Appendix A. Draft Certificate of Inclusion Template – Private Landowners

BENTON COUNTY PRAIRIE SPECIES HCP

CERTIFICATE OF INCLUSION

for Private Landowners

BENTON COUNTY COMMUNITY DEVELOPMENT DEPARTMENT,
360 SW Avery Avenue, Corvallis, OR

The United States Fish and Wildlife Service ("Service") issued to Benton County ("County") an Incidental Take Permit ("Permit") No. _____, on **[[[Date]]],** for a period of 50 years, pursuant to Section 10(a)(1)(B) of the Endangered Species Act of 1973, as amended, 16 U.S.C. 1539(a)(1)(B). Such Permit authorizes the "Take" of Fender's blue butterfly and its habitat in accordance with the terms and conditions of the Permit, the Benton County Prairie Species Habitat Conservation Plan ("HCP"), and the associated Implementing Agreement. Under the Permit, **[[[insert name of party seeking the certificate of inclusion]]]** ("Participating Landowner") is authorized to perform certain activities covered in the Permit resulting in the "Take" of **Fender's blue butterfly** and its habitat, provided all applicable terms and conditions of the Permit, the HCP, and the associated Implementing Agreement are met.

As the owner of the property depicted on Exhibit "A", attached hereto and incorporated herein by this reference, you are entitled to the protection of the Permit for the activities authorized by the County in the **[[[name of County permit]]],** with respect to any Take of **Fender's blue butterfly** and its habitat as identified in the HCP. In the event the property depicted on Exhibit "A" is used for other purposes without the express consent of Benton County, Take Authorization under the Permit will automatically cease and the U.S. Fish and Wildlife Service shall be notified of the revocation of the Certificate of Inclusion within 5 business days of such action. Such authorization is provided as described in the Permit, the HCP, and the Implementing Agreement.

By signing this Certificate of Inclusion, you signify your election to receive Take Authorization under the County's Permit in accordance with the terms and conditions thereof and in accordance with the terms and conditions of the Benton County **[[[name of County permit]]].** This Certificate of Inclusion does not impose additional regulatory control over the signatory nor require the signatory to provide additional information not called for in the Certificate of Inclusion, but instead ensures compliance with 50 Code of Federal Regulations, section 13.25(d).

Coverage under the Permit will become effective upon receipt of the executed Certificate of Inclusion by Benton County and Participating Landowner. In the event the subject property is sold or leased, the buyer or lessee must be informed of these

provisions and execute a new Certificate of Inclusion and **[[[name of County permit]]].**

[[[Name of Private Landowner]]] Date

Address Phone

[[[Name of Community Development Director]]]

Community Development Director, Benton County Representative Date

Appendix B. Draft Certificate of Inclusion Template – Cooperators

BENTON COUNTY PRAIRIE SPECIES HCP

CERTIFICATE OF INCLUSION

for Cooperators

BENTON COUNTY COMMUNITY DEVELOPMENT
DEPARTMENT, 360 SW Avery Avenue, Corvallis, OR

The United States Fish and Wildlife Service (USFWS) issued to Benton County ("County") an Incidental Take Permit ("Permit") No. _____, on **[[[Date]]],** for a period of 50 years, pursuant to Section 10(a)(1)(B) of the Endangered Species Act of 1973, as amended, 16 U.S.C. 1539(a)(1)(B). The Oregon Department of Agriculture ("ODA") entered into an Implementing Agreement with the County and the USFWS on **[[[Date]]],** for a period of 50 years. The Permit and Implementing Agreement authorizes the "Take" of **[[[covered species]]]** and its habitat in accordance with the terms and conditions of the Permit, the Benton County Prairie Species Habitat Conservation Plan ("HCP"), and the associated Implementing Agreement. Under the Permit (USFWS) and Implementing Agreement (ODA & USFWS), **[[[insert name of Cooperator seeking the certificate of inclusion]]]** ("Participating Landowner") is authorized to perform certain activities covered in the HCP resulting in the "Take" of **[[[covered species]]]** and its habitat, provided all applicable terms and conditions of the Permit, the HCP, and the associated Implementing Agreement are met.

As the owner of the property depicted on Exhibit "A", attached hereto and incorporated herein by this reference, you are entitled to the protection of the Permit for the activities authorized by the County in the **[[[(1) name of permit, (2) name of land use approval, or (3) cooperative agreement]]]** with respect to any Take of **[[[covered species]]]** and its habitat as identified in the HCP. In the event the property depicted on Exhibit "A" is used for other purposes without the express consent of Benton County, Take Authorization under the Permit and Implementing Agreement will automatically cease and the USFWS and ODA shall be notified of the revocation of the Certificate of Inclusion within 5 business days of such action. Such authorization is provided as described in the Permit, the HCP, and the Implementing Agreement.

By signing this Certificate of Inclusion, you signify your election to receive Take Authorization under the County's Permit and Implementing Agreement in accordance with the terms and conditions thereof and in accordance with the terms and conditions of the Benton County **[[[(1) name of permit, (2) name of land use approval, or (3)cooperative agreement]]]**. This Certificate of Inclusion does not impose additional regulatory control over the signatory nor require the signatory to provide additional information not called for in the Certificate of Inclusion, but instead ensures compliance with 50 Code of Federal Regulations, section 13.25(d).

Coverage under the Permit will become effective upon receipt of the executed Certificate of Inclusion by Benton County and Participating Landowner. In the event the subject property is sold or leased, the buyer or lessee must be informed of these provisions and execute a new

Certificate of Inclusion and **[[[(1) name of permit, (2) name of land use approval, or (3)cooperative agreement]]].**

[[[Name of Cooperator]]]

_____

[[[Cooperator Representative]]] Date

_____

Address Phone

[[[Name of Benton County Development Director]]]

_____

Community Development Director , Date
Benton County Representative

_____

Appendix C. Draft Cooperative Agreement Template

BENTON COUNTY PRAIRIE SPECIES HCP

COOPERATIVE AGREEMENT

(Between Benton County and HCP Cooperator)

BENTON COUNTY COMMUNITY DEVELOPMENT DEPARTMENT,
360 SW Avery Avenue, Corvallis, OR

1. PARTIES AND PURPOSE. This Cooperative Agreement ("Agreement") is between **Benton County** ("County"), and **[Property owner]** ("Cooperator"). This Agreement is intended to set forth the obligations of the Cooperator for **[short term restoration or permanent]** impacts to **[list the covered species here ("Covered Species")]** on land owned by the Cooperator resulting from covered activities performed by the Cooperator. Participation in this Agreement is a prerequisite for obtaining a Certificate of Inclusion from Benton County issued as part of the County's Prairie Species Habitat Conservation Plan, Incidental Take Permit (Permit #_____) from the U.S. Fish and Wildlife Service (USFWS), and Implementing Agreement from the USFWS and Oregon Department of Agriculture (ODA).

The County's Incidental Take Permit, Implementing Agreement, Certificate of Inclusion, and this Agreement do not release the Cooperator from the responsibility to avoid "take" of any covered species already occupying the property.

This Agreement includes, at a minimum:

(1) Map(s) of Cooperator's property or properties (Exhibit A) showing the following information:
   a) Property boundaries,
   b) Area to be impacted by the covered activity ("Impact Area"),
   c) Location of Covered Species to be impacted by the covered activity, based on a pre-project survey or calculation of nectar species abundance (Documentation attached as Exhibit B),
   d) For projects requiring mitigation, Prairie Conservation Area where mitigation will be undertaken, including area where Covered Species will be restored, enhanced or augmented;

(2) For projects requiring mitigation, Notice of Mitigation Initiation (Reporting Form D);

(3) Current Species Survey/Baseline Assessment (Reporting Form C) of site where habitat restoration, enhancement and management activities or mitigation with occur;

(4) Effectiveness Monitoring Plan (Attached as Exhibit C);

(5) Cooperator and County responsibilities under the Agreement; and

(6) Benton County Habitat Conservation Plan (incorporated herein by reference).

2. AFFECTED PROPERTY. The Cooperator owns property identified as **[list tax lot information]** or milepost **[insert milepost information]** in Benton County, Oregon (Exhibit A).

3. BASELINE CONDITIONS OF MITIGATION SITE. Cooperators have performed a baseline assessment of the Prairie Conservation Area where mitigation will be performed. This assessment (Reporting Form C), includes a species survey (See HCP Appendix A: Project Site Survey and Reporting Protocols for Plants and Butterfly Habitat) of the Covered Species present on the property and an assessment of the habitat. This baseline assessment will be used to track the effectiveness of the conservation measures required under this Agreement.

4. IMPACTED HABITAT. The parties agree Cooperator is allowed to impact **[List the covered species and number of individuals or amount of foliar cover to be affected]** within that area shown on Exhibit A as the Impact Area, as a result of performing the following activities ("Covered Activities") which are covered under the County's Incidental Take Permit, Habitat Conservation Plan, and Implementing Agreement.

- **[List covered activities here]**

5. CONSERVATION MEASURES. The purpose of the County's Incidental Take Permit, Habitat Conservation Plan, Implementing Agreement, and this Agreement is to mitigate for impacts to Covered Species or their habitat on Covered Lands resulting from Cooperator's Covered Activities. The biological goal of the Permit is to maintain viable populations of the Covered Species in Benton County. To accomplish this goal, it is essential that the Cooperator and the County work together to provide good habitat and positive stewardship for the Covered Species on Cooperator's lands. Therefore, Cooperator agrees to conduct the following activities to minimize and mitigate for impacts to the Covered Species as provided for in the Certificate of Inclusion and this Agreement:

- **[Specify conservation measures/mitigation to be undertaken]**

6. EFFECTIVENESS MONITORING

Cooperator shall undertake effectiveness monitoring for any habitat restoration, enhancement, and management activities required in Section 5 above, and according the Effectiveness Monitoring Plan (Exhibit C) prepared by the Cooperator. Cooperator shall complete and submit a Reporting Form C: Monitoring Summary, to the County by December 31st of each year monitoring is conducted.

7. RESPONSIBILITIES OF THE PARTIES

Cooperator's Responsibilities. The Cooperator agrees to limits its impacts on Covered Species to those allowed through the Agreement and Certificate of Inclusion. The Cooperator understands that in order for the County to fulfill the responsibilities of its Incidental Take Permit and Implementing Agreement, the County must report to the U.S. Fish and Wildlife Service and Oregon Department of Agriculture all activities impacting Cooperator's Covered Species in accordance with its Incidental Take Permit and Implementing Agreement. In addition, Cooperator agrees to:

- Implement the Conservation Measures specified herein in compliance with all federal, state and local laws, including, but not limited to, physical delineation of the habitat area on the ground as deemed necessary by the County.
- Perform its Covered Activities in compliance with the Best Management Practices and Management Guidelines identified in the HCP, in addition to all federal, state, and local laws,
- Upon reasonable notice (48 hours), allow access to the Cooperator's Property by the County or its approved contractors, for purposes related to this Agreement, including, but not limited to, compliance monitoring and technical assistance.
- Notify the County, in writing, of any transfer of ownership at least 30 calendar days prior to the intended transfer, so the County can attempt to contact the new owner and explain the responsibilities applicable to the impacted property.
- If pre-mitigation has not been completed, initiate mitigation and within 1 year of the effective date of this agreement. Submit Reporting Form D: Mitigation Notice, Part A: Notification of Mitigation Initiation, with this Agreement and prior to beginning any mitigation required by this Agreement and submit Part B of the form, Notice of Mitigation Completion, at the completion of any mitigation required by this Agreement.
- Conduct effectiveness monitoring as set forth in the Cooperator's Effectiveness Monitoring Plan (Exhibit C), and submit the monitoring forms to the County as required in Section 6 above.
- Submit required Part A and Part B of Reporting Form A: Project Impacts, and Form B: Work Completed, detailing covered activities implemented, including habitat restoration, enhancement and management activities by December 31 of the year in which they were completed.

County's Responsibilities. The County's responsibilities include the following:

- Provide 48 hours advance notification to the Cooperator before any visit by County staff or its contractors to Cooperator's Property.

7. AGREEMENT DURATION. Obligations under this Agreement will be in effect from the date executed until the conservation measures required under this Agreement have been satisfied and Reporting Form D: Part B: Notice of Mitigation Completion has been submitted to and signed off by the County. Upon signing the Agreement and submitting Notice of Mitigation Initiation (Reporting Form D) (and Notice of Mitigation Completion, if premitigation has already been completed), a Certificate of Inclusion will be issued to the Cooperator under the County's Incidental Take Permit and Implementing Agreement. The Certificate of Inclusion will authorize incidental take of the Covered Species at the time the Certificate of Inclusion is issued. Copies of the Agreement and Certificate of Inclusion will be held by the County, and copies will be submitted to the USFWS and ODA as part of the County's Annual Compliance Report.

8. INCIDENTAL TAKE. Take is defined as actions or attempted actions to harass, harm, pursue hunt, shoot, wound, kill, trap, capture, or collect such species. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. "Harass" is further defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns including, but not limited to, breeding, feeding or sheltering. Incidental take is any take of federally-listed wildlife or State-listed wildlife and plants that is incidental to, but not the purpose of, otherwise lawful activities.

9. MODIFICATION OF AGREEMENT. The County or the Cooperator may propose modifications or amendments to this Agreement by providing written notice to the other party and obtaining their written concurrence. Such notice shall include a statement of the proposed modification, the reason for it, and its expected results. The parties will make their best efforts to respond to proposed modifications within 60 calendar days of receiving the notice. Proposed modifications will become effective upon the parties' written concurrence.

10. CERTIFICATE OF INCLUSION SUSPENSION OR REVOCATION. The County may suspend or revoke a Cooperator's Certificate of Inclusion if the Cooperator, without the express written consent of the County, (1) performs activities other than the covered activities allowed for under this Agreement resulting in the take of the Covered Species, (2) does not perform the conservation measures set forth in the Agreement, (3) does not conduct the required effectiveness monitoring required in the Agreement, or (4) does not comply with the provisions of this Agreement. The County will notify the USFWS and ODA within ten (10) business days of the suspension or revocation of the Certificate of Inclusion.

11. SUCCESSION AND TRANSFER. This Agreement shall be binding on and shall inure to the benefit of the parties (including officers, directors, employees, lessees and agents thereof) and their respective successors and transferees. The rights and obligations under this Agreement are transferable to subsequent non-Federal property owners, upon consent of the successor or transferee of the land, execution of a new Agreement, and issuance of a Certificate of Inclusion. A new owner(s) will have the same rights and obligations as the original owner.

12. RELEASE. The Cooperator releases and shall hold the County harmless from any liability arising from or related to this Agreement or activities undertaken on the Cooperator's Property pursuant to this Agreement.

13. NOTIFICATION. Communication/correspondence required by this Agreement should be directed to the addresses below. Names and addresses may be changed upon written notice to all parties.

Benton County Community Development Director	Cooperator's Name
360 SW Avery Avenue	Address
Corvallis, OR 97333-1192	City, State, Zip
(541) 541-6871	Telephone Number

Dated effective as of the last date of signature below.

BENTON COUNTY

Signature_____ Date_____

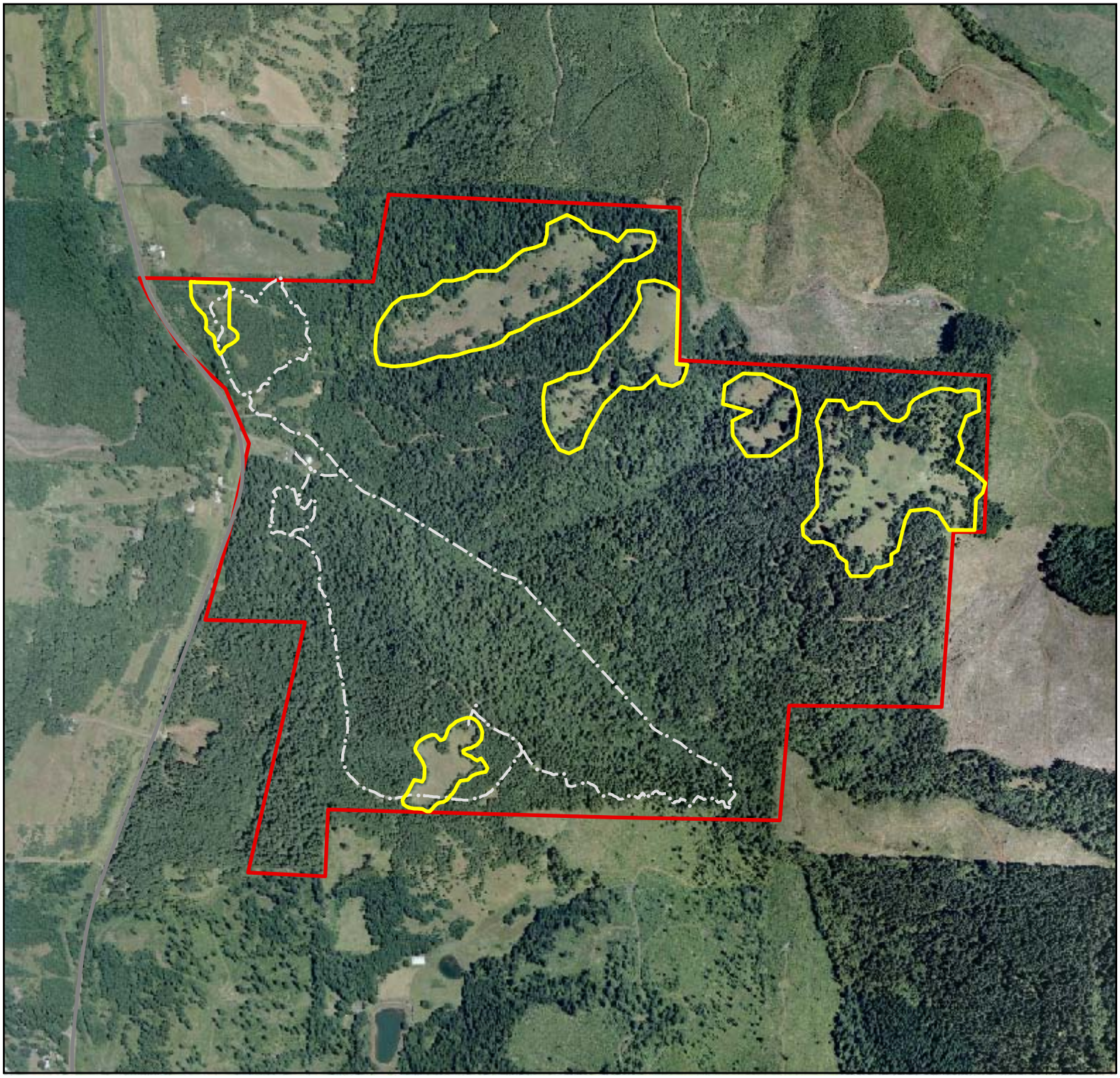
Printed Name_____ Title_____

COOPERATOR

Signature_____ Date_____

Printed Name_____ Title_____

Appendix D. Maps of Prairie Conservation Areas



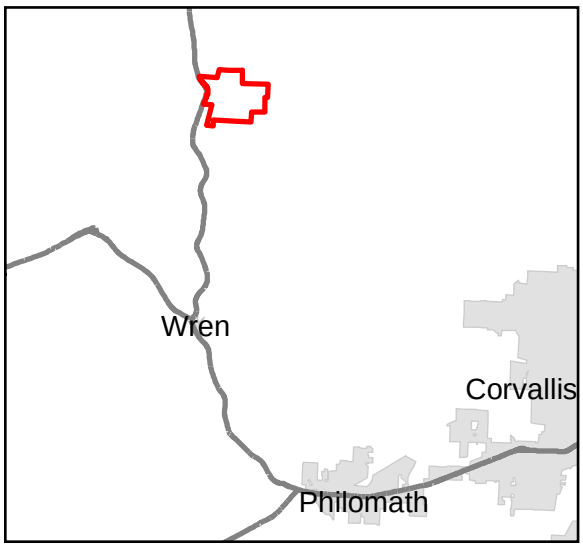
Legend

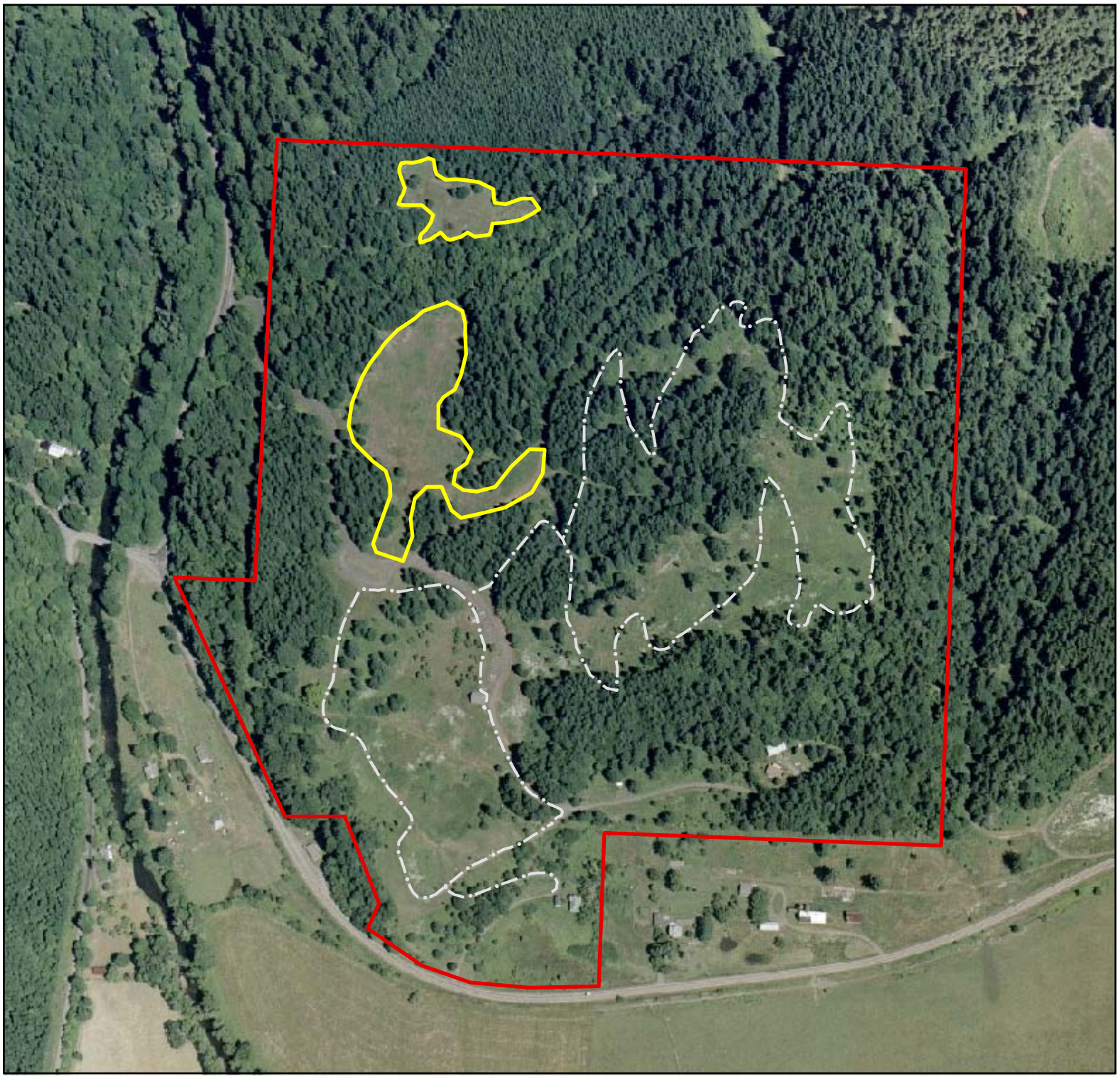
- Beazell Memorial Forest
- Prairie Conservation Area
- Trails
- State Highways

