Western Painted Turtle
Western Bluebird	Western Pond Turtle
Western Meadowlark	Purple Martin
Western Painted Turtle	Willow Flycatcher
Western Pond Turtle	Yellow-Breasted Chat
White Rock Larkspur	Disclaimer
Willow Flycatcher	Data used to generate this report has been summarized.
Yellow-Breasted Chat	See http://dfw.state.or.us/maps/compass/reportingtool.asp

**Report on Research Conducted at LaButte
Submitted to Champoege State Park**

Dr. Marion Dresner
Associate Professor
Portland State University
November 20, 2010

Synopsis:

There is ample evidence that the entire steep north face of LaButte, approximately 8 hectares or 20 acres, is in old growth condition. This is rare for low elevation Willamette Valley forests. Surveyor's notes from the 1850's mention white (grand fir) red and yellow fir (PSME) were abundant at or near the site. Presently, many mature *Abies grandis* (average DBH 75 cm), and, especially noteworthy, many giant *Pseudotsuga menziesii* (approximately 16 having a DBH ranging between 149cm – 178 cm) occur at the site. These trees have many characteristics of old growth besides their giant stature, including sloughed off bark, and are firmly anchored onto the steep slopes. One giant tree (DBH 175 cm) was cored and aged at approximately 300 years old. Throughout the site there are other old growth stand characteristics, including abundant downed woody debris, many snags, canopy gaps, abundant Pacific Yew, and no PSME saplings.

This area is important for ecological study and is of interest to the park for historic reasons. The ages of the older Douglas fir predates by more than 100 years the earliest known settlement (Newell in early 1840's) in the Willamette Valley. Since shrubs can exist in the understory for long periods of time, the shrub members of the plant community may be even older than the giant trees. It is important to ecologists to have forest stands in a reference "pre-settlement" conditions to understand human impacts and project future conditions under various scenarios. This forest community has not experienced a stand replacing disturbance since the oldest cohort of trees were established approximately 300 years ago. There are fire scars on some of the giant trees occurring at the base of the site, probably pre-dating 1850, when Indian burning was forbidden in the Willamette Valley. Before the cessation of Indian burning, fire was probably a regular occurrence on the south side of LaButte, and only rarely did fire swept down to the north side of LaButte. This north facing aspect of the slope and the local topography traps valley fog, keeping the site moist throughout the rainy season.

Introduction:

La Butte is a forested steep site within Champoege State Park. La Butte extends in elevation from approximately 60 ft. to 423 ft. in elevation. It contains 14 very large old trees that are probably around 300 years in age (*Pseudotsuga m.* and *Abies g.*) as well as younger age classes of *Pseudotsuga m.* (Douglas fir), *Abies g.* (Grand fir), *Thuja p.* (Western Redcedar), *Taxus b.* (Pacific Yew), *Quercus g.* (Oregon White Oak), *Populus b.* (black cottonwood), *Acer m.* (Big leaf maple), *Alnus r.* (Red alder) *Arbutus m.* (Madrone), and *Fraxinus l.* (Oregon ash). The oldest conifers date from before any logging in the area. Initial logging began during the 1800's. At the top of La Butte, many tree stumps representing at least two different degrees of decay are present, indicating different logging events before the property reverted to State Park ownership (1930's).

On the north side of LaButte, there are at least three different age classes of living trees: the oldest remnant trees (14 trees), mature trees (several different age classes, ranging in age from 70 to 130 years old), young trees (less than 70 in the subcanopy) and young saplings. Soils are in the Woodburn series, with relatively high nutrient levels (high Ca, Mg, K, with relatively neutral pH (5.7-6.2) relative to other parts of the Willamette valley.

The study site is the entire north facing slope of La Butte, extending from the eastern park boundary to the west boundary of the feature, demarcated by the park service road. The eastern-most and western margins of the study area had been logged during the 1920-30's for the then proposed Champoege highway. Those two sites, probably not replanted with Douglas fir, are now dominated by re-sprouted *Acer macrophyllum* (ACMA, Big leaf maple) communities. Above the steep old growth portion, and directly besides it, on leveler ground, there is evidence of logging indicated by the presence of stumps. It would be interesting to know when this logging occurred. There appears to be one set of very decayed stumps and another set of less decayed, more recent stumps, predating the 1930's date when State Parks took over the ownership of LaButte.

I began this study with an interest in understanding the relationship between the old giant trees and the herbaceous plants on the forest floor. What are the similarities and differences in distribution and abundance of forest plants, and what processes or old growth related structures cause the differences throughout LaButte? A combination of chance for seeds to arrive at right time and successional stage during which the proper conditions exist for the plant to grow and reproduce are used to help explain current plant distribution. How do mycorrhizal networks contribute to the plant community relationships? Root mass of a forest ecosystem could be considered a single functional unit, rather than interwoven independent entities. (Woods and Brock, 1964)

LaButte is moist throughout the rainy season; winter and spring, with a fog patch typically sitting just under the peak throughout the mornings. Overstory influences could act via canopy; light or moisture interception, soil (chemistry and accumulation), underground networks, or all. Moisture status is also important; plots with lower shrub and herb cover are moister, or with no big old trees, or, with less trees (e.g., meadow) (Traut, 1994). Is species richness higher in dry sites? (Zobel, 1976)

Pseudotsuga menziesii (PSME), Douglas fir) is dominant in the overstory at LaButte. *Abies grandis* (ABGR, Grand fir) is now the most abundantly reproducing tree species (besides ACMA sprouts). The clustered distribution of older PSME indicates a more open forest, probably due to burning, when these trees were maturing (Cole, cited by Traut).

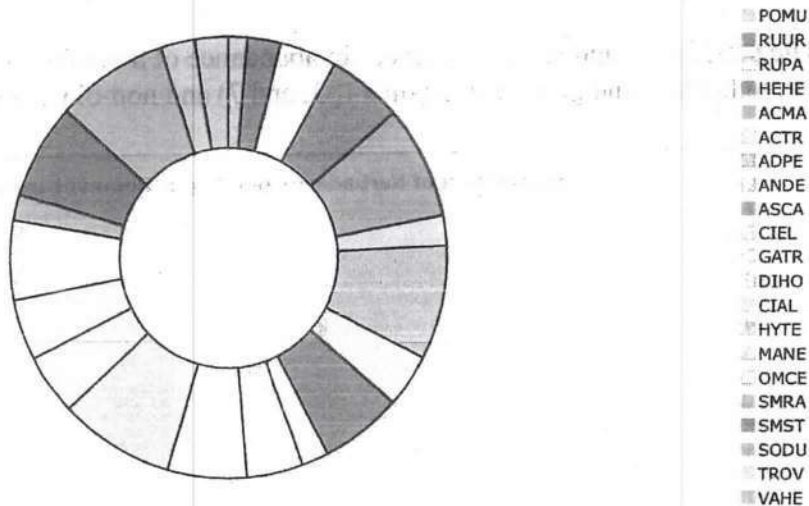
Six 20X 20 m study plots were set up over two successive years, both during same time period in late spring. Size of old growth Douglas fir was measured and percent cover of forest floor plants data was collected around clusters of old trees. Two of these areas are described below; the Grand-Grove-Old Grove unit near the summit of LaButte and the HP-HN unit near the bottom.

GG- OG (Grand grove-Old grove) are on some of the steepest area of La Butte and characterized by 5 mature ABGR, average DBH 75 cm., and some of the largest PSME, 6 trees, average DBH 152 cm, and mature PSME and snags nearby. The Grand fir grove is upslope (25-30 M) from the group of old PSME. and a few snags. This area is considered one megaplot, since the forest floor plant communities were essentially similar. Nearby, another large PSME (157 cm) occurs along with 4 other younger PSME (85.6 cm DBH) and ACMA (many stems)

Near the bottom of the slope is another area (HP-HN plot) having a number of giant trees. 2 larger PSME (av. DBH 129cm), two large old PSME (av. DBH 168.4 cm), 3 young PSME, several snags, much shrub cover (Oemlera, Cascara, COCO, small ACMA, ACCI), downed ACMA. These plots are considered one megaplot, since they are similar in terms of vegetation.

Another area of study is a large, lovely meadow with high abundance of herbaceous plants. This meadow had growing ACMA around perimeter beginning to shade out the meadow plants, decayed snag in middle (PSME?). The chart below illustrates the herbaceous species diversity in the meadow in 2008. Since then, the area has become significantly more shaded by the encroaching ACMA branches.

Herb CV diversity Big Meadow



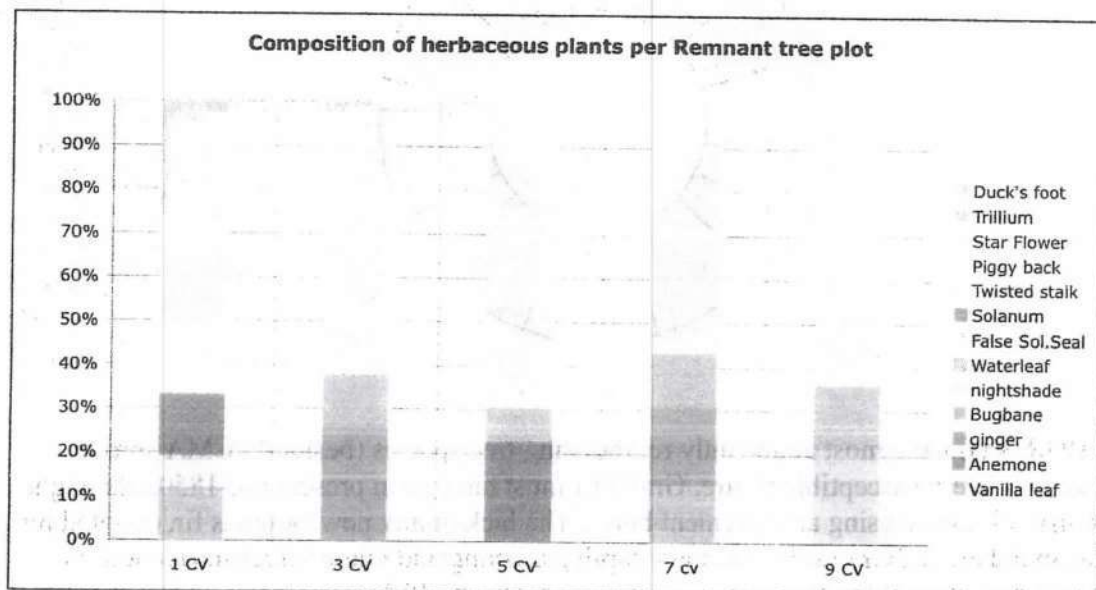
ABGR is now the most abundantly reproducing tree species (besides ACMA sprouts). Since it is very susceptible to fire, Grand fir must have been present pre-1850, although it is difficult to age using an increment borer. The lack of any new Douglas fir, coupled by the abundance of Grand fir seedlings, saplings, young and mature trees throughout La Butte, provide evidence that *Abies grandis* is replacing PSME due in part to fire suppression.

According to a study by Halpern and Spies (1995), there are specific plant species associated with old growth forests for Oregon Coast range and Cascades. They include the following species, all of which are abundant at LaButte:

- Taxis brevifolia (Pacific yew)
- Acer circinatum (Vine maple)
- Achlys triphylla (Vanilla leaf)
- Asarum caudate (ginger)
- Disporum hookeri (fairy bells)
- Mahonia nervosa (Oregon grape)
- Adiantum pendatum (Maidenhair fern)
- Polypodium glycyrriza (licorice fern)
- Smilacina racemosa (False Solomon's seal)

Percent cover data was collected in the two megaplots described above, as well as comparison sites outside of the old growth area. T-tests were run to test the idea that there would be a higher occurrence of sold-growth related species in old growth plots as compared with non-old growth tree plots. *Achlys triphylla* (Vanilla leaf) was the only species whose occurrence was significantly related to old growth conditions at the site ($t=3.3$, t critical = 2.92, $p < 0.05$). *Smilacina racemosa* (False Solomon's seal) was more abundant in plots near giant trees, but was not significantly so. Overall, plant species richness, and abundance of late successional herbs was greater in the old growth area when compared to areas out of that region. See the paragraphs below for more details.

The table below indicates differences in abundance of a number of forest floor herbs throughout the old growth area (sites 1, 3, and 7) and non-old growth area (sites 5, 9)



Average species richness was 17 species for old growth tree plots and 14.8 species for non-old growth tree plots. Differences between herbaceous species of plants in tree plots in the old growth area compared with herbaceous species in the young tree plots, was significant ($t= 1.81$, t critical = 1.79, $p < 0.05$). At first, I assumed this had to do with a

relatively open canopy in the Old growth area. Sunflecks can be important to many understory species (Percy, 1983). Herbaceous species richness tends to decrease with closed canopy. Within the Old Growth steep area, there are areas without old trees due to ecological rather than human influence factors. Old growth is now considered to have a "shifting mosaic" appearance rather than occurring as a uniform old tree stand.

Old growth condition also requires an abundance of coarse woody debris. My surveys of coarse woody debris indicate it is relatively abundant on the site when compared with areas off the steep sloped stand. Coarse woody debris influences soil moisture and stand humidity. Soil litter chemistry is different due to longer accumulation of material. There is probably greater degree of mycorrhizal association developed over time, along with better nutrient uptake. Underground mycorrhizal networks linking individual trees of same and different species, linking herbaceous plant species with tree species. These mutualists serve as solar collectors for plants so that they exist even under low light conditions for long periods of time.

In addition, there is a large population of tall bugbane, *Cimicifuga elata*, throughout the area. This is a rare plant in Oregon. Tall Bugbane was not found where English ivy was predominant. Therefore, it is suggested that ivy removal begins, centering around the old growth site at La Butte. English ivy was found to have a negative association with other forest plants; Anemone, ginger, and Elderberry.

Management Suggestions: This area should be managed as a research natural area and its biodiversity should be maintained. Much of the original forest of Champoege had been harvested when LaButte was added in the 1930's, except for this steep area. The preliminary results of my study indicate a significant difference in the plant diversity in forest herbaceous plants in the old growth area when compared with younger areas outside the steep patch. This area could be seen as a haven for plant species and a source from which plants were able to repopulate the site after logging. The presence of a number of an older age class of trees represents some ecosystem carryover of organisms and processes from an old growth condition that can spread to the neighboring areas. The presence of a diverse understory plant community under the canopy of the old growth area could perpetuate the below-ground ecosystem components and processes associated with old growth forests. The area surrounding the old growth patch, now at a younger developmental stage, could be managed for re-establishment of a structurally rich and species diverse old growth forest environment, a "shifting mosaic" of a variety of stand structures of different age classes (see Franklin et. al., 2006). It might be possible to accelerate of structural features characteristic of old growth forests by selectively felling Big leaf maple or some of the more crowded Douglas fir to allow for growing space for the remaining trees. Additional features that indicate old growth status are already present at the steep site; a shade-tolerant understory of *Abies grandis* (Grand fir) and accumulating large woody debris. It must be noted this area could potentially be habitat for old-growth-related birds and other animals.

Since certain plants of interest, such as tall bugbane, are not found where English ivy predominates, this area should receive special consideration when it comes to invasive species removal and site conservation. English ivy should be kept from encroaching into this unique ecological area as well.

Unfortunately, due to the steepness of the terrain (from 30% to 40% slope), it is impossible to create trails to bring the public up to hike in this area. Any system of trails would accelerate erosion and cause significant soil compaction, which would have negative consequences for the vegetation.

References:

Franklin, J.F., Berg, D.R., Carey, A.B., Hardt, R. A. 2006. Old Growth Conifer Forests. In Restoring the Pacific Northwest, Apostol and Sinclair, Eds. Island Press.

Halpern, C.B., Spies, T.A., 1995. Plant species diversity in natural and managed forests in the Pacific Northwest. *Ecological Applications* 5 (4): 913-934.

Traut, B. H., and Muir, P. S., 2000. Relationships of remnant trees to vascular undergrowth communities in the western Cascades: a retrospective approach. *Northwest Science* 74 (3); 212-223.

Woods and Brock, 1964. Interspecific Transfer of Ca-45 and P-32 by Root Systems, *Ecology* Vol. 45 (4) 886-889.

Zobel, 1976, Relationships of environment to composition, structure and diversity of forest communities, *Ec.o Monographs* 46: 135-156.)

Champoeg State Heritage Area



Natural Resource Function and Value Assessment Site Scores

I. Habitat Values		Score	Notes
a. Size of site	8	675.4 acres	
b. Proximity/connectivity	2	32 acres (Parrette Mountain Access – across river)	
c. Contained within a OCS COA	3	95% within Middle Willamette River Floodplain COA	
d. Diversity of “Strategy Habitats”	4	Flowing water/riparian (75 ac.); Oak woodland (60 ac.); Wetlands (50 ac.); Grasslands (140 ac.)	
e. Percentage “Strategy Habitats”	4	48%: Approximately 325 acres total	
f. Quantity/quality of native vegetation	2	Average overall: Native vegetation communities above average; Large amount of acreage in agricultural production with no native vegetation	
g. Human-caused disturbance factors	1	Disturbance factor: Adjacent and on-site agriculture; Adjacent residential; Large number of visitors; Major trails; Significant mowed area	
h. Presence Invasive plant species	1	Moderate	
i. Presence of rare plant and/or wildlife species	10	Documented: Chinook Salmon; Coho Salmon; Steelhead; Pacific Lamprey; Willow Flycatcher; Olive-Sided Flycatcher; Acorn Woodpecker; Western Bluebird; Western Meadowlark; White-breasted Nuthatch; Pileated Woodpecker; Common Nighthawk; Chipping Sparrow; Northern Red-legged Frog; Monarch Butterfly; Western Gray Squirrel; Peacock larkspur; White rock larkspur	
j. OPRD property designation	2	State Park	
k. Bonus	4	Heron nesting; mature oaks; Portions of park are ranked in top 10% highest habitat value lands in Regional Conservation Strategy; Multiple habitat snags; old growth conifers at La Butte; past restoration investment; Large amount of Wapato wetland soils	
Sub Total (of 62 possible):		41	
II. Water Quality and Floodplain Function			
a. Floodplain function	7	552 acres within 100-year floodplain	
b. Presence and permanence of water on site	4	Perennial Mission Creek, Champoeg Creek, and Ryan Creek pass through the park; Approximately 50 acres of seasonal and perennial wetlands	
c. Water quality function of riparian vegetation	2	Moderate: Broad band of mature riparian vegetation along river on east side of park; Very narrow or missing riparian forest along segments on the creeks and river on west side	
d. Bonus	1	Extensive river frontage; Seeps on hillside at west end	
Sub Total (of 20 possible):		14	
III. Public Use and Enjoyment			
a. Recreational access and facilities	6	High: Campground; Day use area; Extensive trail network; Boat ramp; Interpretive center	
b. Existing educational use	3	High: Interpretive center; School program; Interpretive staff and volunteers; Interpretive signage	
c. Nature Appreciation	4	High: River views and views of surrounding landscape; Some quiet trail segments; Heavy use, especially in summer	
d. Bonus	3	On designated water trail; High level of community support; Unique historical landscape; Near population center (Newberg)	
Sub Total (of 18 Possible):		16	
Total All Categories:		71	

