

# Conservation Strategy

## FOR FENDER'S BLUE BUTTERFLY & ASSOCIATED HABITATS IN YAMHILL COUNTY



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Prepared for the Yamhill Soil and Water Conservation District by the  
Institute for Applied Ecology



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Cover Photo: Fender's blue butterfly on Kincaid's lupine by Tom Kaye. All photos by IAE unless labeled otherwise.

# Table of Contents

<b>Section 1: Background and Purpose</b> .....	1
<i>Conservation Challenges in Yamhill County</i> .....	1
<i>Conservation Opportunities in Yamhill County</i> .....	2
<i>Goals</i> .....	2
<b>Section 2: Upland Prairie and Oak Savanna Habitat</b> .....	3
<b>Section 3: Fender’s Blue Butterfly and Kincaid’s Lupine</b> .....	7
<i>Fender’s Blue and Kincaid’s Lupine Population Dynamics</i> .....	7
<i>Fender’s Blue and Kincaid’s Lupine Habitat Connectivity Needs</i> .....	8
<b>Section 4: Recovery Plan Recommendations</b> .....	8
<i>Benchmarks for Yamhill County</i> .....	10
<b>Section 5: Key Habitat Areas</b> .....	11
<i>Habitat Locations and Quality</i> .....	11
<i>Prioritizing Areas for Conservation Actions</i> .....	11
<b>Section 6: Meeting Fender’s Blue Recovery Goals in Yamhill County</b> .....	17
<i>Actions in Priority Habitat Zones</i> .....	17
<b>Section 7: County-Wide Habitat Conservation Actions</b> .....	21
<b>Section 8: Voluntary Conservation Tools</b> .....	24
<i>Habitat Restoration Guides</i> .....	24
<i>Landowner Incentives and Opportunities</i> .....	25
<b>References</b> .....	27

# Section 1: Background and Purpose

Prairie and oak savanna habitats in Yamhill County support unique plant and animal species and contribute to the scenic landscape enjoyed by its residents and visitors. Much of the historic prairie and oak savanna in Yamhill County have been lost to land use conversion, habitat fragmentation, fire suppression and invasive species spread (ODFW 2006). Populations of plant and animal species dependent on prairie and oak savanna have declined and several are listed as threatened or endangered by Federal and State agencies. Strategic conservation planning can help focus conservation actions around the best remaining habitat for the benefit of both listed species and associated species that may also be in decline.

This strategy was developed to complement the Habitat Conservation Plan for the endangered Fender's blue butterfly (*Icaricia icarioides fenderi*) (Figure 1) that was developed by the Yamhill Soil and Water Conservation District and funded by a U.S. Fish and Wildlife Service (USFWS) grant, and it also serves as a stand-alone reference document. The continued existence of prairie and oak savanna habitats and associated species in Yamhill County depends on the willingness of private landowners to voluntarily undertake conservation actions. This document provides an overview of voluntary actions that can be enacted in Yamhill County to promote recovery of Fender's blue butterfly and enhance prairie and oak savanna habitats for other common and at risk species.

## Conservation Challenges in Yamhill County



Figure 1. Fender's blue butterfly.

In the Willamette Valley, prairie and oak savanna habitats have declined from their historic extent. Unless protected and restored, these habitats will likely continue to decline due to a variety of factors, including land use change, urban expansion to accommodate future population growth and spread of invasive species. Much of Yamhill County's historic prairie and oak savanna habitat has been converted to agricultural or forestry purposes, or has become Douglas-fir (*Pseudotsuga menziesii*) forest through natural succession. Remaining prairie and oak savanna habitats in Yamhill County are almost exclusively under private ownership, and tend to be managed for other purposes, including vineyards, pasture, and hay/forage production.

Prairie and oak savanna patches in the western valleys of Yamhill County (Gopher Valley, Muddy Valley) and rolling open areas in the north of the County (Oak Ridge and Turner Creek) are naturally isolated by topography. Within those areas, habitat patches are often isolated from one another by roads, forests,

agricultural fields and other habitat types. This habitat fragmentation makes it difficult for some plant and animal species to disperse between patches, reducing their ability to survive over the long term.

Fire suppression over the last two centuries has allowed shrubs and trees to displace prairie species and prairies have slowly been replaced by coniferous forests in a process called succession. In addition, non-native species introduced to our region pose a new threat to prairie and oak savanna ecosystems by changing the habitat ecology and composition.

**The primary threats to prairie and oak savanna habitats are:**

- Habitat loss and fragmentation due to change in land use
- Invasion by non-native plant species
- Vegetative succession to shrub and tree species

*Conservation Opportunities in Yamhill County*

Opportunities for habitat conservation in Yamhill County hinge on the actions of Yamhill County's private landowners. Many dedicated individuals work on their own or with the Yamhill Soil and Water Conservation District or other entities to restore and protect prairie and oak savanna habitat on private lands. Many private landowners also manage much of the best remaining native habitat on their own or in partnership with public agencies, such as the U.S. Fish and Wildlife Service Partners for Fish and Wildlife Program, or the Oregon Department of Fish and Wildlife Landowner Incentive Program (learn more about these programs in Section 8: Voluntary Conservation Tools). Conservation actions on private lands are crucial for maintaining habitat for both rare and common native species. Engaging private landowners in prairie conservation is vital to retain native prairie and oak savanna habitat in Yamhill County and throughout the Willamette Valley.

*Goals*

This strategy was developed to guide long-term conservation of prairie and oak savanna habitats for Fender's blue butterfly and associated native prairie and oak savanna species in Yamhill County. Actions recommended by this strategy are voluntary and emphasize opportunities for public and private landowners to work together towards habitat conservation. Funding for conservation is often limited, so this strategy also identifies methods to achieve species conservation using diverse sources of funding.

**Goal 1: Prioritize areas in Yamhill County where conservation actions may have the greatest benefit for rare species and habitats.**

Goal 1 Actions

- Identify current habitats in Yamhill County that support Fender's blue butterfly and its habitat. Investigate whether these sites support other rare species.
- Identify areas within Yamhill County that support prairie and oak savanna habitats with a diversity of native plants.
- Identify lands protected under conservation easement, or ownership by a public or conservation entity, and evaluate their potential to enhance connectivity or host new populations that promote species recovery.

**Goal 2: Identify key conservation actions to promote Fender’s blue butterfly survival and expansion in Yamhill County.**

Goal 2 Actions

- Identify connectivity opportunities and obstacles for Fender’s blue on unprotected lands.
- Provide private landowners with basic information on widely beneficial management actions to enhance upland prairie and oak savanna habitats for Fender’s blue and other upland prairie or oak savanna species.
- Evaluate the potential to expand Fender’s blue butterfly distribution in Yamhill County through introductions into currently unoccupied areas.

**Goal 3: Encourage public and private partnerships to enhance prairie conservation.**

Goal 3 Actions

- Identify voluntary programs and other conservation opportunities and existing funding sources for habitat conservation (see Section 8: Voluntary Conservation Tools).
- Create opportunities such as field days, workshops and other outreach opportunities to engage private landowners in prairie and oak savanna habitat conservation.

## **Section 2: Upland Prairie and Oak Savanna Habitat**



**Figure 2. Upland prairie-oak savanna habitat in Yamhill County, Oregon.**

Upland prairies and oak savannas ([Figure 2](#)) are identified in the Oregon Conservation Strategy (ODFW 2006) as particularly reduced in the Willamette Valley. Loss of prairie habitat in Yamhill County has contributed to the listing of several prairie and oak savanna dependent species, such as Fender’s blue butterfly and Kincaid’s lupine, under the federal and state Endangered Species Acts. Identifying remaining areas with quality upland prairie and oak savanna habitat is a first step to promoting the down-listing from endangered to threatened of species like Fender’s blue. Further work to restore and enhance a network of prairie and oak savanna habitat will benefit a wide variety of rare and common species (see list in Attachment 1).

In the Willamette Valley, upland prairie and oak savanna habitats typically occur on low elevation, well drained slopes along the valley bottom and surrounding foothills. Upland prairies (“prairies”) are among the most threatened ecosystems in Oregon. These open grasslands historically occurred across the Willamette Valley and supported diverse animal and plant species. Upland prairies are typically



dominated by perennial grasses and annual or perennial forbs. Oak savanna areas may also contain widely spaced (a few trees per acre) open grown Oregon white oaks (*Quercus garryana*) with wide canopies. Trees may occur in widely spaced clumps ('savanna groves').

Wet prairies have an open structure similar to upland prairies, and may transition to upland prairie along hydrological, soil and topographical gradients. Both upland and wet prairies were historically maintained as open habitats with seasonal fire by native peoples. As upland prairie and oak savanna habitats are the primary system for Fender's blue and Kincaid's lupine in the north Willamette valley, they are the target habitat of this strategy, but adjacent wet prairies are likely to benefit as well.

Common native and perennial bunchgrasses in upland prairie and oak savanna include Roemer's fescue (*Festuca roemerii*), California oatgrass (*Danthonia californica*), and prairie junegrass (*Koeleria macrantha*). Somewhat drier sites on thinner soils or south facing slopes may also include Lemmon's needlegrass (*Achnatherum lemmonii*).

Native forbs commonly intermixed with the grasses frequently include Oregon sunshine (*Eriophyllum lanatum*), slender cinquefoil (*Potentilla gracilis*), dwarf checkermallow (*Sidalcea virgata*), lance selfheal (*Prunella vulgaris* ssp. *lanceolata*), and Tolmie startulip (*Calochortus tolmiei*) (Figure 3). Other common forbs include yarrow (*Achillea millefolium*) and strawberry (*Fragaria virginiana*).