0 150 300 600 900 1,200 Meters

0 550 1,100 2,200 3,300 4,400 Feet

N W E S





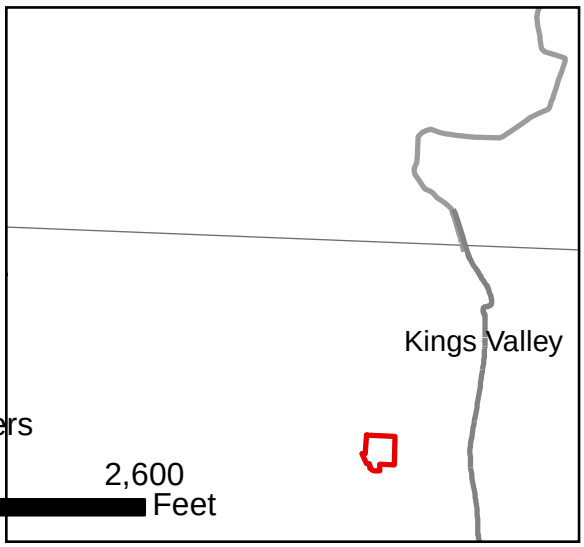
Legend

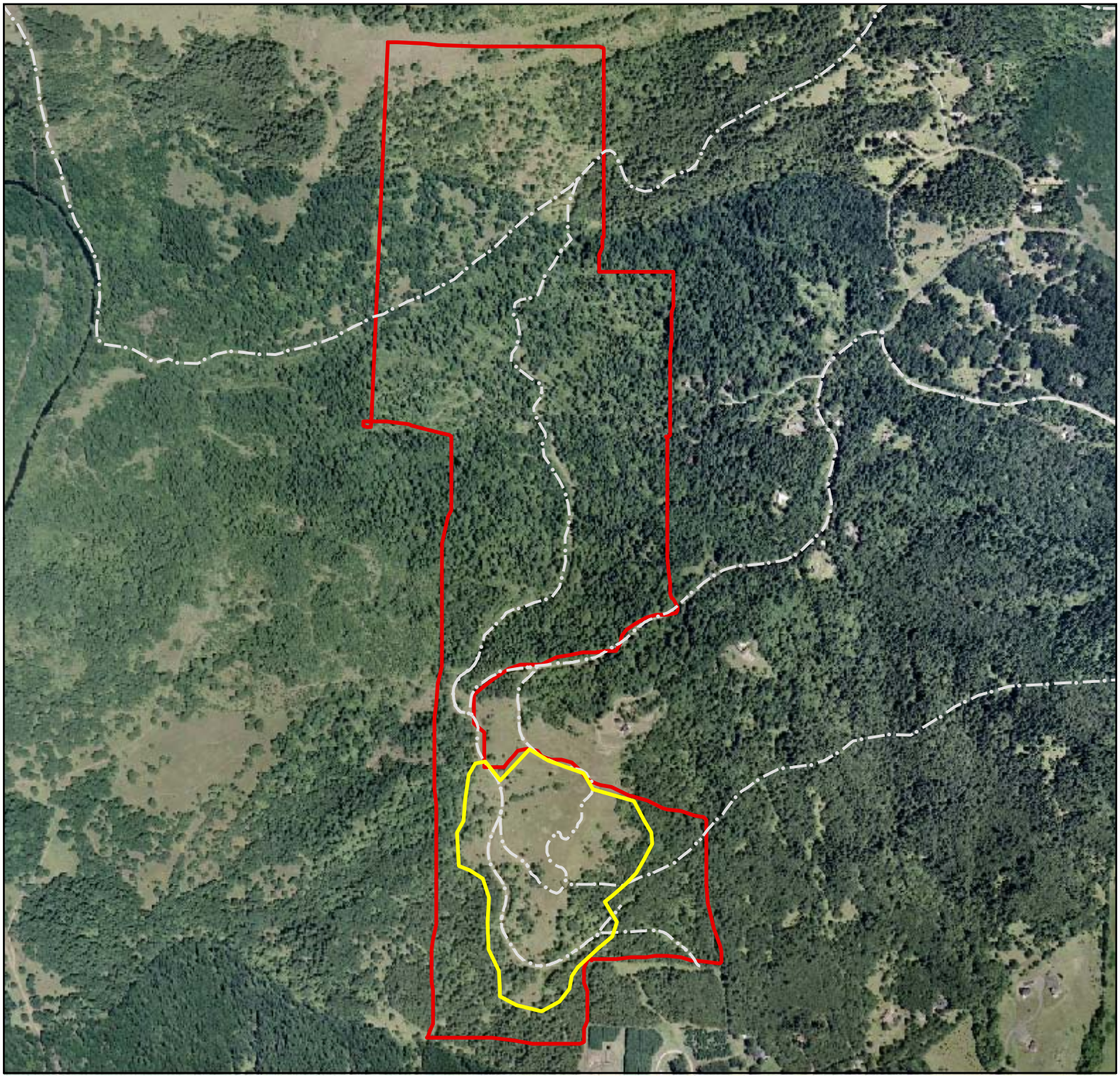
- Prairie Conservation Areas
- Fort Hoskins Historic Park
- Trails
- State Highways

0 80 160 320 480 640 Meters

0 325 650 1,300 1,950 2,600 Feet

N W E S





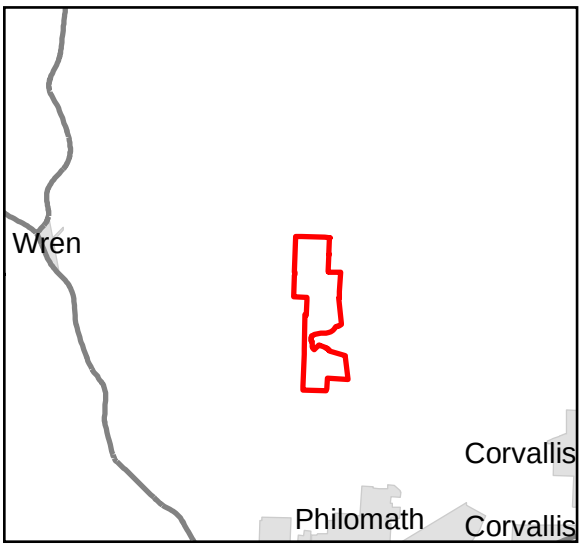
Legend

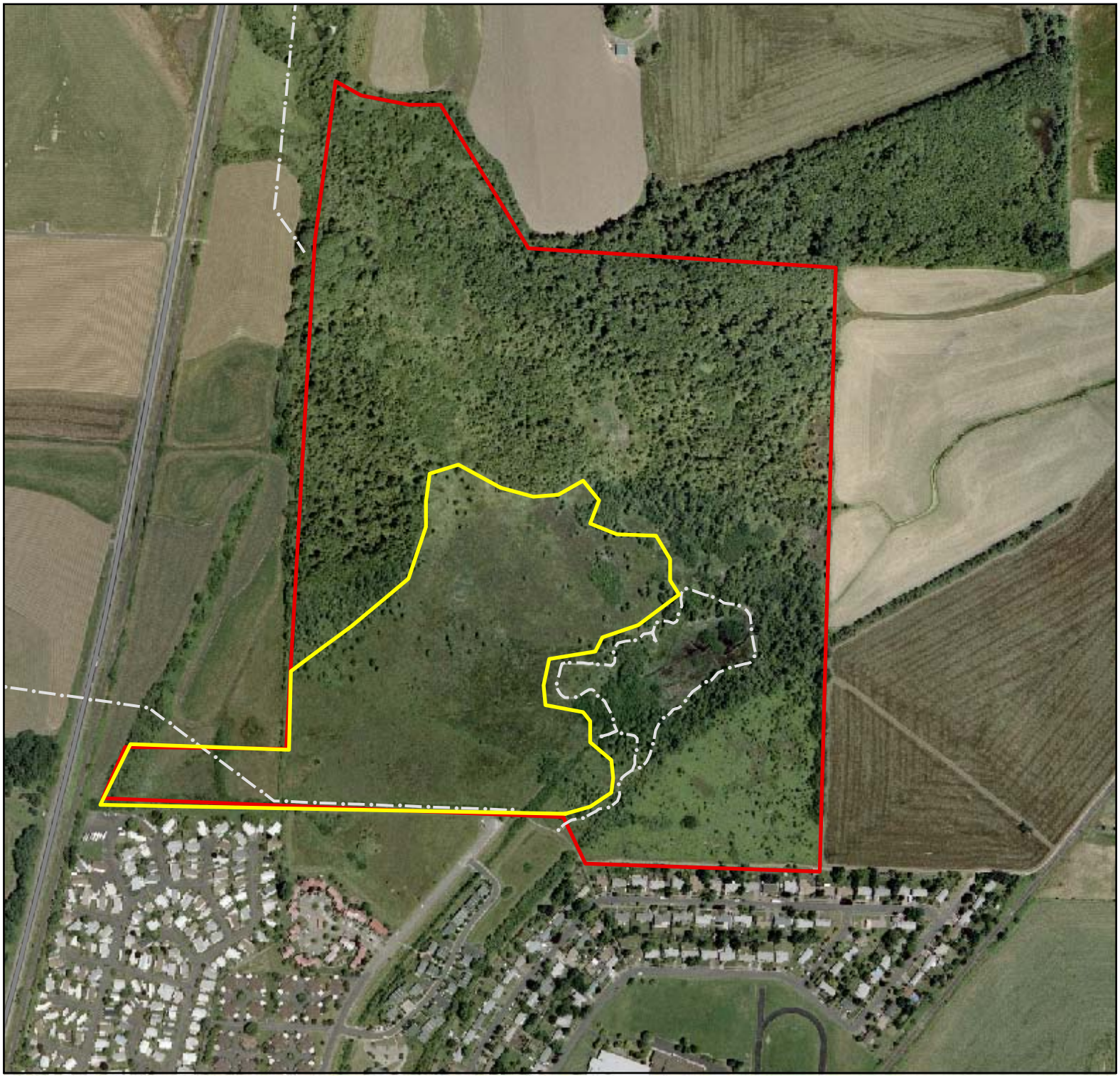
- Fitton Green Natural Area
- Prairie Conservation Area
- Trails
- State Highways

0 150 300 600 900 1,200 Meters

0 550 1,100 2,200 3,300 4,400 Feet

N W E S





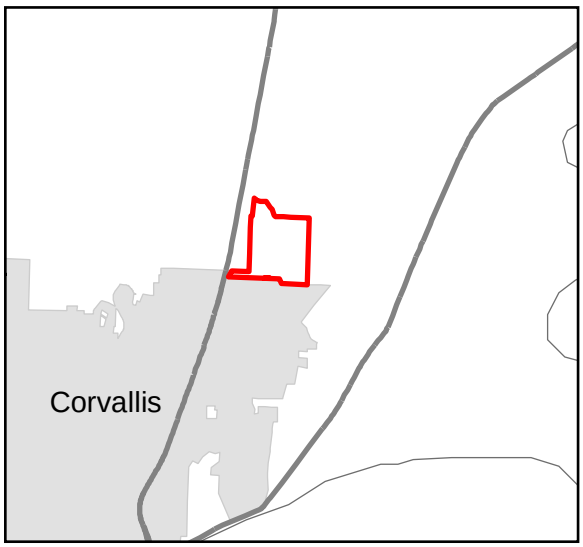
Legend

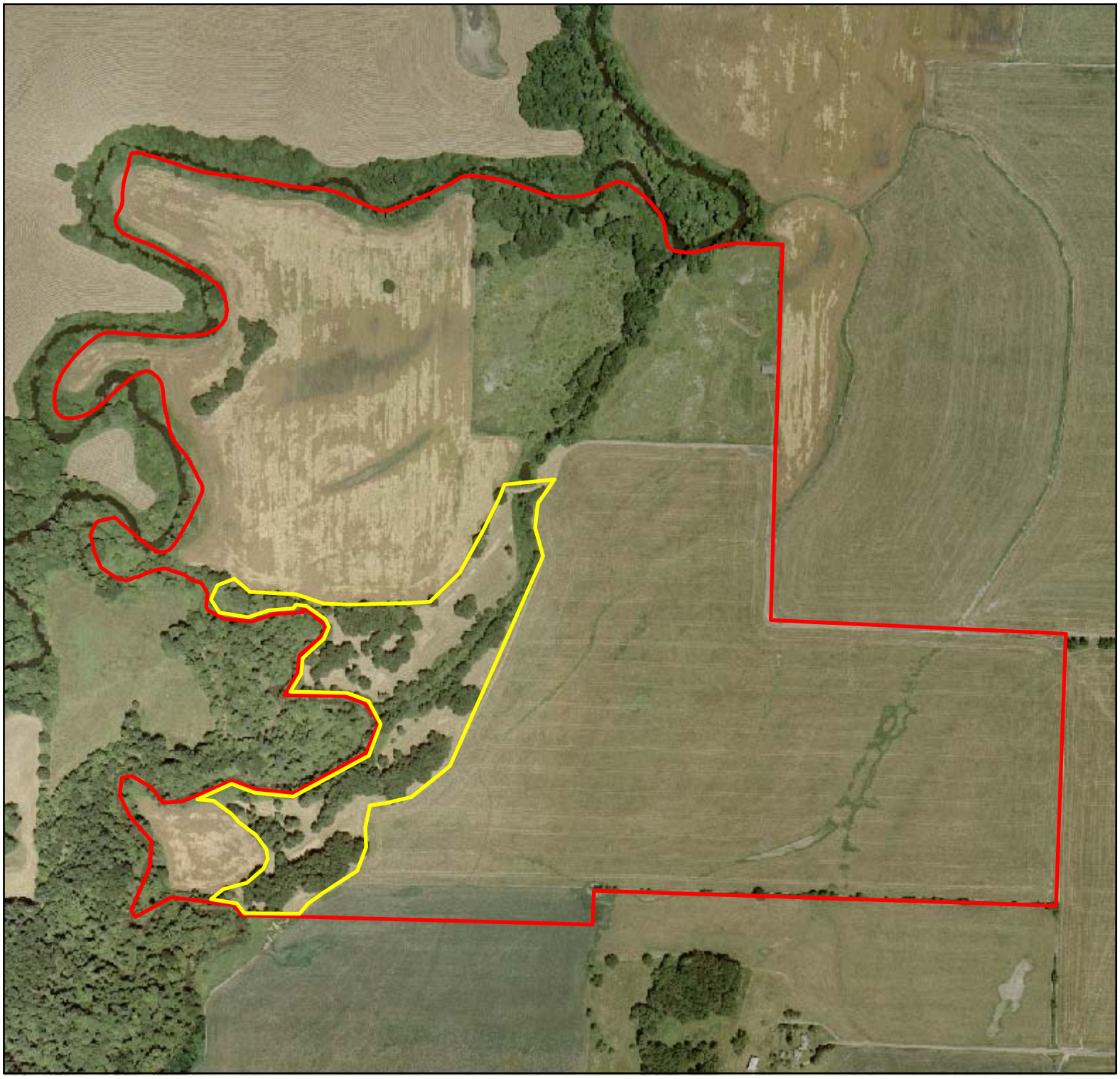
- Prairie Conservation Area
- Jackson-Frazier Wetland
- Trails
- State Highways

0 80 160 320 480 640 Meters

0 305 610 1,220 1,830 2,440 Feet

N W E S





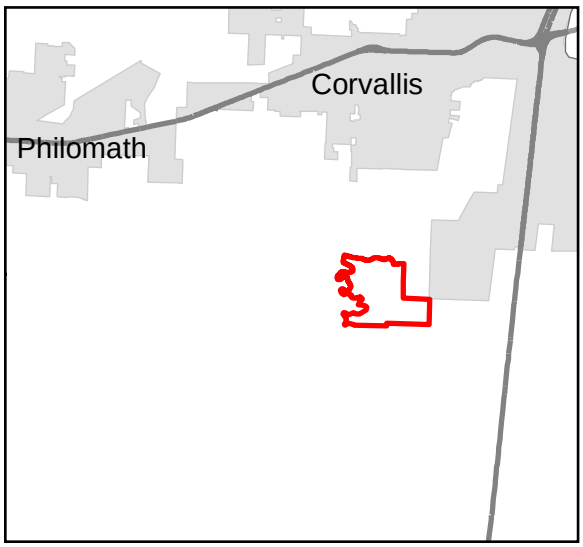
Legend

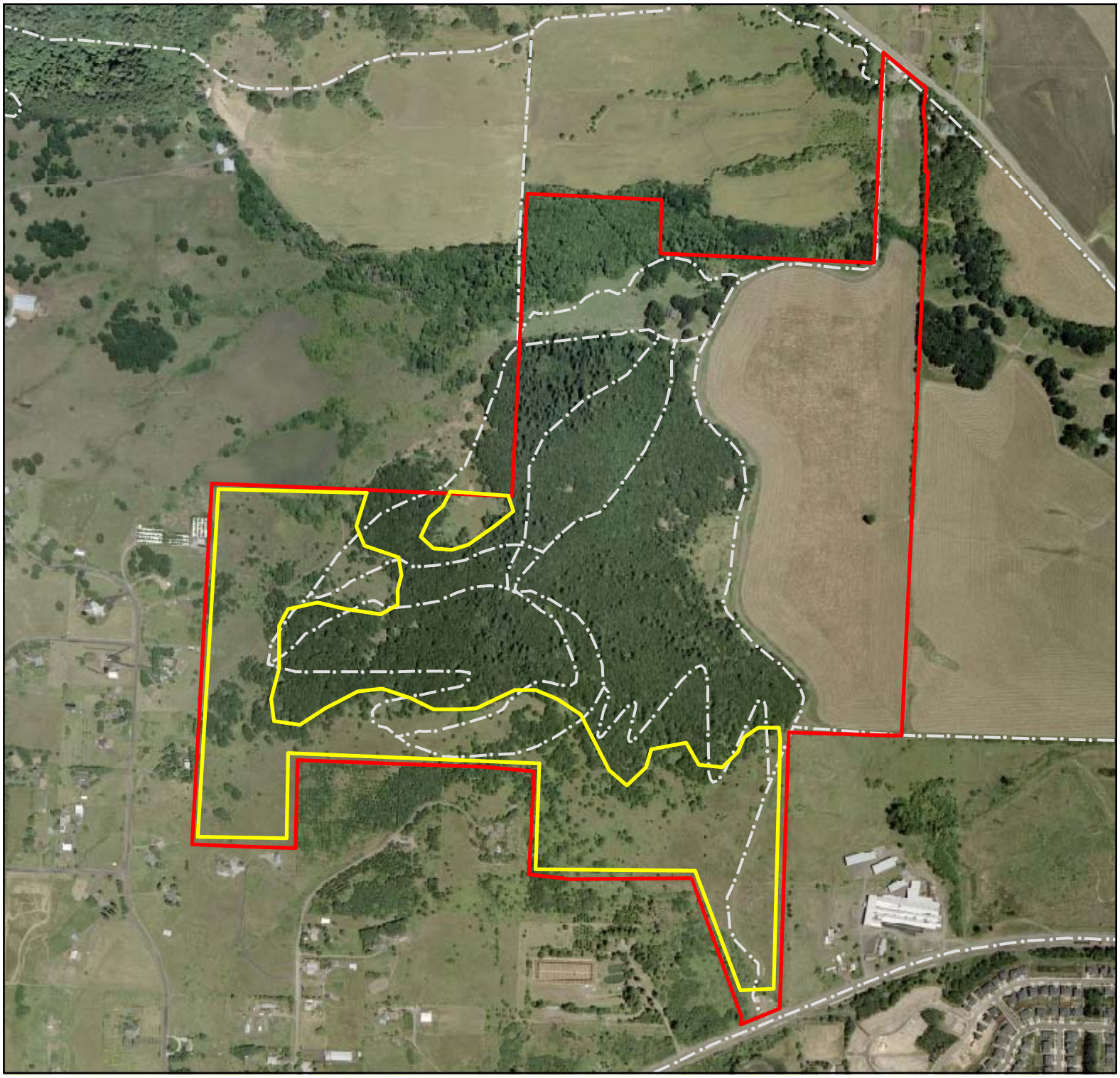
- Prairie Conservation Area
- Herbert Open Space
- Trails
- State Highways