Related Plans or Studies: Champoeg State Park Master Plan Summary (OPRD, 1990); Champoeg Bioblitz Tally (OPRD, 2010); Regional Conservation Strategy for the Greater Portland-Vancouver Region (Intertwine, 2012)

Parrette Mountain Access Willamette River Greenway



Natural Resource Function and Value Assessment Site Scores

I. Habitat Values	Score	Notes
a. Size of site	4	32.2 acres
b. Proximity or connectivity to other conserved or public lands	4	675 acres: Champoeg State Heritage Area on opposite bank of Willamette River
c. Contained within a OCS Conservation Opportunity Area (COA)	3	70 % within Middle Willamette River Floodplain COA
d. Diversity of OCS "Strategy Habitats"	2	Flowing water/riparian (15 acres); Grasslands (6 acres)
e. Percentage of site containing OCS "Strategy Habitats"	4	65% (21 acres)
f. Quantity and quality of native vegetation	1	Limited native understory in riparian area, and mostly non-native pasture grasses in grassland area
g. Human-caused disturbance factors	1	Disturbance factor: Adjacent residential; Adjacent agriculture; Adjacent road; Mowed area
h. Presence of habitat altering non-native invasive plant species	1	Moderate: Invasive species noted during rapid field assessment include: Ludwigia (along river bank), purple loosestrife, blackberry, English ivy, clematis, walnut, hops, and mainly non-native pasture grasses in grassland area
i. Presence of rare plant and/or wildlife species	3.5	Documented: Steelhead; Chinook Salmon; Coho Salmon Likely: Willow Flycatcher
j. OPRD property designation	3	Willamette River Greenway
k. Bonus: Presence of specialized habitats or unique habitat features	0	None
Sub Total (of 62 possible):	26.5	
II. Water Quality and Floodplain Function		
a. Floodplain function	3	7 acres
b. Presence and permanence of water on site	2	2 streams pass through property; no mapped wetland
c. Water quality function of riparian vegetation	3	Moderate-High: Forested riparian edge along river and streams, but less than 100' width in some locations
d. Bonus: Additional water quality and floodplain function benefits	1	Extensive river frontage
Sub Total (of 20 possible):	9	
III. Public Use and Enjoyment		
a. Recreational access and compatible facilities	4	Moderate: River access; Designated landing; Trails
b. Existing educational use	0	None
c. Nature Appreciation (user experience)	2	Moderate: River views from trail; Significant traffic noise from nearby road; Some quiet areas along river edge
d. Bonus: Additional public use and enjoyment benefits	1	On designated water trail
Sub Total (of 18 Possible):	7	
Total All Categories (of 100 possible):	42.5	

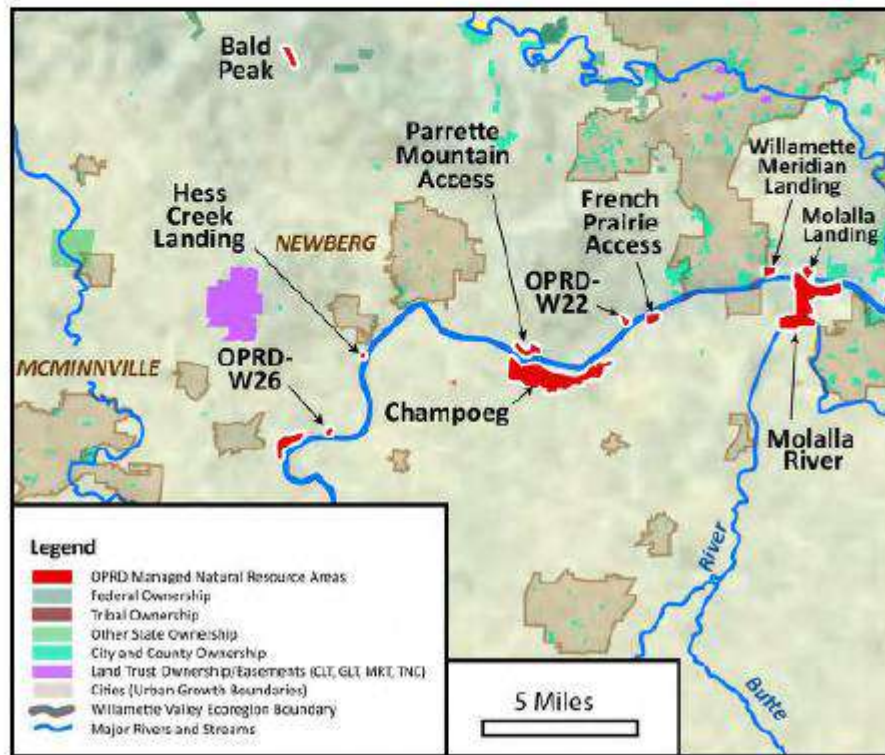
Related Plans or Studies: *Rapid Field Assessment* (Conducted by OPRD, September 2, 2016)

Excerpt from OPRD Willamette Basin Natural Resources Strategic Plan (August 31, 2017):

5.4 Champoege Management Unit

The Champoege Management Unit contains two large parks – Champoege and Molalla River – as well as a state scenic vista and several small Willamette River Greenways (see Figure 5-10). Total acreage in the unit is over 1,380 acres.

Figure 5-10: Champoege Management Unit Context Map



Key Strategy Habitats and known Strategy Species within the Management Unit

- Grasslands, oak woodland, flowing water, riparian, and wetlands.
- Chinook Salmon, Coho Salmon, Steelhead, Cutthroat Trout, Lamprey spp., Willow Flycatcher, Olive-Sided Flycatcher, Acorn Woodpecker, Western Bluebird, Western Meadowlark, White-breasted Nuthatch, Pileated Woodpecker, Common Nighthawk, Chipping Sparrow, Northern Red-legged Frog, Western Pond Turtle, Western Painted Turtle, Monarch Butterfly, Western Gray Squirrel, Peacock Larkspur, and White Rock Larkspur.
- Likely species include Oregon Chub, and Western Ridged Mussel; other notable species include Olympia Pebblesnail



Champoege State Heritage Area (photo by A. Berkley)

Champoeg State Heritage Area is the 7th largest OPRD park in the Willamette Basin. The park contains a wide variety of habitats, including prairie, oak woodland, wetlands, creeks (Ryan, Mission, and Champoeg), riparian forest, extensive Willamette River frontage, and a volcanic butte with upland conifer forest. A large amount of the park is in agricultural production. Portions of the park are within the top 10% highest habitat value lands in the Portland Metro Area's Regional Conservation Strategy. Ongoing ivy control is improving conditions on 100 acres on La Butte at the east end of the park. OPRD's most successful prairie restoration project to date is taking place on 40 acres in the center of the park. Champoeg enjoys a high level of community support and involvement, interpretive programming, and is located near Newberg. A new park Master Plan may be developed in the next few years, and may include campground expansion; the park also has a partially completed draft Natural Resource Management Plan.

Molalla River State Park is the 9th largest OPRD park in the Willamette Basin and is uniquely situated at the confluence of three major rivers: the Willamette, Molalla and Pudding Rivers. The park is within the top 10% highest habitat value lands in the Portland Metro Area's Regional Conservation Strategy. Most of the park (over 400 acres) is comprised of expansive, frequently flooded forest, wetlands, side channels, and alcoves. The forest was once the home to the largest heron rookery in the basin, but has since degraded significantly in some areas due to expansion of Japanese and other knotweed species. Knotweed control and updating the park invasive species map are underway. Grasslands dominate the upland areas and, along with a series of ponds, are used by nesting turtles. The park includes a long expanse of Willamette River shoreline, including a problematic revetment. A group of partners is interested in restoring side channels and enhancing the floodplain at the park and early scoping is underway.

Parrette Mountain Access WRG is located across the Willamette River from Champoe and is comprised of riparian forest and grassland. The site suffers from a wide variety of invasive and ornamental non-native species along the lengthy Willamette River riparian zone and shoreline. Bald Peak is the highest point in the Chehalem Mountains and is a state scenic vista. Three of the other sites in this unit are Willamette River Greenways 15-30 acres in size: French Prairie Access WRG is a mix of upland grassland and forest with a degrading riparian zone and river access; Willamette Meridian Landing WRG is in good condition and includes a healthy stream corridor; Molalla Landing WRG is located across from Molalla River State Park and has had ground and tree ivy removed in the 2015-2017 biennium. Three other Greenways are less than 5 acres in size: W22 WRG, W26 WRG, and Hess Creek Landing WRG.

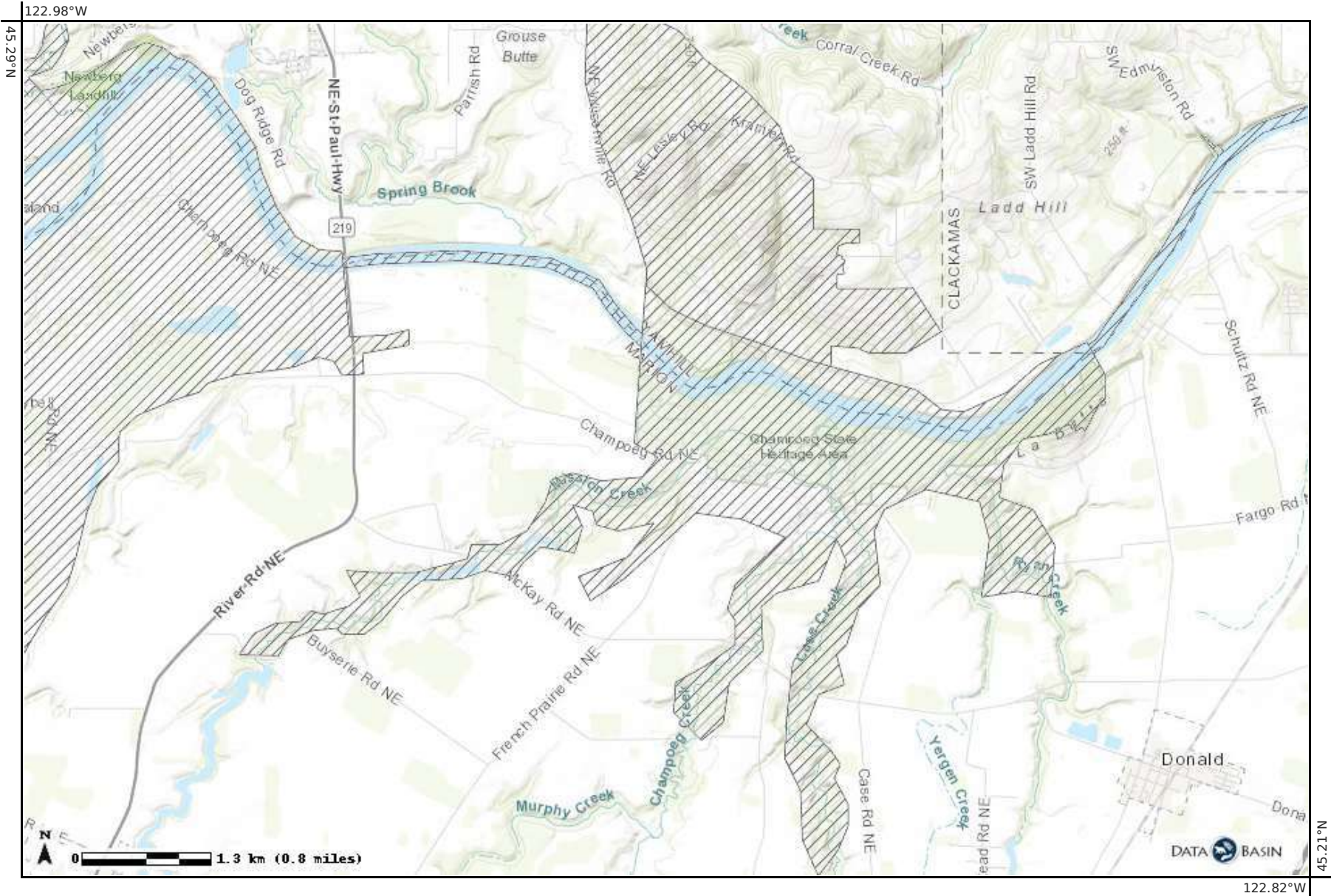
Current partners include Friends of Historic Champoege, Institute for Applied Ecology, Confederated Tribes of the Grand Ronde, Molalla River Watch, and others.

Site Name	Acres	Habitat Values										Floodplain Function				Public Use and Enjoyment				Ranking						
		a. Size of Natural Resource Area	b. Proximity to Conserved Lands	c. Within OCS ODA	d. Diversity of OCS Habitats	e. Strategy Habitats Total Area	f. Native Vegetation	g. Human Cause Disturbance	h. Presence of Invasive Species	i. Rare Plant or wildlife species	j. OPRD Property Designation	k. Habitat Bonus	Habitat Value	a. Floodplain Function	b. Presence/Persistence of Water	c. Water Quality Function of Veg	d. WC and Floodplain Bonus	Water Quality/Floodplain Function Value	e.a. Recreational Access and Facilities	e.b. Existing Educational Use	e.c. User Experience	f.d. Public Use and Enjoyment Bonus	Public Use and Enjoyment Value	GRAND TOTAL	Rank (All Categories)	Rank (Habitat + Floodplain Function)
Bald Peak SSV	28.8	4	0	0	1	1	2	1	3	0.0	0	0	12.0	0	0	0	0	0.0	3	0	2	1	6.0	18.0	74	67
Champoog SHA	675.4	8	2	3	4	4	2	1	1	10.0	2	4	41.0	7	4	2	1	14.0	6	3	4	3	16.0	71.0	30	8
French Prairie Access WRG	26.8	4	0	3	1	2	1	1	1	3.0	3	0	19.0	3	3	4	1	11.0	3	0	2	1	6.0	36.0	58	49
Hess Creek Landing WRG	1.1	0	0	3	0	0	3	1	3	2.0	3	0	15.0	1	0	3	1	5.0	2	0	3	1	6.0	26.0	68	61
Molalla Landing WRG	23.0	2	4	2	1	2	3	1	3	2.5	3	1	24.5	1	3	2	2	8.0	2	2	1	5.0	37.5	56	46	
Molalla River SP	569.7	8	3	3	3	6	2	1	1	10.0	2	4	43.0	7	4	6	3	20.0	4	2	5	1	12.0	75.0	9	4
OPRD-W22 WRG	4.9	0	0	1	1	4	2	1	3	3.0	3	0	18.0	3	1	4	1	9.0	2	0	2	1	5.0	32.0	61	52
OPRD-W26 WRG	2.7	0	0	3	0	1	2	1	3	3.5	3	0	16.5	0	0	6	1	7.0	1	0	2	1	4.0	27.5	66	56
Parrette Mountain Access WRG	32.2	4	4	3	2	4	1	1	1	3.5	3	0	26.5	3	2	3	1	9.0	4	0	2	1	7.0	42.5	49	42
Willamette Meridian Landing WRG	16.2	2	0	0	1	2	2	3	3	3.0	3	2	21.0	3	3	3	1	10.0	3	0	3	2	8.0	39.0	55	48
Average:																						40.5				

Legend

Willamette Valley Synthesis C
onservation Opportunity Are
as (version 2.0)

- Conservation
- Opportunity Areas



Map Details

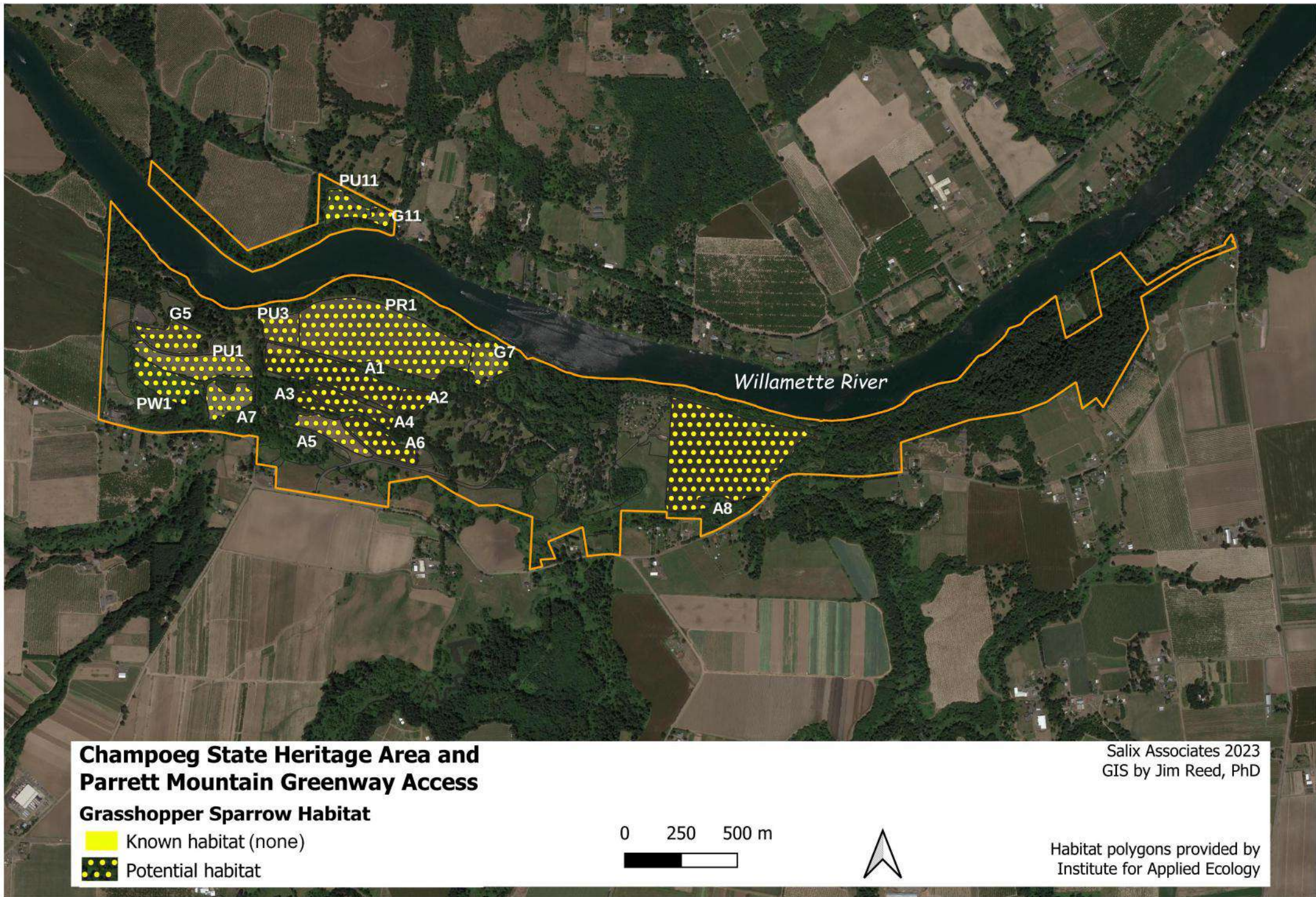
Datasets



Willamette Valley Synthesis Conservation Opportunity Areas (version 2.0)