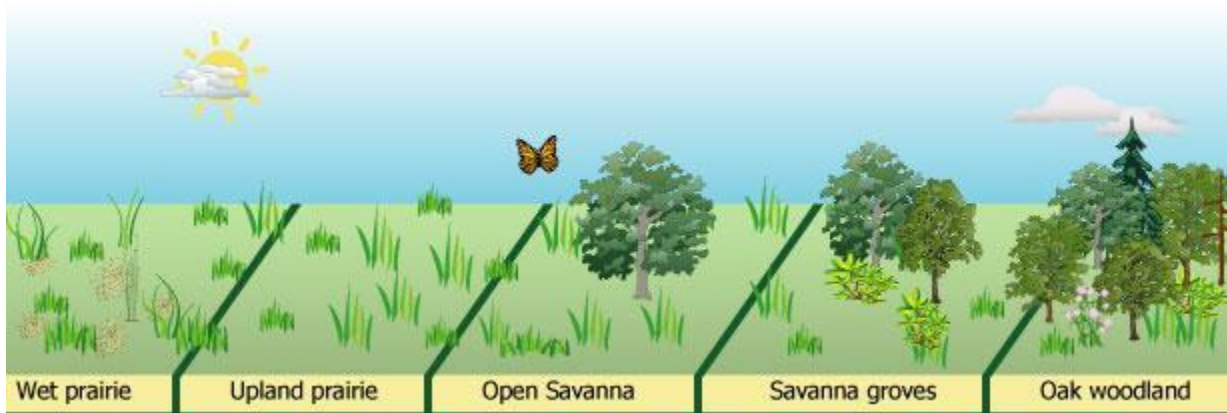
**Figure 3. Native prairie and oak savanna forb species that are also nectar species for Fender's blue butterfly, Tolmie startulip (Top) and dwarf checkermallow (Bottom).**

Several plant species frequently invade upland prairie and oak savanna habitats, reducing their size and quality for prairie species. Common problematic species include native trees such as Douglas fir, which can provide important bird habitat, but left unchecked will eventually convert prairie habitat to forest. A wide variety of non-native shrubs also invade prairie habitats, including one seed hawthorn (*Crataegus monogyna*), Scotch broom (*Cytisus scoparius*) and Armenian blackberry (*Rubus armeniacus*). The aggressive invasive grass false brome (*Brachypodium sylvaticum*) is a particular problem for upland prairie and oak savanna, as is meadow knapweed (*Centaurea pratensis*) (Figure 4).



**Figure 4. Invasive species in Willamette Valley prairie-oak savanna habitats. One seed hawthorn (left) and false brome (right).**

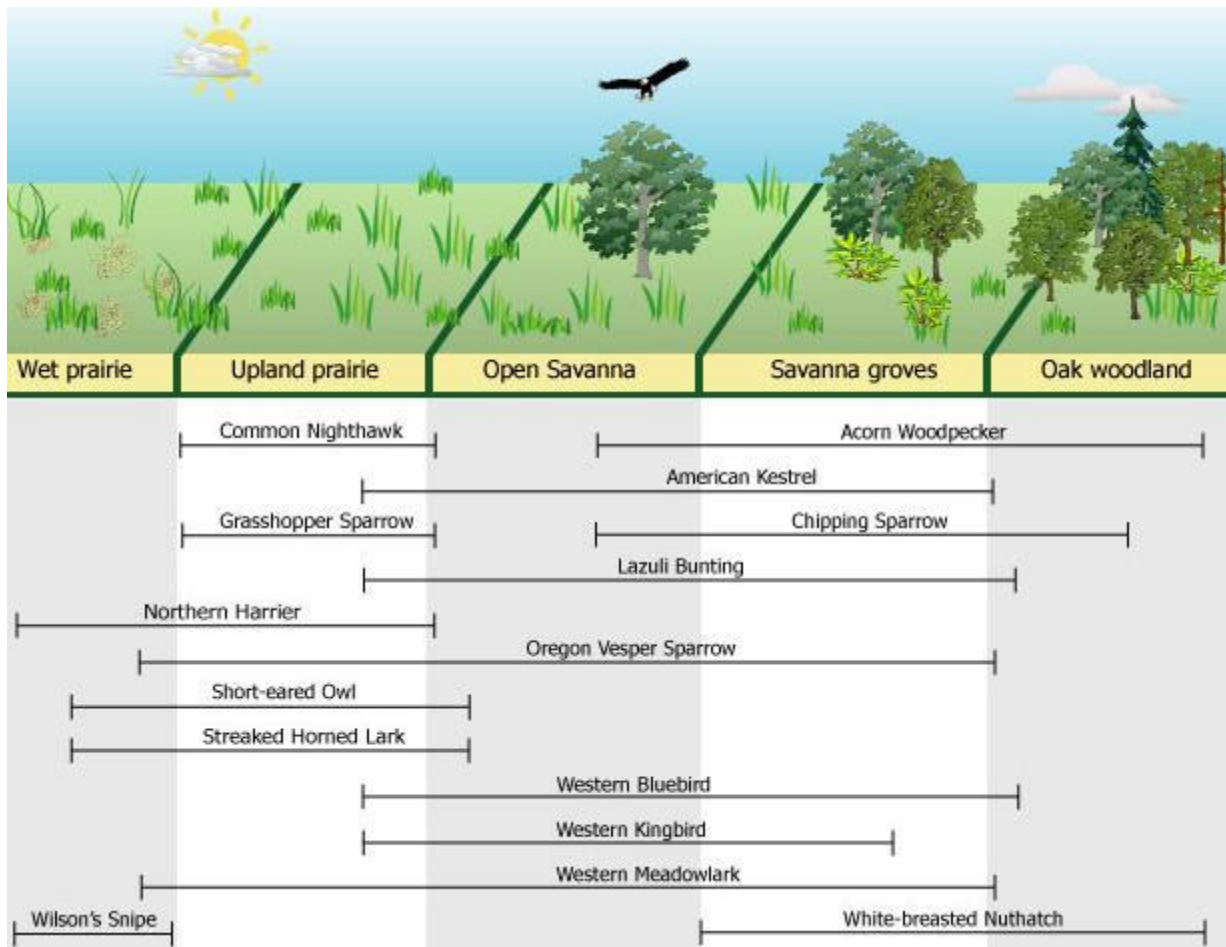
A diversity of native plant species, insects and birds use prairie and oak savanna habitats, and may also use adjoining wet prairie or oak woodland systems (Figure 5 and Figure 6; Attachment 1). As the availability of all these habitats in the Willamette Valley has decreased over time, some of these species have declined and become less common or even rare. Conservation actions to restore, protect and enhance upland prairie and oak savanna for Fender’s blue butterfly and Kincaid’s lupine will provide benefits to many other species in these habitats at the same time (Attachment 1). More information about many of these species is available in the ODFW Oregon Conservation Strategy (ODFW 2006).



		Kincaid’s lupine	
	Willamette/Pale larkspur		
		Golden paintbrush	
	Willamette Daisy		
		Fender’s blue butterfly	
		Taylor’s checkerspot butterfly	

**Figure 5. Habitat guide for plant and butterfly species present or likely historically present in prairie and oak habitats of Yamhill County. Symbols courtesy of the Integration and Application Network ([ian.umces.edu/symbols/](http://ian.umces.edu/symbols/)), University of Maryland Center for Environmental Science.**





**Figure 6. Habitat guide for key bird species in Yamhill County. Symbols courtesy of the Integration and Application Network ([ian.umces.edu/symbols/](http://ian.umces.edu/symbols/)), University of Maryland Center for Environmental Science.**

## Section 3: Fender’s Blue Butterfly and Kincaid’s Lupine

Fender’s blue butterfly (Figure 1) and its host plant, Kincaid’s lupine (Figure 7) occur in the prairie and oak savanna habitats of central and western Yamhill County. The decline, rarity and threats to these species led the U.S. Fish and Wildlife Service to list the butterfly as endangered and the lupine as threatened under the Endangered Species Act. This strategy focuses on actions to benefit Fender’s blue butterfly and Kincaid’s lupine where it is used by the butterfly. There are additional species, while not considered endangered, that have declining populations and are likely to benefit from prairie and savanna restoration for Fender’s blue (Attachment 1). To plan the most effective conservation actions for Fender’s blue and Kincaid’s lupine, it is necessary to take population size (the number of butterflies in a habitat patch and the area of the patch) and connectivity (distance between habitat patches) into account.



Figure 7. Kincaid’s lupine, host plant for Fender’s blue butterfly.

### *Fender’s Blue and Kincaid’s Lupine Population Dynamics*

As a consequence of being rare species, populations (patches of butterflies or patches of plants occurring in the same place) of Fender’s blue and Kincaid’s lupine tend to be small and isolated from one another. They tend to have relatively few individuals and cover limited areas. Small populations are

quite vulnerable to threats from accidental damage and years of poor weather conditions, since the loss of a dozen individuals could be half or more of the population. Populations that shrink to a very small size (sometimes referred to as a ‘population bottleneck’) often lose much of their genetic diversity (variability between individuals in the population), and never fully recover their population vitality even if they are able to expand back to a larger size at a later time. Small populations also have fewer opportunities to outcross (breed with unrelated individuals), and may experience frequent inbreeding (crossing with related individuals), which also results in lower population genetic diversity and resiliency. Populations of insects already tend to fluctuate widely, and combined with limited habitat availability and decline in prairie quality, Fender’s blue is prone to dangerously shrinking populations.