0 87.5 175 350 525 700 Meters

0 337.5 675 1,350 2,025 2,700 Feet

N W E S





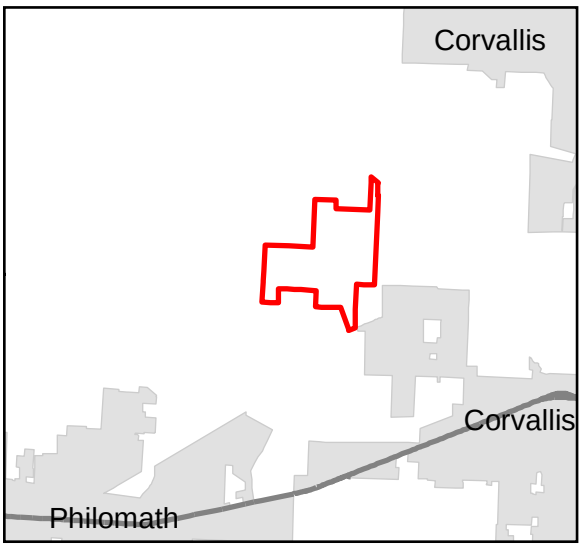
Legend

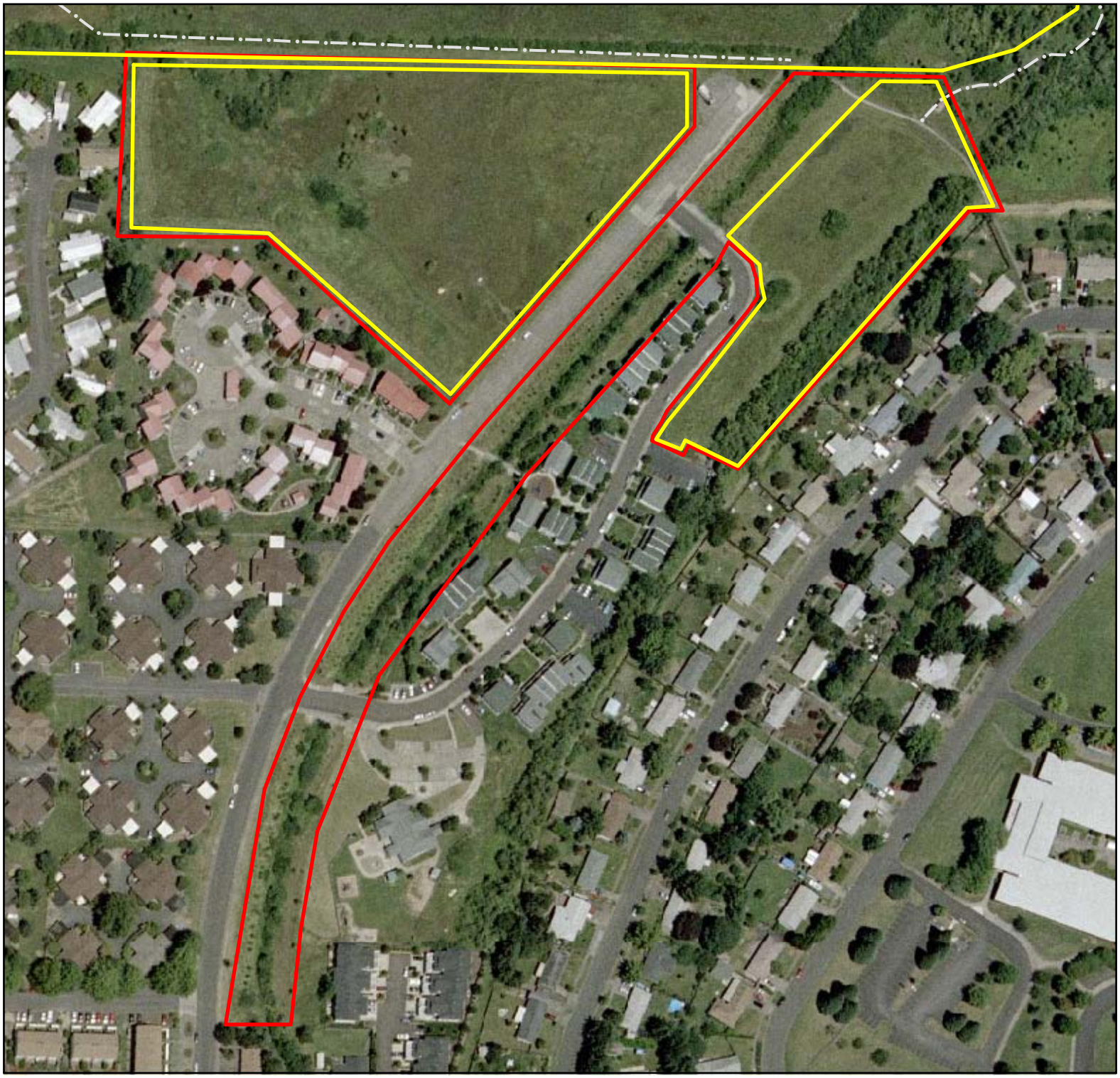
- Prairie Conservation Area
- Bald Hill Park
- Trails
- State Highways

0 112.5 225 450 675 900 Meters

0 370 740 1,480 2,220 2,960 Feet

N W E S





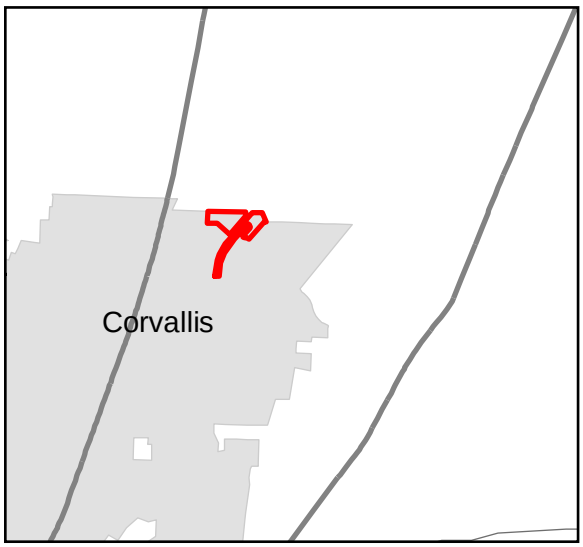
Legend

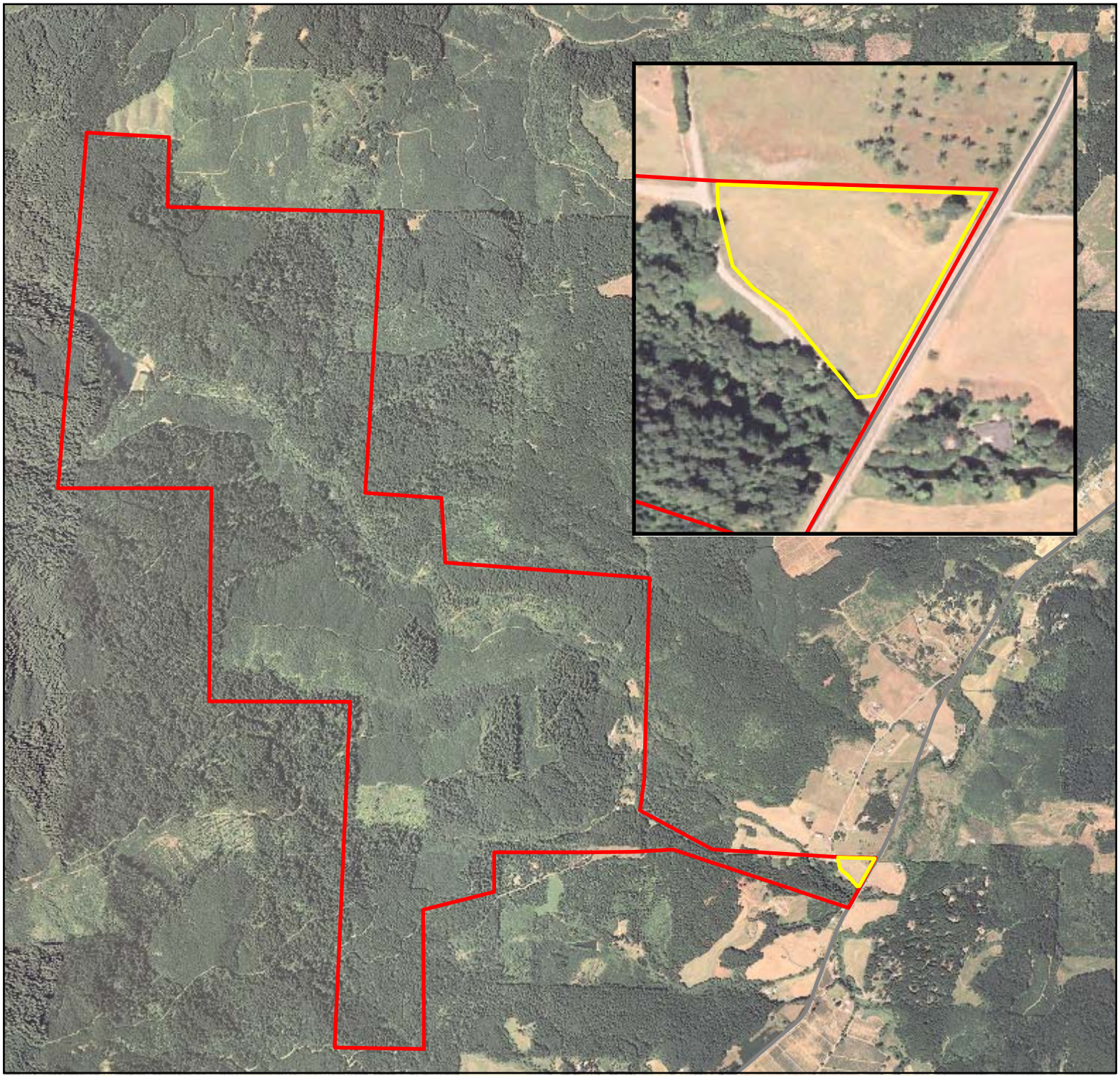
- Prairie Conservation Area
- Lancaster Property
- Trails
- State Highways

0 25 50 100 150 200 Meters

0 95 190 380 570 760 Feet

N W E S





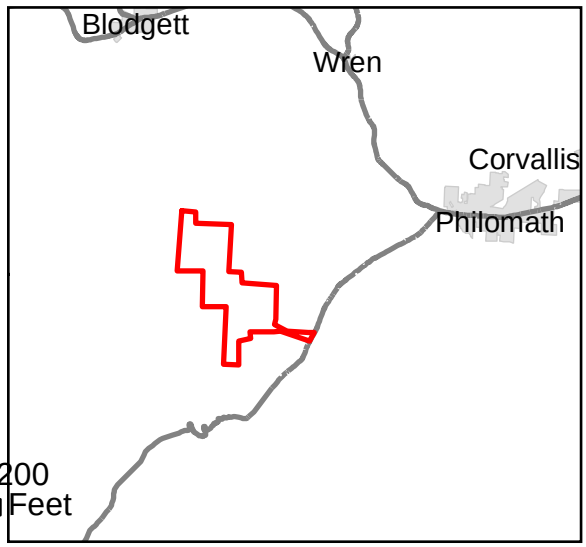
Legend

- Prairie Conservation Area
- Corvallis Watershed
- Trails
- State Highways

0 425 850 1,700 2,550 3,400 Meters

0 1,650 3,300 6,600 9,900 13,200 Feet

N W E S



Legend

ODOT Wren Mitigation Site and PCA

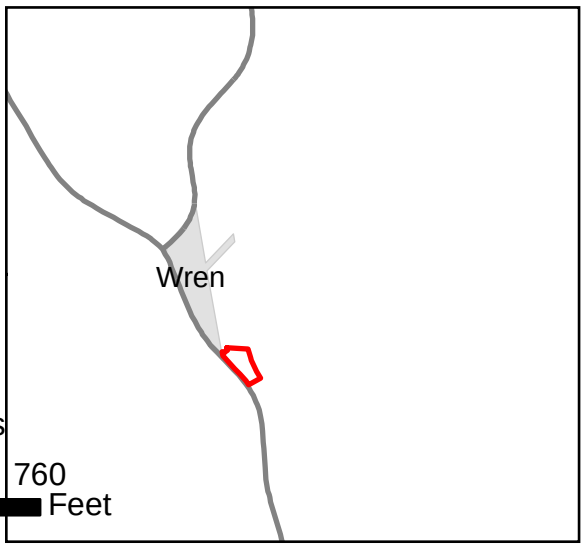
Trails

State Highways

0 25 50 100 150 200 Meters

0 95 190 380 570 760 Feet

N W E S



Legend

ODOT Henkle Quarry and PCA

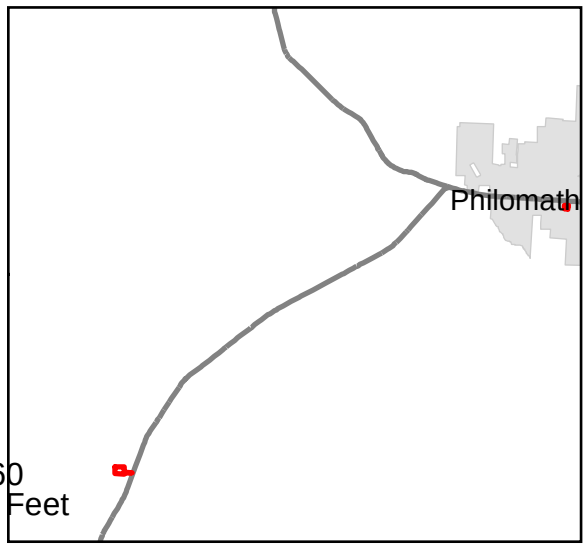
Trails

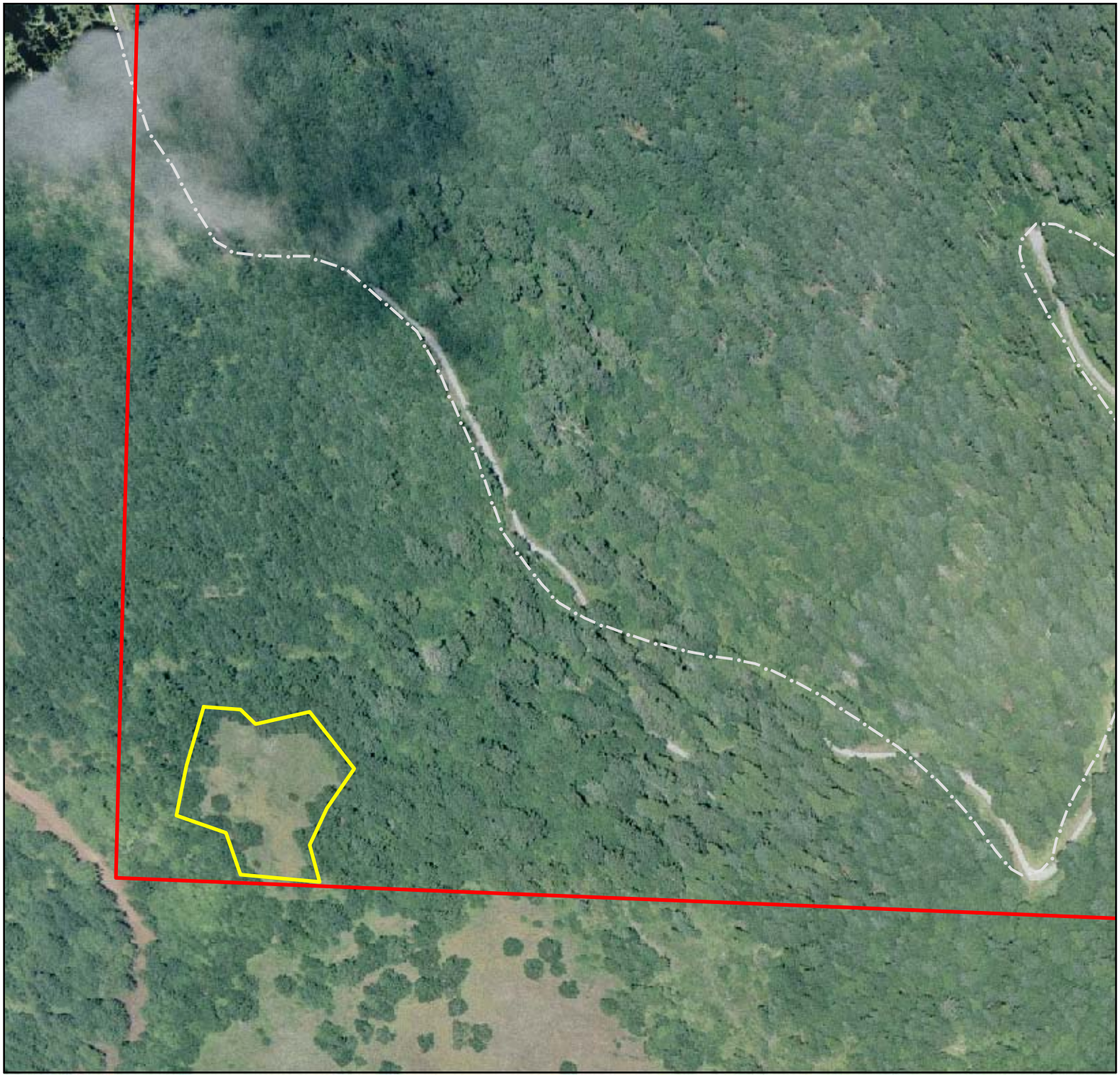
State Highways

0 25 50 100 150 200 Meters

0 95 190 380 570 760 Feet

N W E S





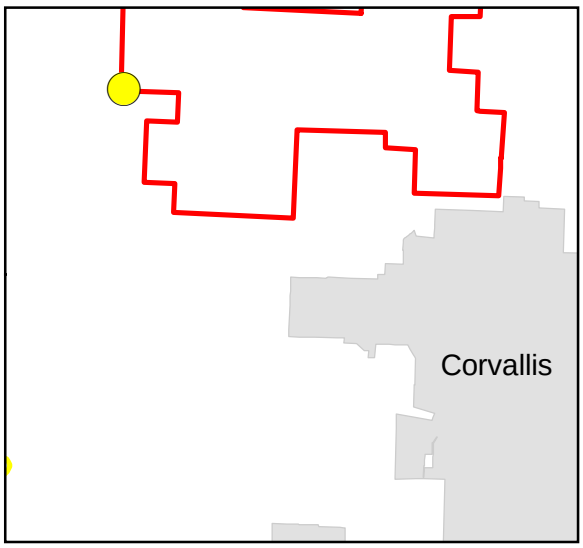
Legend

- Butterfly Meadows Prairie Conservation Area
- OSU Forest Boundary
- Trails
- State Highways