<https://databasin.org/datasets/9f79ce2035b7402fb60ef70e63c72142/>

- Credits:** The Nature Conservancy of Oregon has worked with a great number of partners on this project. A partial list would include the Oregon Department of Fish and Wildlife, Defenders of Wildlife, Oregon State University, the Environmental Protection Agency, Oregon Department of Environmental Quality, the Oregon Biodiversity Project, Metro, The Wetlands Conservancy, the Willamette Partnership, U.S. Fish and Wildlife Service, Oregon Parks & Recreation Department, Oregon Watershed Enhancement Board and various Willamette Valley Watershed Councils.
- Layers:**
- Willamette Valley Synthesis Conservation Opportunity Areas (version 2.0)



**Champoege State Heritage Area and
Parrett Mountain Greenway Access**

Grasshopper Sparrow Habitat

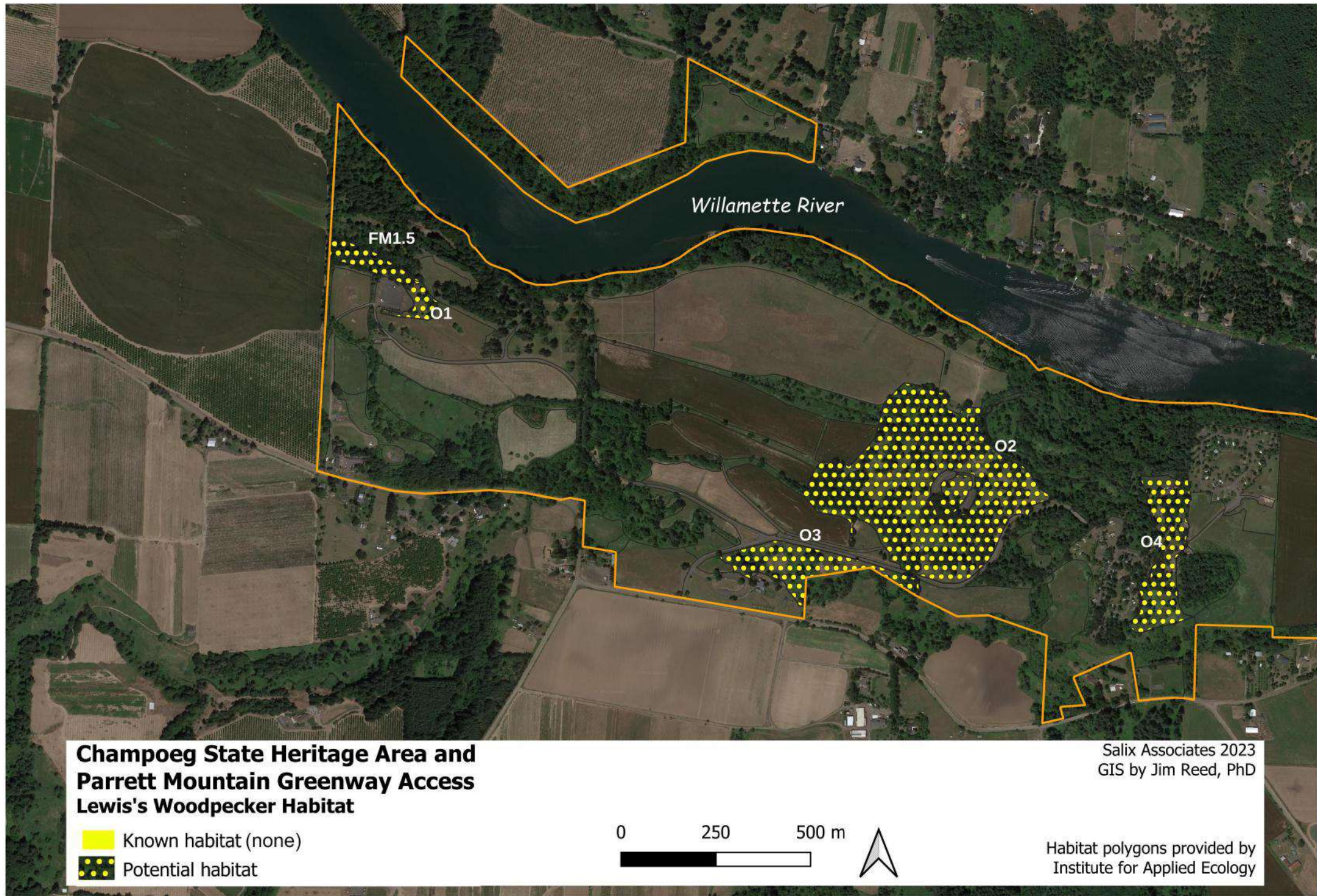
- Known habitat (none)
- Potential habitat

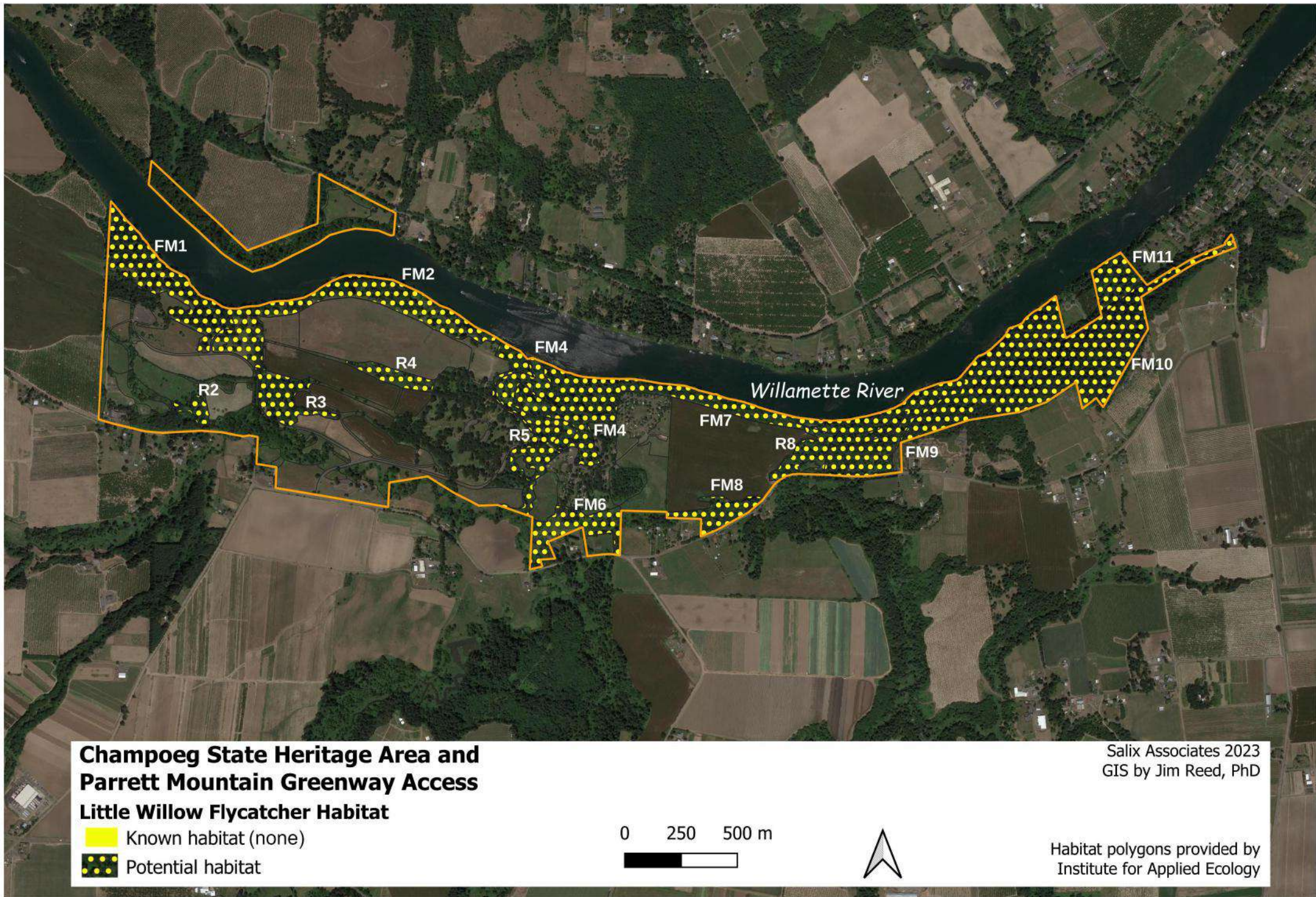
0 250 500 m

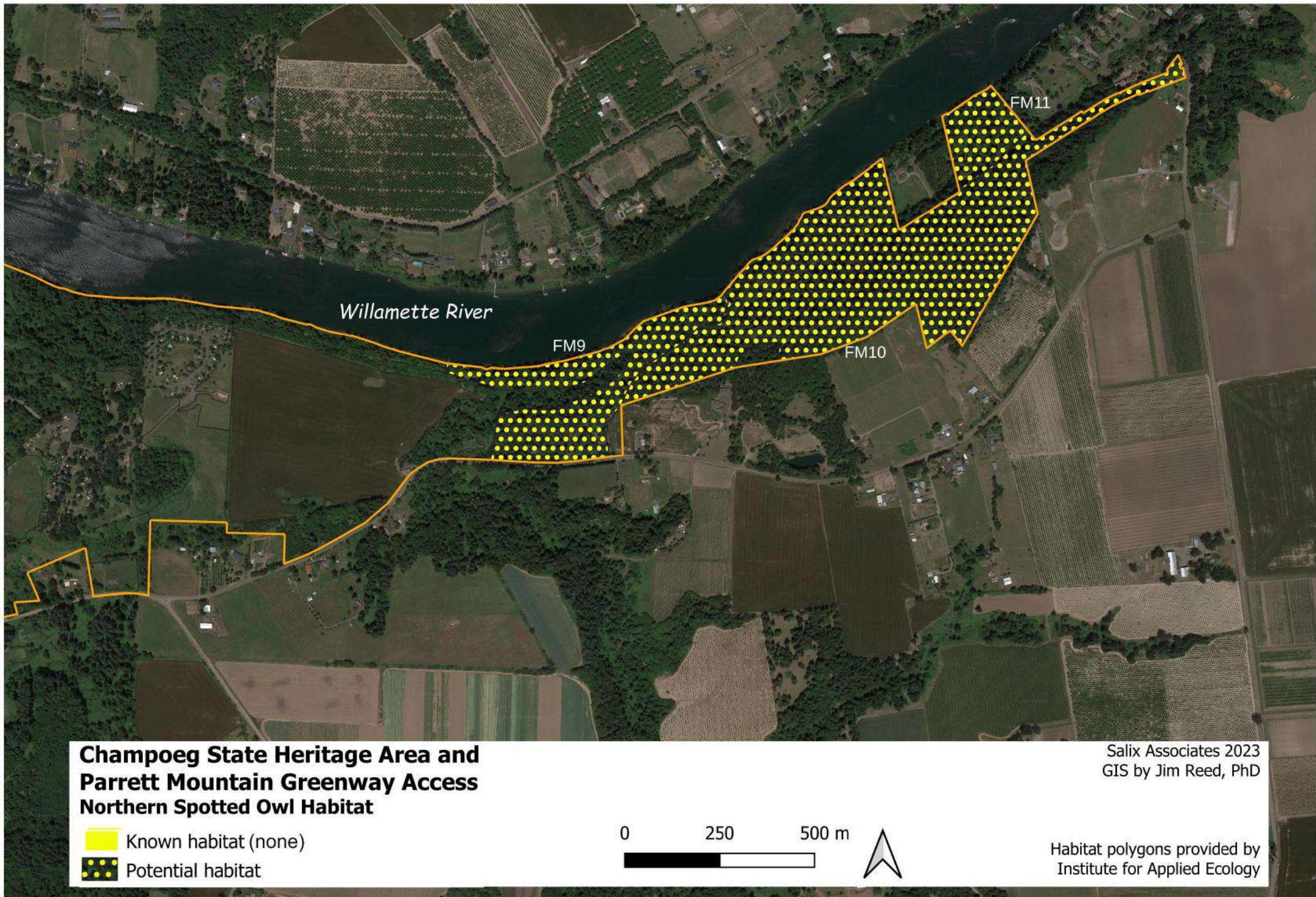


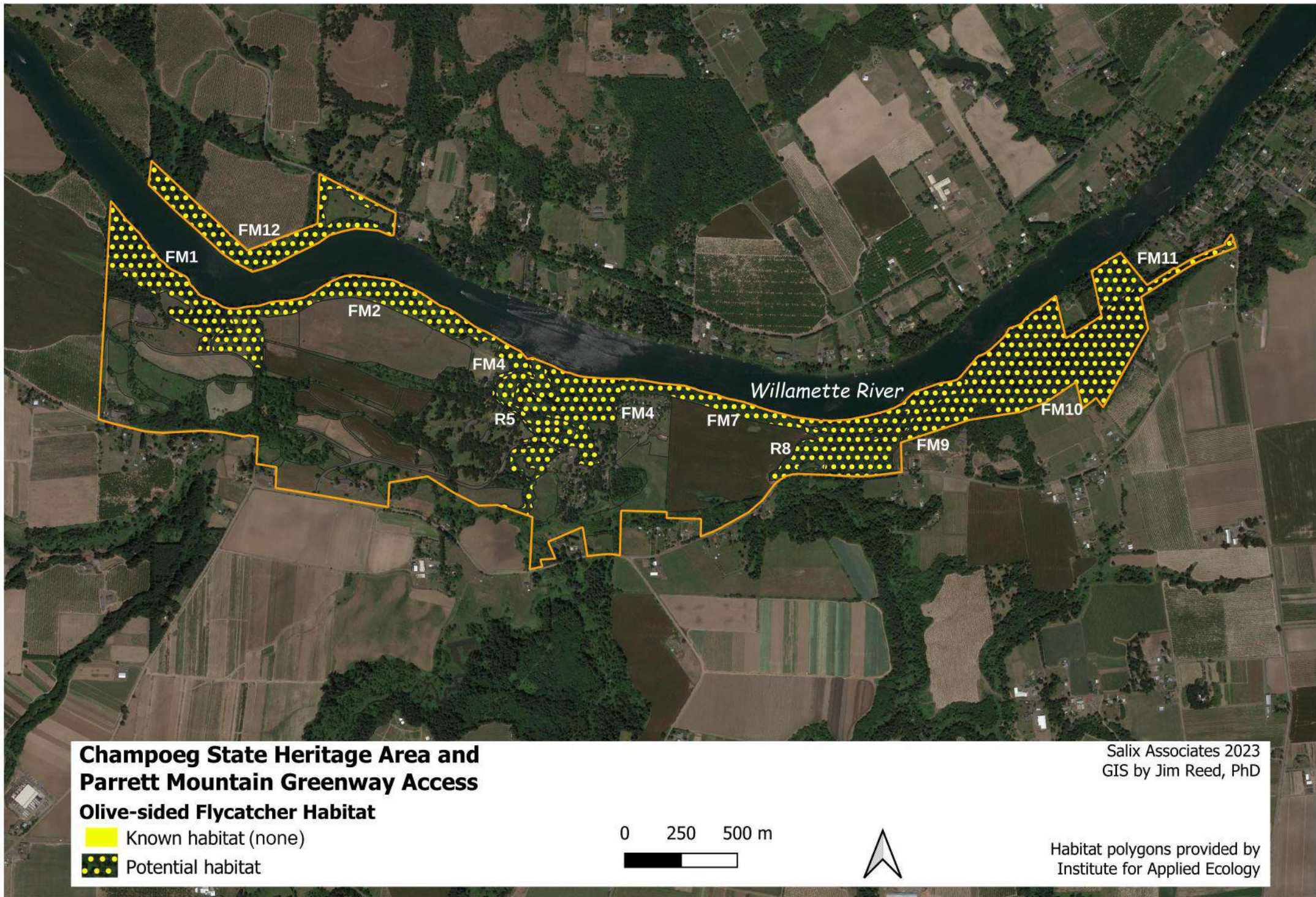
Salix Associates 2023
GIS by Jim Reed, PhD

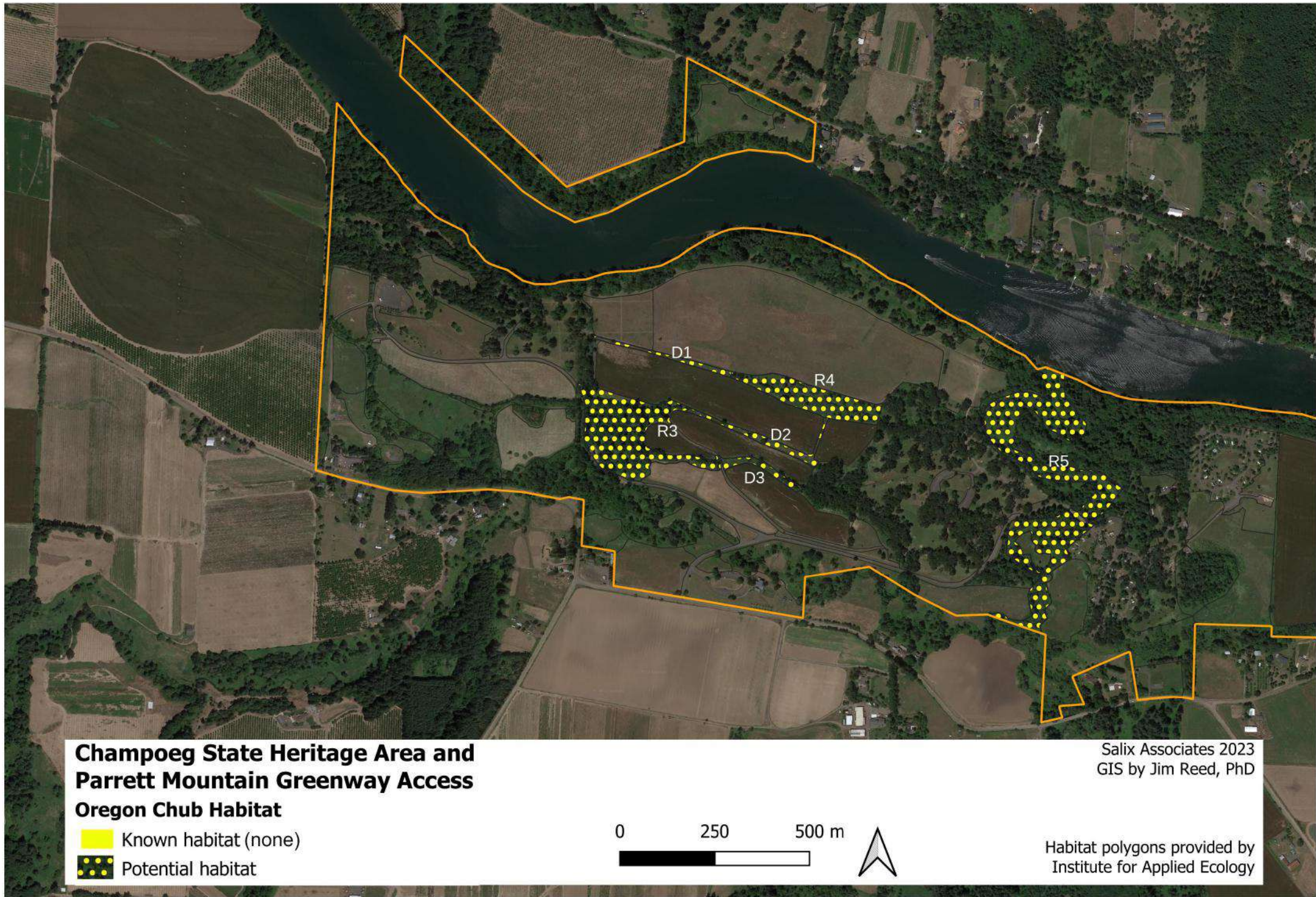
Habitat polygons provided by
Institute for Applied Ecology