### *Fender’s Blue and Kincaid’s Lupine Habitat Connectivity Needs*

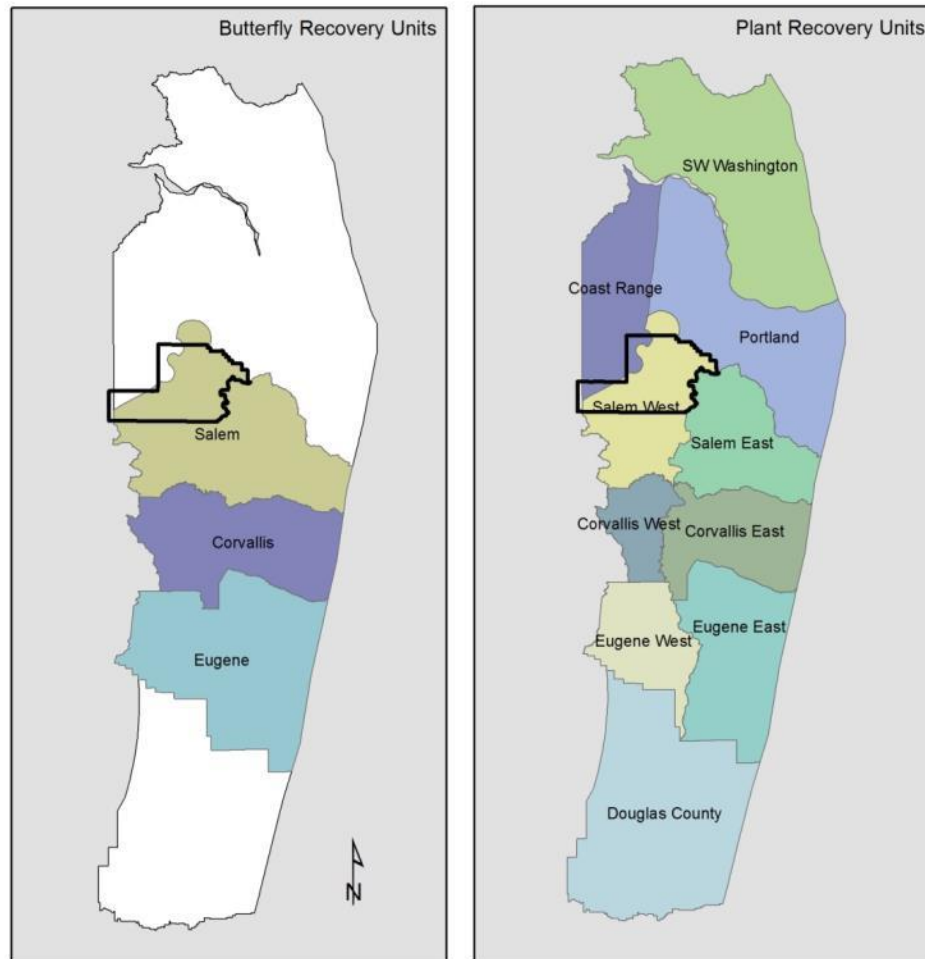
Fender’s blue butterfly is not a species that travels long distances- adult butterflies typically travel only up to 2 km (1.2 mi) from the lupine patch where they hatched as larvae and eventually became adult butterflies. They travel even shorter distances, usually between 50 and 100 m (164 and 328 ft), to obtain food, the sugar containing nectar from certain flowering plants. Plants like Kincaid’s lupine, by their nature, do not travel at all, and depend on pollinators (e.g., bees, bumblebees) to transfer pollen between plants and populations. The pollinators that visit Kincaid’s lupine typically travel up to 3 km (1.9 mi). Keeping the flow of pollinators and butterflies between populations of Fender’s blue and Kincaid’s lupine is critical to maintain genetic diversity, which helps buffer the populations against disease and decline and helps maintain population vigor.

Butterflies and pollinators are often not able to cross barriers such as forests, major highways or urban/industrial areas. Ensuring butterfly populations are not isolated from each other or from nectar sources is vital to Fender’s blue butterfly conservation. Small parcels of property or strips of native vegetation along field margins or roadsides can provide stepping stones to link more distant patches of habitat together. While this strategy focuses primarily on Kincaid’s lupine only where it hosts Fender’s blue, maintaining vigorous lupine populations requires addressing its connectivity needs in addition to those of Fender’s blue.

## **Section 4: Recovery Plan Recommendations**

The U.S. Fish and Wildlife Service has prepared a Recovery Plan for listed and at risk prairie species, which includes Fender’s blue butterfly and Kincaid’s lupine, in addition to other threatened and endangered prairie species in the Willamette Valley and adjacent Washington (USFWS 2010). The purpose of a Recovery Plan is to identify what actions are needed to increase the abundance and stability of threatened and endangered species, and set forth criteria to move (‘down-list’) species from being endangered to threatened, and even remove them from the endangered species list all together (‘de-list’).

In the Plan, the Willamette Valley is divided into nine recovery zones for prairie plant species and three zones for Fender’s blue butterfly (Figure 8).



**Figure 8. USFWS recovery zones for Fender’s blue butterfly (left) and Kincaid’s lupine (and other rare plants) (right) in Oregon and SW Washington. Bold line indicates the location of Yamhill County.**

For each recovery zone, the Recovery Plan lays out the number, size, connectivity, and quality of populations/habitat patches that would be needed to down-list or de-list Fender’s blue butterfly and Kincaid’s lupine. These recovery criteria were generated by a panel of scientists analyzing Fender’s blue butterfly population dynamics throughout the Willamette Valley; if the recovery criteria are achieved, the risk of the butterfly declining and going extinct in the future is extremely low. In this strategy we focus on achieving the benchmarks to down-list Fender’s blue from endangered to threatened. To completely remove Fender’s blue from the endangered species list the benchmarks are higher, and considerably larger numbers of butterflies are required.

For a site to contribute to achieving the recovery benchmarks, it must be managed for high quality prairie habitat, and be under some sort of site protection- either conservation easement for prairie values, or public land ownership and management. Such protections are needed to ensure the stability of management of the population and the species as a whole into the future and across its range. Only

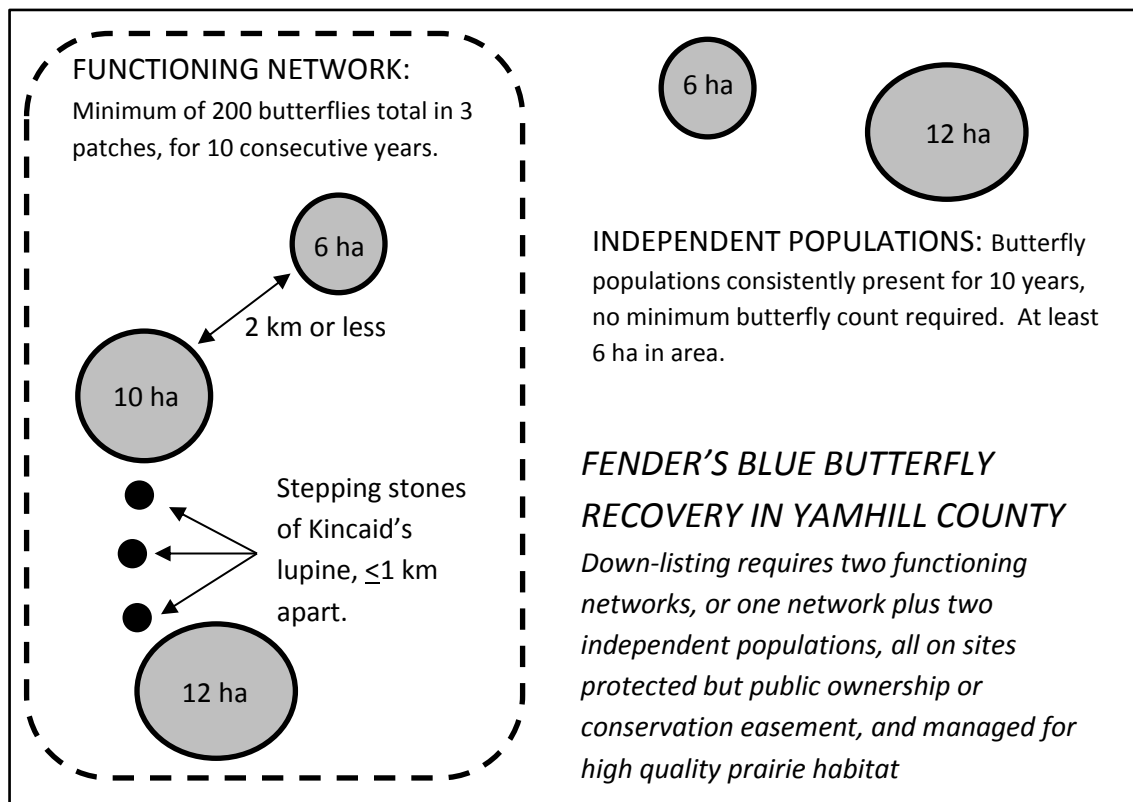


when sufficient populations are secure can the U.S. Fish and Wildlife Service consider lifting part or all of the protections for the species elsewhere.

We use the benchmarks from the U.S. Fish and Wildlife Service Recovery Plan to guide our strategy of actions on private lands to facilitate recovery of Fender’s blue in Yamhill County, and contribute to its recovery throughout the Willamette Valley.

### *Benchmarks for Yamhill County*

Yamhill County includes much of the Fender’s blue butterfly habitat in the Fender’s blue Salem Recovery Zone. To down-list the butterfly from endangered to threatened, this zone must have two functioning networks of protected habitat or one functioning network plus two independent populations (Figure 9). Functioning networks are made up of at least three patches of protected and high quality butterfly habitat supporting Fender’s blue. Each of the three patches must be a minimum of 6 ha (15 ac) in size, and separated from each other by no more than 2 km (1.2 mi), unless they are linked by habitat stepping stones. Stepping stones are small patches of Kincaid’s lupine (no minimum size) that are located less than 1 km (0.6 mi) apart. In a recovery zone, at least one functioning network must have a minimum count of 200 butterflies each year for a 10-year period. If there is a second network, it must also support butterflies every year for a 10-year period, but there is no minimum count of butterflies required.



**Figure 9. Benchmarks in Yamhill County (as part of the Salem Recovery Zone) to down-list Fender’s blue butterfly from endangered to threatened.**

Independent populations are populations of butterflies occurring in high quality habitat patches of at least 6 ha (15 ac). There is no minimum butterfly count required for independent populations, but they must support butterflies for a period of 10 consecutive years.

To de-list the butterfly completely, two functioning networks in Yamhill County would each have to have a minimum of 4,500 butterflies for 10 years (in addition to benchmarks being met in the Corvallis and Eugene Recovery Zones). There could also be a larger number of networks or additional independent populations. The target butterfly counts are far greater for de-listing than down-listing. Further details on counts required are included in the Recovery Plan (USFWS 2010).