0 30 60 120 180 240 Meters

0 120 240 480 720 960 Feet

N
W E
S



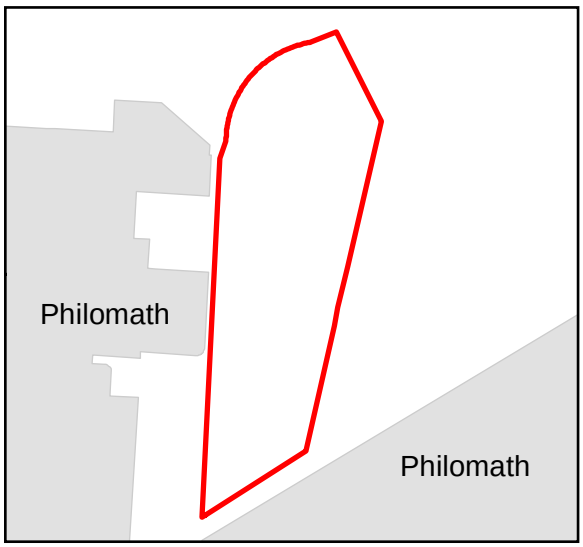
Legend

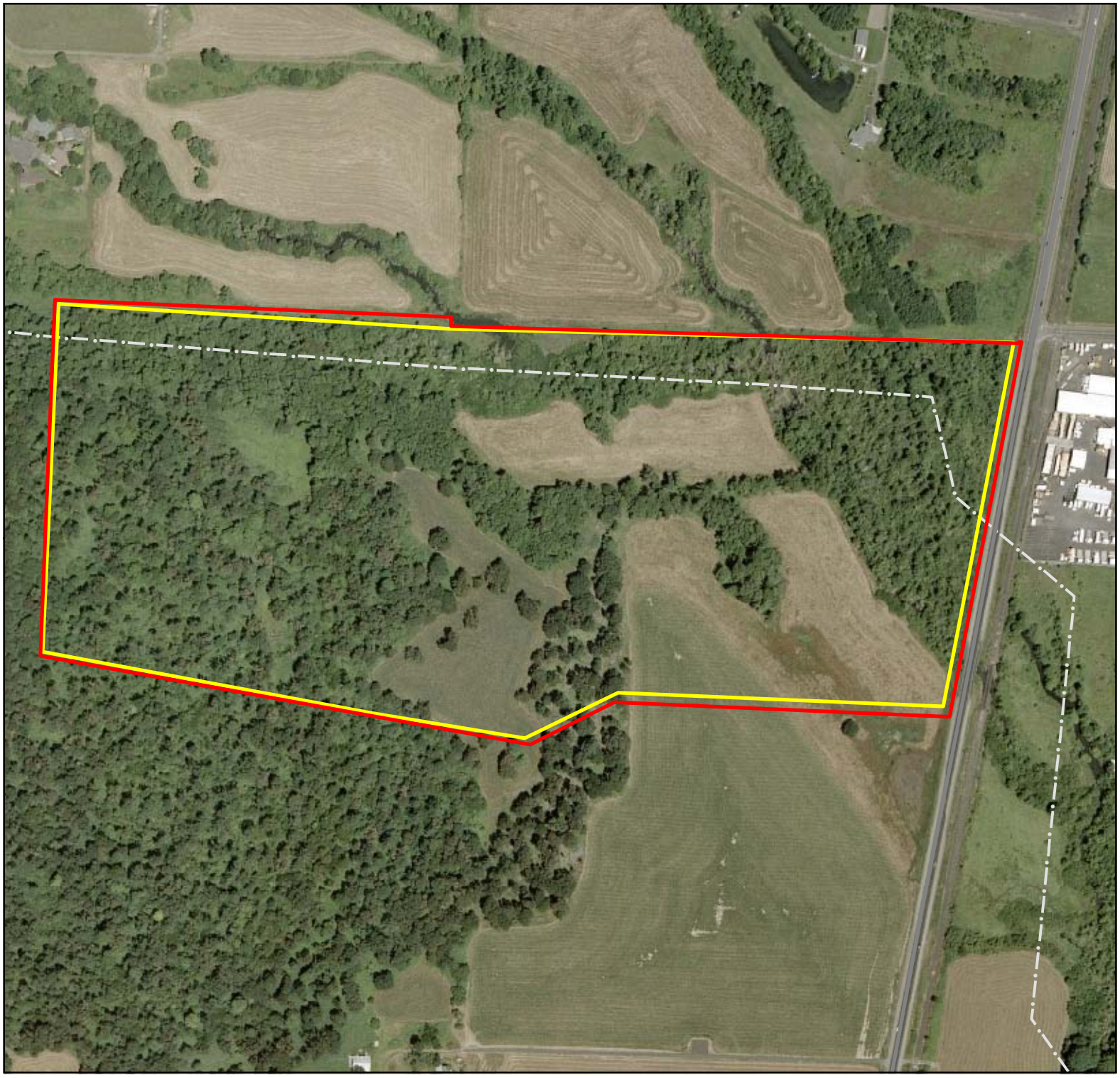
- Prairie Conservation Area
- Lupine Meadows
- Trails
- State Highways

0 60 120 240 360 480 Meters

0 220 440 880 1,320 1,760 Feet

N W E S





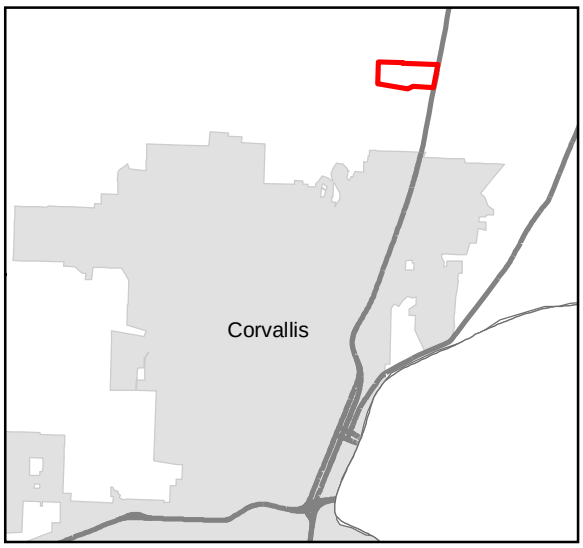
Legend

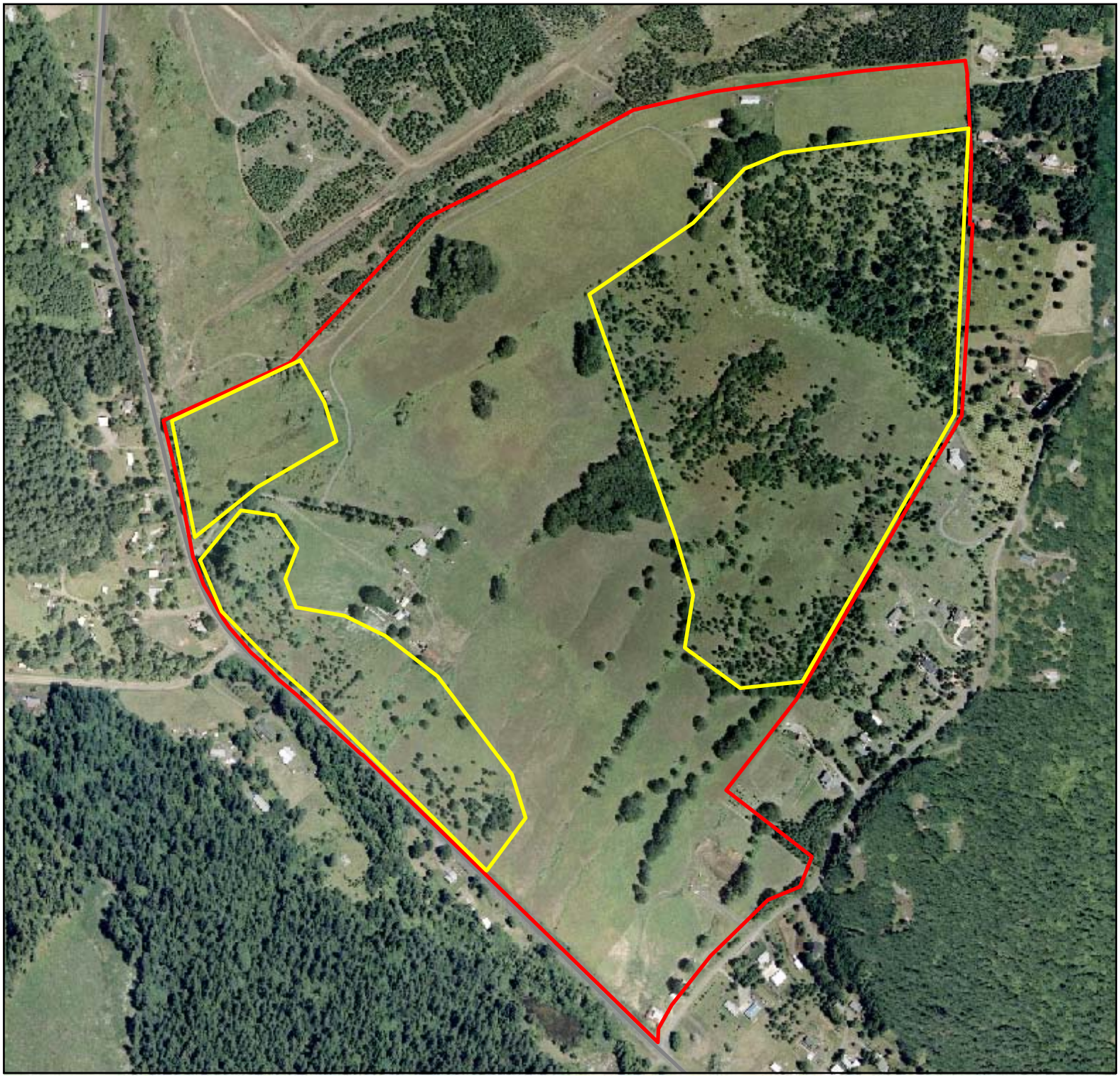
- Prairie Conservation Area
- Owens Farm
- Trails
- State Highways

0 55 110 220 330 440 Meters

0 200 400 800 1,200 1,600 Feet

N W E S





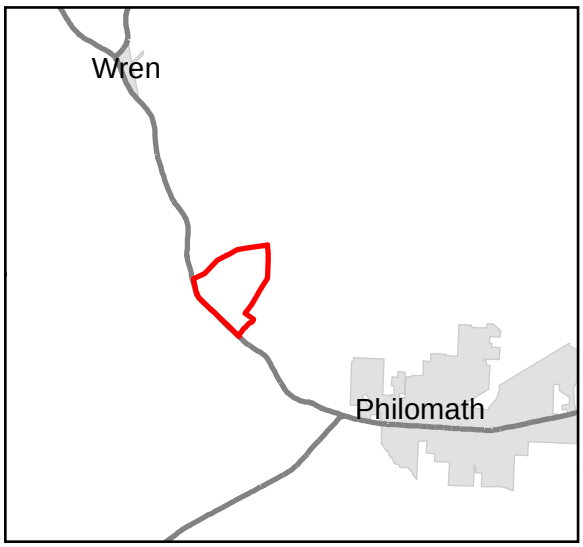
Legend

- Prairie Conservation Area
- Lonestar Ranch
- Trails
- State Highways

0 80 160 320 480 640 Meters

0 265 530 1,060 1,590 2,120 Feet

N W E S



Appendix E. Draft Prairie Conservation Strategy

DRAFT

BENTON COUNTY, OREGON

PRAIRIE CONSERVATION STRATEGY

APRIL 2010

This document was prepared for Benton County by staff at
the Institute for Applied Ecology

The Institute for Applied Ecology is a non-profit 501(c)(3) organization whose mission is to conserve native ecosystems through restoration, research, and education.

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Cover photos:

Photos top left to right:
Fender's blue butterfly: Tom Kaye
Kincaid's lupine: Lori Wisehart
American Kestrel: Rod Gilbert
Wren upland prairie tour: Rachel Schwindt
Western gray squirrel: Rod Gilbert
Willamette daisy: Lori Wisehart

Photo bottom:
Jackson-Frazier and Owens Farm: Rachel Schwindt

Preamble

The Benton County Prairie Conservation Strategy has been developed to educate citizens and land managers about at-risk habitat and species in Benton County, and to provide voluntary long-term strategies for conservation on both public and private lands. The Strategy is the result of input from local citizens and land managers who participated in meetings, workshops, and a web based survey. The Benton County Habitat Conservation Plan Stakeholder Advisory and Technical Advisory Committees guided the goals and objectives of the Strategy, as well as provided technical information on species and habitats (Benton County 2009). The information in this Strategy provides a reference for landowners and land managers to recognize at-risk habitat and species, and understand where these species occur in Benton County. This information is useful for planning efforts to protect listed species and reintroduce species no longer locally present.

Habitat loss due to land use change and invasive species has led to the decline of many species locally and worldwide. Conservation actions on privately owned land are essential for protection of unique habitats and rare species that occur across multiple ownerships. Several chapters in this Strategy provide additional information specifically for voluntary private landowner conservation actions. This information is appropriate both for those who wish to collaborate on projects with public agencies or who are interested in working independently. For those working independently, relevant chapters in this guide include Chapter 3: Species habitat needs, Chapter 5: Habitat conservation guide for private lands, and Chapter 6: Landowner incentives and opportunities. It is hoped that local citizens will utilize the information in this Strategy to learn about local conservation efforts and to participate where possible.

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Acronyms

The following is a list of acronyms used in the Benton County Prairie Conservation Strategy:

ESA – Endangered Species Act
FSA – Farm Service Agency
NGO – Non-governmental organization
NRCS – Natural Resources Conservation Service
ODA – Oregon Department of Agriculture
ODFW – Oregon Department of Fish and Wildlife
SWCD – Soil Water Conservation District
TNC – The Nature Conservancy
USFWS – United States Fish and Wildlife Service

1 Background and purpose

Benton County encompasses some of the highest quality prairie and oak habitat in the Willamette Valley of Oregon. These habitats support unique plant and animal species and contribute to the scenic landscape enjoyed by Benton County's residents and visitors. Though significant remnants of prairie habitats remain in Benton County, much of the historic prairie, oak savanna, and oak woodlands have been lost to land use conversion, habitat fragmentation, fire and flood suppression, and invasive species introductions (ODFW 2006). Populations of several plant and animal species dependent on prairie and oak habitat 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 species that may be at risk for future extinction.

This strategy was developed as one of the Conservation Measures of a multi-species Habitat Conservation Plan funded by a U.S. Fish and Wildlife Service grant to Benton County and also serves as a stand-alone reference document. The continued existence of prairie habitats and species depends on the willingness of land managers and private landowners to voluntarily undertake conservation actions. This document provides an overview of voluntary actions that can be enacted in Benton County to increase prairie habitats and recover high priority species.

Prairie conservation strategy vision

The vision for the Prairie Conservation Strategy is that:
Benton County will contain abundant and high value prairie and oak habitat for secure populations of native species. Prairie and oak habitat are valued community assets for native species protection, scenic landscapes, and recreation opportunities.

Benton County conservation issues

In the Willamette Valley, prairie and oak habitats have declined from their historic extent and, unless protected and restored, will likely continue to decline due to a variety of factors, including land use change to accommodate future population growth and invasive species spread. In Benton County, much of the historic open prairie and oak habitat has been developed into farmland and urban areas or has become Douglas-fir forest through natural succession. The few remaining habitat patches have been maintained by low intensity management. Habitat patches that were once interconnected are now 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 and altered floodplain connections over the last two centuries have allowed native shrubs and trees to displace prairie species and slowly prairies have been replaced by ash and coniferous forests in a process called succession. In addition, non-native species introduced to our region pose a new threat to prairie ecosystems by changing the habitat ecology and composition.

The primary threats to prairie and oak habitat are:

- Habitat loss and fragmentation through development
- Invasion by non-native plant species
- Vegetative succession to shrub and tree species

Benton County conservation opportunities

There are many opportunities for habitat conservation in Benton County due to the remaining intact prairie sites and the conservation interest of Benton County's citizens. Many dedicated individuals and groups are working to restore and protect prairie and oak habitat on private and public lands. State and federal agencies, as well as several non-governmental organizations (NGOs), manage more than 16,000 acres of land for conservation in Benton County. Many private landowners also manage much of the best remaining native habitat on their own or in partnership with public agencies and NGOs and their work is crucial for maintaining habitat for rare native species. Engaging private landowners in prairie conservation is key to this strategy for native prairie and oak habitat retention in Benton County and throughout the Willamette Valley.

How this strategy was prepared

This strategy is the result of input from land managers, scientists, and local citizens who participated in meetings, workshops, and a survey between 2006 and 2009. Groups associated with Benton County's Prairie Species Habitat Conservation Plan were convened to share ideas and information on the species and habitats discussed here. The Stakeholder Advisory Committee to the HCP held a series of meetings to define the vision, goals and objectives of this strategy, as well as obstacles to conservation and solutions to these challenges. In addition, this group set the scope of the strategy, including the habitats and species to be included. Riparian habitats are an integral component of ecosystem processes but were excluded to focus the strategy on prairie and oak habitats.


Short-eared Owl © Rod Gilbert

Technical information on the habitats and species was provided by the Technical Advisory Committee to the HCP and its taxonomic subgroups. An online survey conducted in 2009 provided background information on community willingness to participate in habitat conservation on public and private lands, and identified obstacles, priorities and techniques for community engagement. With technical and community information in hand, the Stakeholders reconvened in a summer workshop to discuss on-the-ground priorities for prairie habitats in Benton County, focusing on site-specific needs of the local landscape and opportunities for establishing connectivity between habitat patches and populations. Benton County Natural Areas and Parks Department staff and consultants assembled the outcomes of this process into a single document. The result is summarized in this strategy.

Strategy goals

Prairie Conservation Strategy goals were developed to guide long-term conservation of prairie and oak habitat for native species in Benton 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 efficient methods for species conservation using diverse sources of funding are crucial.

Goal 1: Identify prairie and oak habitats and habitat attributes important to Benton County's at-risk species

Goal 1 Actions

- Identify areas within Benton County that have prairie or oak habitat with a predominantly native plant component.
- Identify actions for strategic habitat conservation.
- Identify at-risk species that would benefit from prairie or oak habitat management and the habitat requirements for these species.
- Identify current habitats in Benton County that support at-risk native species.
- Identify connectivity needs and obstacles for these species and their habitat on unprotected lands.
- Identify actions for strategic species conservation.

Goal 2: Encourage voluntary cooperative partnerships among public and private landowners and the general community to enhance conservation

Goal 2 Actions

- Identify voluntary tools for conservation.
- Identify opportunities to engage private landowners in habitat conservation.

Goal 3: Facilitate access to diverse sources of funding to maximize the likelihood of stable support

Goal 3 Actions

- Identify existing funding sources for conservation.
- Identify gaps in funding for conservation.

Hitchcock's blue-eyed-grass

How to use this strategy

This strategy outlines an approach for interested parties, both public and private, to conserve and restore habitats and recover prairie-dependent species in Benton County in a non-binding, non-regulatory framework. Chapters in this document are structured around the key steps needed for habitat conservation at any location:

- Identify key habitats (Chapter 2)
- Identify key species (Chapter 3)
- Understand habitat geography and locate partners (Chapter 4)
- Identify actions (Chapter 5)
- Get help (Chapter 6)

Identification of the key habitats already, or potentially, present at a site, including wetland prairie, upland prairie and savanna, and oak woodland, is covered in Chapter 2. Chapter 3 discusses key species, from the uncommon to the endangered, that could be supported and describes their habitat, population, and connectivity needs. With this information a landowner or manager can decide which habitats and species their property has the potential to support. Chapter 4 describes the existing network of public and conservation lands in Benton County, putting into geographic context restoration projects on public or private lands. Actions needed to support these habitats and species locally are identified in Chapter 5, with high and low priorities assigned to such activities as enhancing existing sites and populations, creating new populations or restoring habitats to provide connectivity across the landscape, and conducting outreach to the local community. Landowners and managers can find their sites on the maps in this section and learn how their actions can contribute directly to conservation. Finally, chapter 6 describes several conservation tools available to private individuals and public agencies, from technical to financial assistance and existing support programs to new ideas. This strategy puts necessary information into the hands of our local community, enabling conservation through informed action.

Northern red-legged frog
© James Bettaso USFWS

2 Key habitats

Habitat selection criteria

This Prairie Conservation Strategy focuses on three key habitats with opportunities for conservation in Benton County. Upland prairie/oak savanna, wet prairie, and oak woodland habitat types have been identified in the Oregon Conservation Strategy as being particularly reduced by development in the Willamette Valley (ODFW 2006). Additionally, the loss of prairie habitat in Benton County has contributed to the listing of several prairie-dependent species which makes protection of prairie habitat particularly important. The U.S. Fish and Wildlife Service (USFWS) has drafted a Recovery Plan for listed prairie-dependent species and for additional prairie species that may be candidates for listing in western Oregon (USFWS 2008a). This Prairie Conservation Strategy applies the USFWS's recovery criteria from that plan to identify networks of habitat that could assist in the recovery of listed species.