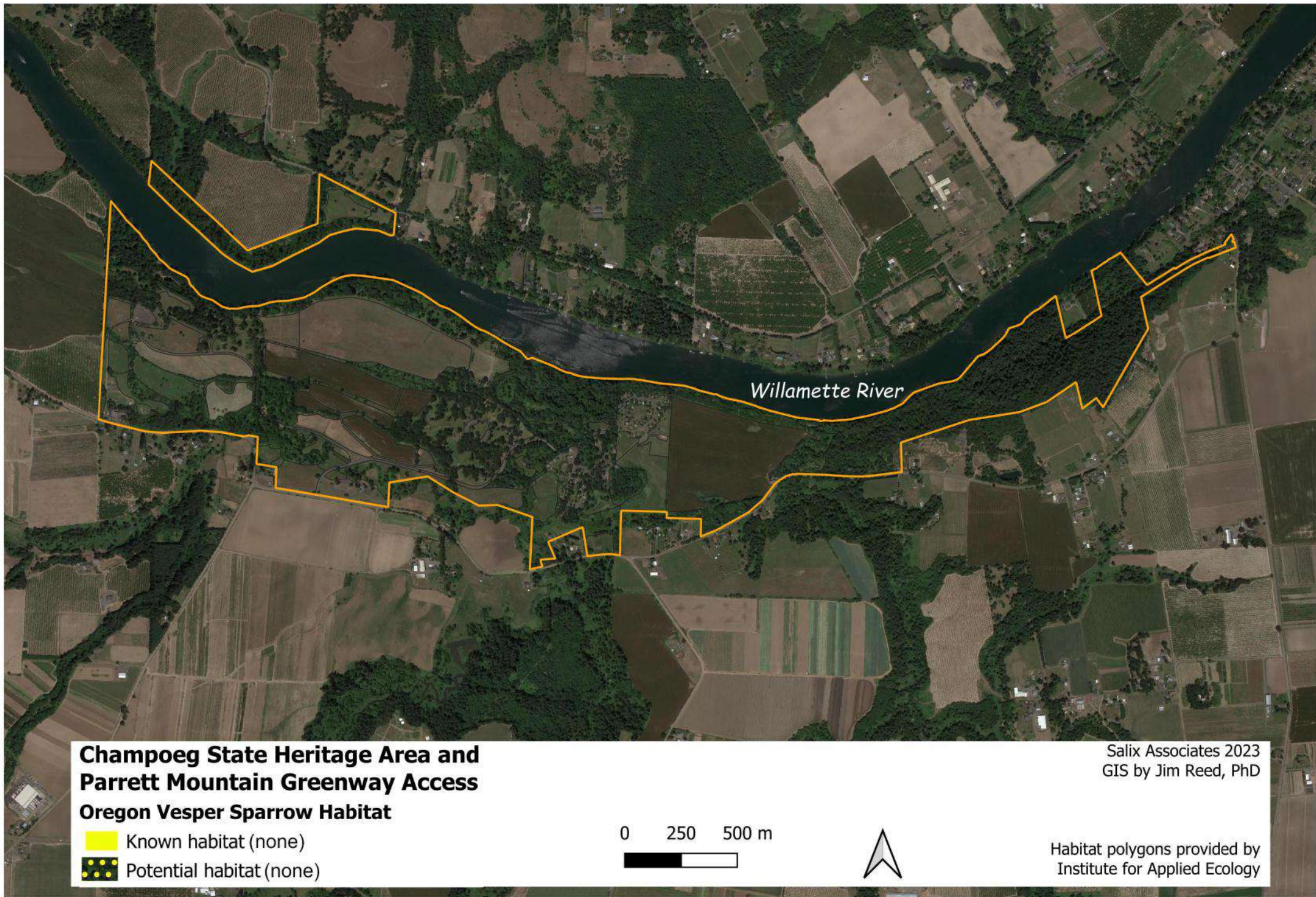


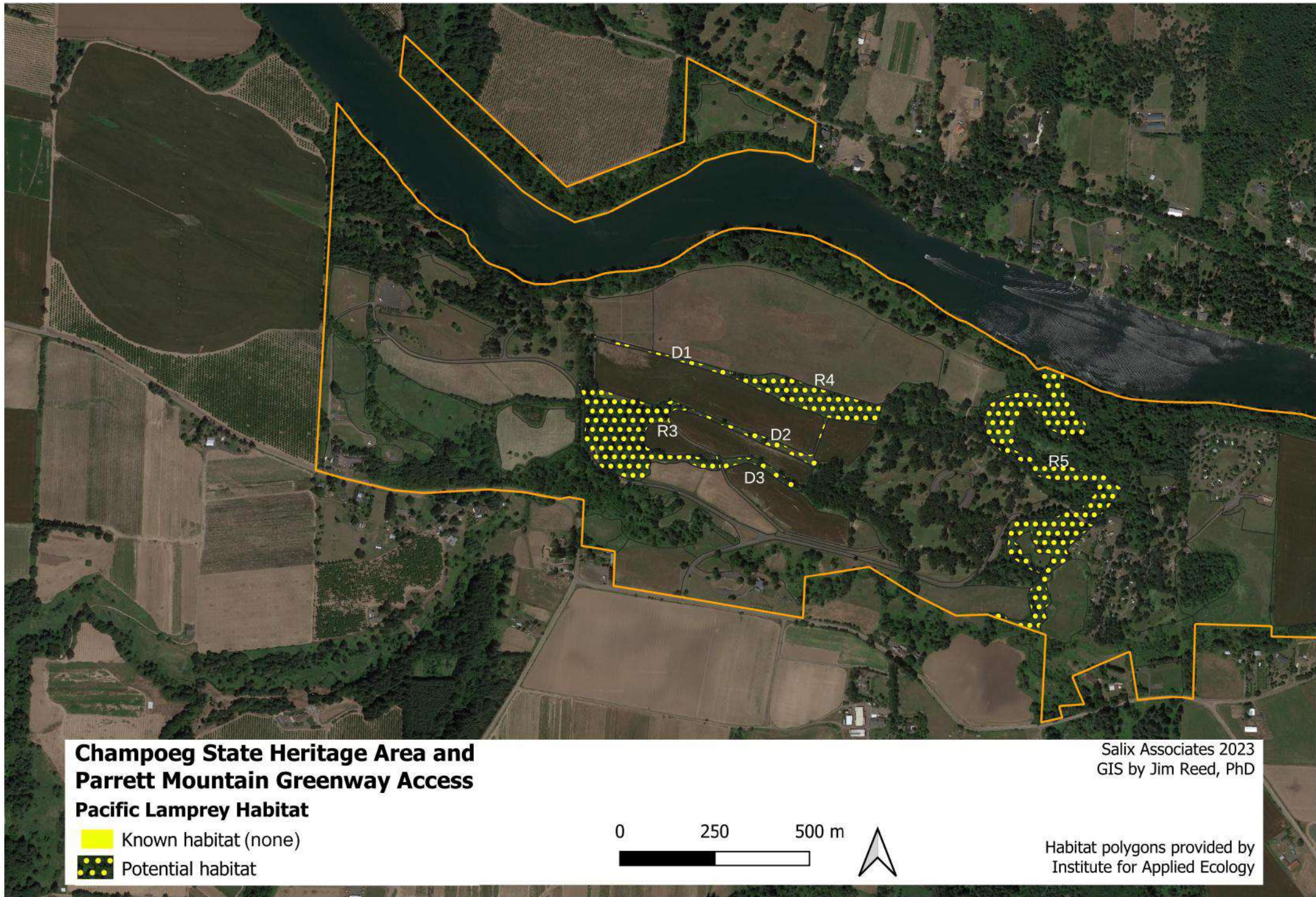


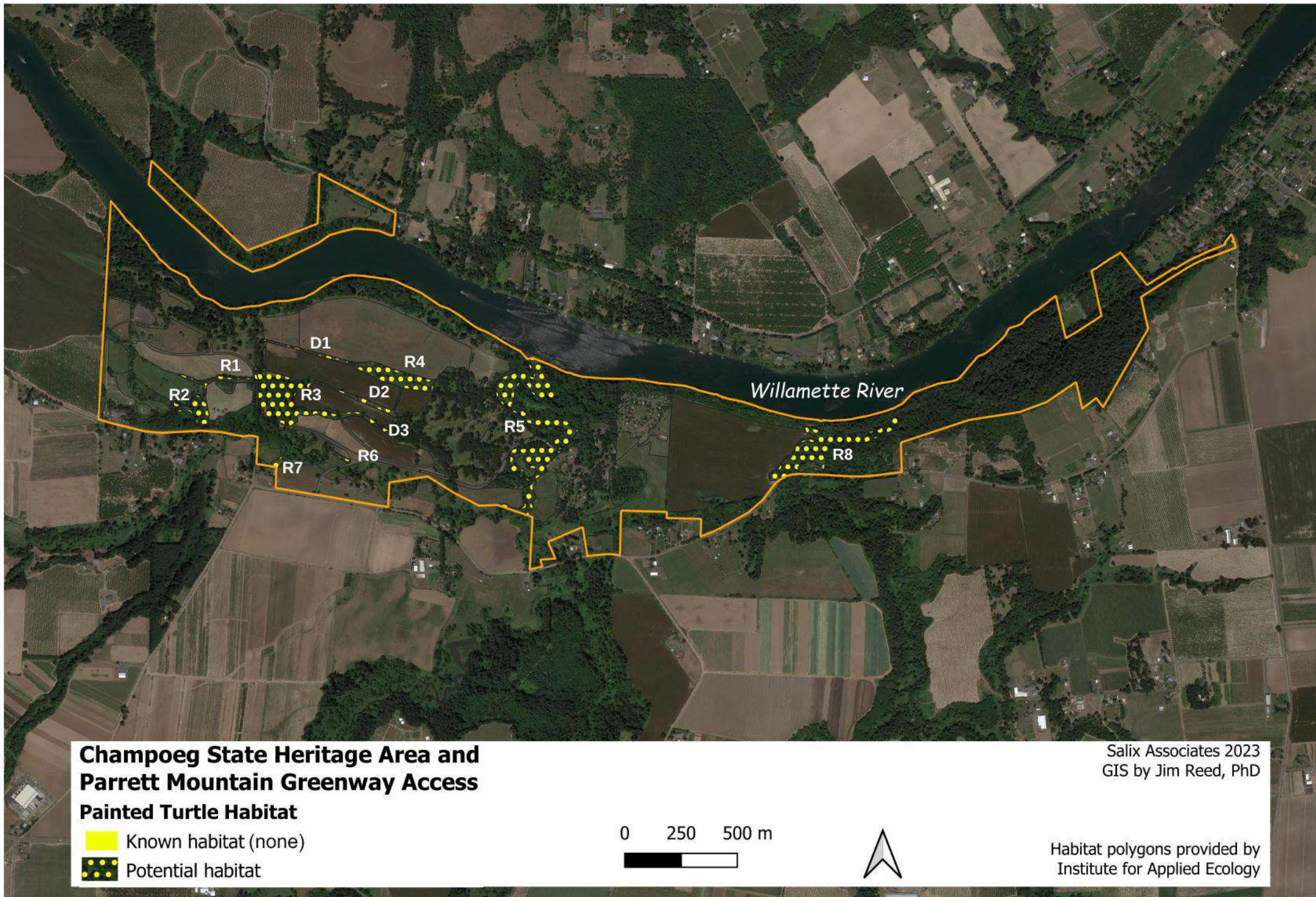


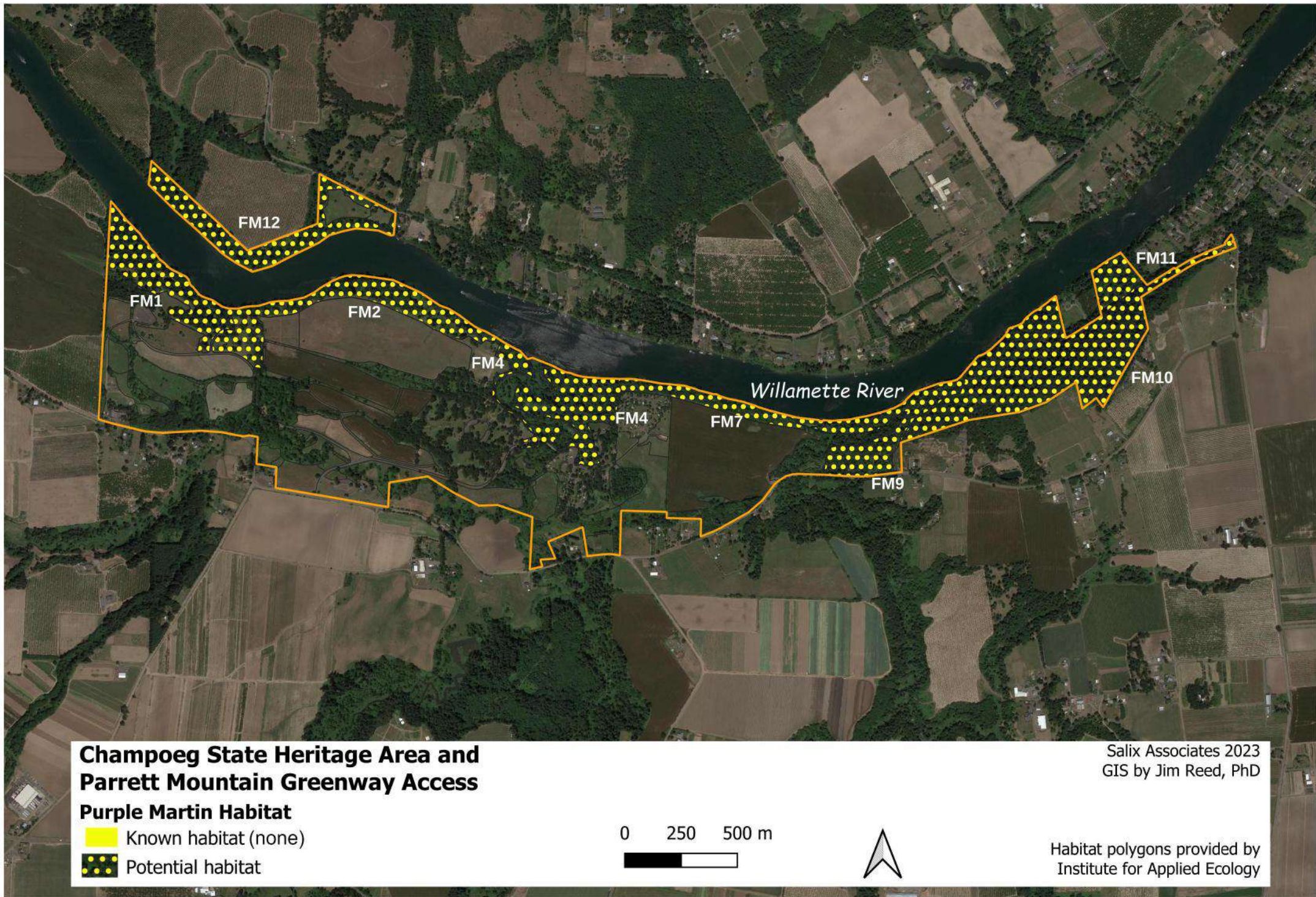












Champoege State Heritage Area and Parrett Mountain Greenway Access

Purple Martin Habitat

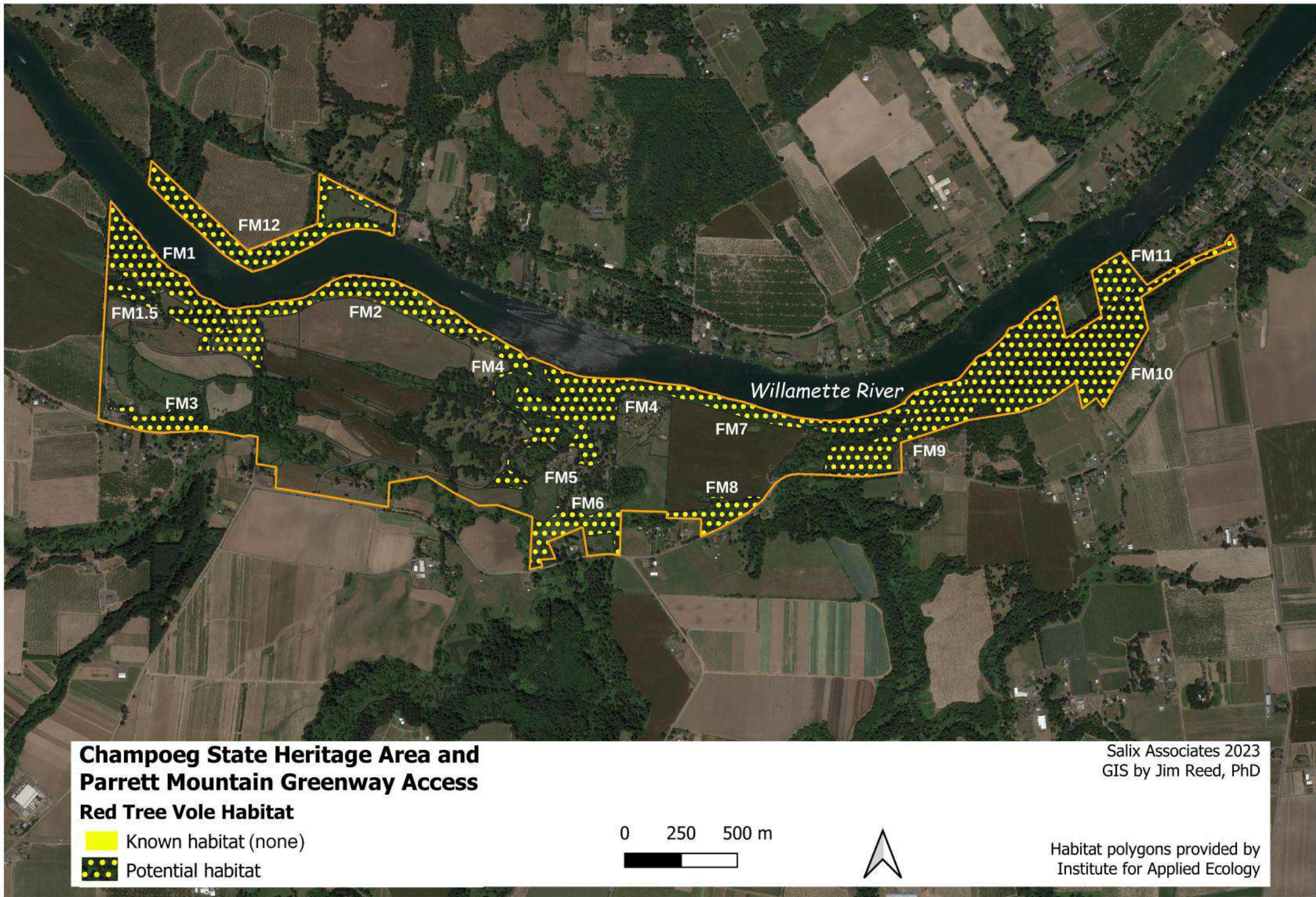
- Known habitat (none)
- Potential habitat