## Section 5: Key Habitat Areas

### *Habitat Locations and Quality*

Patches of high quality prairie and oak savanna habitat can be found throughout Yamhill County, but often these areas are isolated by topography, vegetation barriers like conifer forests, or distances beyond the dispersal ability of butterfly and plant populations. Creating and maximizing zones of protected habitat (through partnerships, conservation easements and property acquisition) will benefit many native species, especially threatened and endangered ones prone to small populations like Fender's blue. Small, isolated populations are almost always at a greater risk of extinction. Creating larger blocks of suitable habitat and providing connections between such blocks will reduce the threat of individual populations disappearing, whether due to accidental disturbance, disease or other factors related to small, genetically isolated populations. Understanding the current distribution of upland prairie and oak savanna habitat, Fender's blue, Kincaid's lupine and protected sites in Yamhill County helps identify priorities for conservation and restoration actions (Goal 1 of this Strategy). Several questions that still need to be answered include:

- Is there suitable habitat on private lands for species dispersal from known population sites?
- Where can restoration work take place to enhance current species habitat?
- What are the habitat improvement and population introduction/augmentation needs?
- Where can connectivity between populations be enhanced?

### *Prioritizing Areas for Conservation Actions*

The Yamhill SWCD has completed extensive surveys for Fender's blue butterfly and Kincaid's lupine within the county. While not all possible areas were surveyed, the SWCD found several new populations of both species, expanding the known distribution of Fender's blue and Kincaid's lupine in the county. With this information, gained from more than 4,850 ha (12,000 ac) of surveys from 2011 to 2013, we can outline the main areas that have Fender's blue butterfly or Kincaid's lupine in Yamhill County (Figure 10) and have the greatest potential for further conservation work to benefit the species:

- Baker Creek
- Chehalem Mountain
- Gopher Valley
- Hill Road
- Meadow Lake
- Moores Valley
- Turner Creek
- Muddy Valley
- Oak Hill
- Oak Ridge
- Rock Creek
- Rockyford

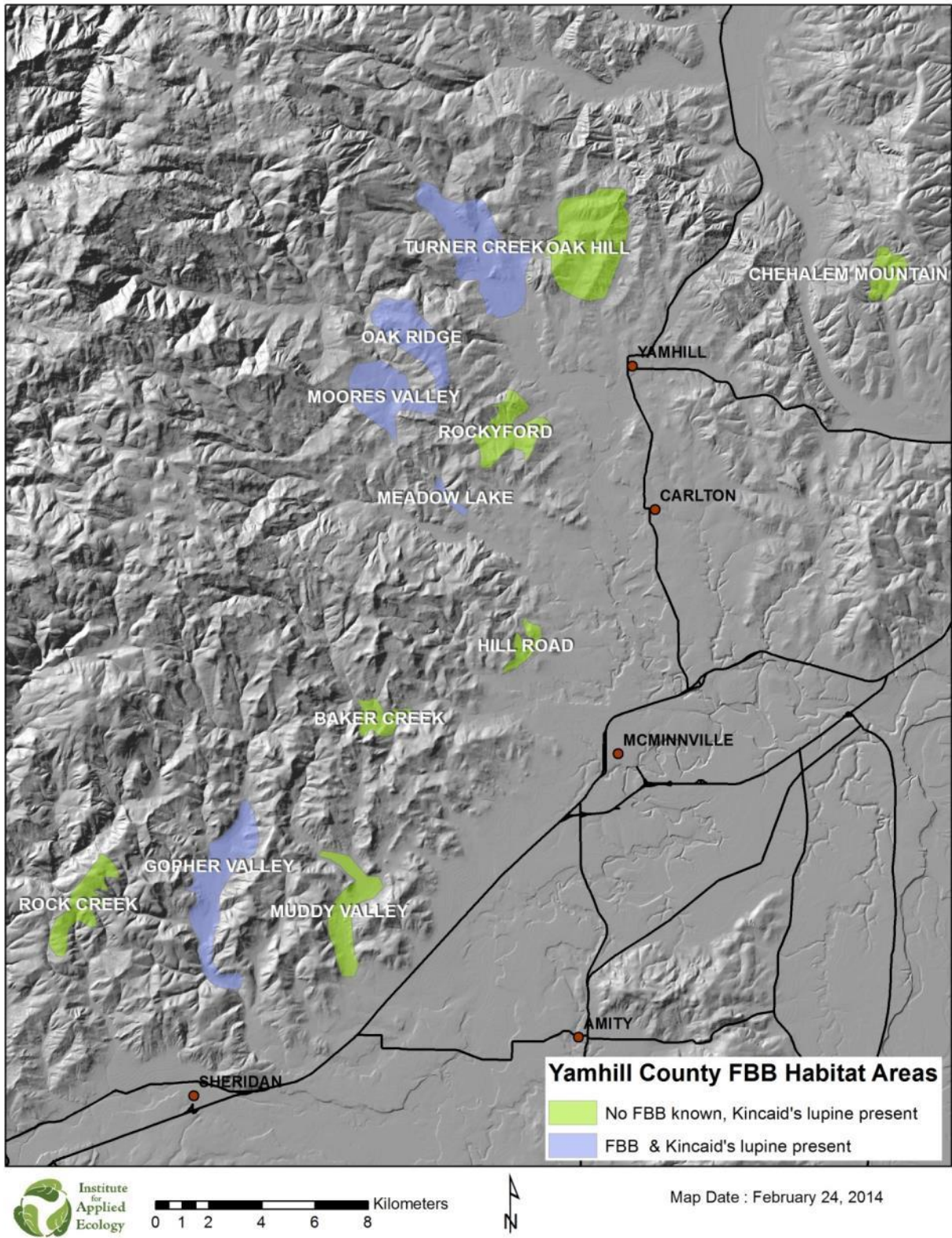


Figure 10. Priority prairie and oak savanna habitat areas with Fender's blue butterfly and Kincaid's lupine in Yamhill County.

Several planning efforts have defined areas of high priority for conservation in the Willamette Valley, including the Oregon Conservation Strategy (ODFW 2006). A 2007 planning initiative led by The Nature Conservancy combined areas identified as high priority for conservation in a single map for the Willamette Valley (The Nature Conservancy 2009). In addition to forest land and riparian areas, this effort mapped priority areas of upland prairie and oak savanna habitat, the focus of this document. The Nature Conservancy's mapping, in combination with more current data regarding known locations for Fender's blue butterfly and Kincaid's lupine, can help prioritize habitat and species conservation actions in Yamhill County (Figure 11). Areas outside of these zones and identified populations may also contain important habitat and can provide opportunities for meaningful habitat acquisition and restoration.

### **Sites Managed for Permanent Conservation**

Many areas in Yamhill County have key habitat or the potential for key habitat after habitat restoration. Those that are permanently protected through public ownership or habitat conservation easements that include endangered species or habitat as a conservation value can help meet the U.S. Fish and Wildlife's benchmarks for threatened or endangered species down-listing or de-listing. Sites in Yamhill County with habitat under permanent protection are listed in Table 1. The position of these sites is shown in Figure 11.

### **Sites Managed for Limited Time-frame Conservation**

There are many sites in Yamhill County that are protected under limited time-frame habitat conservation agreements, such as the Partners for Fish and Wildlife Program through the U.S. Fish and Wildlife Service, or through Safe Harbor Agreements with the U.S. Fish and Wildlife Service. Partners for Fish and Wildlife agreements are typically for 10 years (and can be renewed) and Safe Harbor Agreements last for a minimum of 10 years. Partners and Safe Harbor Agreements benefit land owners by providing financial or technical assistance with conservation, and provide benefits to species through habitat restoration, enhancement and management. See Section 8 for descriptions of conservation assistance tools. Properties currently enrolled in these programs in or near Fender's blue butterfly habitat are described in Table 2 and mapped in Figure 11.



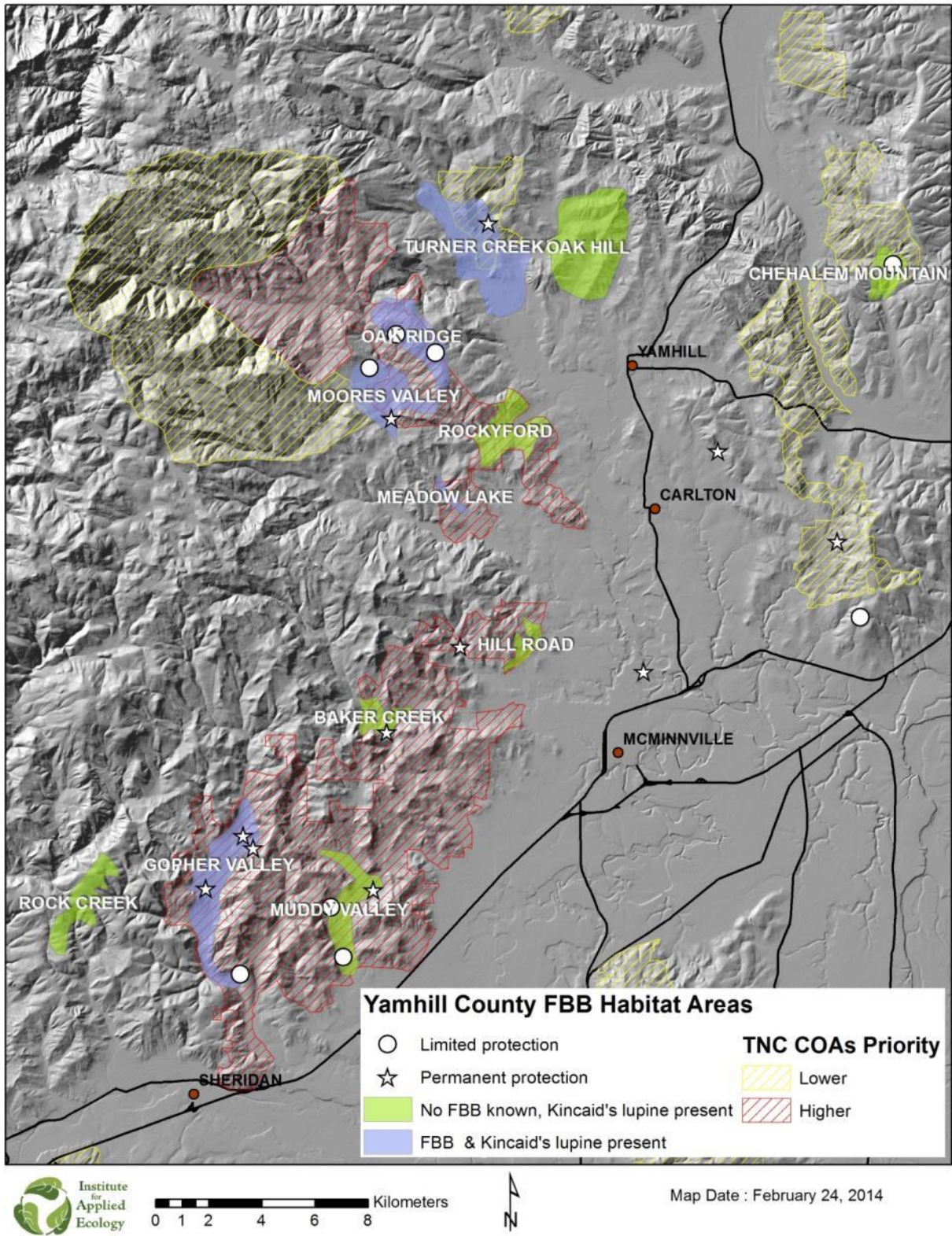


Figure 11. Prairie and oak savanna areas in Yamhill County and sites with limited time frame or permanent protection. Cross hatch overlay is conservation opportunity area (COA) prioritization synthesized by The Nature Conservancy (2009).