All of the selected habitat types have been mapped in the Willamette Valley by several groups and are defined in the International Terrestrial Ecological Systems Classification system (NatureServe 2009).

The key habitat types addressed in this strategy are:

- **Willamette Valley Upland Prairie and Oak Savanna**
- **Willamette Valley Wet Prairie**
- **North Pacific Oak Woodland**

Conservation of these broadly defined habitat types across our landscape will serve to improve conditions for rare species as well as the diverse suite of species that reside in those habitats. Landscape level conservation actions will also allow for increased connectivity between fragmented sites.

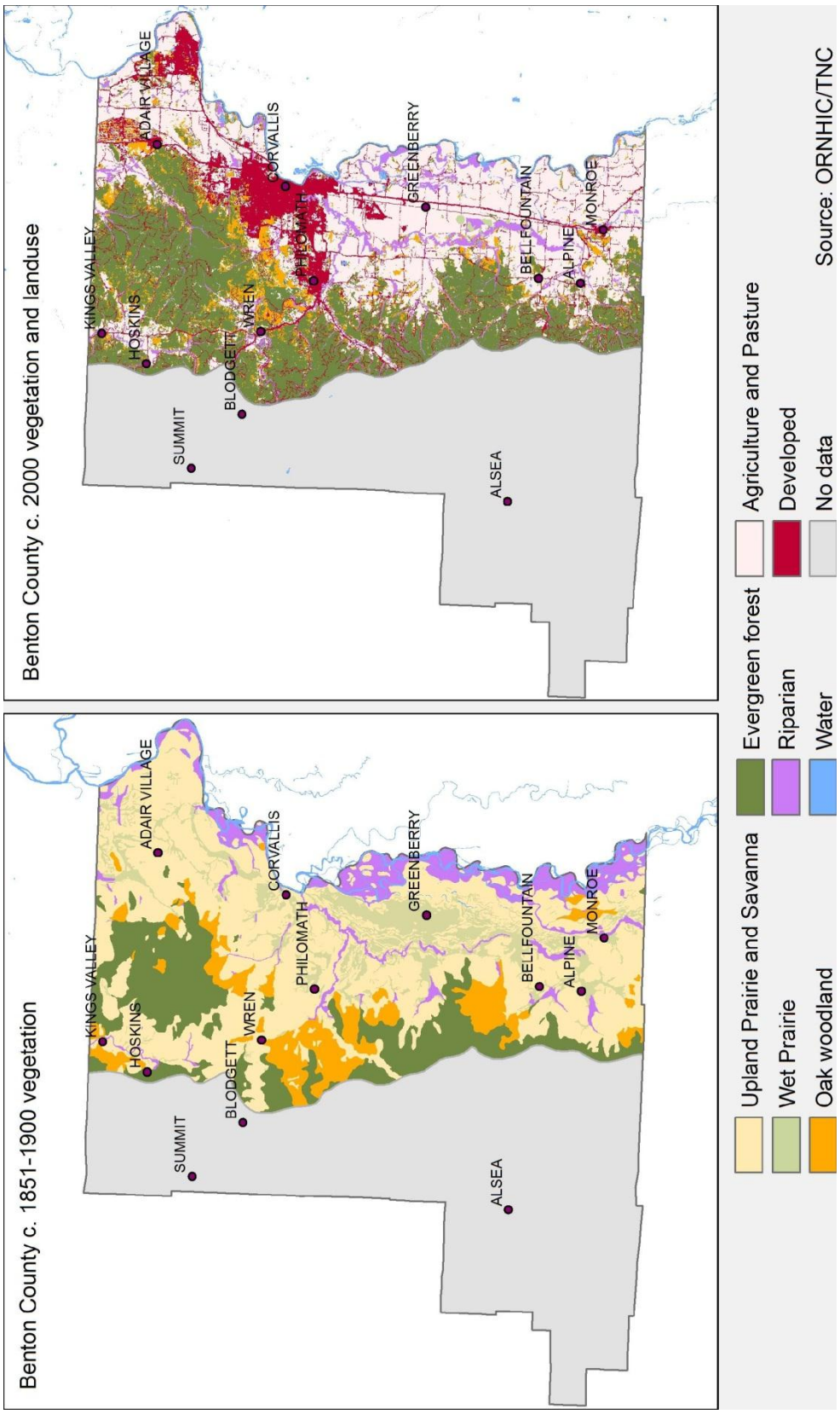


Figure 2.1 Historic and current vegetation/land use in Benton County

Habitat descriptions

Upland prairie and savanna

Upland prairies are among the most threatened ecosystems in Oregon. These open grasslands historically occurred across the Willamette Valley and supported diverse animal and herbaceous plant species. Upland prairies are typically dominated by perennial grasses and annual or perennial forbs. Savanna areas may also contain widely spaced (a few trees per acre) open grown Oregon white oaks (*Quercus garryana*), Douglas-fir (*Pseudotsuga menziesii*), or ponderosa pines (*Pinus ponderosa*) with wide canopies. In the Willamette Valley, upland prairies and savanna typically occur on low elevation, well draining slopes along the valley bottom and surrounding foothills. This habitat was historically maintained by seasonal fire.

Common native grasses in upland prairie include Roemer's fescue (*Festuca roemeri*), California oatgrass (*Danthonia californic*a), prairie junegrass (*Koeleria macrantha*), blue wildrye (*Elymus glaucus*), and Lemmon's needlegrass (*Achnatherum lemmonii*). Native forbs that are commonly intermixed with the grasses include Oregon sunshine (*Eriophyllum lanatum*), slender cinquefoil (*Potentilla gracilis*), dwarf checkermallow (*Sidalcea virgata*), lance selfheal (*Prunella vulgaris* ssp. *lanceolata*) and Tolmie startulip (*Calochortus tolmiei*).

Plant species that invade the prairie when there is a lack of management include native woody species such as Douglas-fir and non-natives such as oneseed hawthorn (*Crataegus monogyna),* Scot's broom (*Cytisus scoparius*), Himalayan blackberry (*Rubus armeniacus*), false brome (*Brachypodium sylvaticum*) and a wide diversity of other invasive plants.

Key at-risk species associated with upland prairie and savanna include: Fender's blue butterfly (*Icaricia icarioides fenderi*), Taylor's checkerspot butterfly (*Euphydryas editha taylori*), field crescent butterfly (*Phyciodes pulchella*), tailed copper (*Lycaena arota*), Western Meadowlark (*Sturnella neglecta*), Streaked Horned Lark (*Eremophila alpestris strigata*), camas pocket gopher (*Thomomys bulbivorus*), golden paintbrush (*Castilleja levisecta*), Kincaid's lupine (*Lupinus sulphureus* ssp. *kincaidii*), shaggy horkelia (*Horkelia congesta* ssp. *congesta*), and Willamette daisy (*Erigeron decumbens* var. *decumbens*).

Field crescent © Rod Gilbert

Wet prairie

Wet prairies were once a common habitat in the floodplain of the Willamette River. These prairies are a mosaic of ash swales, vernal pools, emergent marsh, and seasonally flooded grasslands that occur on poorly drained clay soils or shallow soils above bedrock. Wet prairies are maintained by seasonal flooding, which creates anaerobic wetland soil characteristics, and many were also historically maintained by late summer fires.

Wet prairies are dominated by herbaceous plants, often including facultative or obligate wetland plant species. Common native grass species found in wet prairies include tufted hairgrass (*Deschampsia cespitosa*) and meadow barley (*Hordeum brachyantherum*). One-sided sedge (*Carex unilateralis*) and dense sedge (*C. densa*) are also common. Native forbs found in wet prairie include camas (*Camassia quamash* and *C. leichtlinii*), Oregon sunshine, elegant downingia (*Downingia elegans*), and coyote-thistle (*Eryngium petiolatum*).

Without management or natural disturbance, native tree and shrub species such as Oregon ash (*Fraxinus latifolia*) and Nootka rose (*Rosa nutkana*) invade into the prairie. Non-native invading plants include sweetbriar rose (*Rosa eglanteria*), reed canarygrass (*Phalaris arundinacea*), common St. Johnswort (*Hypericum perforatum*) and many others.

Key at-risk species associated with wet prairies include: American grass bug (*Acetropis Americana*), Wilson's Snipe (*Gallinago delicata*), Northern Harrier (*Circus cyaneus*), Short-eared Owl (*Asio flammeus*), Bradshaw's lomatium (*Lomatium bradshawii*), shaggy horkelia, Nelson's checkermallow (*Sidalcea nelsoniana*), racemed goldenweed (*Pyrrocoma racemosa* var. *racemosa*), white-topped aster (*Sericocarpus rigidus*), and Willamette daisy.

Northern Harrier © Rod Gilbert

Oak woodland

In Benton County, oak woodlands are characterized by Oregon white oak and have an open to moderately shrubby understory historically maintained by low severity fire. These woodlands have >30% of the canopy shading the ground. Oak woodlands contain multiple trees as compared to the single open grown oaks in an oak savanna but these woodlands still filter light to the ground to allow oak seedling germination. Oaks do not tolerate shading by other trees and will eventually die if overtopped. These woodlands are found on low elevation slopes and on drier flat terrain. Oaks provide multiple benefits to wildlife such as acorns for food or cavities for nesting. Most of these habitats have been lost to Douglas-fir encroachment, fire wood cutting, or conversion to agriculture and development.

Common native plant species in oak woodlands include blue wildrye, small camas, Pacific blacksnakeroot (*Sanicula crassicaulis*), poison-oak (T*oxicodendron diversilobum*), common snowberry (*Symphoricarpos albus*), and sword fern (*Polystichum munitum*). Douglas-fir is a common invader that can overtop and shade the oaks resulting in conversion of oak woodlands to conifer forest. Non-native species that colonize this habitat include false brome, Himalayan blackberry, oneseed hawthorn, spurgelaurel (*Daphne laureola*), and Scot's broom.

Key at-risk species associated with oak woodlands include Acorn Woodpecker (*Melanerpes formicivorus*), Chipping Sparrow (*Spizella passerina*), White-breasted Nuthatch (*Sitta carolinensis aculeate*), Western gray squirrel (*Sciurus griseus*), and thin-leaved peavine (*Lathyrus holochlorus*). Red-legged frogs (*Rana aurora*) use this habitat during their summer migration from wetlands to upland habitat.

Thin-leaved peavine © Tom Kaye

3 Key species

Priority species for conservation

In Benton County, several populations of prairie or oak dependent species have declined and are listed as threatened or endangered by the U.S. Fish and Wildlife Service and/or the State of Oregon or are candidates for listing with their status in review. In addition, some species, while not considered threatened, have declining populations which could be increased through targeted restoration within a habitat type.

The prairie species considered in this strategy include those covered by the Oregon Conservation Strategy (ODFW 2006) and USFWS Draft Recovery Plan for Prairie Species of Western Oregon and Southwest Washington (USFWS 2008) that occur in Benton County. Several species that may have secure populations region-wide, but which are currently locally rare, were also included. These at-risk species are highly associated with the strategy habitats or utilize close approximations of their historic habitat, such as pasture lands or mowed roadsides.

Taylor's checkerspot nectaring on native strawberry

Several of the species, such as pond turtles and red-legged frogs, are dependent on prairies or oaks during a part of their lifecycle, while others remain in a single habitat type over their lifespan. Some species, such as Dusky Canada Goose, were not selected for inclusion because habitat conditions outside of Benton County are responsible for the species viability. All of the selected species have specific habitat requirements that should be addressed by restoring diverse vegetation structure within a key habitat.

The species summarized in this strategy have habitat requirements that may overlap with the needs of other species (Table 3.1). Conserving diverse and connected habitats can benefit many species by opening up new territory and providing opportunities for migration and genetic exchange. 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, Altman personal communication June 10, 2009, USFWS 2008a). Some species can be found in smaller habitat patches than recommended and in smaller population sizes, but generally a larger habitat patch is preferable. Large or very open territory requirements can be achieved through single ownership or multiple adjacent properties of suitable habitat.

Table 3.1 Prairie Conservation Strategy key species habitat requirements.

See Chapter 7 for web links to additional species information.

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, Altman pers. Comm. June 10, 2009, USFWS 2008a).

Common name	Scientific name	Status		ODFW Strategy species	Ideal habitat conditions	Habitat patch size for small population (animals) or population size (plants)
		Fed[1]	State[2]			
Amphibians:						
Northern red-legged frog	*Rana aurora*	SOC	SV	✓	Oak Woodland-Wet prairie: Floodplain, lowland, and foothill ponds and wetlands with shallow areas and access to adjacent upland habitat Connectivity: <1 km (0.6 mi) between habitat patches in wetland/upland mosaic (Hammerson 2005)	Information needed
Birds:						
Grasshopper Sparrow	*Ammodramus savannarum*		SV	✓	Upland prairie: Lowland prairie with low to moderate grass height (Johnson et al 1998)	>80 ha (200 acre)
Short-eared Owl	*Asio flammeus*			✓	Wet prairie-Upland prairie: Lowland and floodplain prairie with large open expanses (Canning 2001)	>80 ha (200 acre)
Common Nighthawk	*Chordeiles minor*		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	*Circus cyaneus*				Wet prairie-Upland prairie: Lowland and floodplain prairie with large open expanses	>80 ha (200 acre)
Streaked Horned Lark	*Eremophila alpestris strigata*	C	SC	✓	Upland prairie: Lowland and floodplain prairie with significant bare ground patches and sparse low growing vegetation	>80 ha (200 acre)
American Kestrel	*Falco sparverius*				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)
Wilson's Snipe	*Gallinago delicata*				Wet prairie: Floodplain prairie with low growing vegetation	8-20 ha (20-50 acre)

Acorn Woodpecker	*Melanerpes formicivorus*	SOC	SV	✓	Oak woodland-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	*Passerina amoena*				Savanna-Upland prairie: Foothill prairie with scattered shrubs and trees with grassy openings	4-8 ha (10-20 acre)
Oregon Vesper Sparrow	*Pooecetes gramineus affinis*	SOC	SC	✓	Upland prairie-Savanna: Lowland and foothill prairie with scattered shrubs and trees and some bare ground with grassy openings	4-8 ha (10-20 acre)
Western Bluebird	*Sialia mexicana*		SV	✓	Savanna-Upland prairie: 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)	*Sitta carolinensis aculeata*		SV	✓	Oak woodland-Savanna: Mature oaks with nesting cavities in savanna groves or open woodland (Grubb and Pravosudov 2008)	8-20 ha (20-50 acre)
Chipping Sparrow	*Spizella passerina*			✓	Oak woodland-Savanna: Herbaceous cover in understory of oak woodlands or savanna in foothills or rural areas	0.8-4 ha (2-10 acre)
Western Meadowlark	*Sturnella neglecta*		SC	✓	Upland prairie-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	*Tyrannus verticalis*				Upland prairie-Savanna: Scattered oaks with a grassy (herbaceous) understory in floodplain, lowland, or foothills	8-20 ha (20-50 acre)

Invertebrates:

American grass bug	*Acetropis americana*	SOC		✓	Wet prairie: Wet prairie with tufted hairgrass	Information needed
Taylor's checkerspot	*Euphydryas editha taylori*	C		✓	Upland prairie-Savanna: Upland prairie and savannas with host plant species such as *Castilleja* and plantain and nectar plants like strawberry (*Fragaria virginiana*) and rosy plectritis (*Plectritis congesta*). 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	*Icaricia icarioides fenderi*	E		✓	Upland prairie-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 1 km (0.6 mi) for nectaring (USFWS 2008a)	>6 ha (15 acre) (USFWS 2008a)
Tailed copper	*Lycaena arota*				Upland prairie-Savanna-Oak Woodland: Open areas with yellow and mauve composites for nectar, near shrubby or riparian areas with *Ribes divaricatum* 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	*Phyciodes pulchella*				Upland prairie-Savanna: Meadows with diverse composite species, larvae feed on asters such as *Symphyotrichum hallii* or *Erigeron decumbens* Connectivity: 2 km/1.2 mi (possibly up to 10 km/6 mi) dispersal distance between habitat patches (Schweitzer 2001c)	Information needed
Sonora skipper	*Polites sonora*				Upland prairie-Savanna: Meadows with diverse floral species, larvae feed on *Danthonia californica*, possibly *Festuca roemeri* and *Panicum occidentale* Connectivity: 1 km/0.6 mi (possibly 4-10 km/2.5-6 mi) dispersal distance between habitat patches (Schweitzer, 2001a)	Information needed
Mammals:						
Western gray squirrel	*Sciurus griseus*		SV	✓	Oak woodland: Continuous canopy within 200 feet of nest site in lowlands and foothills oak/conifer forest Connectivity: 0.1 km (2-5 km and greater) dispersal distance between habitat patches (Hammerson 2005)	>2 ha (5 acre) with goal of >4 ha (10 acre) (Ryan and Carey 1995)
Camas pocket gopher	*Thomomys bulbivorus*	SOC			Upland prairie: Floodplain to lowland open meadows in areas with heavy clay, but not wetland, soils Connectivity: 1-3 km (0.6-1.9 mi) dispersal distance between habitat patches, roads >30 m (100 ft) are rarely crossed (Cannings and Hammerson 2004)	Information needed

Plants:

Golden paintbrush (not currently found growing wild in Oregon)	*Castilleja levisecta*	T	E	✓	Upland prairie-Wet prairie: 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 Corvallis West Recovery Zone (USFWS 2008a)
Peacock larkspur	*Delphinium pavonaceum*	SOC	E	✓	Wet prairie-Upland prairie-Savanna: Well-drained native prairie or dry sites within wet prairie, or dry roadsides in floodplain, lowlands and foothills Connectivity: Populations within 3 km (2 mi) pollinator travel distance	200 individuals per patch; 5,000 individuals in several populations in Corvallis West Recovery Zone (USFWS 2008a)
Willamette daisy	*Erigeron decumbens* var. *decumbens*	E	E	✓	Wet prairie-Upland prairie: Open, flat prairie with heavier soils, as well as wetlands and balds in floodplains, lowlands, and foothills Connectivity: Populations within 3 km (2 mi) pollinator travel distance	200 individuals per patch; 10,000 individuals in several populations in Corvallis West Recovery Zone (USFWS 2008a)
Shaggy horkelia	*Horkelia congesta* ssp. *congesta*	SOC	C		Wet prairie-Upland prairie: Drier microhabitats within wet prairie and in open native upland prairie in floodplains, lowlands, and foothills Connectivity: Populations within 3 km (2 mi) pollinator travel distance	200 individuals per patch; 5,000 individuals in several populations in Corvallis West Recovery Zone (USFWS 2008a)
Howellia (Not currently found growing wild in Benton County)	*Howellia aquatilis*	T	T	✓	Wet prairie-Riparian: Vernal pools and sloughs that dry up by the end of the year in floodplains; dry fall is best for vegetative growth and a wet spring is best for flowering	200 individuals per patch; 5000 individuals in several populations in Corvallis West Recovery Zone (USFWS 2008a)
Thin-leaved peavine	*Lathyrus holochlorus*	SOC			Upland prairie-oak woodland ecotone in lowlands and foothills Connectivity: Populations within 3 km (2 mi) pollinator travel distance	200 individuals per patch; 5000 individuals in several populations in Corvallis West Recovery Zone (USFWS 2008a)

Bradshaw's lomatium	*Lomatium bradshawii*	E	E	✓	Wet prairie: Flat, moist native prairies with heavy clay soils in floodplains Connectivity: Populations within 3 km (2 mi) pollinator travel distance	200 individuals per patch; 10,000 individuals in several populations in Corvallis West Recovery Zone (USFWS 2008a)
Kincaid's lupine	*Lupinus sulphureus* ssp. *kincaidii*	T	T	✓	Upland prairie-Savanna: Native open prairie or woodland edge in lowlands and foothills Connectivity: Populations within 3 km (2 mi) pollinator travel distance	60 m^2 foliar cover per patch; 7,500 m^2 foliar cover in several populations in Corvallis West Recovery Zone (USFWS 2008a)
Racemed goldenweed (Not currently found growing wild in Benton County)	*Pyrrocoma racemosa var. racemosa*				Wet prairie-Upland prairie: Flat, native prairies with heavy clay soils in lowlands and foothills Connectivity: Populations within 3 km (2 mi) pollinator travel distance	200 individuals per patch; 5,000 individuals in several populations in Corvallis West Recovery Zone (USFWS 2008a)
White-topped aster (Not currently found growing wild in Benton County)	*Sericocarpus rigidus*	SOC	T	✓	Wet prairie: Low elevation native prairie in floodplains Connectivity: Populations within 3 km (2 mi) pollinator travel distance	200 individuals per patch; 5,000 individuals in several populations in Corvallis West Recovery Zone (USFWS 2008a)
Nelson's checkermallow	*Sidalcea nelsoniana*	T	T	✓	Wet prairie: Relatively open areas on damp soil, in meadows, wet prairie remnants, fencerows, roadsides, deciduous forest edges, and occasionally Oregon ash wetlands in floodplains and foothills Connectivity: Populations within 3 km (2 mi) pollinator travel distance	200 individuals per patch or 60 m^2 foliar cover; 20,000 individuals or 10,000 m^2 foliar cover in several populations in Corvallis West Recovery Zone (USFWS 2008a)
Hitchcock's blue-eyed-grass (Not currently found growing wild in Benton County)	*Sisyrinchium hitchcockii*	SOC			Upland prairie-Wet prairie: Open prairie habitat in floodplain and lowlands Connectivity: Populations within 3 km (2 mi) pollinator travel distance	200 individuals per patch; 5000 individuals in several populations in Corvallis West Recovery Zone (USFWS 2008a)