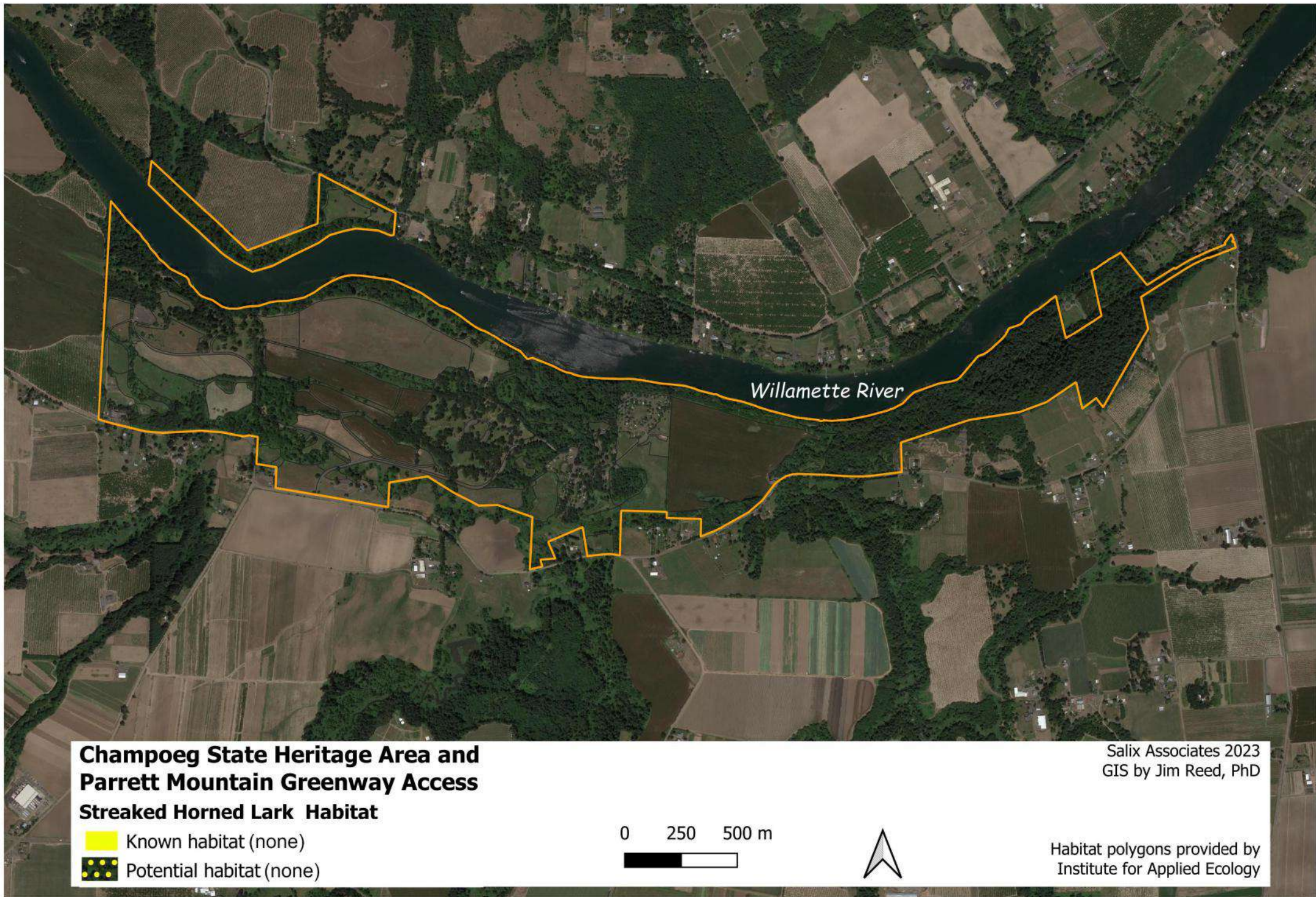
0 250 500 m

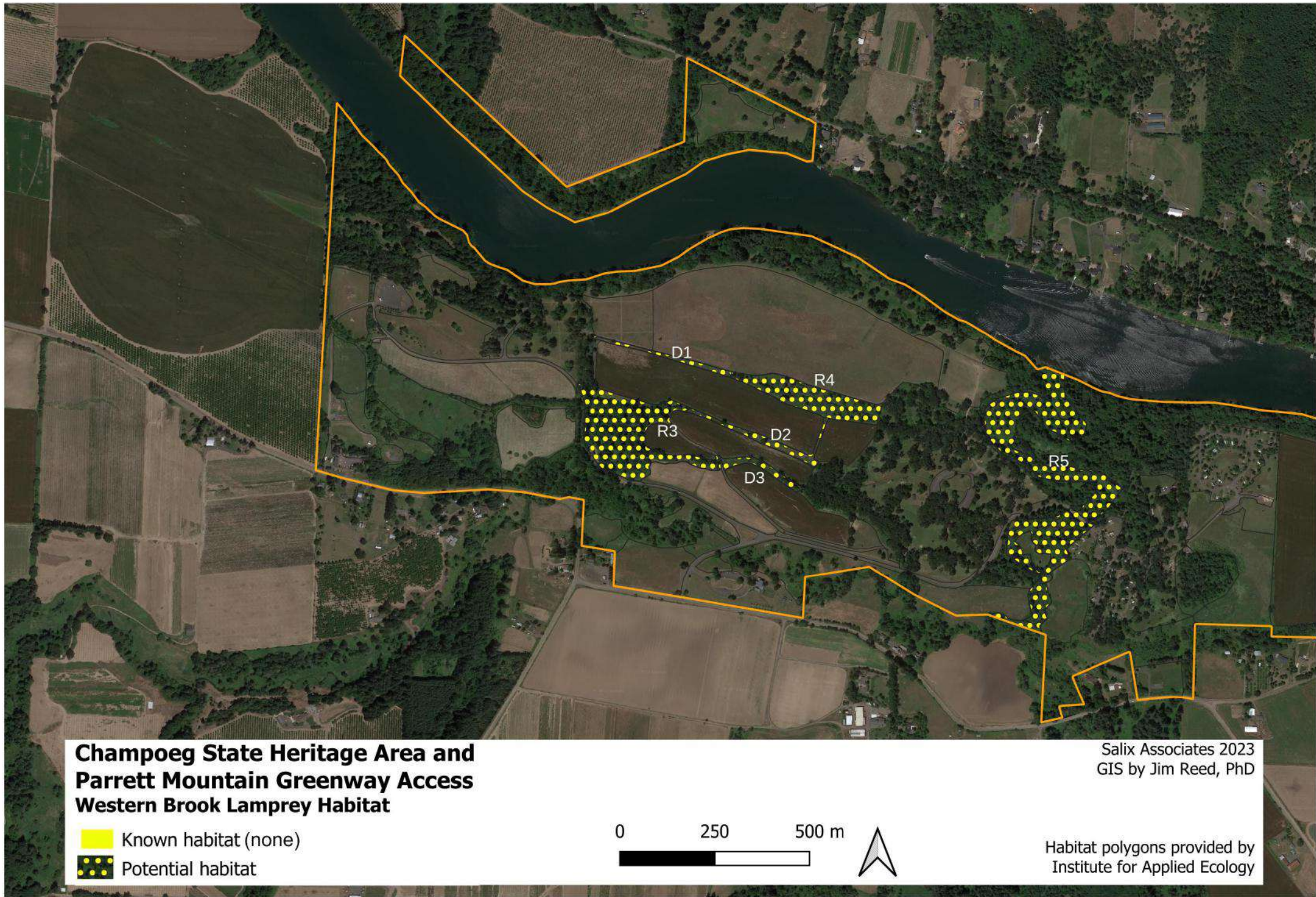


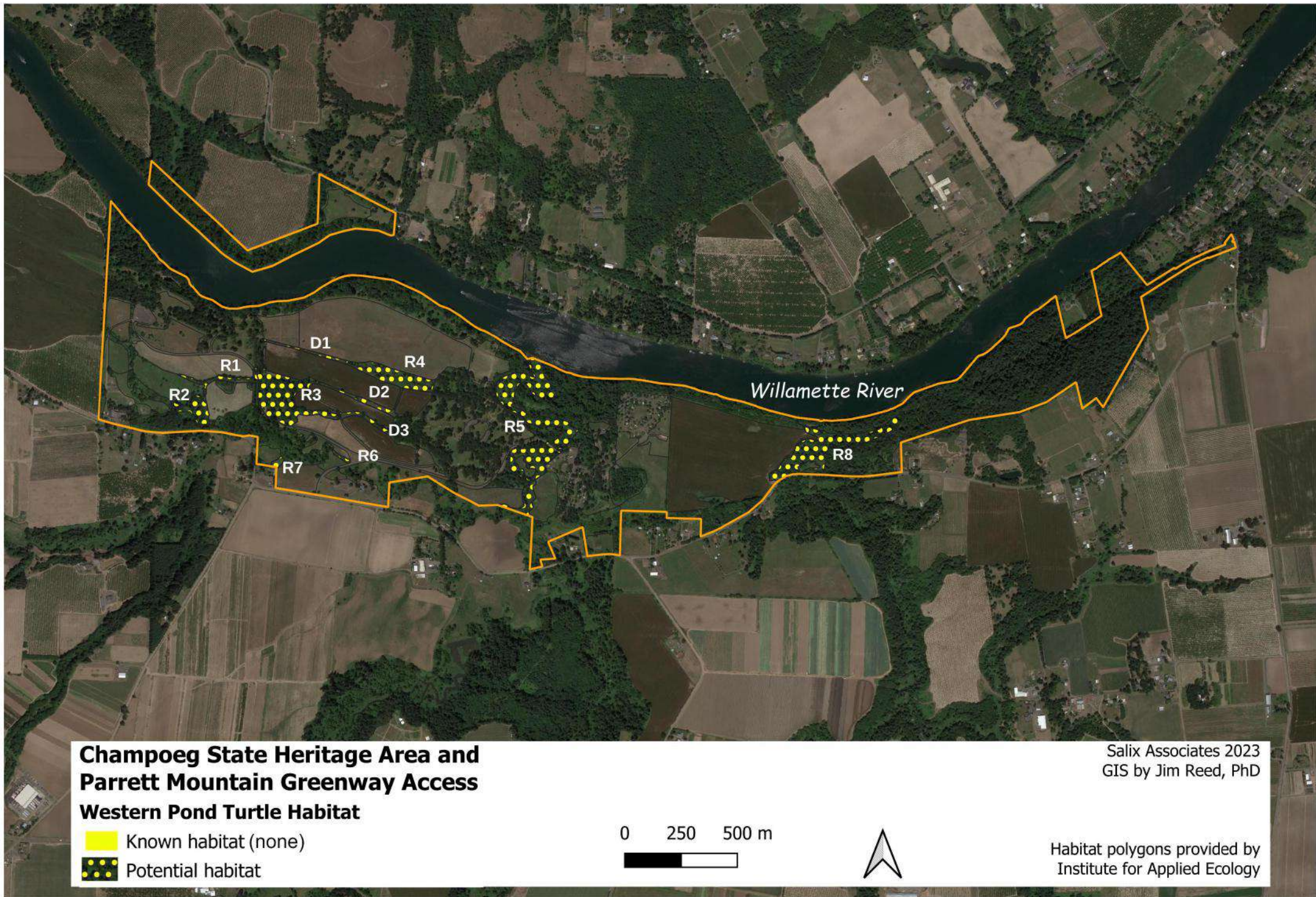
Salix Associates 2023
GIS by Jim Reed, PhD

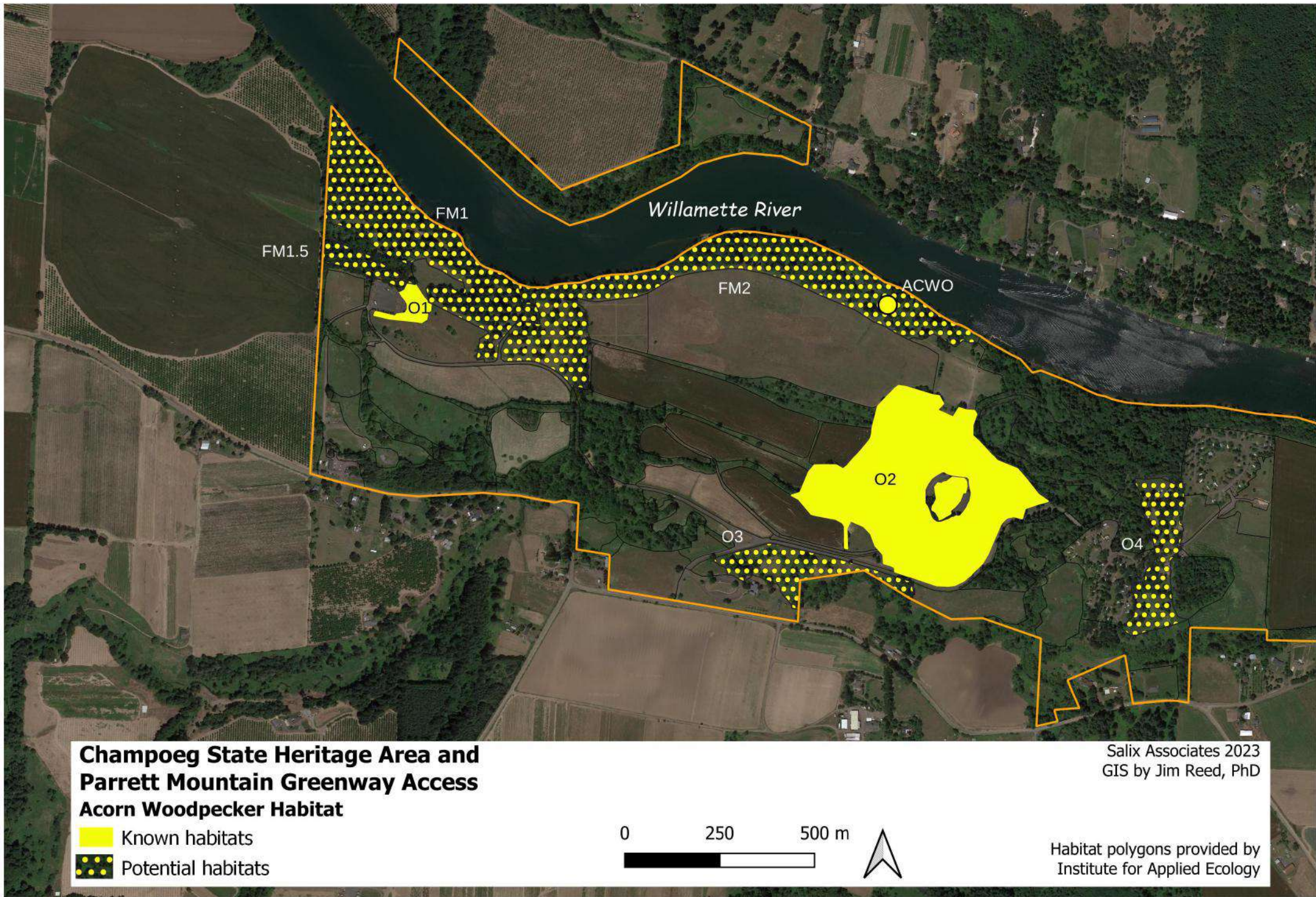
Habitat polygons provided by
Institute for Applied Ecology





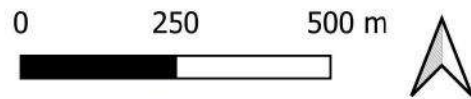






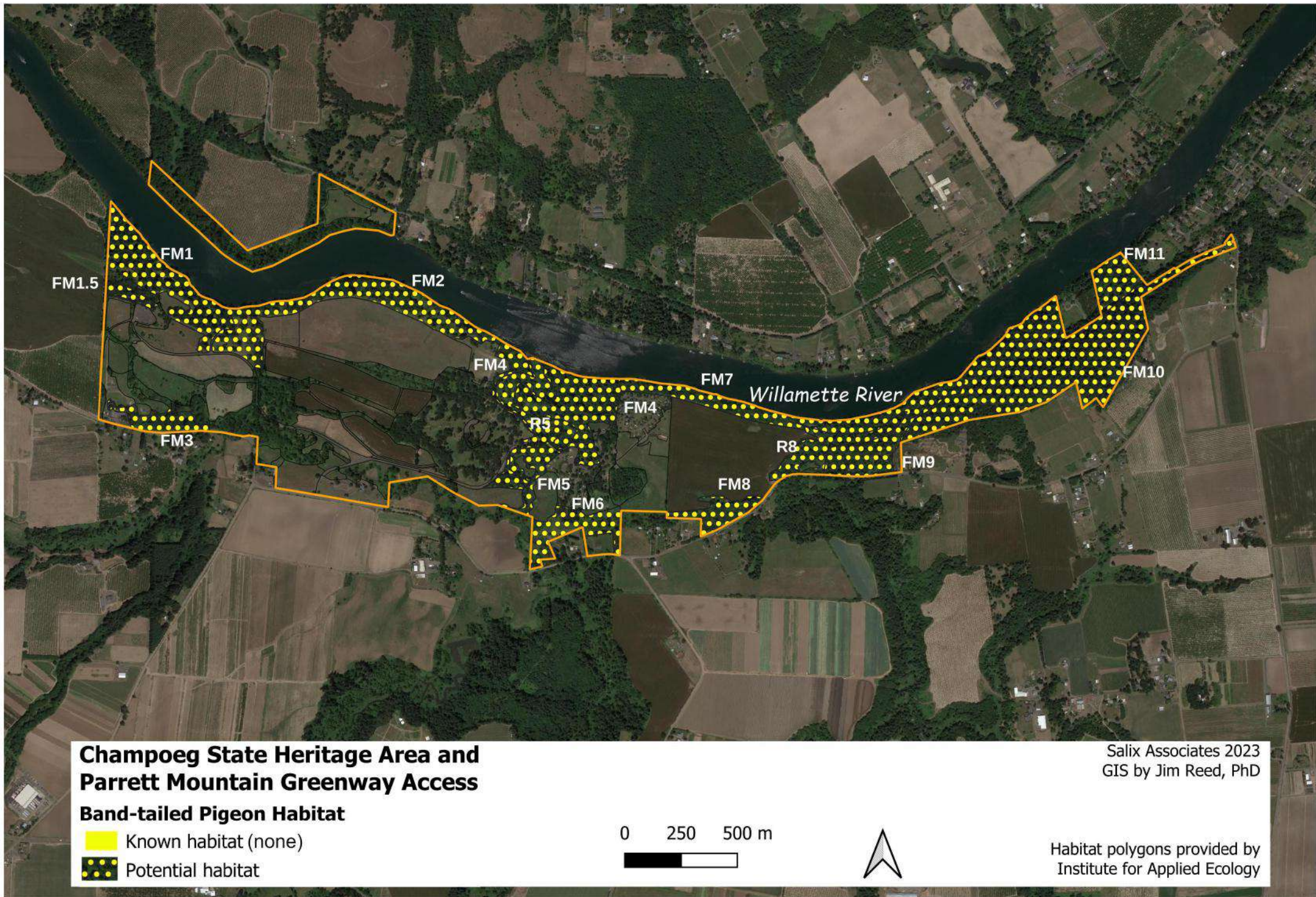
**Champoege State Heritage Area and
Parrett Mountain Greenway Access
Acorn Woodpecker Habitat**