**Table 1. Sites with conservation easements or public ownership in prairie areas of Yamhill County.**

Site name	Total Area-hectares (acres)	Grassland/Prairie/ Savanna Area-hectares (acres)	Key species present ( <sup>1</sup> Planted)	Currently available for FBB conservation <sup>2</sup>
<i>Yamhill SWCD</i>				
Mount Richmond Conservation Easement-Turner Creek	115 (284)	61+ (150+)	Kincaid's lupine, Fender's blue, Western pond turtle	YES
Miller Woods	53 (132)	8 (20)	Kincaid's lupine <sup>1</sup>	YES
Private Conservation Easement (not in priority area- east of Carlton)	19 (46)	4 (10)		
Private Conservation Easement- Moores Valley	69 (170)	14 (35)	Kincaid's lupine, Fender's blue, Western pond turtle	
Private Conservation Easement- Baker Creek	293 (725)	656 (160)	Kincaid's lupine	
<i>The Nature Conservancy</i>				
Yamhill Oaks- Gopher Valley	101 (249)	32 (80)	Kincaid's lupine, Fender's blue	YES
Pugh Easement- Gopher Valley	20 (50)	6 (15)	Kincaid's lupine, Fender's blue	YES
Gahr Farms-Muddy Valley	126 (311)	20 (50)	Kincaid's lupine	YES
<i>Yamhill County</i>				
Deer Creek County Park- Gopher Valley	12 (30)	4 (10)	Kincaid's lupine, Fender's blue	YES
<i>Bonneville Power Administration</i>				
Trappist Abbey	545 (1346)	24 (60)		

<sup>2</sup>Under public ownership or under conservation easement for conservation values including Fender's blue butterfly habitat.

**Table 2. Sites with limited protection through a U.S. Fish and Wildlife conservation program- either Partners for Fish and Wildlife or Safe Harbor Agreements.**

	Site name	Total Area-hectares (acres)	Grassland/ Prairie/ Savanna Area-hectares (acres)	Key species present ( <sup>2</sup> planted)
	USFWS Partners for Fish and Wildlife Program			
	Private – Chehalem Mountain	11 (27)	1.2 (3)	Kincaid’s lupine
	Private – Gopher Valley <sup>1</sup>	20 (8)	2 (5)	Kincaid’s lupine <sup>2</sup>
	Private – Moores Valley <sup>1</sup>	13 (32)	10 (25)	Kincaid’s lupine and Fender’s blue
	Private – Muddy Valley <sup>1</sup>	22 (54)	8 (20)	Kincaid’s lupine
	Private – Muddy Valley	183 (453)	30+ (75+)	Kincaid’s lupine
	Private – Not in priority Area	20 (50)	11 (28)	
	Private – Oak Ridge <sup>1</sup>	54 (134)	6 (16)	Kincaid’s lupine and Fender’s blue
	Private – Oak Ridge	4 (9)	2 (5)	Kincaid’s lupine and Fender’s blue

<sup>1</sup>Site also has Safe Harbor Agreement with USFWS.

# Section 6: Meeting Fender’s Blue Recovery Goals in Yamhill County

While the U.S. Fish and Wildlife Service Recovery Plan recognizes the Oak Ridge/Turner Creek Gopher Valley as potential population networks (see Figure 9) for Fender’s blue butterfly, much of the framework to meet the endangered species recovery benchmarks in Yamhill County needs to be established. Of the two population networks (or one population network plus two independent populations (Figure 9)) needed for Fender’s blue in Yamhill County, a partial network exists in Gopher Valley and a single protected population occurs in Turner Creek.

Further conservation actions are needed is needed to secure additional upland prairie and oak savanna habitat, enhance habitat at existing sites to meet habitat quality benchmarks, expand existing habitat to meet acreage needs, and potentially establish new butterfly populations to satisfy network needs. This section outlines a strategy to prioritize locations to receive the needed conservation actions.

### Actions in Priority Habitat Zones

As funding for conservation actions is often quite limited, it can be necessary to prioritize areas to receive different conservation actions, including securing, enhancing, expanding and restoring habitat (Goals 1 and 2 of this Strategy). A summary of how Yamhill County sites are prioritized for prairie and oak savanna and Fender’s blue butterfly habitat conservation actions is included in [Table 3](#) and described in detail below.

**Table 3. Summary of conservation action priorities by area in Yamhill County.**

Conservation Action	Priority to Receive Conservation Actions		
	Higher	Intermediate	Lower
<b>Secure Habitat</b> Through conservation easements	Oak Ridge Moores Valley	Turner Creek Muddy Valley Gopher Valley	Baker Creek Hill Road Chehalem Mountain Oak Hill Rock Creek Rockyford
<b>Enhance</b> Existing habitat	Oak Ridge Moores Valley Turner Creek Muddy Valley Gopher Valley	Baker Creek Hill Road Rock Creek Rockyford	Chehalem Mountain Oak Hill
<b>Expand</b> Habitat within the opportunity area	Turner Creek Moores Valley Oak Ridge Gopher Valley	Meadow Lake Muddy Valley	
<b>Introduce</b> New butterfly populations	Muddy Valley Rockyford	Rock Creek	



## Secure habitat

Protecting prairie and oak savanna habitat from future land use change and securing it for conservation purposes allows it to contribute to species recovery benchmarks and sustain multiple prairie and oak savanna species into the future. The quantity of protected habitat in the priority habitat areas of Yamhill County, and the amount with permanent and limited protection, is summarized in [Table 4](#).

The two highest priority areas for securing prairie and oak savanna habitat in Yamhill County are Oak Ridge and Moores Valley. These areas are identified by the TNC as Conservation Opportunity Areas (COA), and support the highest concentrations of Fender’s blue and Kincaid’s lupine in Yamhill County, yet have the least amount of protected habitat. Oak Ridge has no permanent conservation easements, and the only conservation easement in Moores Valley is not expressly for endangered species conservation.

Lands in Turner Creek and Muddy Valley have intermediate priority for habitat protection. Turner Creek is a priority 2 TNC Conservation Opportunity Area and it is the location of the Yamhill SWCD Mount Richmond Conservation Easement. The purpose of the Mount Richmond easement area is to conserve Fender’s blue butterfly and prairie and oak savanna habitat conservation values, and is also the mitigation site for the Yamhill SWCD Habitat Conservation Plan (HCP) for Private lands (Yamhill SWCD 2014), and will be managed and enhanced into the future. Additional protected lands in this area will complement the Mount Richmond Easement, and funding for securing nearby lands may be facilitated by the HCP. Muddy Valley is a priority 1 TNC Conservation Opportunity Area, and it is the highest priority area for future species introductions (see below), which have to occur on lands already secured for conservation.

**Table 4. Summary of the acreage of prairie and oak savanna habitat areas in Yamhill County with Fender’s blue butterfly (FBB) or Kincaid’s lupine. Shaded/bold rows are in or near areas that already support Fender’s blue. Unshaded/non-bold rows only support Kincaid’s lupine.**

Sub-population Name (# sites with limited or permanent protection)	Currently available for FBB conservation*	Other Conservation Easement	Limited Term Protection	Total -
	Hectares (acres) of Habitat			
Baker Creek (1)	0	65+ (160+)	0	65+ (160+)
Chehalem Mountain (1)	0	0	1 (3)	1 (3)
<b>Gopher Valley (4)</b>	<b>42 (105)</b>	<b>0</b>	<b>2 (5)</b>	<b>44 (110)</b>
<b>Moores Valley (2)</b>	<b>0</b>	<b>14 (35)</b>	<b>10 (25)</b>	<b>24 (60)</b>
Muddy Valley (3)	20 (50)	0	38 (95)	58 (145)
<b>Oak Ridge (2)</b>	<b>0</b>	<b>0</b>	<b>8 (21)</b>	<b>8 (21)</b>
Hill Road (0)	0	0	0	0
<b>Meadow Lake (0)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Turner Creek (1)</b>	<b>61 (150)</b>	<b>0</b>	<b>0</b>	<b>61 (150)</b>
Oak Hill (0)	0	0	0	0
Rockyford (0)	0	0	0	0
Rock Creek (0)	0	0	0	0
Total (14)	123 (305)	79 (195)	59 (149)	261 (649)

\*Under public ownership or under conservation easement for conservation values including Fender’s blue butterfly habitat.

Gopher Valley is the lowest priority for habitat acquisitions of all the Fender's blue occupied areas, as it already has significant habitat protected within The Nature Conservancy's Yamhill Oaks, and also includes the Yamhill County Deer Creek Park, which is under public ownership. Deer Creek Park will be enhanced as a mitigation site for the Yamhill County Public Works HCP (Yamhill County 2013).