Reptiles:

	Pacific pond turtle	*Actinemys marmorata*	SOC	SC	✓	Wetland prairie-Upland prairie-Oak 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	*Chrysemys picta*		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

[1] ***Federal Status October 2009:***

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

[2] ***State Status October 2009:***

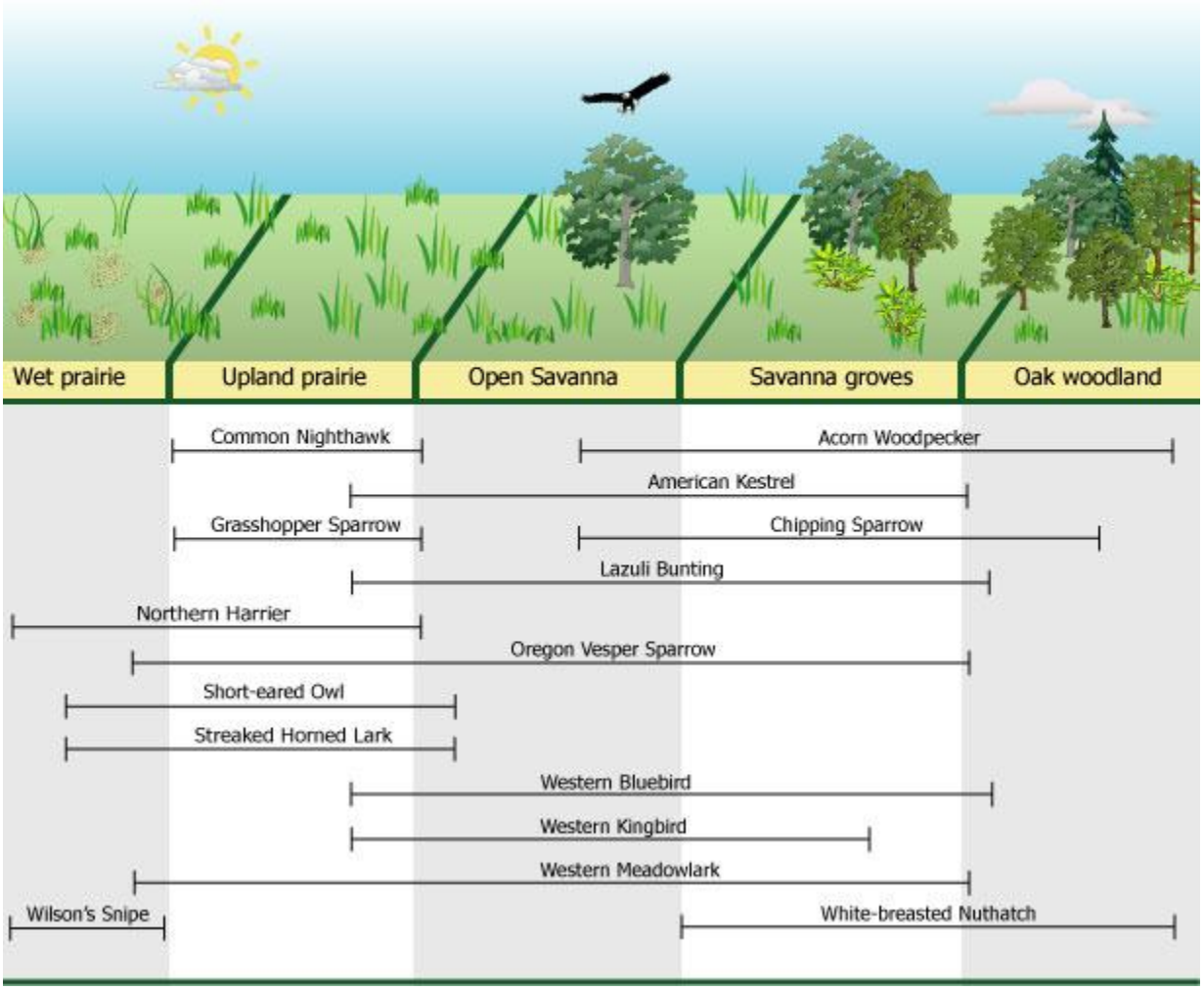
E – Listed Endangered
T – Listed Threatened
C – Candidate (plants only)
SC – Sensitive Species, Critical category
SV – Sensitive Species, Vulnerable Category (note: Sensitive Species applies to vertebrates only)

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.

Species habitat needs

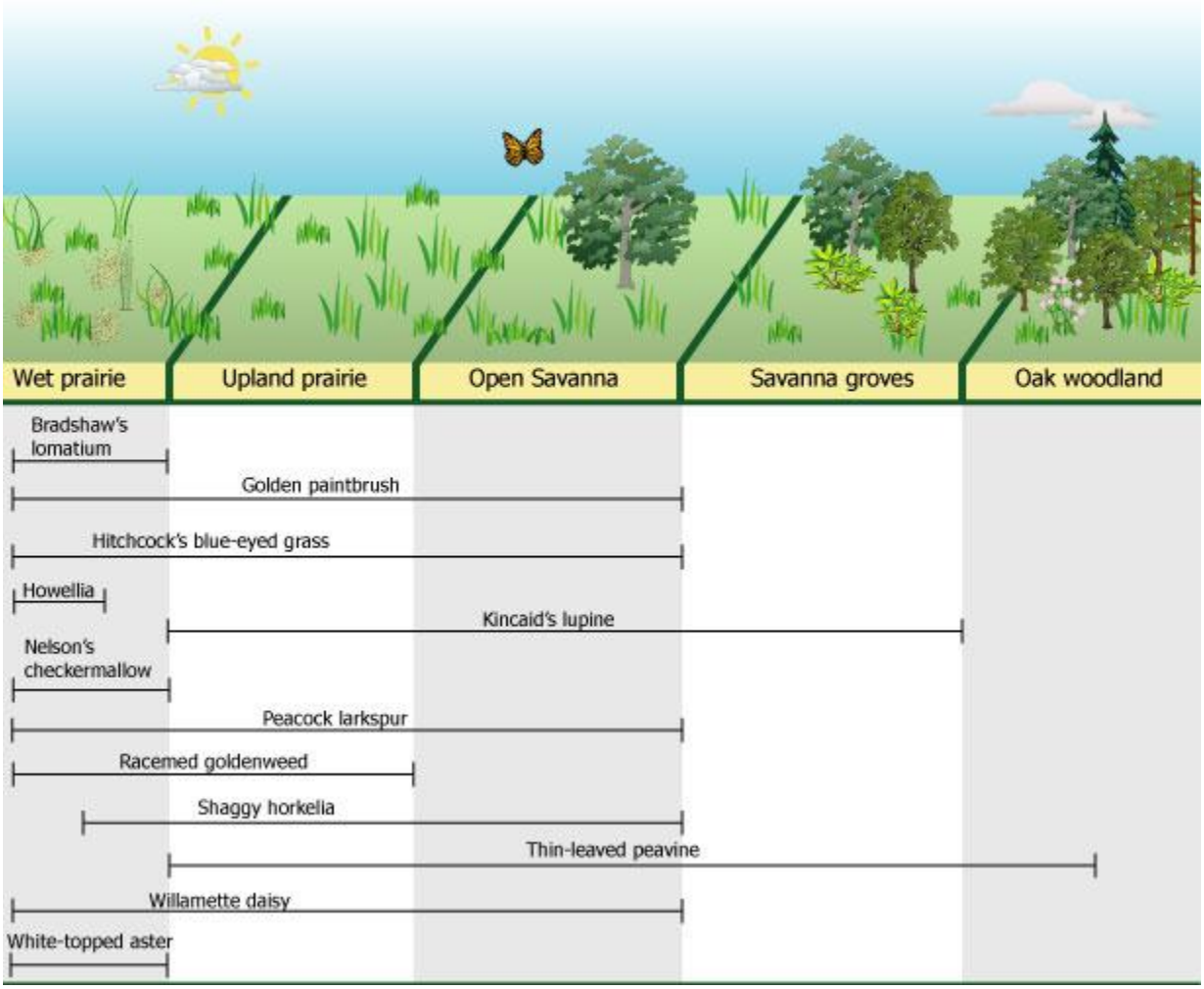
Many bird species are able to quickly colonize restored habitat, but plants, insects, and turtles are not always able to cross barriers such as forests or highways. Riparian areas and roadsides can provide pathways for animal movement and are important areas to enhance with native vegetation. Even small parcels of property can provide habitat for certain key species. When several neighbors with smaller properties enhance suitable habitat on adjoining property areas, this action can benefit species that require larger territories. Figures 3.1-3.3 graphically outline some of the key species habitat requirements.

Figure 3.1 Habitat guide for key bird species in Benton County



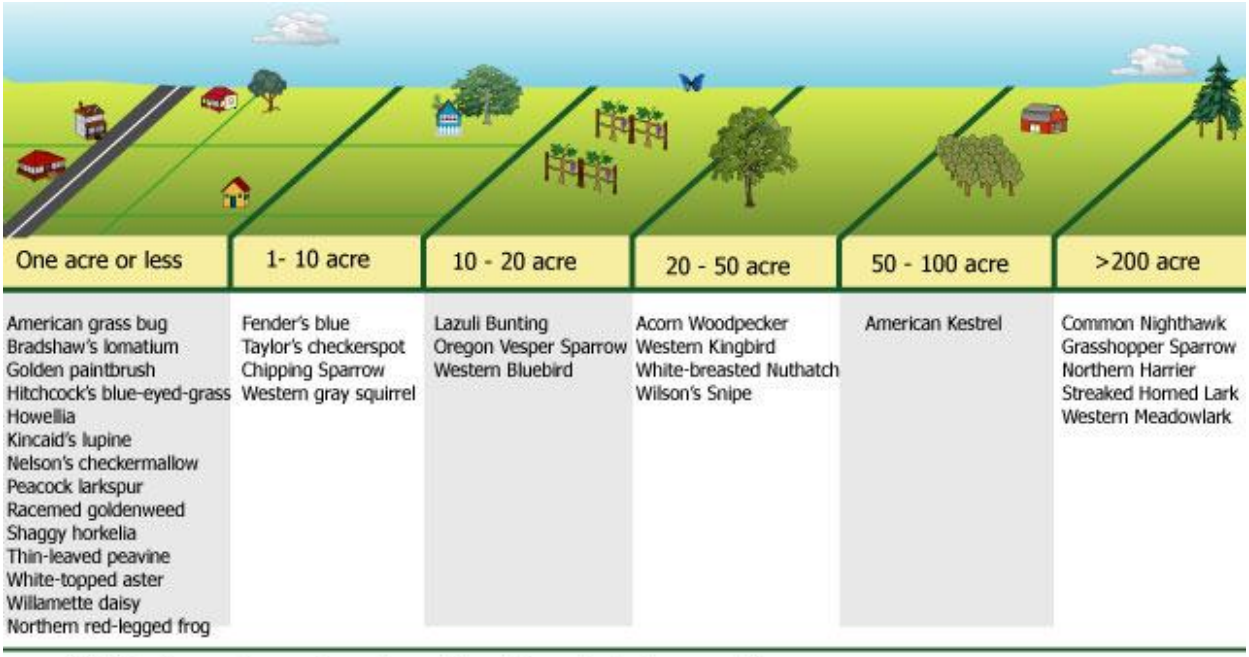
Symbols courtesy of the Integration and Application Network (ian.umces.edu/symbols/), University of Maryland Center for Environmental Science.

Figure 3.2 Habitat guide for key plant species in Benton County



Symbols courtesy of the Integration and Application Network (ian.umces.edu/symbols/), University of Maryland Center for Environmental Science.

Figure 3.3 Minimum area required for small population of key species in Benton County



Symbols courtesy of the Integration and Application Network (ian.umces.edu/symbols/), University of Maryland Center for Environmental Science.

Draft Prairie Species Recovery Plan

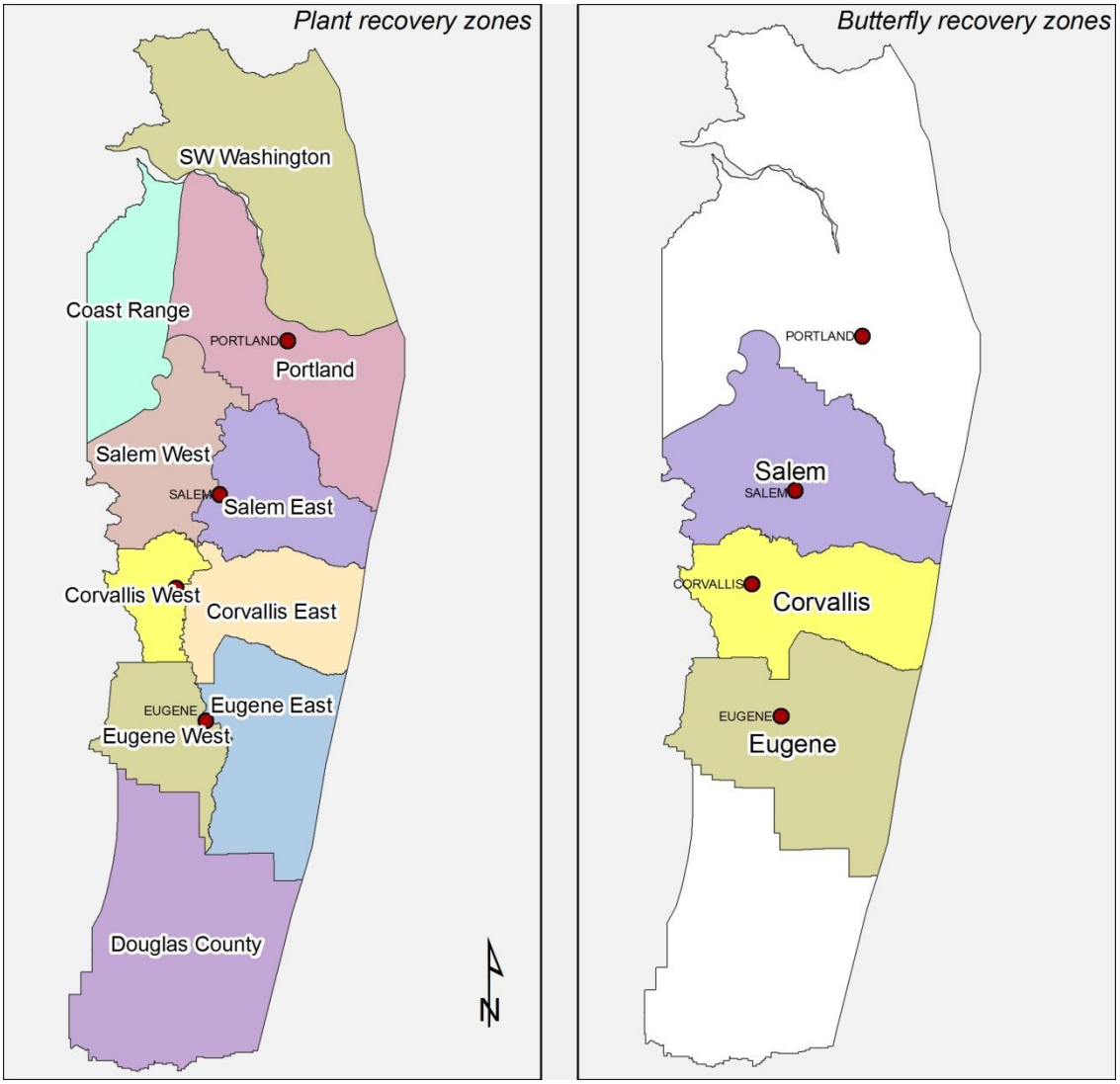
The U.S. Fish and Wildlife Service has prepared a Draft Recovery Plan for listed prairie species of Western Oregon and Southwestern Washington, including Fender's blue butterfly, Bradshaw's lomatium, Willamette daisy, Kincaid's lupine, Nelson's checkermallow, and golden paintbrush (USFWS 2008a). The plan also provides conservation measures for Taylor's checkerspot butterfly, a candidate for listing, and addresses six species of concern: pale larkspur, peacock larkspur, Willamette Valley larkspur, white-topped aster, shaggy horkelia, and Hitchcock's blue-eyed grass. The goal of the recovery plan is to achieve viable populations of listed species to ultimately remove them from the Endangered Species list and to enhance native prairie habitat to preclude the need to list additional species.

The recovery strategy calls for the preservation and appropriate management of native prairies, and the establishment of networks of diverse prairie reserves across the historical geographic range of the species. **To count towards recovery, sites must be under long term protection by either a public agency or conservation agreement on private land.**

High quality prairie habitat requires active management to limit woody species encroachment and invasion by non-natives. Reserve sites require a diversity of native vegetation with a relative cover of more than 50% of the site and <15% woody vegetation cover. Additionally, high quality prairie habitat for Fender's blue butterflies should include at least five nectar flower species available throughout the flight season as well as robust Kincaid's lupine populations (USFWS 2008a).

USFWS has designated nine recovery zones in Oregon for prairie dependent plant species and three zones for Fender's blue butterfly (Figure 3.4). One of the recovery zones for plants is Corvallis West, which encompasses much of the historic prairie area within Benton County. For Fender's blue, the Corvallis recovery zone encompasses Benton County as well as adjacent Linn County.

Figure 3.4 Draft USFWS recovery zones for prairie species in Oregon and SW Washington



Recovery implementation

Implementation of the prairie species recovery plan in Benton County can contribute to removing these threatened and endangered plants and butterflies from the U.S. endangered species list. Through this recovery plan, USFWS has established criteria for the number, size, and connectivity of populations in each recovery zone necessary for downlisting and delisting species (USFWS 2008a).

For each zone, downlisting Fender's blue butterfly will require at least:

1. **A minimum number of butterflies and habitat patches**: >200 butterflies each year for 10 years in a network of habitat that contains at least three butterfly subpopulation patches of >6 ha (15 acre), and in addition there must be a second network or two large independent populations also >6 ha (15 acre). The patches must be separated by <2 km (1.2 mi) or linked by smaller lupine stepping stone patches < 1 km (0.6 mi) apart, and
2. **Protected habitat and active management:** All sites must be under long-term protection, have a management plan approved by USFWS, and be managed for habitat quality. Larval host plants, such as Kincaid's lupine, and nectar plant species must be present.

Delisting Fender's blue butterfly requires greater minimum population sizes such that the probability of persistence is 95% over the next 100 years (USFWS 2008a). The Wren area has a large population of Fender's blue butterfly which can function as a population network. Populations in OSU McDonald Forest could be linked to Lupine Meadows, and potentially Fitton Green along the Oak Creek corridor. Enhancing habitat and working with landowners on creating stepping stone patches less than 1 km apart will require coordination between USFWS, Benton County Natural Areas and Parks Department, Greenbelt Land Trust, Marys River Watershed Council, Oregon State University, The Nature Conservancy, additional NGOs, and private landowners.

USFWS has identified Finley National Wildlife Refuge as a potential Fender's blue butterfly network. Additionally, E.E. Wilson has the potential to support Fender's blue butterfly and could form a network with Kincaid's lupine patches currently existing along the Soap Creek drainage and along the Benton/Polk county border. Creating stepping stone patches less than 1 km apart in north Benton County will require coordination and cooperation between USFWS, ODFW, Oregon National Guard, Oregon State University, Luckiamute Watershed Council, additional NGOs, and private landowners.

Listed species recovery actions

The following actions are suggested to strategically promote habitat conservation and species reintroductions for listed and at-risk species throughout Benton County.