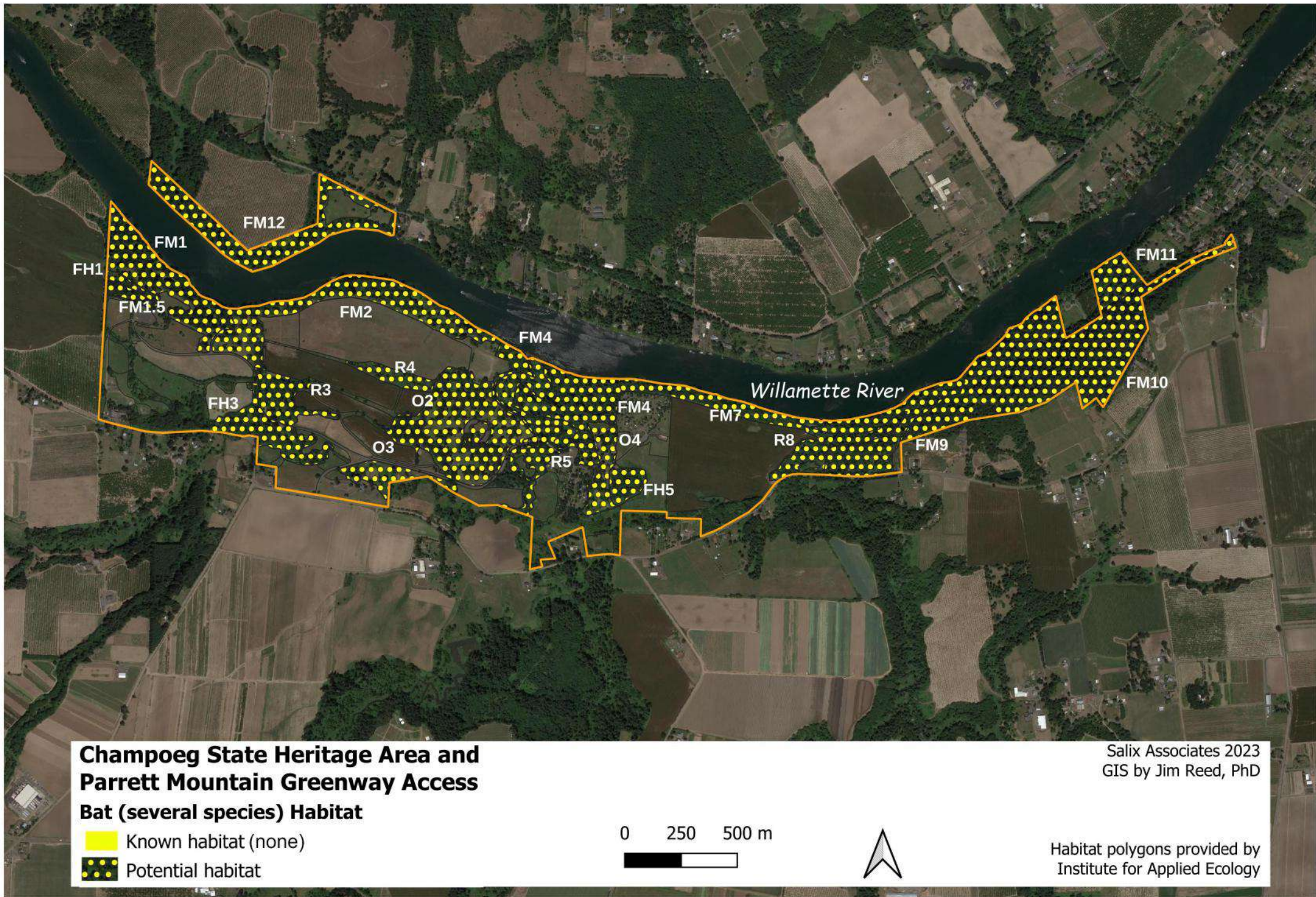
- Known habitats
- Potential habitats

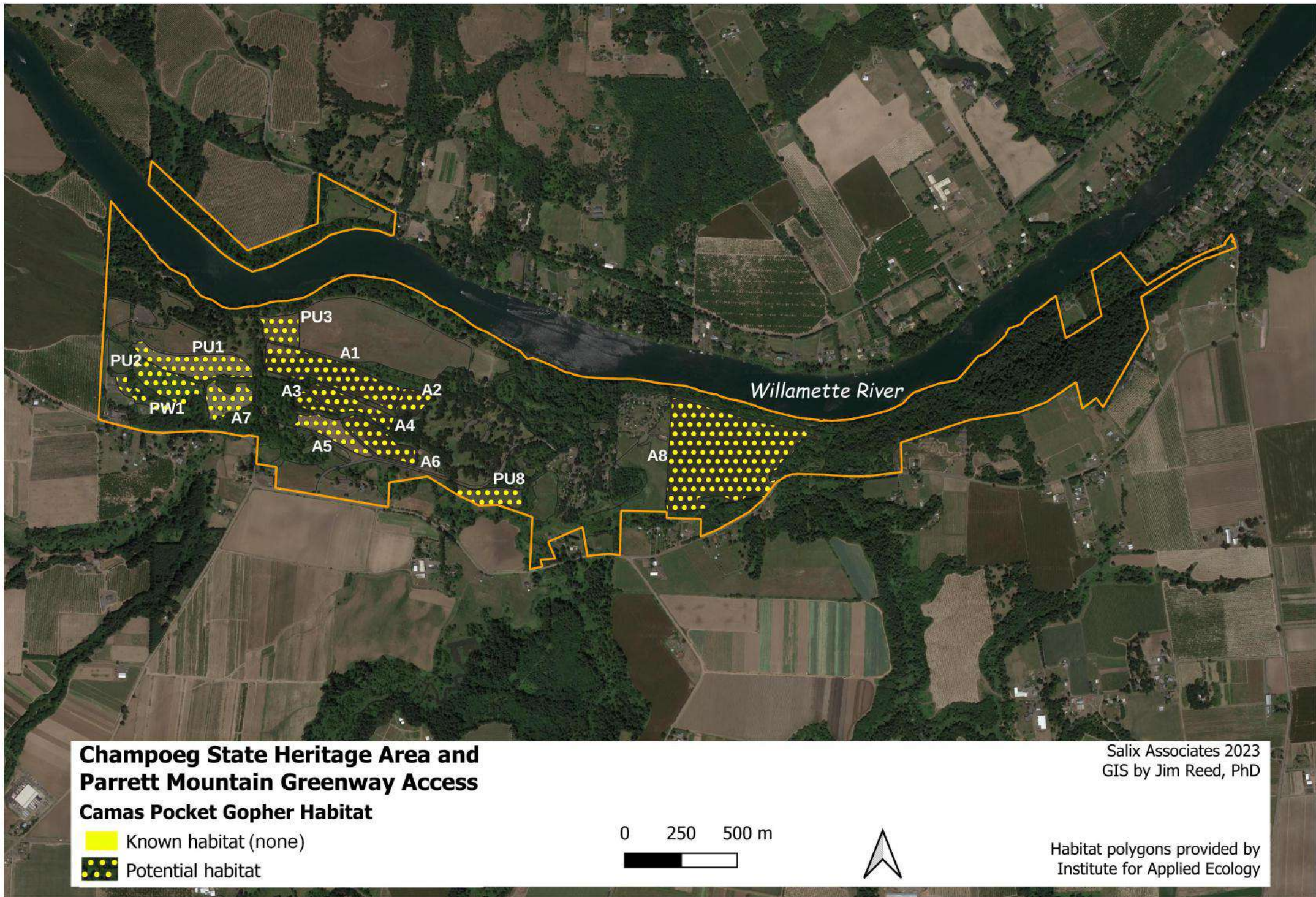


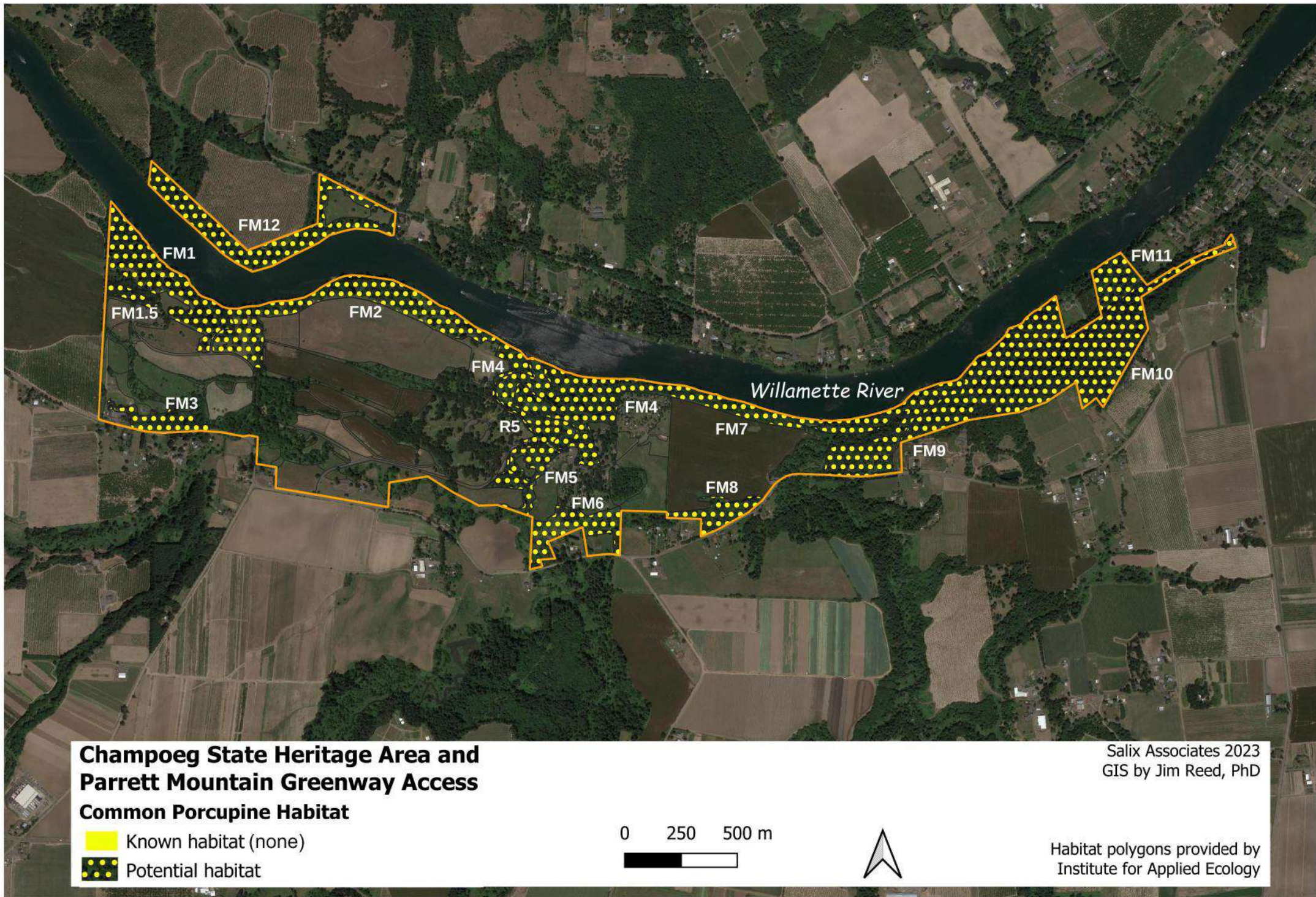
Salix Associates 2023
GIS by Jim Reed, PhD

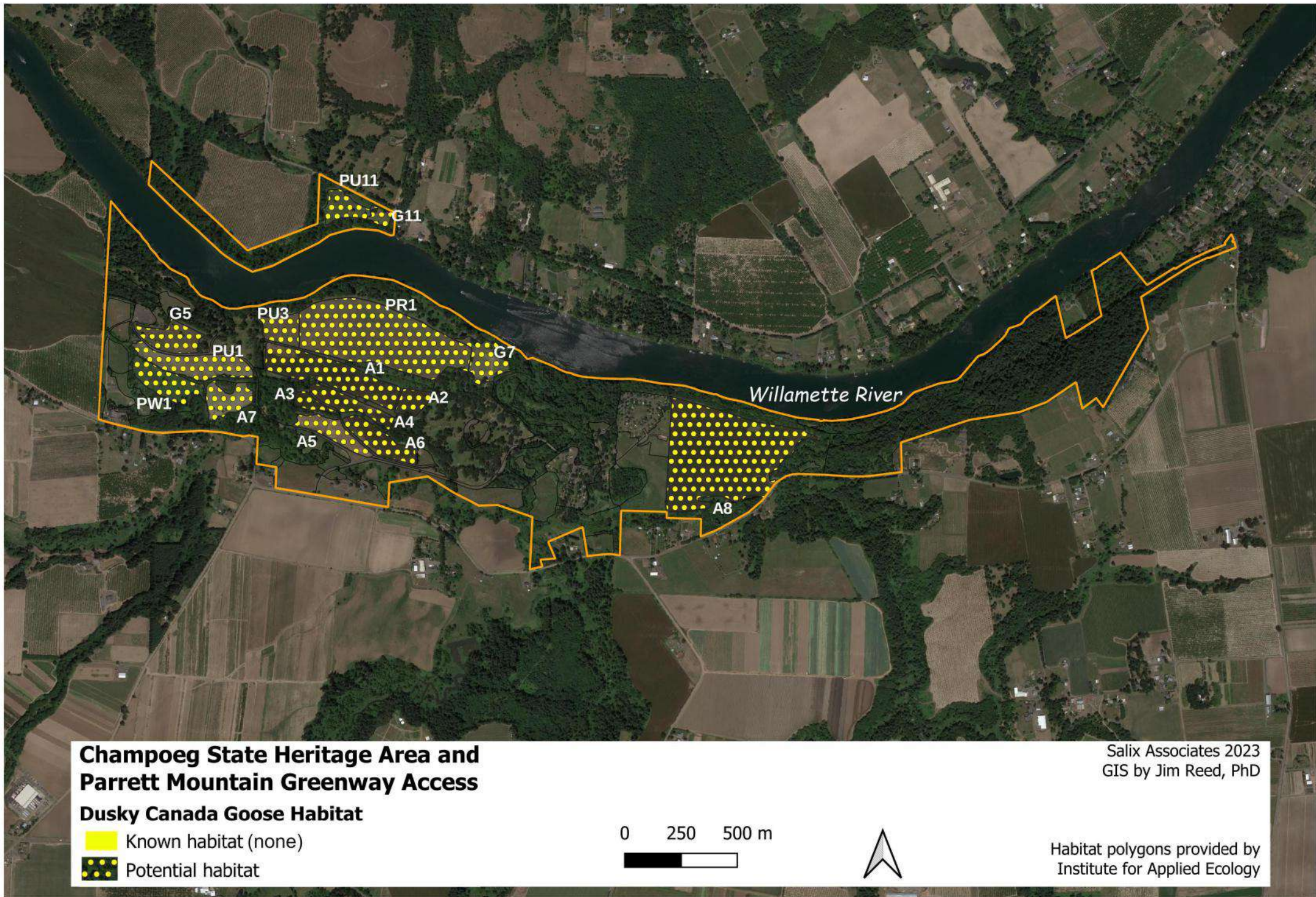
Habitat polygons provided by
Institute for Applied Ecology