### **Enhance existing habitat**

Habitat enhancement work, including management and restoration to increase host and native nectar species, is most important at sites with Fender's blue butterfly, including those in Gopher Valley, Moores Valley, Turner Creek, Oak Ridge and Meadow Lake. If future butterfly introductions occur (see below), enhancing habitat at a new site (e.g., in Muddy Valley) before butterflies arrive is essential. The U.S. Fish and Wildlife Service guidelines on habitat quality for recovery sites are useful at all sites, whether under protection and able to contribute to Fender's blue recovery or not. Active management to minimize woody species encroachment and to reduce non-native plant invasions using appropriate management techniques ([Figure 12](#)) developed for the conditions at each site will enhance habitat quality for multiple species, including Fender's blue.



**Figure 12. Mowing with skid steers is often used in prairie-savanna habitats in the fall to control woody shrub species (e.g., hawthorn or blackberry) in tight spaces or between trees in oak savanna habitats.**

### **Expand habitat within priority areas**

Habitat restoration and enhancement work to expand Fender's blue butterfly populations in areas where they already occur (Turner Creek, Moores Valley, Oak Ridge, Gopher Valley, and Meadow Lake) can help achieve the butterfly population growth (networks and independent populations) needed to move the butterfly from endangered to threatened, and eventually help it be removed from the ESA list entirely (butterfly recovery) (Goal 2 of this strategy). Turner Creek is highest priority for habitat expansion as it has the lowest butterfly/habitat abundance currently, followed by Moores Valley, Oak Ridge, and Gopher Valley. Meadow Lake is intermediate priority since the confirmed butterfly population there is extremely small and potentially of limited sustainability. Muddy Valley is intermediate priority since it currently lacks Fender's blue, has multiple sites with Kincaid's lupine already, has potential as a future butterfly introduction site.

The most promising expansion opportunities exist on sites with suitable habitat that currently do not have Fender's blue, but that are within butterfly flight distance (2 km or 1.2 miles or less) of existing populations. The closer a new site (expansion site) is to an existing butterfly site, the greater the likelihood of attracting butterflies. The path between the existing population(s) and the expansion site should be free of major hills, ridges, or other topographic barriers, and not be blocked by areas of dense

forest or stream (riparian) habitat over 100 m (100 yards) wide. Enhancing the resources at expansion sites, including native nectar plants and Kincaid's lupine, and ensuring that habitat structure is free of major barriers to butterfly travel will increase the likelihood of establishing butterfly populations in new areas.

### **Introduce new butterfly populations**

New introductions of Fender's blue butterfly to secured conservation sites with suitable prairie and oak savanna habitat may occur in the future to help recover the species. Introductions may involve bringing Fender's blue eggs, larvae (Figure 13), or adults from an existing population to a new site. Such introductions have not occurred for Fender's blue to date, but in an area like Yamhill County, where much of the butterfly habitat and many of the existing butterfly populations occur in valleys that constrict the dispersal of the butterfly, introductions may be the only means to expand its local distribution.



**Figure 13. Larvae (left) and eggs (right) of Fender's blue butterfly.**

Any site for new Fender's blue butterfly introductions will need to support sufficient Kincaid's lupine and nectar species to sustain the new butterfly population, in addition to providing suitable upland prairie or oak savanna habitat. Such a site would likely contain at least 6 ha (15 ac) or more of prairie or oak savanna habitat and meet or have a strong potential to meet the U.S. Fish and Wildlife Service guidelines for habitat quality at recovery sites.

Of the prairie and oak savanna habitat areas that are currently unoccupied by Fender's blue butterfly in Yamhill County, Muddy Valley has high potential for new Fender's blue introductions. Muddy Valley currently supports multiple Kincaid's lupine populations and has similar quantities of nectar species to other butterfly sites. One property in this area is already under conservation easement for habitat values, and several other properties are enrolled in U.S. Fish and Wildlife Service programs such as Partners for Fish and Wildlife (see Section 8: Voluntary Conservation Tools).

Another high priority area for Fender's blue butterfly introductions is the upland prairie and oak savanna habitat in the Rockyford priority area, which is adjacent to, but separated from Moores Valley and Oak Ridge. Habitat in the Rockyford area is a priority 1 TNC Conservation Opportunity Area, yet currently has no habitat secured for conservation. The Yamhill SWCD is pursuing funding to acquire a conservation

easement over a 76 ha (187 ac) parcel with more than 6 ha (15 ac) of upland prairie and oak savanna habitat and successful plantings of Kincaid's lupine.

Where landowners are successful in introducing new Fender's blue butterfly populations, at least two separate mechanisms exist to ensure that land use activities on neighboring properties are not restricted. The Good Neighbor Principle described in the Yamhill SWCD HCP for Fender's Blue Butterfly on Private Lands (YSWCD 2014) provides landowners with regulatory assurance that butterflies from introduced populations may migrate off of the targeted lands and onto adjacent properties without restricting the rights of those neighboring landowners. U.S. Fish and Wildlife Service Safe Harbor Agreements provide similar assurances and are described in this document in Section 8: Voluntary Conservation Tools.

## Section 7: County-Wide Habitat Conservation Actions

All landowners in Yamhill County, urban and rural, can provide habitat for native species and can participate in conservation of prairie and oak savanna habitat. The actions described below can promote habitat conservation, wherever prairie or oak savanna habitat occurs (Goal 3 of this Strategy).

### **Conserve and protect remaining habitats**

- Participate in efforts by public agencies or conservation groups to inventory and map prairie and oak savanna sites in Yamhill County. Sharing habitat information with these groups will allow those entities to integrate the information into their planning and management programs.
- Take advantage of opportunities to learn more about the habitat quality of your property and opportunities for enhancement. Consider conserving and enhancing high quality habitat on your property. Where possible, focus on preserving large habitat blocks and areas that provide connectivity for wildlife. Collaborating with your neighbors may increase the area conserved and protected, and produce a greater benefit to Fender's blue and other prairie and oak savanna species.
- Engage with programs that offer assistance with rare habitat enhancement, like the U.S. Fish and Wildlife Service Partners for Fish and Wildlife Program.

### **Enhance and restore degraded habitats**

- Maintain prairie and oak savanna habitat with management strategies tailored to your property that will improve the habitat structure and increase native species. Tools such as carefully timed mowing, prescribed burning, and well managed grazing can promote some native species and inhibit shrub, conifer, and Scotch broom encroachment.
- Commit to invasive species removal and long-term management. False brome, Scotch broom, Armenian blackberry, and meadow knapweed (*Centaurea pratensis*) (Figure 14) management will be crucial to control these very invasive species. Download the Field Guide to Weeds of the Willamette Valley ([www.appliedeco.org/invasive-species-resources/](http://www.appliedeco.org/invasive-species-resources/)) for more information.
- Work with knowledgeable person or group such as the Yamhill SWCD or a watershed council to identify invasive plants and determine the appropriate management timing.



- Maintain large oaks and reintroduce oaks to appropriate sites. In agricultural areas, single oaks planted along hedgerows can replace those lost to attrition.
- Remove trees that will overtop and kill oak trees through shading.
- Leave several large dead trees for wildlife habitat.
- Obtain information about oak habitat and technical assistance whether you live in rural or urban areas, since oaks can attract native wildlife in most locations.
- Remove Douglas-fir trees by pulling small trees or girdling/removing large trees. Where there is a need to block views or winds, limb the lower Douglas-fir branches to enable light to reach the ground.
- Mow after native flowers have set seed.
- Allow grazing after August 15 to control woody vegetation
- Minimize soil disturbance to reduce invasion of non-native plants. Many non-native seeds last many years in the soil and will germinate when brought to the surface.
- Plant local native flowering species to encourage pollinators. Many local nurseries sell native plants and the Yamhill SWCD holds a yearly native plant sale.
- Identify bird and turtle nesting sites and avoid impacting those areas during the nesting season (April 15-July 15 [ODFW 2006, Rosenberg et al. 2009]).
- If your property is located in the flat and open portion of Yamhill County, evaluate whether it has the potential to support Streaked Horned Lark (see Appendix 1). This extremely rare species prefers unproductive and sparsely vegetated areas, often in open intensive agricultural landscapes.



**Figure 14. Meadow knapweed plants (left) and flowers (right).**

**Actively manage for open habitat**

- Actively manage to reduce woody species encroachment and to reduce non-native plant invasions using appropriate management techniques developed for the conditions in the habitat on your property.
- Provide open habitat to encourage the travel of Fender’s blue butterfly and pollinators between known habitat patches and benefit other prairie species that prefer open conditions. Barriers, such as coniferous forest, often limit insect dispersal and movement between habitat patches.

### **Create network opportunities**

- Enhance stepping stone habitat (Figure 9) on your property to help connect known habitat patches that are otherwise too far for Fender's blue butterfly and pollinators to reach.
- If you are located near a possible butterfly expansion site, but lack Kincaid's lupine, consider participating in programs that encourage conservation in areas that currently do not have listed species, such as the Safe Harbor with Assurances or Partners for Fish and Wildlife (Section 8: Voluntary Conservation Tools).

### **Evaluate the success of conservation actions and use adaptive management**

- Monitor habitat restoration and enhancement projects on your property to evaluate their effectiveness. Take the time to describe and photograph what habitat conditions are like before you begin work, including the abundance of invasive and weedy species, and the diversity and abundance of native species. Keep detailed records of your restoration actions, including time of year implemented, total area treated, and the specifics of your treatment method (mowing height, herbicide concentration, etc.). Then, track the effects of your restoration methods on habitat conditions, to determine which treatments are producing the desired results which seem to be less effective. Share the information with other landowners directly or more broadly through the Yamhill SWCD, so the knowledge you gain can help others manage land more effectively.
- Share conservation strategies and monitoring results by participating in site tours with the Yamhill SWCD or watershed council, conferences, and written project evaluations. The Oregon Conservation Registry, a website to upload or search for project information, is one way to share information about the effectiveness of conservation actions (<http://or.conservationregistry.org/>).
- Use adaptive management principles to improve your methods of habitat conservation over the long-term. On at least an annual basis, review your monitoring data and determine what has been most effective. Modify your planned actions in the future to reflect what you have learned on your own property or from other land managers.