Actively manage for open habitat

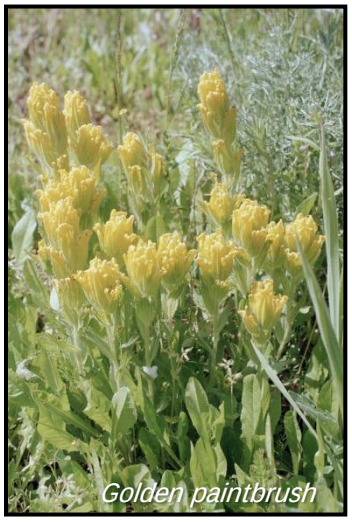
- Actively manage protected sites to reduce woody species encroachment and to reduce non-native plant invasions using appropriate management techniques developed for the conditions at each site.
- Provide open habitat for pollinator dispersal between known habitat patches. Prairie species require relatively open habitat. Barriers, such as coniferous forest, limit dispersal or pollinator movement between habitat patches.

Identify habitat network opportunity areas

- Identify privately owned sites where landowners are willing to enhance stepping stone habitat to connect known habitat patches that are currently too far for pollinator dispersal.
- Work with USFWS to identify programs that encourage conservation in areas that currently do not have listed species but that are close to possible reintroduction sites.

Use adaptive management

- Utilize adaptive management principles to improve conservation methods over the long-term. Adaptive management allows the latest, most effective information learned from restoration actions and monitoring to be incorporated into future management actions for an individual site.
- Monitor projects to evaluate their effectiveness and to help land managers utilize effective strategies to conserve species. Evaluation and monitoring of reintroduction efforts is especially important for recovery of listed species.
- Share conservation strategies and monitoring results via site tours, 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/).


Golden paintbrush

Use genetically appropriate materials

- Work with USFWS, ODA, and other appropriate entities to determine the appropriate genetic source of plant materials for reintroduction. Benton County is considered a single genetic zone for most species, with the exception of locally extirpated species such as golden paintbrush (USFWS 2008a).
- Provide education on plant material collection laws to private landowners. A permit is required to collect seeds or plant material on Federal lands. ODA requires a permit to collect seeds or plant materials from non-federal public lands, transport seeds or plant materials on non-federal public lands (i.e. roads), and

propagate or cultivate state-listed plant species. Plant material collection can harm wild populations and should be done to minimize risk.

Create production partnerships

- Reintroduction efforts require new plant materials, preferably from seeds or cuttings of nearby populations. Plant material production partnerships between ODA and local farmers can enhance the amount of material available locally for recovery.

Identify funding sources

- The USFWS 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. See additional landowner assistance programs under Voluntary Conservation Tools (Chapter 6) or visit the USFWS website at http://www.fws.gov/endangered/grants/section6/index.html.
- Identify incentive programs, such as reduced property tax assessment, for private landowners who wish to enhance and protect habitat for listed animal species.

Table 3.2 Summary of draft recovery objectives from the Western Oregon and Southwestern Washington Prairie Species Recovery Plan (USFWS 2008a)

Criteria	Willamette daisy, Bradshaw's lomatium, Kincaid's lupine, Nelson's checkermallow	Fender's blue butterfly
Population trend and evidence of reproduction	• Stable or increasing for at least 10 years (15 year for delisting). • Evidence of reproduction (seed set, seedlings).	
Habitat quality and diversity	• ≥50% relative cover of non-woody natives at 70% of local populations. • ≤15% cover of woody species. • No single non-native species >50% cover.	• ≥50% cover of non-woody natives at 70% of populations. • 10% (20% for delisting) nectar species. • ≥5 ha of quality habitat in network; ≥2 ha in subpopulations.
Size of each population network (group of local populations with connectivity)	• Varies per species	• Downlisting: 90% probability of persistence for 25 years. • Delisting: 95% probability of persistence for 100 years.

Criteria	Willamette daisy, Bradshaw's lomatium, Kincaid's lupine, Nelson's checkermallow	Fender's blue butterfly
Distribution and size of local populations	• At least two local populations per population network. • 10,000 plants/zone for Willamette daisy and Bradshaw's lomatium. • 7,500 m2 foliar cover for Kincaid's lupine delisting. • 20,000 plants (10,000 m2 foliar cover for Nelson's checkermallow. • 3 km maximum distance between local populations. • Sufficient area for expansion.	• Distance between local populations ≤1 km, none ≥2 km.
Security of habitat	• Habitat of local populations must be owned or managed by a government agency or conservation organization that manages the site specifically for the species in question. Or the site must be under permanent or long-term conservation easement that commits present and future landowners to the conservation of the species.	
Management, monitoring, and threat abatement	• Sites must be managed to ensure quality habitat. • Management plans must be developed for each site.	

4 Protected habitat sites

Private landowners who wish to enhance their land for at-risk species are encouraged to do so. Creating or maintaining native prairie for plants and insects requires a commitment to long term management, but some key species, especially birds, do well in grassy areas that are kept open by fall mowing or light grazing. See the private lands habitat conservation guide in Chapter 5 for actions to enhance key habitats.

The key to conserving native species is conservation of native habitat across the county. Private landowners can help native species on their land by retaining native habitats such as prairie and oak woodlands, planting native species, and removing invasive plants such as Scot's broom, Himalayan blackberry, and Douglas-fir. See Chapter 6 for existing assistance programs.

Habitat locations and quality

High quality habitat can be found throughout Benton County but often these areas are beyond the dispersal ability of populations of plants and animals. Creating a network of protected habitat (through partnerships, conservation easements and property acquisition), along dispersal corridors facilitates native species movement and reduces genetic isolation. Understanding the current distribution of protected sites helps identify areas within Benton County that are beyond the dispersal ability of at-risk species.

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 in the county?
- Where are the connectivity problems for species/habitat on unprotected lands?

Sites managed for permanent habitat conservation

There are many sites in Benton County that have key habitat or the potential for key habitat after restoration. Those that are permanently protected by public ownership or conservation easement specifically for habitat conservation meet USFWS's guidelines for species recovery. Several sites have protected habitat but are specifically managed for recreation. These sites provide important habitat while connecting people with wildlife. (Bird species checklists were determined from Birdnotes.net)

Table 4.1 Benton County sites managed for permanent habitat conservation by local, state, and federal government agencies
See Table 3.1 for species habitat requirements

Site #	Site name	Area ha (acre)	Key Habitat	Key species present (*Planted)
Benton County Natural Areas and Parks				
1	Beazell Memorial Forest	237 (586)	Upland Prairie	Taylor's checkerspot butterfly Chipping Sparrow Kincaid's lupine*
2	Fitton Green Natural Area	125 (308)	Upland Prairie Oak woodland	Taylor's checkerspot butterfly Lazuli Bunting Oregon Vesper Sparrow Kincaid's lupine*
3	Fort Hoskins Historical Park	51 (126)	Upland prairie and savanna Oak woodland	Taylor's checkerspot butterfly Chipping Sparrow Northern Harrier Western Bluebird
4	Jackson-Frazier Wetland	58 (144)	Wet prairie	American Kestrel Wilson's Snipe Northern Harrier American grass bug Bradshaw's lomatium Kincaid's lupine Nelson's checkermallow
City of Corvallis Parks and Recreation				
5	Bald Hill Park	115 (284)	Upland prairie Oak woodland	American Kestrel Chipping Sparrow Lazuli Bunting Western Bluebird White-breasted Nuthatch Kincaid's lupine* Willamette daisy Nelson's checkermallow
6	Chip Ross Park	51 (126)	Upland prairie	Bird checklist needed
7	Rock Creek Park	12 (30)	Upland prairie	Peacock larkspur Bird checklist needed
8	Caldwell Open Space	15 (36)	Wet prairie	Bird checklist needed
9	Herbert Farm and Natural Area	90 (221)	Upland prairie Wet prairie	Pacific pond turtle Red-legged frog Chipping Sparrow White-breasted Nuthatch Streaked Horned Lark Kincaid's lupine Nelson's checkermallow Peacock larkspur Thin-leaved peavine

Site #	Site name	Area ha (acre)	Key Habitat	Key species present (*Planted)
10	Marys River Natural Area	30 (74)	Wet prairie	Kincaid's lupine* Nelson's checkermallow* Northern Harrier Bird checklist needed
11	Noyes Natural Area	2 (5)	Wet prairie	Nelson's checkermallow Bird checklist needed
12	Owens Open Space	53 (131)	Wet prairie Oak woodland	Nelson's checkermallow Bird checklist needed
13	Timberhill Open Space	19 (47)	Upland prairie Oak woodland	Lazuli Bunting Thin-leaved peavine
14	Witham Hill Natural Area	14 (35)	Oak woodland	Bird checklist needed
Bureau of Land Management (BLM)				
15	Maxfield Creek meadows	130 (321)	Upland Prairie Oak woodland	Kincaid's lupine* Bird checklist needed
Oregon Department of Fish and Wildlife (ODFW)				
16	E. E. Wilson Wildlife Area	681 (1,683)	Upland prairie Wet prairie Oak woodland	Red-legged frog Acorn Woodpecker American Kestrel Common Nighthawk Wilson's Snipe Lazuli Bunting Northern Harrier Oregon Vesper Sparrow Short-eared Owl Western Bluebird Western Kingbird Western Meadowlark White-breasted Nuthatch Camas pocket gopher Western gray squirrel Kincaid's lupine Nelson's checkermallow Pacific pond turtle
Oregon Parks and Recreation Department (OPRD)				
17	Luckiamute State Park Natural Area – South tract	126 (311)	Upland prairie Wet prairie Oak woodland	American Kestrel Wilson's Snipe Northern Harrier Western Bluebird Western Meadowlark White-breasted Nuthatch Camas pocket gopher Pacific pond turtle

Site #	Site name	Area ha (acre)	Key Habitat	Key species present (*Planted)
Oregon State University (OSU)				
18	Butterfly Meadows	2 (5)	Upland Prairie	Fender's blue butterfly Kincaid's lupine Bird checklist needed
United States Fish and Wildlife Service (USFWS)				
19	Finley Wildlife Refuge	2,155 (5,325)	Upland prairie Wet prairie Oak woodland	Red-legged frog Acorn Woodpecker American Kestrel Chipping Sparrow Wilson's Snipe Lazuli Bunting Northern Harrier Oregon Vesper Sparrow Short-eared Owl Western Kingbird Western Meadowlark White-breasted Nuthatch American grass bug Camas pocket gopher Western gray squirrel Bradshaw's lomatium Golden paintbrush* Kincaid's lupine* Nelson's checkermallow Peacock larkspur Thin-leaved peavine Willamette daisy* Pacific pond turtle Northern painted turtle
US Army Corps of Engineers				
20	Oregon National Guard Rifle Range	206 (509)	Upland prairie Wet prairie Oak woodland	Streaked Horned Lark Kincaid's lupine Nelson's checkermallow Bird checklist needed

Table 4.2 Benton County sites managed for permanent habitat conservation by non-governmental organizations (owned or under conservation easement)
See Table 3.1 for species habitat requirements

Site #	Site name	Area ha (acre)	Key habitat	Key species present (*Planted)
Greenbelt Land Trust				
21	Lupine Meadows	24 (58)	Upland Prairie Wet prairie	Oregon Vesper Sparrow Fender's blue butterfly Kincaid's lupine Nelson's checkermallow Racemed goldenweed*
22	Owens Farm	38 (95)	Wet prairie Oak woodland	Bradshaw's lomatium* Nelson's checkermallow Bird checklist needed
23	Evergreen Creek	89 (221)	Upland prairie Wet prairie Oak woodland	Bird checklist needed
24	Private land easements	>120 (>300)	Upland prairie Wet prairie Oak woodland	
The Nature Conservancy (TNC)				
25	Wren Preserve	4 (9)	Upland Prairie	Fender's blue butterfly Bird checklist needed
26	Philomath Prairie (Easement)	48 (119)	Upland prairie	Kincaid's lupine Bird checklist needed

Elk browsing in Finley Wildlife Refuge

Sites managed for limited timeframe habitat conservation

There are many sites in Benton County protected under short term habitat conservation agreements or that provide mitigation for habitat impacts elsewhere in Benton County (**Figure 4.1**). These agreements benefit land owners who receive financial or technical help with conservation. See Chapter 6 for descriptions of conservation assistance tools.

Table 4.3 Benton County sites managed for habitat conservation under limited timeframe protection
See Table 3.1 for species habitat requirements

	Site name	Area ha (acre)	Key habitat	Key species present (*planted)
Natural Resource Conservation Service (NRCS) WRP land easements				
	Private – Finley NWR vicinity	9 (23)	Wet prairie	Pacific pond turtle
	Private – Finley NWR vicinity	49 (120)	Wet prairie Upland prairie	Pacific pond turtle
	Private – E.E. Wilson vicinity	10 (24)	Wet prairie	
	Private – Corvallis airport vicinity	116 (286)	Wet prairie Upland prairie Oak woodland	Bradshaw's lomatium Kincaid's lupine Nelson's checkermallow
	Private – Finley NWR vicinity	44 (108)	Wet prairie Upland prairie Oak woodland	Pacific pond turtle
	Private – Finley NWR vicinity	24 (60)	Upland prairie Wet prairie Oak woodland	Kincaid's lupine*
Oregon Department of Transportation (ODOT)				
	Mitigation site	1 (3)	Upland prairie	
	Mitigation site	2.5 (6)	Upland prairie	
Oregon State University – FSA CREP agreement				
	Oak Creek dairy	22 (55)	Wet prairie	
	Horse Center	2 (5)	Wet prairie	Nelson's checkermallow
	Sheep Farm	19 (48)	Wet prairie	
	Soap Creek Ranch	46 (103)	Wet prairie	
	Walnut St.	19 (47)	Wet prairie	Nelson's checkermallow
USFWS Partners for Fish and Wildlife Program				
	Newton Creek Wetlands - Philomath	8 (21)	Wet prairie Oak woodland	Red-legged frog Acorn Woodpecker Thin-leaved peavine Pacific pond turtle
	Private – Wren area	20 (50)	Upland prairie Oak woodland	Fender's blue butterfly Kincaid's lupine
	Private – Wren area	3 (7)	Upland prairie Oak woodland	

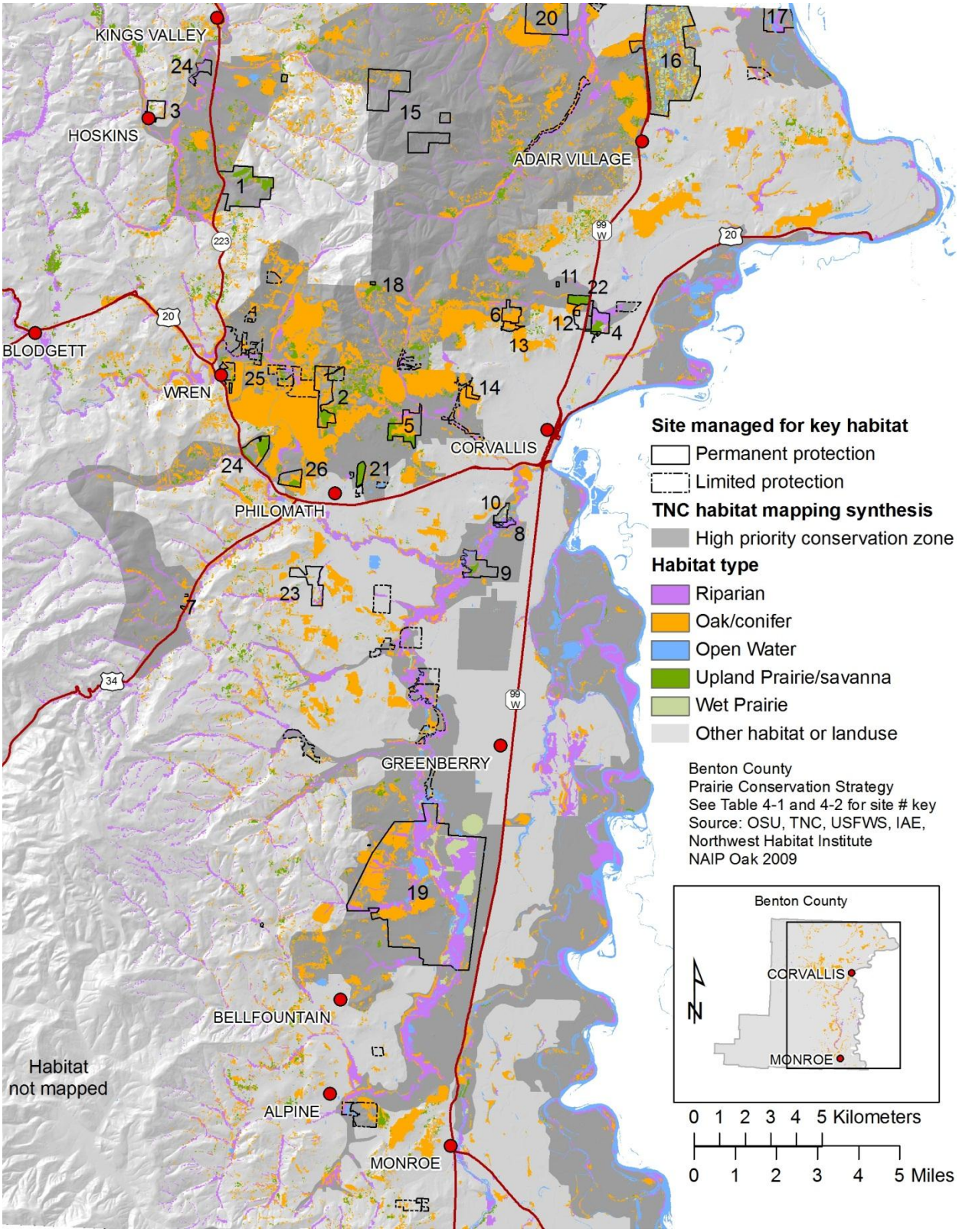
	Site name	Area ha (acre)	Key habitat	Key species present (*planted)
	Private – Wren area	43 (106)	Upland prairie	Fender's blue butterfly Kincaid's lupine Pacific pond turtle
	Private – Wren area	8 (21)	Upland prairie	Pacific pond turtle
	Private – Wren area	2 (5)	Upland prairie	Fender's blue butterfly Kincaid's lupine
	Private – Wren area	13 (32)	Upland prairie Oak woodland	Fender's blue butterfly Kincaid's lupine
	Private – Wren area	39 (95)	Upland prairie	Fender's blue butterfly Kincaid's lupine
	Private – Wren area	3 (6.5)	Upland prairie	Fender's blue butterfly
	Private – Wren area	26 (64)	Upland prairie	Fender's blue butterfly Kincaid's lupine
	Private – Wren area	2 (5)	Upland prairie	Fender's blue butterfly Kincaid's lupine
	Private – Wren area	4 (10)	Upland prairie Oak woodland	Fender's blue butterfly Kincaid's lupine
	Private – Wren area	1 (3)	Upland prairie	
	Private – Wren area	0.6 (1.5)	Upland prairie	
	Private – Wren area	35 (87)	Upland prairie Oak woodland	Kincaid's lupine
	Private – Wren area	82 (202)	Upland prairie Oak woodland	Kincaid's lupine
	Private – Corvallis airport vicinity	16 (40)	Wet prairie	Pacific pond turtle
	Private –Finley NWR vicinity	32 (80)	Wet prairie	Pacific pond turtle
	Private – Finley NWR vicinity	1.5 (3.5)	Upland prairie	
	Private – Finley NWR vicinity	13 (33)	Wet prairie	
	Private – Finley NWR vicinity	46 (113)	Upland prairie	
	Private – Finley NWR vicinity	84 (208)	Upland prairie Wet prairie	Kincaid's lupine*
Wetland mitigation banks				
	Evergreen	71 (175)	Wet prairie	Streaked Horned Lark
	Frazier	11 (26)	Wet prairie	
	Mid-Valley	17 (43)	Wet prairie	
	Muddy Creek	44 (108)	Wet prairie	

Priority habitat zones

Several planning efforts have defined areas of high priority for conservation in the Willamette Valley, including the Oregon Conservation Strategy (ODFW 2006). A planning group, led by The Nature Conservancy, came together in 2007 to combine the identified high priority areas into a single map for the Willamette Valley (The Nature Conservancy 2009). This mapping effort includes high priority forest land and riparian areas, as well as prairie and oak woodland (Figure 4.1). These areas can currently be considered the highest priority for habitat and species conservation actions in Benton County. Areas outside of this zone contain important habitat and can provide opportunities for meaningful habitat acquisition and restoration, but focusing in priority areas makes strategic use of limited funding.

Menzies' larkspur in upland prairie near Wren
Photo: Lori Wisehart

Figure 4.1 Key protected prairie and oak habitat in Benton County



5 Key Conservation Actions

Habitat conservation actions

Landowners in all parts of Benton County, urban to rural, can provide habitat for native species and can participate in conservation of prairie and oak habitat by actively managing to maintain open vegetation. The following actions are suggested to strategically promote habitat conservation throughout Benton County.

Conserve and protect the best remaining key habitats

- Inventory and map the best remaining prairie and oak sites in Benton County to determine habitat quality and opportunities for enhancement. Public agencies and conservation groups should share mapped habitat information and integrate it into their planning and management programs.
- Conserve and enhance high quality sites. Focus on preserving large habitat blocks and areas that provide connectivity for wildlife.
- Engage private landowners who are interested in habitat assessment and conservation on their land. The USFWS Partners for Fish and Wildlife Program offers assistance with rare habitat enhancement.