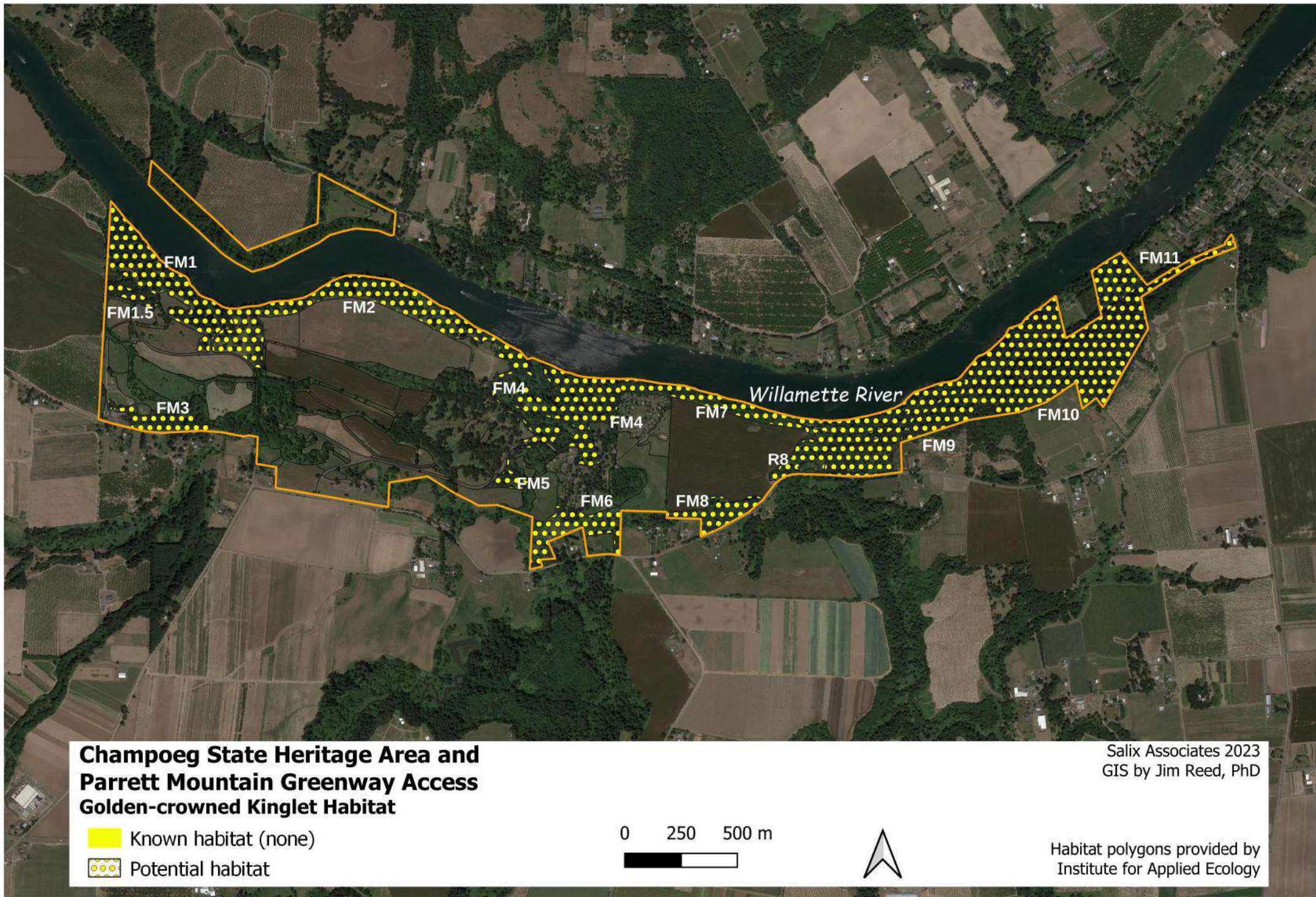












APPENDIX D: PLANT ASSOCIATIONS

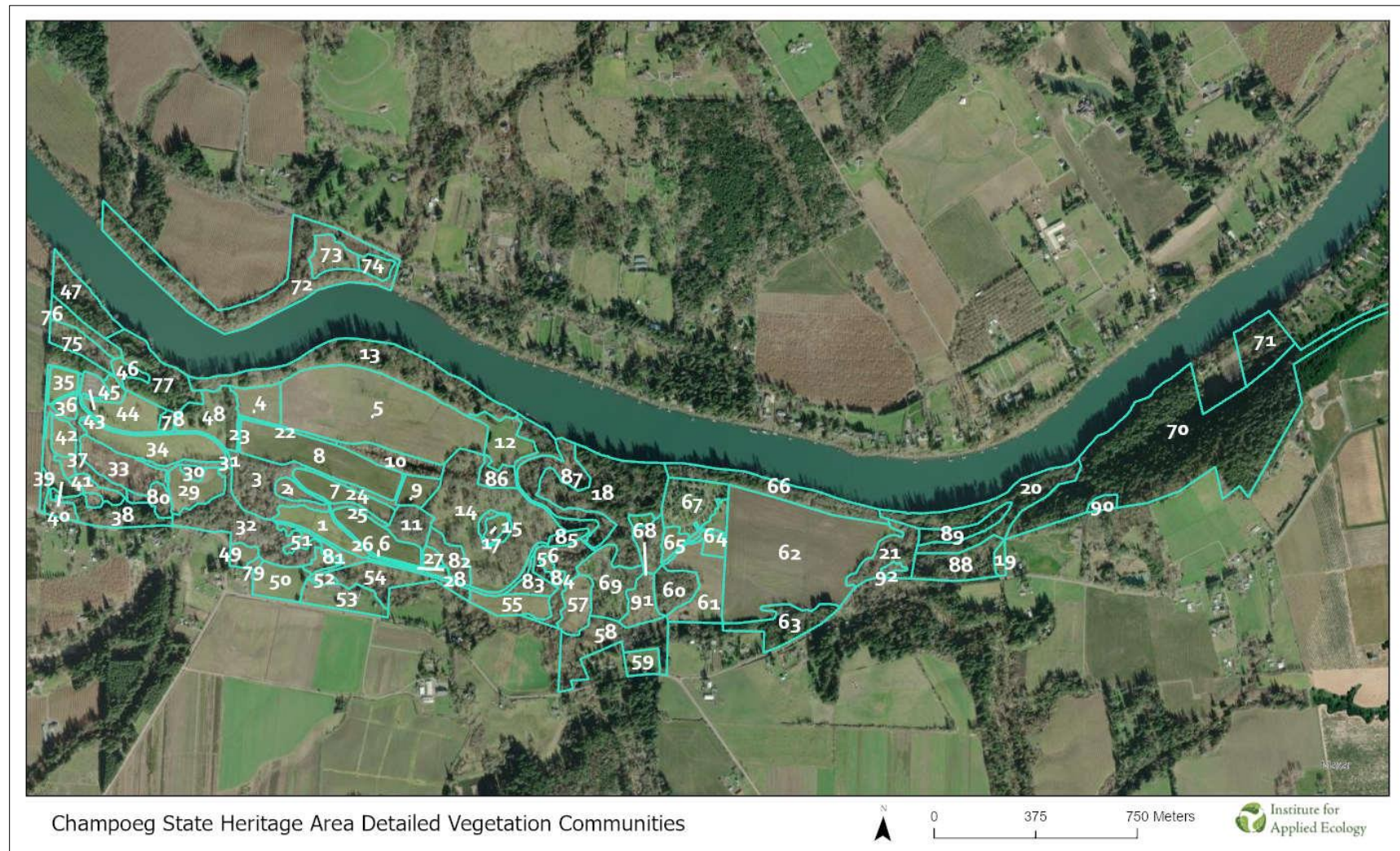


Figure 48. Existing vegetation communities at Champoege State Heritage Area.

Numbers correlate to polygons found in Figure 48. Grouped habitat types correlate to polygons in Figures 11 and 12. Plant species are listed in order of most common to least. Equivalent plant associations are taken from Kagan et al. (2019).

1. Oregon ash / Himalayan blackberry / tall fescue, meadow foxtail, velvetgrass, tansy ragwort, narrowleaf plantain
FRALAT/RUBARM/SCHARU, ALOPRA, HOLLAN, SENJAC, PLALAN
 - Grouped habitat type: Agriculture
 - Equivalent plant association: None
2. Tall fescue
SCHARU
 - Grouped habitat type: Agriculture
 - Equivalent plant association: None
3. Oregon ash, Oregon white oak, common pear / Nootka rose, Himalayan blackberry, snowberry, pacific ninebark, redosier dogwood / bigflower tellima, common cowparsnip
FRALAT, QUEGAR, PYRCOM / ROSNUT, RUBURS, RUBARM, SYMALB, PHYCAP, CORSER / TELGRA, HERMAX
 - Grouped habitat type: Riparian
 - Equivalent plant association: FRALAT / SYMALB Rank: G4S4
4. Black locust, common pear / Himalayan blackberry / tall oat grass, silver lupine, velvetgrass, narrowleaf plantain
ROBPSE, PRUAVI / RUBARM / ARRELA, LUPALB, HOLLAN, PLALAN
 - Grouped habitat type: Upland prairie
 - Equivalent plant association: None
5. Oregon ash, black locust, Oregon white oak / Himalayan blackberry / tufted hairgrass, common selfheal, velvetgrass, rattail fescue, blue wildrye, Roemer's fescue, Canada thistle
FRALAT, ROBPSE, QUEGAR / RUBARM / DESCES, PRUVUL, HOLLAN, VULMYU, ELYGLA, FESROE, CIRARV
 - Grouped habitat type: Upland prairie
 - Equivalent plant association: None
6. Tall fescue, reed canary grass, witchgrass
SCHARU, PHAARU, PANCAP
 - Grouped habitat type: Agriculture
 - Equivalent plant association: None
7. Tall fescue, reed canary grass, Queen Anne's lace
SCHARU, PHAARU, DAUCAR
 - Grouped habitat type: Agriculture
 - Equivalent plant association: None
8. Tall fescue, reed canary grass
SCHARU, PHAARU
 - Grouped habitat type: Agriculture
 - Equivalent plant association: None
9. Tall fescue, tall oat grass, Canada thistle

SCHARU, ARRELA, CIRARV

- Grouped habitat type: Agriculture
 - Equivalent plant association: None
10. Tristis poplar, arroyo willow, Oregon ash / Nootka rose / blue wildrye, reed canary grass, western water hemlock
POPTRI, SALLAS, FRALAT / ROSNUT / ELIPAL, PHAARU, CICDOU
- Grouped habitat type: Riparian
 - Equivalent plant association: None
11. Oregon white oak, Oregon ash, Douglas-fir, bigleaf maple / snowberry, Himalayan blackberry, serviceberry, poison oak, osoberry, beaked hazelnut, thimbleberry / erect hedgeparsley, shining geranium, salal
QUEGAR, FRALAT, PSEMEN, ACEMAC / SYMALB, RUBURS, AMEALN, TOXDIV, OEMCER, CORCOR, RUBPAR / TORJAP, GERLUC, GALAPE
- Grouped habitat type: Oak woodland
 - Equivalent plant association: QUEGAR, FRALAT / SYMALB Rank: G2S2
12. Douglas-fir, bigleaf maple / Himalayan blackberry
PSEMEN, ACEMAC / RUBARM
- Grouped habitat type: Managed grassland
 - Equivalent plant association: None
13. Bigleaf maple, Douglas-fir, tristis poplar, Oregon ash / English ivy, California blackberry, snowberry, Himalayan blackberry, osoberry, beaked hazelnut, thimbleberry / shiny geranium, stickywilly, sweet cicely
ACEMAC, PSEMEN, POPTRI, FRALAT / HEDHEL, RUBURS, SYMALB, RUBARM, OEMCER, CORCOR, RUBPAR / GERLUC, GALAPA, OSMBER
- Grouped habitat type: Mixed forest
 - Equivalent plant association: ACEMAR / RUBURS Rank: G3S3
14. Oregon white oak, Oregon ash / Himalayan blackberry/non-native grasses
QUEGAR, FRALAT / RUBARM
- Grouped habitat type: Oak woodland
 - Equivalent plant association: QUEGAR / FES spp. Rank: G1S1
15. Oregon white oak / Himalayan blackberry, snowberry/non-native grasses
QUEGAR / RUBARM, SYMALB
- Grouped habitat type: Oak woodland
 - Equivalent plant association: QUEGAR / FES spp. Rank: G1S1
17. Oregon white oak, Oregon ash / Himalayan blackberry/non-native grasses
QUEGAR, FRALAT / RUBARM
- Grouped habitat type: Oak woodland
 - Equivalent plant association: QUEGAR / FES spp. Rank: G1S1
18. Bigleaf maple, Douglas-fir, western redcedar, grand fir, Oregon white oak, Oregon ash / California blackberry, beaked hazelnut, snowberry, osoberry, poison oak, Oregon grape, Nootka rose, Himalayan blackberry, serviceberry / English ivy, western swordfern, sweet cicely, bristlystalked sedge, erect hedgeparsley, bigflower tellima, blue wildrye, California brome

ACEMAC, PSEMEN, THUPLI, ABIGRA, QUEGAR, FRALAT / RUBURS, CORCOR, SYMALB, OEMCER, TOXDIV, MAHNER, ROSNUT, RUBARM, AMEALN / HEDHEL, POLMUN, OSMBER, CARLEP, TORJAP, TELGRA, ELYGLA, BROCAR

- Grouped habitat type: Mixed forest
- Equivalent plant association: ACEMAC, PSEMEN / ACECIR / POLMUN Rank: G4S4

19. Non-native grasses

- Grouped habitat type: Agriculture
- Equivalent plant association: None

20. Douglas-fir, bigleaf maple, western redcedar, Oregon white oak, Oregon ash, grand fir / English ivy, snowberry, California blackberry, Himalayan blackberry, Oregon grape, thimbleberry / blue wildrye, feathery false lily of the valley
PSEMEN, ACEMAC, THUPLI, QUEGAR, FRALAT, ABIGRA / HEDHEL, SYMALB, RUBURS, RUBARM, MAHNER, RUBPAR / ELYGLA, MAIRAC

- Grouped habitat type: Mixed forest
- Equivalent plant association: PSEMEN, QUEGAR / SYMALB Rank: G3S3

21. Oregon ash, red alder / redosier dogwood, pacific ninebark, Himalayan blackberry / stinging nettle, reed canary grass, jewelweed
FRALAT, ALNRUB / CORSER, PHYCAP, RUBARM / URTDIO, PHAARU, IMPCAM

- Grouped habitat type: Riparian
- Equivalent plant association: ALNRUB / PHYCAP Rank: G1S1

22. Oregon ash / Himalayan blackberry / meadow foxtail, reed canary grass
FRALAT / RUBARM / ALOPRA, PHAARU

- Grouped habitat type: Riparian
- Equivalent plant association: None

23. Black locust, Oregon ash / Himalayan blackberry / meadow foxtail, tall fescue, common hop, perennial pea
ROBPSE, FRALAT / RUBARM / ALOPRA, SCHARR, HUMLUP, LATLAT

- Grouped habitat type: Operations
- Equivalent plant association: None

24. Oregon ash / Himalayan blackberry / meadow foxtail, soft brome, coast tarweed, large-leaved lupine, reed canary grass, Queen Anne's lace
FRALAT / RUBARM / ALOPRA, BROHOR, MADSAT, LUPPOL, PHAARU, DAUCAR

- Grouped habitat type: Riparian
- Equivalent plant association: None

25. Oregon ash, black cottonwood / Nootka rose, Himalayan blackberry, snowberry / reed canary grass, meadow foxtail, tall fescue
FRALAT, POTTRI / ROSNUT, RUBARM, SYMALB / PHAARU, ALOPRA, SCHARR

- Grouped habitat type: Riparian
- Equivalent plant association: FRALAT, POTTRI / SYMALB Rank: G3S3

26. Oregon ash / Himalayan blackberry / meadow foxtail, Queen Anne's lace
FRALAT / RUBARM / ALOPRA, DAUCAR

- Grouped habitat type: Operations

- Equivalent plant association: None
27. Oregon white oak / Nootka rose, Himalayan blackberry / meadow foxtail, velvetgrass, splitawn sedge, rattail fescue, coast tarweed
QUEGAR / ROSNUT, RUBARM / ALOPRA, HOLLAN, CARTUM, VULMYU, MADSAT
- Grouped habitat type: Upland prairie
 - Equivalent plant association: None
28. Douglas-fir, oneseed hawthorn / poison oak, Himalayan blackberry / non-native grasses, English plantain
PSEMEN, CRAMON / TOXDIV, RUBARM / PLALAN
- Grouped habitat type: Upland prairie
 - Equivalent plant association: None
29. Oregon ash, black hawthorn / Nootka rose, Himalayan blackberry / tall fescue, St. John's wort, hemp dogbane, smartweed
FRALAT, CRADOU / ROSNUT, RUBARM / SCHARR, HYPRAD, APOCAN, PER spp.
- Grouped habitat type: Upland prairie
 - Equivalent plant association: None
30. Sweet cherry, western red cedar, cascara buckthorn, paradise apple, oneseed hawthorn, red alder, bigleaf maple / Himalayan blackberry, poison oak / meadow foxtail
PRUAVI, THUPLI, FRAPUR, MALDOM, CRAMON, ALNRUB, ACEMAC / RUBARM, TOXDIV / ALOPRA
- Grouped habitat type: Mixed forest
 - Equivalent plant association: None
31. Oregon ash, tristis poplar / Nootka rose, redosier dogwood, Himalayan blackberry, cascara buckthorn / slough sedge, poverty rush
FRALAT, POPTRI / ROSNUT, CORSER, RUBARM, FRAPUR / CAROBN, JUNTEN
- Grouped habitat type: Riparian
 - Equivalent plant association: FRALAT / CAROBN Rank: G4S4
32. Oregon ash, Oregon white oak, bigleaf maple, Douglas-fir, arroyo willow, tristis poplar / Himalayan blackberry, Nootka rose, cascara buckthorn, pacific ninebark, snowberry / English ivy, reed canary grass
FRALAT, QUEGAR, ACEMAC, PSEMEN, SALLAS, POPTRI / RUBARM, ROSNUT, CORSER, PHYCAP, SYMALB / HEDHEL, PHAARU
- Grouped habitat type: Mixed forest
 - Equivalent plant association: FRALAT, POPTRI / CORCON, PHYCAP Rank: G3S3
33. Oregon ash, black hawthorn, cascara buckthorn / cluster rose, Nootka rose / meadow foxtail, common rush
FRALAT, CRADOU, CRAMON / ROSPIS, ROSNUT / ALOPRA, JUNEFF
- Grouped habitat type: Wet prairie
 - Equivalent plant association: None
34. Oregon ash / Nootka rose, Himalayan blackberry / common camas, sweet vernalgrass, Queen Anne's lace, velvetgrass, English plantain, oxeye daisy
FRALAT / ROSNUT, RUBARM / CAMQUA, ANTODO, DAUCAR, HOLLAN, PLALAN, LEUVUL
- Grouped habitat type: Upland prairie

- Equivalent plant association: CAMQUA
- Rank: G3S3
35. Sweet cherry, paradise apple, red oak / Himalayan blackberry
PRUAVI, MALDOM, QUERUB / RUBARM
- Grouped habitat type: Managed grassland
 - Equivalent plant association: None
36. Douglas-fir, sweet cherry, bigleaf maple, tristis poplar, arroyo willow / Himalayan blackberry / sweet vernalgrass, tall oat grass, rattail fescue, English plantain
PSEMEN, PRUAVI, ACEMAC, POPTRI, SALLAS / RUBARM / ANTODO, ARRELA, VULMYU, PLALAN
- Grouped habitat type: Managed grassland
 - Equivalent plant association: None
37. Oregon ash, sweet cherry, arroyo willow, tristis poplar / Himalayan blackberry, Hooker's willow / reed canary grass, meadow foxtail
FRALAT, PRUAVI, SALLAS, POPTRI / RUBARM, SALHOO / PHAARU, ALOPRA
- Grouped habitat type: Mixed forest
 - Equivalent plant association: None
38. Douglas-fir, sweet cherry, arroyo willow, bigleaf maple / Himalayan blackberry, California blackberry / English ivy
PSEMEN, PRUAVI, SALLAS, ACEMAC / RUBARM, RUBURS / HEDHEL
- Grouped habitat type: Mixed forest
 - Equivalent plant association: None
39. Grouped habitat type: Mixed forest
40. Douglas-fir, Oregon ash, bigleaf maple / Himalayan blackberry / Meadow foxtail, giant horsetail, Canada thistle, Queen Anne's lace, oxeye daisy, Fuller's teasel, Mexican hedgenettle, rose spirea, tall oat grass
PSEMEN, FRALAT, ACEMAC / RUBARM / ALOPRA, EQUTEL, CIRARV, DAUCAR, LEUVUL, DIPFUL, STAMEX, SPIDOU, ARRELA
- Grouped habitat type: Operations
 - Equivalent plant association: None
41. Oregon white oak, Oregon ash / Himalayan blackberry, oneseed hawthorn / meadow foxtail, oxeye daisy
QUEGAR, FRALAT / RUBARM, CRAMON / ALOPRA, LEUVUL
- Grouped habitat type: Upland prairie
 - Equivalent plant association: None
42. Grouped habitat type: Managed grassland
43. Grouped habitat type: Operations
44. Jeffrey pine, bigleaf maple, Oregon ash / Himalayan blackberry / rattail fescue, Queen Anne's lace, English plantain, sweet vernalgrass, orchardgrass
PINJEF, ACEMAC, FRALAT / RUBARM / VULMYO, DAUCAR, PLALAN, ANTODO, DACGLO
- Grouped habitat type: Managed grassland
 - Equivalent plant association: None
45. Norway maple, black locust, Douglas-fir, red oak / Himalayan blackberry / English plantain, Canada thistle, Queen Anne's lace