### **Use local seed sources**

- Work with the U.S. Fish and Wildlife Service, Oregon Department of Agriculture (ODA) Native Plant Conservation Program, and others to determine the best source of plant materials (seeds or live plants) for your project. Obtaining plant materials from nearby sources is ideal, but can be challenging for many species. ODA staff will be able to help you determine which source is best, and may be able to find materials that are not widely available.
- Contact ODA to learn about plant material collection laws for private landowners. A permit is required to collect seeds, plants or plant parts from Federal lands. ODA requires a permit to collect seeds or plant materials of state-listed plant species from non-federal public lands, transport seeds or plant materials on non-federal public lands (i.e. roads), and propagate or cultivate state-listed species. ODA's permit program is in place to track how much plant material is collected at various locations over time; taking too much seed or plant material from any given population, particularly if done repeatedly, can reduce a population's ability to reproduce and sustain itself, potentially leading to its decline or disappearance.
- Plant material production partnerships between ODA and local farmers can enhance the amount of material available locally for recovery.
- If Kincaid's lupine is to be established on a new site in preparation for the introduction of Fender's blue, the lupine should be sourced from a nearby Kincaid's lupine population. This may be through seeds collected directly from nearby populations, or through seeds produced by lupines grown from local seed sources in controlled conditions.

- Landowners with Kincaid’s lupine on their property can work directly with ODA to allow lupine seed collection from their property, increasing the amount of seed available for restoration efforts on their property or nearby.

### **Use conservation tools for private landowners**

- Almost all remaining prairie and oak savanna sites are on privately owned lands, making them exceptionally crucial for conservation. Voluntary tools such as technical assistance, financial incentives, and conservation easements can assist you with conservation actions (see Section 8: Voluntary Conservation Tools for a list of programs) (ODFW 2006).
- Learn about Willamette Valley habitats and species, using resources like the OSU Extension Service ecology field cards <http://extension.oregonstate.edu/benton/natural/eco>.
- Obtain information about management guidelines and resources (See Section 8: Voluntary Conservation Tools). Habitat conservation and restoration actions are most important to protect remaining high quality habitats and vital sites for connectivity, and to reduce the impact of invasive plant species on these habitats and on at-risk plant populations.

### **Research funding opportunities**

- The U.S. Fish and Wildlife Service provides grants for projects benefiting listed species through its Cooperative Endangered Species Conservation Fund (section 6 of the ESA). These grants require a 25% match of the estimated project cost, and may require coordination by a state agency. More landowner assistance programs are in Section 8: Voluntary Conservation Tools and can be found at <http://www.fws.gov/endangered/grants/section6/index.html>.
- Incentive programs, such as reduced property tax assessment, may be available at the County level to enhance and protect habitat for listed animal species other than Fender’s blue.

## **Section 8: Voluntary Conservation Tools**

### *Habitat Restoration Guides*

Several documents provide management guidelines for enhancement of prairies and oak habitats:

1. *Restoring Rare Native Habitats in the Willamette Valley* ([Campbell 2004](#))
2. *A Landowner's Guide for Restoring and Managing Oregon White Oak Habitats* ([Vesely 2004](#))
3. *Native Willamette Valley prairie and oak habitat restoration site preparation and seeding information* ([Boyer 2009](#))
4. *Techniques for restoring native plant communities in upland and wetland prairies in the Midwest and west coast regions of North America* ([Fitzpatrick 2004](#))
5. *Use of prescribed fire in Willamette Valley native prairies* ([Alverson 2006](#))
6. *Managing agricultural land to benefit Streaked Horned Larks: A guide for Landowners and Land Managers* ([Moore 2011](#)).

## *Landowner Incentives and Opportunities*

Private lands conservation is essential for preserving native habitat and rare species. Several programs are available to Yamhill County landowners that provide technical and financial assistance for restoration and enhancement of wetlands, riparian areas and wildlife habitat. These programs are offered through a variety of state and federal agencies such as Oregon Department of Fish and Wildlife ([ODFW](#)), USDA Natural Resources Conservation Service ([NRCS](#)), USDA Farm Service Agency ([FSA](#)), and U.S. Fish and Wildlife Service ([USFWS](#)). Conservation programs often lack secure funding, therefore availability of programs can vary over time. **See links under each subject for more information.**

### **Several organizations offer help accessing programs and funding:**

- Yamhill Soil and Water Conservation District ([Yamhill SWCD](#)): <http://www.yamhillswcd.org/>
- Greater Yamhill Watershed Council ([GYWC](#)): <http://www.yamhillwatershedcouncil.org/>
- Trust for Public Land ([TPL](#)): <http://www.tpl.org/>

### **Technical assistance programs**

- **Conservation Technical Assistance (CTA)** – NRCS technical assistance to landowners for conservation, maintenance, and improvement of natural resources.
- **Conservation of Private Grazing Land (CPGL)** – NRCS technical assistance program for private landowners with grazing lands. Unfunded as of 6/2009.

### **Habitat improvement programs**

- **Access and Habitat Program (A&H)** – ODFW grants for improving wildlife habitat, increasing public hunting access to private land, or addressing wildlife damage issues.
- **Conservation Innovation Grants (CIG)** – This nationally competitive grant program awards funds to projects that “stimulate the development and adoption of innovative conservation approaches and technologies while leveraging Federal investment in environmental enhancement and protection, in conjunction with agricultural production.” Grants are awarded to help develop and demonstrate novel ideas to improve conservation on private lands and grantees “will demonstrate innovative approaches to improving soil health, conserving energy, managing nutrients and enhancing wildlife habitat.”
- **Conservation Security Program (CSP)** – This NRCS program provides technical and financial assistance to agricultural producers who undertake or increase conservation actions on their lands. These actions can include increasing native pollinator plants in hedgerows or creating windbreaks for native habitat.
- **Cooperative Endangered Species Conservation Fund (Section 6)** – USFWS grants to States that may, in turn, be provided to individual landowners and groups to benefit endangered species conservation.
- **Environmental Quality Incentives Program (EQIP)** – NRCS cost share program to help landowners install or implement structural and management practices on eligible agricultural land.
- **North American Wetland Conservation Act (NAWCA)** – USFWS matching grants to organizations and individuals who have developed partnerships to carry out wetlands conservation projects.
- **USFWS Partners for Fish and Wildlife (PFW)** – USFWS provides technical and financial assistance to private landowners who are willing to work with USFWS and other partners on a voluntary basis to help meet the habitat needs of Federal Trust Species.



- **Wildlife Habitat Incentive Program (WHIP)** – A voluntary program, administered by NRCS, designed to help private landowners who want to develop and improve wildlife habitat on their lands. NRCS provides technical assistance and up to 75% match (funding) to assist with establishing and improving fish and wildlife habitat.

### Easement programs

- **Conservation Reserve Program (CRP)** – This FSA program provides annual payments for 10-15 years for those landowners who retire highly erodible croplands or cropped wetlands. The intent of the program is to reduce soil erosion, reduce sedimentation into lakes and streams, improve water quality, establish wildlife habitat, and restore and enhance wetland and forest resources. Landowners are required to plant the enrolled lands with native species.
- **Forest Legacy Program (FLP)** – US Forest Service program, administered locally by ODF, provides a conservation easement payment to help protect private forest lands from development or fragmentation.
- **Grassland Reserve Program (GRP)** – Conservation easement or cost share program administered by NRCS and FSA that helps landowners and operators restore and protect grassland, including rangeland, pastureland, shrubland, and certain other lands, while maintaining the areas as grazing lands.
- **Wetlands Reserve Program (WRP)** – This program, administered by NRCS, provides a financial incentive to private landowners to restore and protect wetlands in exchange for retiring marginal agricultural lands.

### Tax incentives

- **Conservation Easement Special Assessment** – Land that has a recorded conservation easement can qualify for a reduced property tax assessment. The easement must be held in perpetuity. The property is assessed at the forestland or farm use special assessment rate.
- **Wildlife Habitat Conservation and Management Program (WHCMP)** – Not Currently Available in Yamhill County. In other Willamette Valley counties, private landowners currently in Exclusive Farm Unit (EFU) zoning, Forestland zoning, or in designated wildlife areas can receive a reduced property tax assessment to voluntarily conserve native wildlife habitat. There is no additional tax for switching to a wildlife special assessment.

### Endangered species regulatory assurance

- **Safe Harbor Agreement (SHA)** - A Safe Harbor Agreement (SHA) is a voluntary agreement between USFWS and a non-federal landowner to promote habitat management for listed species on non-federal lands. During the term of the agreement, the landowner sets aside all or a portion of a property for listed species habitat management. By entering into the agreement, the USFWS provides the landowner with assurances that if habitat management attracts or increases the population of a listed animal species, when the agreement ends the landowner may use the property in any legal manner that does not place the species below the baseline condition assessed at the beginning of the agreement. An agreement is only entered into when the USFWS finds the covered species will receive a net conservation benefit from the management actions to be taken by the landowner.

The USFWS has developed a programmatic Fender's blue butterfly SHA to streamline the enrollment process for private landowners (USFWS 2008a) in Yamhill County and neighboring counties.

- **Candidate Conservation Agreement with Assurances (CCAA)** - Candidate Conservation Agreements are voluntary agreements between the USFWS and non-federal landowners that encourage species conservation stewardship. A Candidate Conservation Agreement applies only to species that are not listed. There are currently no candidate species in prairie habitats, but should a prairie-oak savanna species become a candidate for listing, some landowners might wish to consider pursuing a CCAA because it would assure that their conservation efforts will not result in future regulatory obligations in excess of those they agree to at the time they enter into the agreement. Non-candidate species may be included. The conservation benefits sought through the CCAA are similar to those under Safe Harbor Agreements.