ACEPLA, ROBPSE, PSEMEN, QUERUB / RUBARM / PLALAN, CIRVUL, DAUCAR

- Grouped habitat type: Mixed forest
- Equivalent plant association: None

46. Bigleaf maple, Douglas-fir / Himalayan blackberry / Queen Anne's lace, English plantain, orchardgrass

ACEMAC, PSEMEN / RUBARM / DAUCAR, PLALAN, DACGLO

- Grouped habitat type: Managed grassland
- Equivalent plant association: None

47. Bigleaf maple, Oregon ash, tristis poplar, Douglas-fir, red alder / Himalayan blackberry, California blackberry, snowberry, osoberry / stinging nettle, bigflower tellima, jewelweed
ACEMAC, FRALAT, POPTRI, PSEMEN, ALNRUB / RUBARM, RUBURS, SYMALB, OEMCER /

URTDIO, TELGRA, IMPCAP

- Grouped habitat type: Mixed forest
- Equivalent plant association: ACEMAC / SYMALB / URTDIO Rank: G3S3

48. Black locust, spruce / English ivy, Himalayan blackberry, non-native grasses, tall fescue, sweet vernalgrass

ROBPSE, Picea sp. / HEDHEL, RUBARM / non-native grasses, SCHARR, ANTODD

- Grouped habitat type: Mixed forest
- Equivalent plant association: None

49. Oregon ash, arroyo willow / Himalayan blackberry, Nootka rose / meadow foxtail, tansy ragwort, Queen Anne's lace, oxeye daisy

FRALAT, SALLAS / RUBARM, ROSNUT / ALOPRA, SENJAC, DAUCAR, LEUVUL

- Grouped habitat type: Upland prairie
- Equivalent plant association: None

50. Oregon ash / Himalayan blackberry, Nootka rose / meadow foxtail, tall oat grass, St. John's wort, Queen Anne's lace, field bindweed

FRALAT / RUBARM, ROSNUT / ALOPRA, ARRELA, HYPRAD, DAUCAR, CONARV

- Grouped habitat type: Managed grassland
- Equivalent plant association: None

51. Oregon ash, sweet cherry / Himalayan blackberry, Nootka rose, pacific ninebark, redosier dogwood / tall oat grass, meadow foxtail, Canada thistle, reed canary grass, field bindweed, common reed, Fuller's teasel

FRALAT, PRUARV / RUBARM, ROSNUT, PHYCAP, CORSER / ARRELA, ALOPRA, CIRARV, PHAARU, CONARV, JUNsp, DIPFUL

- Grouped habitat type: Wet prairie
- Equivalent plant association: None

52. Grouped habitat type: Upland prairie

53. Grouped habitat type: Operations

54. Oregon ash, bigleaf maple, Oregon white oak, Douglas-fir / Himalayan blackberry, redosier dogwood, oneseed hawthorn, snowberry / meadow foxtail, giant horsetail, Canada thistle, Queen Anne's lace, oxeye daisy, Fuller's teasel, Mexican hedgenettle, rose spirea, tall oat grass

FRALAT, ACEMAC, QUEGAR, PSEMEN / RUBARM, CORSER, CRAMON, SYMALB /
ALOPRE, EQUDEL, CIRARV, DAUCAR, LEUVUL, DIPFUL, STAMEX, SPIDOU, ARRELA

- Grouped habitat type: Mixed forest
- Equivalent plant association: FRALAT / SYMALB
G4S4

Rank:

55. Douglas-fir, western red cedar, bigleaf maple, black locust, Oregon white oak /
Himalayan blackberry / meadow foxtail, grassy tarweed, European centaury
PSEMEN, THUPLI, ACEMAC, ROBPSE, QUEGAR / RUBARM / ALOPRA, MADGRA, CENERY

- Grouped habitat type: Upland prairie
- Equivalent plant association: None

56. Douglas-fir, oak species, ponderosa pine, red maple / redosier dogwood, pacific
ninebark, Nootka rose, California blackberry, poison oak, Himalayan blackberry / reed
canary grass, Mexican hedgenettle
PSEMEN, QUE sp., PINPON, ACERUB / CORSER, PHYCAP, ROSNUT, RUBURS, TOXDIV,
RUBARM / PHAARU, STAMEX

- Grouped habitat type: Riparian
- Equivalent plant association: None

57. Oregon ash, oneseed hawthorn / Himalayan blackberry, rose spirea, snowberry /
meadow foxtail, reed canary grass, Canada thistle, tiny vetch, European centaury, bull
thistle, garden vetch, oxeye daisy, Gardner's yampah, silver hairgrass
FRALAT, CRAMON / RUBARM, SPIDOU, SYMALB / ALOPRA, PHAARU, CIRARV, VICHIR,
CENERY, CIRVUL, VICSAT, LEUVUL, PERGAI, AURCAR

- Grouped habitat type: Wet prairie
- Equivalent plant association: None

58. Oregon white oak, sweet cherry, Oregon ash, paradise apple, Douglas-fir, European plum
/ Himalayan blackberry, beaked hazelnut, osoberry / meadow foxtail, tall oat grass,
oxeye daisy, tall fescue, Queen Anne's lace
QUEGAR, PRUAVI, FRALAT, MALDOM, PSEMEN, PRUDOM / RUBARM, CORCOR, OEMCER
/ ALOPRA, ARRELA, LEUVUL, SCHARR, DAUCAR

- Grouped habitat type: Managed grassland
- Equivalent plant association: None

59. Bigleaf maple, sweet cherry, oneseed hawthorn / Himalayan blackberry / Canada thistle,
Fuller's teasel, velvetgrass, St. John's wort, woodland ragwort, Queen Anne's lace
ACEMAC, PRUAVI, CRAMON / RUBARM / CIRARV, DIPFUL, HOLLAN, HYPRAD, SENSYL,
DAUCAR

- Grouped habitat type: Managed grassland
- Equivalent plant association: None

60. Grouped habitat type: Oak woodland

61. Oneseed hawthorn, Oregon ash, Oregon white oak / Himalayan blackberry, Nootka rose,
snowberry / meadow foxtail, splitawn sedge, reed canary grass, Canada thistle, oxeye
daisy, wiregrass
CRAMON, FRALAT, QUEGAR / RUBARM, ROSNUT, SYMALB / ALOPRA, CARTUM,
PHAARU, CIRARV, LEUVUL, VENDUB

- Grouped habitat type: Wet prairie
 - Equivalent plant association: None
62. Grouped habitat type: Agriculture
63. Douglas-fir, sweet cherry, bigleaf maple, Fremont cottonwood, arroyo willow / Himalayan blackberry / reed canary grass
PSEMEN, PRUAVI, ACEMAC, POPFRE, SALLAS / RUBARM / PHAARU
- Grouped habitat type: Mixed forest
 - Equivalent plant association: None
64. Douglas-fir, oak species, Italian stone pine, red alder / Himalayan blackberry, Nootka rose / Queen Anne's lace, English plantain, tansy ragwort
PSEMEN, QUE spp., PINPIN, ACERUB / RUBARM, ROSNUT / DAUCAR, PLALAN, SENJAC
- Grouped habitat type: Managed grassland
 - Equivalent plant association: None
65. Oregon ash, Oregon white oak / Nootka rose / meadow foxtail
FRALAT, QUEGAR / ROSNUT / ALOPRA
- Grouped habitat type: Managed grassland
 - Equivalent plant association: None
66. Douglas-fir, bigleaf maple, Oregon white oak, Oregon ash, beaked hazelnut, redosier dogwood, paradise apple, Fremont's cottonwood / Himalayan blackberry, thimbleberry, snowberry, Nootka rose / English ivy, common selfheal, orchardgrass, poison oak
PSEMEN, ACEMAC, QUEGAR, FRALAT, PRUAVI, CORCOR, CORSER, MALDOM, POPFRE / RUBARM, RUBPAR, SYMALB, ROSNUT / HEDHEL, PRUVUL, DACGLO, TOXDIV
- Grouped habitat type: Mixed forest
 - Equivalent plant association: PSEMEN, QUEGAR / SYMALB G3S3
67. Non-native oak, ash, and maple, non-native shrubs, English ivy, Himalayan blackberry, salal, Cascade barberry / non-native grasses
PINPON, ACEMAC / HEDHEL, RUBARM, GAUSHA, MAHNER
- Grouped habitat type: Operations
 - Equivalent plant association: None
68. Oregon white oak, Oregon ash, Douglas-fir, tristis poplar / beaked hazelnut, California blackberry, Himalayan blackberry, serviceberry, osoberry / non-native grasses, English ivy
QUEGAR, FRALAT, PSEMEN, POPTRI / CORCOR, RUBURS, RUBARM, AMEALN, OEMCER / HEDHEL
- Grouped habitat type: Oak woodland
 - Equivalent plant association: QUEGAR, FRALAT / SYMALB Rank:
G2S2
69. Oregon white oak, Oregon ash, bigleaf maple, sweet cherry / non-native shrubs, Pacific wax myrtle / non-native grasses and perennial weeds
QUEGAR, FRALAT, ACEMAC, PRUAVI / MYRCAL
- Grouped habitat type: Operations
 - Equivalent plant association: None

70. Bigleaf maple, Douglas-fir, western red cedar, grand fir, sweet cherry, Oregon white oak, Oregon ash / beaked hazelnut, vine maple, snowberry, osoberry, Cascade barberry, English holly, thimbleberry, red elderberry, pacific rhododendron / Siberian springbeauty, English ivy, western swordfern, pacific waterleaf, shining geranium, white insideout flower, sweet cicely
 ACEMAC, PSEMEN, THUPLI, ABIGRA, PRUAVI, QUEGAR, FRALAT / CORCOR, ACECIR, SYMALB, OMECER, MAHNER, ILEAQU, RUBPAR, SAMRAC, RUBSPE, RHOMAC / CLASIB, HEDHEL, POLMUN, HYDREN, GERLUC, VANHEX, OSMBER
- Grouped habitat type: Mixed forest
 - Equivalent plant association: ACEMAC, PSEMEN / ACECIR / POLMUN Rank: G4S4
71. Douglas-fir, bigleaf maple, Oregon ash, sweet cherry, tristis poplar, western red cedar, red alder / English ivy, beaked hazelnut, osoberry, poison oak, Cascade barberry, redosier dogwood / English ivy, erect hedgeparsley, western swordfern, bristlystalked sedge, alverjilla, sweet cicely, Columbia brome
 PSEMEN, ACEMAC, FRALAT, PRUAVI, POPTRI, THUPLI, ALNRUB / HEDHEL, CORCOR, OMECER, TOXDIV, MAHNER, CORSER / HEDHEL, TORJAP, POLMUN, CARLEP, ADEBIC, OSMBER, BROVUL
- Grouped habitat type: Mixed forest
 - Equivalent plant association: ACEMAC, PSEMEN / ACECIR / POLMUN Rank: G4S4
72. Tristis poplar, bigleaf maple, sweet cherry, Oregon ash, arroyo willow / beaked hazelnut, snowberry, redosier dogwood, vine maple, Himalayan blackberry / English ivy, western swordfern, false lily of the valley
 POPTRI, ACEMAC, PRUAVI, FRALAT, SALLAS / CORCOR, SYMALB, CORSER, ACECIR, RUBARM / HEDHEL, POLMIN, MAIDIL
- Grouped habitat type: Mixed forest
 - Equivalent plant association: ACEMAC / ACECIR Rank: G4S3
73. Oregon ash, oneseed hawthorn, red alder, Oregon white oak / Himalayan blackberry, poison oak, Nootka rose, snowberry, serviceberry / tall oat grass, Roemer's fescue, sweet vernalgrass, splitawn sedge, velvetgrass, oxeye daisy, common selfheal, English plantain
 FRALAT, CRAMON, ALNRUB, QUEGAR / RUBARM, TOXDIV, ROSNUT, SYMALB, AMAALN / ARRELA, FESROE, ANTODD, CARTUM, HOLLAN, LEUVUL, PRUVUL, PLALAN
- Grouped habitat type: Upland prairie
 - Equivalent plant association: None
74. Spruce species / Himalayan blackberry / non-native grasses and forbs
 PIC spp. / RUBARM
- Grouped habitat type: Operations
 - Equivalent plant association: None
75. Oregon ash, Oregon white oak / Himalayan blackberry / creeping bentgrass, common selfheal, reed canary grass
 FRALAT, QUEGAR / RUBARM / AGRGEN, PRUVUL var. VUL, PHAARU

- Grouped habitat type: Oak woodland
 - Equivalent plant association: None
76. Douglas-fir, bigleaf maple / osoberry, western swordfern / bigflower tellima
PSEMEN, ACEMAC / OEMCER, POLMUN / TELGRA
- Grouped habitat type: Mixed forest
 - Equivalent plant association: None
77. Douglas-fir, cedar species, bigleaf maple, black locust, Oregon white oak / snowberry, California blackberry, English ivy / shining geranium, bigleaf tellima
PSEMEN, CED spp., ACEMAC, ROBPSE, QUEGAR / SYMALB, RUBURS, HEDHEL / GERLUC, TELGRA
- Grouped habitat type: Mixed forest
 - Equivalent plant association: None
78. Jeffrey pine, pacific madrone / California blackberry, poison oak / non-native grasses
PINJEF, ARBMEN / RUBURS, TOXDIV
- Grouped habitat type: Mixed forest
 - Equivalent plant association: None
79. Arroyo willow / Himalayan blackberry, Nootka rose / reed canary grass, common rush
SALLAS / RUBARM, ROSNUT / PHAARU, JUNEFF
- Grouped habitat type: Riparian
 - Equivalent plant association: None
80. Oregon ash, paradise apple / Nootka rose, cluster rose / meadow foxtail, sedge species
FRALAT, MALDOM / ROSNUT, ROSPIS / ALOPRA, CAR sp.
- Grouped habitat type: Riparian
 - Equivalent plant association: None
81. Oregon ash, redosier dogwood, Oregon white oak / Himalayan blackberry, rose spirea / reed canary grass, Fuller's teasel
FRALAT, CORSER, QUEGAR / RUBARM, SPIDOU / PHAARU, DIPFUL
- Grouped habitat type: Managed grassland
 - Equivalent plant association: None
82. Oregon white oak, sweet cherry, oneseed hawthorn / osoberry, Himalayan blackberry, California blackberry / non-native grasses, blue wildrye, Alaska brome
QUEGAR, FRALAT, PRUAVI, CRAMON / OEMCER, RUBARM, RUBURS / ELYGLA, BROSIT
- Grouped habitat type: Oak woodland
 - Equivalent plant association: QUEGAR / TOXDIV / ELYGLA Rank: G2S1
83. Oregon white oak, Oregon ash, bigleaf maple, Douglas-fir, ponderosa pine / Himalayan blackberry, English ivy, snowberry, beaked hazelnut, snowberry / common cowparsnip, stickywilly, St. John's wort, erect hedgeparsley, sweet cicely
QUEGAR, FRALAT, ACEMAC, PSEMEN, PINPON / RUBARM, HEDHEL, SYMALB, CORCOR, OEMCER / HERMAX, GALAPA, HYPPER, TORJAP, OSMBER
- Grouped habitat type: Mixed forest
 - Equivalent plant association: QUEGAR, FRALAT / SYMALB Rank: G2S2

84. Oregon ash, Oregon white oak / Nootka rose, Himalayan blackberry, poison oak / reed canary grass, meadow foxtail, common tansy, splitawn sedge, Canada thistle
FRALAT, QUEGAR / ROSNUT, RUBARM, TOXDIV / PHAARU, ALOPRA, TANVUL, CARTUM, CIRARV
- Grouped habitat type: Wet prairie
 - Equivalent plant association: None
85. Douglas-fir, western red cedar, bigleaf maple / Himalayan blackberry, English ivy / non-native grasses, Queen Anne's lace, common selfheal
PSEMEN, THUPLI, ACEMAC / RUBARM, HEDHEL / DAUCAR, PRUVUL var. VUL
- Grouped habitat type: Mixed forest
 - Equivalent plant association: None
86. Oregon white oak, bigleaf maple, Oregon ash, sweet cherry, Douglas-fir, oneseed hawthorn / Himalayan blackberry, serviceberry, snowberry, Nootka rose, California blackberry, beaked hazelnut / non-native grasses, St. John's wort, bristlystalked sedge, spreading rush
QUEGAR, ACEMAC, FRALAT, PRUAVI, PSEMEN, CRAMON / RUBARM, AMEALN, SYMALB, ROSNUT, RUBURS, CORCOR / HYPPER, CARLEP, JUNPAT
- Grouped habitat type: Oak woodland
 - Equivalent plant association: QUEGAR, FRALAT / SYMALB Rank: G2S2
87. Oregon ash, red alder, bigleaf maple, Oregon white oak / redosier dogwood, pacific ninebark, Himalayan blackberry, arroyo willow, Nootka rose / reed canary grass, stinging nettle
FRALAT, ALNRUB, ACEMAC, QUEGAR / CORSER, PHYCAP, RUBARM, SALLAS, ROSNUT / PHAARU, URTDIO
- Grouped habitat type: Riparian
 - Equivalent plant association: None
88. Bigleaf maple, Oregon ash, Douglas-fir, Oregon white oak, tristis poplar, sweet cherry / snowberry, poison oak, salal, vine maple / English ivy, western swordfern
ACEMAC, FRALAT, PSEMEN, QUEGAR, POPTRI, PRUAVI / SYMALB, TOXDIV, GAUSHA, ACECIR / HEDHEL, POLMUN
- Grouped habitat type: Mixed forest
 - Equivalent plant association: ACEMAC, PSEMEN / ACECIR / POLMIN Rank: G3S3
89. Oregon ash, red alder / redosier dogwood, pacific ninebark, Himalayan blackberry / reed canary grass, jewelweed
FRALAT, ALNRUB / CORSER, PHYCAP, RUBARM / PHAARU, IMPCAP
- Grouped habitat type: Riparian
 - Equivalent plant association: None
90. Oregon white oak, bigleaf maple, sweet cherry / serviceberry, poison oak, oceanspray, osoberry, Himalayan blackberry / shining geranium, sweet cicely, English ivy
QUEGAR, ACEMAC, PSEMEN, PRUAVI / AMEALN, TOXDIV, HOLDIS, OEMCER, RUBARM / GERLUC, OSMBER, HEDHEL
- Grouped habitat type: Oak woodland

- Equivalent plant association: QUEGAR, ACEMAC, PSEMEN / ACECIR, CORCOR
Rank: G3S3

91. Oregon white oak, Oregon ash, oneseed hawthorn / Himalayan blackberry, rose spirea / tall fescue, meadow foxtail, large camas

QUEGAR, FRALAT, CRAMON / RUBARM, SPIDOU / SCHARR, ALOPRA, CAMLEI

- Grouped habitat type: Oak woodland
- Equivalent plant association: QUERGAR, FRALAT / SYMALB Rank: G2S2

92. Oneseed hawthorn, Oregon ash, paradise apple, Oregon ash / snowberry, rose spirea, Himalayan blackberry, poison oak / tall fescue, oxeye daisy, orchardgrass, Queen Anne's lace

CRAMON, QUEGAR, MALDOM, FRALAT / SYMALB, SPIDOU, RUBARM, TOXDIV / SCHARR, LEUVUL, DACGLO, DAUCAR

- Grouped habitat type: Upland prairie
- Equivalent plant association: None