### **Conservation Banking**

A conservation bank is a parcel or parcels of land containing natural resource values that are conserved and managed in perpetuity for listed or at-risk species and their habitat. In exchange for permanently protecting an area, the landowner receives credits from USFWS that they may use to offset impacts to habitat or species in other areas or can sell the credits to others. This concept is similar to wetland mitigation banks that sell credits for impacts to wetlands from development. Generally it costs less per acre to manage a conservation bank than the equivalent acreage on many smaller isolated parcels of land. Additionally, larger acreage reserves are more likely to ensure ecosystem functions, biodiversity, and conservation of the species. Advantages of a conservation bank include:

- Streamlined permitting process
- Reduced cost of compliance with regulations
- Increased economic value of the conservation bank land
- Reduced administrative burden of permitting on regulatory agencies
- Support for endangered species recovery
- Effective management and monitoring in a preserve system
- Opportunity for large, un-fragmented, high quality habitat preservation
- Market incentive for habitat preservation, restoration, and enhancement.

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**Attachment 1:** Species that may benefit from the prairie and oak savanna conservation for Fender’s blue butterfly, and their habitat requirements. Ideal habitat patch or population size is the recommended minimum for sustaining a breeding population and is based on territory requirements or genetic viability (Altman 2000, Benton County 2010, USFWS 2010).

Common name	Scientific name	Status		ODFW Strategy species	Ideal habitat conditions	Habitat patch size for small population (animals) or population size (plants)
		Fed <sup>1</sup> State <sup>2</sup>				
<b>Birds:</b>						
Common Nighthawk	<i>Chordeiles minor</i>		SC	✓	Upland prairie: Gravel bars and sparse low growing vegetation and some bare ground in floodplain, lowland, or foothills.	>80 ha (200 acre)
Northern Harrier	<i>Circus cyaneus</i>				Wet and upland prairie: Lowland and floodplain prairie with large open expanses.	>80 ha (200 acre)
Streaked Horned Lark	<i>Eremophila alpestris strigata</i>	T		✓	Sparsely vegetated, treeless areas within open habitat context. Short vegetation (<30 cm (13 in) with a high proportion of bare ground (16-17%).	300 ac (120 ha), or 100 ac (40 ha) if adjacent to larger, open area.
American Kestrel	<i>Falco sparverius</i>				Oak savanna: Small groves of scattered oak or ponderosa pine with nesting cavities and herbaceous understory in floodplain, lowland, or foothills.	20-40 ha (50-100 acre)
Acorn Woodpecker	<i>Melanerpes formicivorus</i>	SOC	SV	✓	Oak woodland and savanna: Lowland valley areas with mature oaks and open understory with dead limbs or snags for storing acorns Connectivity: <9.7 km (6 mi) habitat patch from existing occupied patch (Vesely and Rosenberg 2010).	8-20 ha (20-50 acre)
Lazuli Bunting	<i>Passerina amoena</i>				Upland prairie and oak savanna: Foothill prairie with scattered shrubs and trees with grassy openings.	4-8 ha (10-20 acre)
Oregon Sparrow Vesper Sparrow	<i>Pooecetes gramineus affinis</i>	SOC	SC	✓	Upland prairie and oak savanna: Lowland and foothill prairie with scattered shrubs and trees and some bare ground with grassy openings.	4-8 ha (10-20 acre)

Common name	Scientific name	Status		ODFW Strategy species	Ideal habitat conditions	Habitat patch size for small population (animals) or population size (plants)
		Fed <sup>1</sup> State <sup>2</sup>				
Western Bluebird	<i>Sialia mexicana</i>		SV	✓	Upland prairie and oak savanna: Lowland areas with scattered shrubs or small trees for perches or foraging with grassy (herbaceous) understory and oak cavities or nesting boxes for nesting.	4-8 ha (10-20 acre)
White-breasted Nuthatch (Slender-billed)	<i>Sitta carolinensis aculeata</i>		SV	✓	Oak woodland and savanna: Mature oaks with nesting cavities in savanna groves or open woodland (Grubb and Pravosudov 2008).	8-20 ha (20-50 acre)
Chipping Sparrow	<i>Spizella passerina</i>			✓	Oak woodland and savanna: Herbaceous cover in understory of oak woodlands or savanna in foothills or rural areas.	0.8-4 ha (2-10 acre)
Western Meadowlark	<i>Sturnella neglecta</i>		SC	✓	Upland prairie and oak savanna: Lowland or floodplain areas with large patches of scattered shrubs or trees for perches. Locate restoration sites in areas with few grass seed fields (Vesely and Rosenberg 2010).	>80 ha (200 acre)
Western Kingbird	<i>Tyrannus verticalis</i>				Upland prairie and oak savanna: Scattered oaks with a grassy (herbaceous) understory in floodplain, lowland, or foothills.	8-20 ha (20-50 acre)
<b>Butterflies:</b>						
Taylor's checkerspot (Not currently known to occur in Yamhill County)	<i>Euphydryas editha taylori</i>	E		✓	Upland prairie and oak savanna: Upland prairie and savannas with host plant species such as <i>Castilleja</i> and plantain and nectar plants like strawberry ( <i>Fragaria virginiana</i> ) and rosy plectritis ( <i>Plectritis congesta</i> ). Connectivity: 1.5 km (0.9 mi) dispersal distance between habitat patches (Converse 2009).	>~2 ha (5 acre) for annual survival probability>5% (Converse 2009)
Fender's blue	<i>Icaricia icarioides fenderi</i>	E		✓	Upland prairie and oak savanna: Lowland and foothill open upland prairie. Connectivity: 2 km (1.2 mi) dispersal distance to host lupine plants and open upland or wet prairie within 50-55 m (164-180 ft) for nectaring (USFWS 2010).	>6 ha (15 acre) (USFWS 2010)

Common name	Scientific name	Status		ODFW Strategy species	Ideal habitat conditions	Habitat patch size for small population (animals) or population size (plants)
		Fed <sup>1</sup> State <sup>2</sup>				
Tailed copper	<i>Lycaena arota</i>				Upland prairie, oak savanna and oak woodland: Open areas with yellow and mauve composites for nectar, near shrubby or riparian areas with <i>Ribes divaricatum</i> . Connectivity: habitat patches 0.5 km/0.3 mi (possibly 4-10 km/2.5-6 mi) dispersal distance between habitat patches (Schweitzer 2001b).	Information needed
Field crescent	<i>Phyciodes pulchella</i>				Upland prairie and oak savanna: Meadows with diverse composite species, larval host plants are asters such as <i>Symphyotrichum hallii</i> or <i>Erigeron decumbens</i> . Connectivity: 2 km/1.2 mi (possibly up to 10 km/6 mi) dispersal distance between habitat patches (Schweitzer 2001c).	Information needed
Sonora skipper	<i>Polites sonora</i>				Upland prairie and oak savanna: Meadows with diverse floral species, larvae feed on <i>Danthonia californica</i> , possibly <i>Festuca roemerii</i> and <i>Panicum occidentale</i> . Connectivity: 1 km/0.6 mi (possibly 4-10 km/2.5-6 mi) dispersal distance between habitat patches (Schweitzer, 2001a).	Information needed

**Plants:**

Golden paintbrush <i>(not currently found growing wild in Oregon)</i>	<i>Castilleja levisecta</i>	T	E	✓	Upland prairie and oak savanna: Dry to moist meadows and flat prairies on hill tops and at low elevations in lowlands and foothills. Connectivity: Populations within 3 km (2 mi) pollinator travel distance.	200 individuals per patch; 1,000 individuals in several populations in Salem West Recovery Zone (USFWS 2010)
Kincaid's lupine	<i>Lupinus oreganus</i>	T	T	✓	Upland prairie and oak savanna: Native open prairie or woodland edge in lowlands and foothills. Connectivity: Populations within 3 km (2 mi) pollinator travel distance.	60 m <sup>2</sup> foliar cover per patch; 7,500 m <sup>2</sup> foliar cover in several populations in Salem West Recovery Zone (USFWS 2010)



Common name	Scientific name	Status		ODFW Strategy species	Ideal habitat conditions	Habitat patch size for small population (animals) or population size (plants)
		Fed <sup>1</sup> State <sup>2</sup>				
Pale Larkspur or White Rock Larkspur	<i>Delphinium leucophaeum</i>	SOC	E	✓	Upland prairie and oak savanna: Oak edges, along river banks, bluffs, and meadows. Connectivity: Populations within 3 km (2 mi) pollinator travel distance.	200 individuals per patch; 5,000 individuals in several populations in Salem West Recovery Zone (USFWS 2010)
Willamette Valley Larkspur	<i>Delphinium oreganum</i>	SOC	C		Upland and wet prairie: Moist high elevation sites or low elevation prairie. Connectivity: Populations within 3 km (2 mi) pollinator travel distance.	200 individuals per patch; 5,000 individuals in several populations in Salem West Recovery Zone (USFWS 2010)

**Reptiles:**

Pacific (Western) pond turtle	<i>Actinemys marmorata</i>	SOC	SC	✓	Wet and upland prairie, oak savanna and woodland: Ponds and adjacent open ground up to 250 m (nesting <200 m) from water in floodplain, lowlands, and foothills (Rosenberg et al 2009). Clay soils with <25% vegetative cover and <40% litter cover for appropriate nesting habitat (Thorpe 2007). Connectivity: 1 km (0.6 mi) between habitat patches, usually along stream corridors (Hammerson 2001a)	Information needed
Northern painted turtle	<i>Chrysemys picta</i>		SC	✓	Upland prairie: Ponds and adjacent open nesting ground up to several hundred meters from water in floodplain and lowlands. Connectivity: 1 km/0.6 mi (3-10 km/1.9-6 mi) between habitat patches, usually along stream corridors (Hammerson 2001b)	Information needed

<sup>1</sup>Federal Status October 2009:

E – Listed Endangered  
T – Listed Threatened  
C – Candidate for listing  
SOC – Species of Concern

<sup>2</sup>State Status October 2009:

E – Listed Endangered  
T – Listed Threatened  
C – Candidate (plants only)  
SC – Sensitive Species, Critical category  
SV – Sensitive Species, Vulnerable Category (note: Sensitive Species applies to vertebrates only)

Note: An endangered species is in danger of extinction throughout all or a significant portion of its range. A threatened species is likely to become endangered in the foreseeable future.