Enhance and restore degraded key habitats

- Maintain prairies with site specific management strategies to 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 Scot's broom encroachment.
- Engage landowners in invasive species removal and long-term management. Education on false brome and meadow knapweed (*Centauria pratensis*) management will be crucial to control these very invasive species. See Benton SWCD brochures available on their webpage www.bentonswcd.org (invasive weeds.pdf and meadow knapweed.pdf) or download the Field Guide to Weeds of the Willamette Valley (www.appliedeco.org/invasive-species-resources/) for more information.
- Minimize soil disturbance to reduce new weed infestations.
- 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.


Invasive meadow knapweed


Invasive false brome

- Maintain oak woodlands by removing Douglas-fir trees growing through the canopy and utilize appropriate management to encourage native species.
- Create wet prairies and vernal pools as part of mitigation programs.
- Provide landowners with technical assistance and education regarding the importance of vernal pools to wildlife.
- Provide information about oak habitat and technical assistance to landowners in both rural and urban areas since oaks can attract native wildlife in most locations.

Identify conservation tools for private landowners

- Many of the best remaining prairie and oak sites are on privately owned lands. Voluntary tools such as technical assistance, financial incentives, and conservation easements can assist landowners with conservation on their own land (see Chapter 6: Voluntary Conservation Tools for a list of programs) (ODFW 2006)
- Provide links to educational materials. For example, OSU Extension Service ecology field cards for students describe Willamette Valley habitat attributes and species. See http://extension.oregonstate.edu/benton/natural/eco.
- Provide management guidelines and resources to interested landowners. Habitat conservation and restoration actions should be implemented to protect remaining high quality habitats and key sites for connectivity, and to reduce the impact of invasive plant species on these habitats and on at-risk plant populations.

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. *Draft Benton County Prairie Species Habitat Conservation Plan* (Benton County 2009)

Prescribed burn at Bald Hill Park
Photo: Steve DeGhetto

Habitat conservation guide for private lands

Private landowners can contribute to conservation of prairie and oak habitat by taking actions to enhance the habitat on their property. USFWS or NRCS also have programs to assist private landowners with habitat conservation actions (Chapter 6). The following actions are suggested to strategically promote habitat conservation on private lands throughout Benton County.

Enhance upland prairie and savanna habitat:

- Remove invasive shrubs such as Scot's broom and blackberry by mowing and/or pulling small plants or cutting down large plants.
- 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.
- Identify large oaks to retain.
- Mow after native flowers have set seed.
- Work with knowledgeable person or group such as a watershed council or SWCD to identify invasive plants and determine the appropriate management timing.
- Allow grazing after July 15 to control woody vegetation. See (Benton County 2009)
- 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 Benton SWCD and OSU master gardeners each hold a yearly native plant sale.
- Identify bird and turtle nesting sites and avoid impacting those areas during the nesting season.

Enhance wet prairie habitat:

- Remove rose and hawthorn shrubs, and ash trees that shade prairie plants. Mow and/or pull small plants or cut large plants.
- Work with knowledgeable person or group to determine if the site's hydrology has been altered by dikes or tile drains, and restore hydrology if needed.
- Minimize disturbance to the soil, especially when the ground is wet. Heavy vehicles can permanently change a site's hydrology by creating ruts where water pools.
- Plant local native flowering species to encourage pollinators.

Enhance oak woodland habitat:

- Identify live, large oaks that have been shaded by Douglas-fir or other conifers.
- Remove shrubs such as Scot's broom, spurge laurel, and Himalayan blackberry by mowing and/or pulling small plants or cutting large plants.
- Remove Douglas-fir trees by pulling small trees or removing/girdling large trees.
- Leave large snags for wildlife.
- Avoid management during wildlife nesting season.

Opportunity areas for species conservation

Habitat and species conservation opportunity areas occur across Benton County. These areas have potential habitat that can be enhance or restored to benefit key species. While specific habitat condition maps are not available for Benton County, general habitat maps can help land owners and land managers assess the types of species they may be able to retain, attract, or plant. Figure 5.1 divides Benton County into elevation and gradient areas that roughly correspond to the species requirements listed in Table 3.1. These areas were based on historic vegetation. Wet prairie, upland prairie and oaks, and foothill prairie and oaks may be found in any geographic area depending on local soil and moisture conditions, but broad expanses of prairie habitats were more likely historically in lowland and floodplain areas.

Where information was available, species locations or potential habitats were mapped in Benton County to give readers a sense of the distribution of at-risk species in the county. Maps showing general species locations, as well as habitat types, indicate possible areas for conservation and habitat enhancement (Figure 5.2, Figure 5.3, Figure 5.4, Figure 5.5, Figure 5.6). Several of the key plant species are not currently found in Benton County (Table 3.1) and current information is not available for other species.

The habitat types represented on several of the maps in this section indicate potential habitat that may be an opportunity for enhancement to suitable habitat but may not show currently suitable habitat for a particular species. Future work to identify suitable habitat for at-risk species on public and private lands should include:

1. Mapping of prairie and oak habitat quality.
2. Outreach to private landowners.

Figure 5.1 Opportunity areas for key species in Benton County based on historic vegetation and elevation

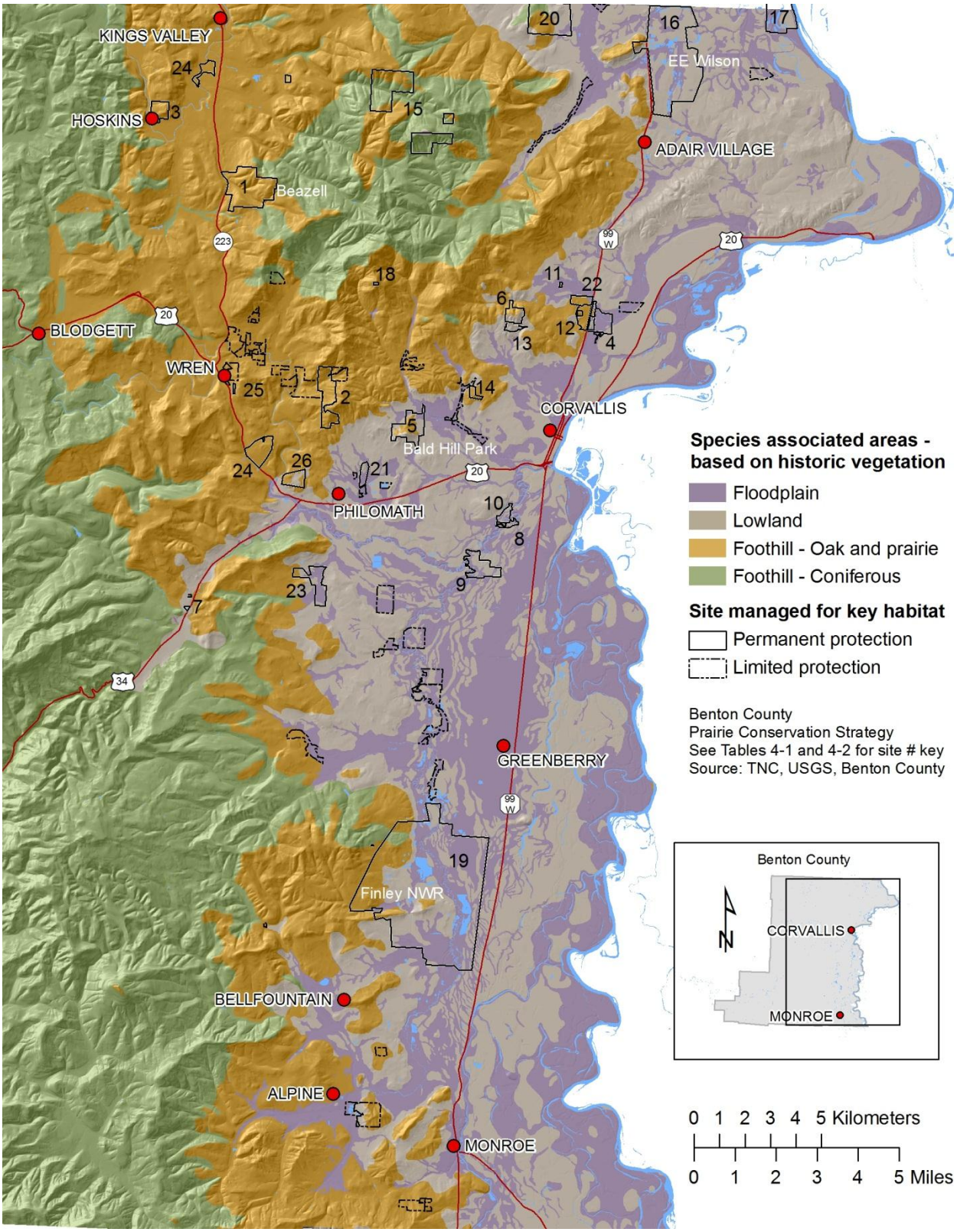


Figure 5.2 Opportunity areas for key butterfly species in Benton County

Shaded or hatched areas are within the dispersal distance of Fender's blue and Taylor's checkerspot and represent potential habitat.

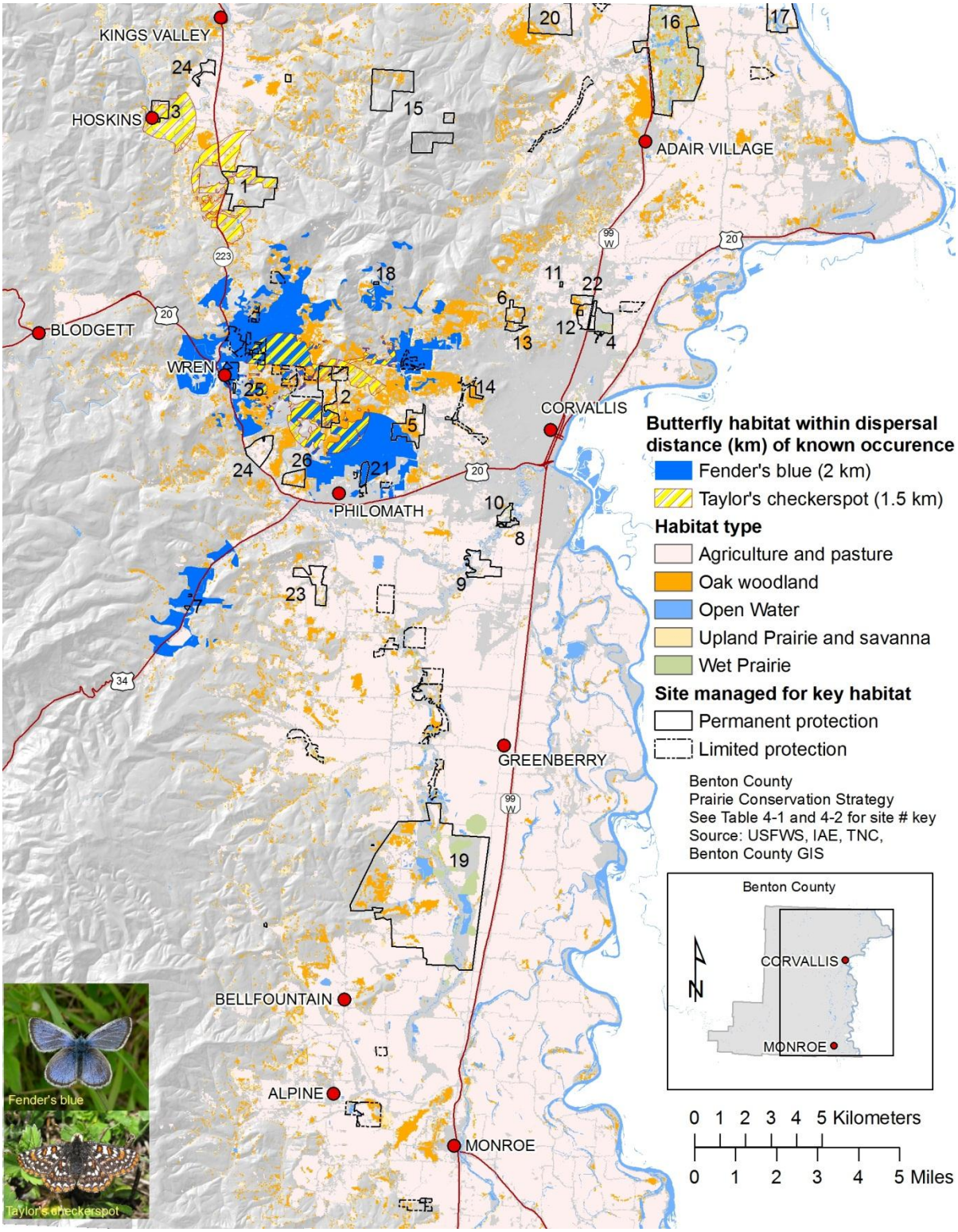


Figure 5.3 Opportunity areas for key turtle species in Benton County

Turtle locations indicate areas where turtles have been found in the recent past.

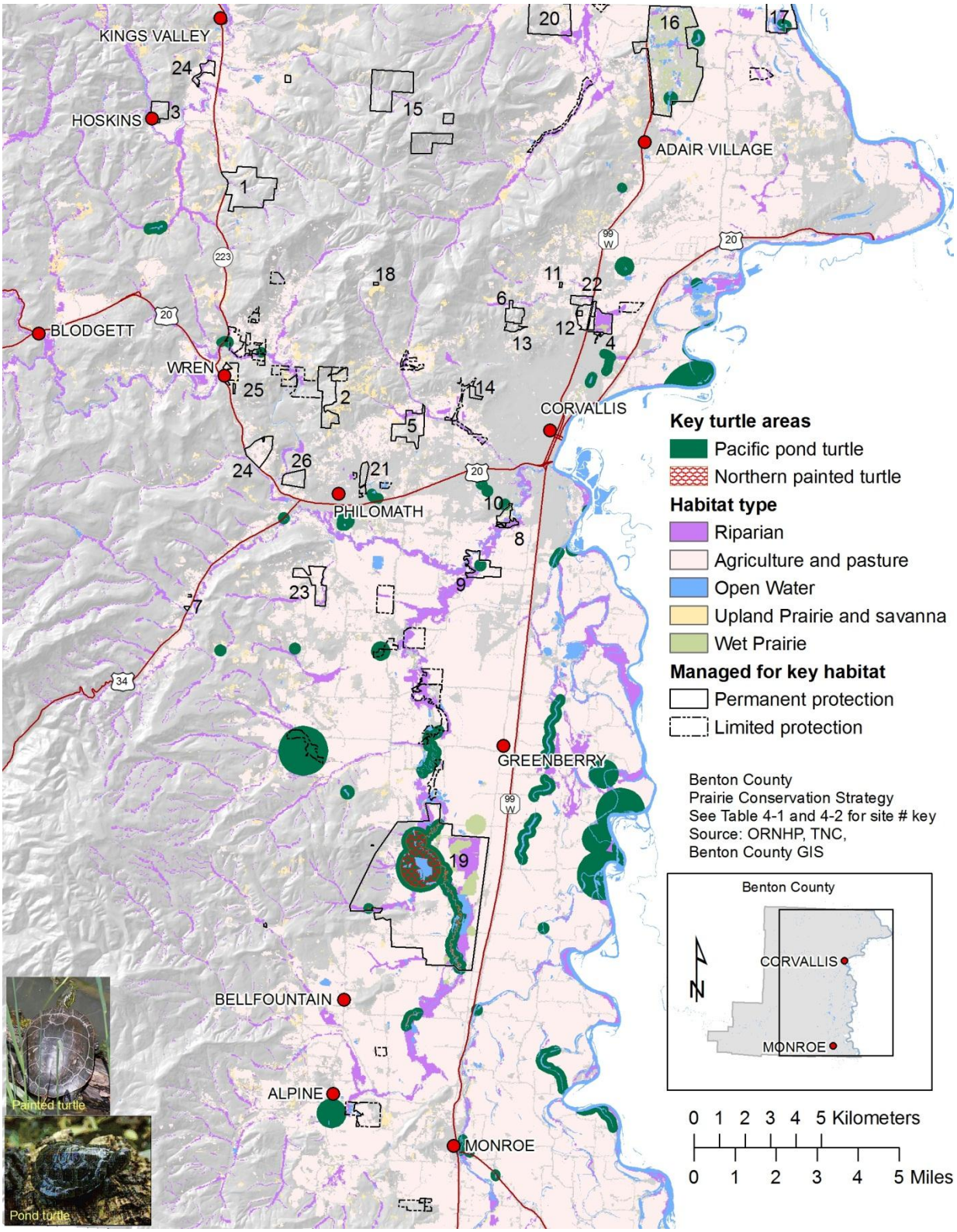


Figure 5.4 Opportunity areas for Peacock larkspur, Bradshaw's lomatium, and Nelson's checkermallow in Benton County

Plant locations indicate areas where plants have been found in the recent past.

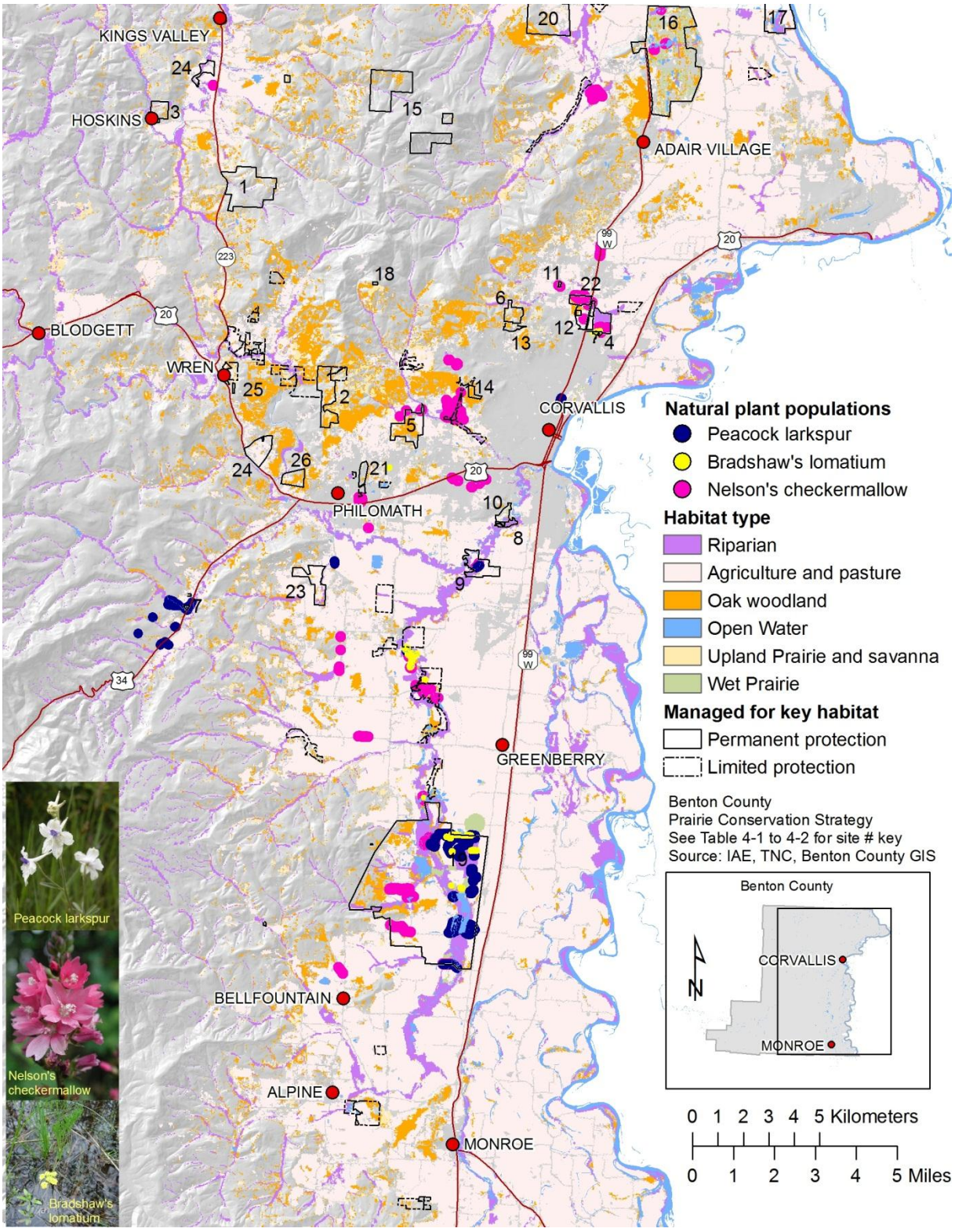


Figure 5.5 Opportunity areas for Kincaid's lupine and shaggy horkelia in Benton County

Plant locations indicate areas where plants have been found in the recent past.

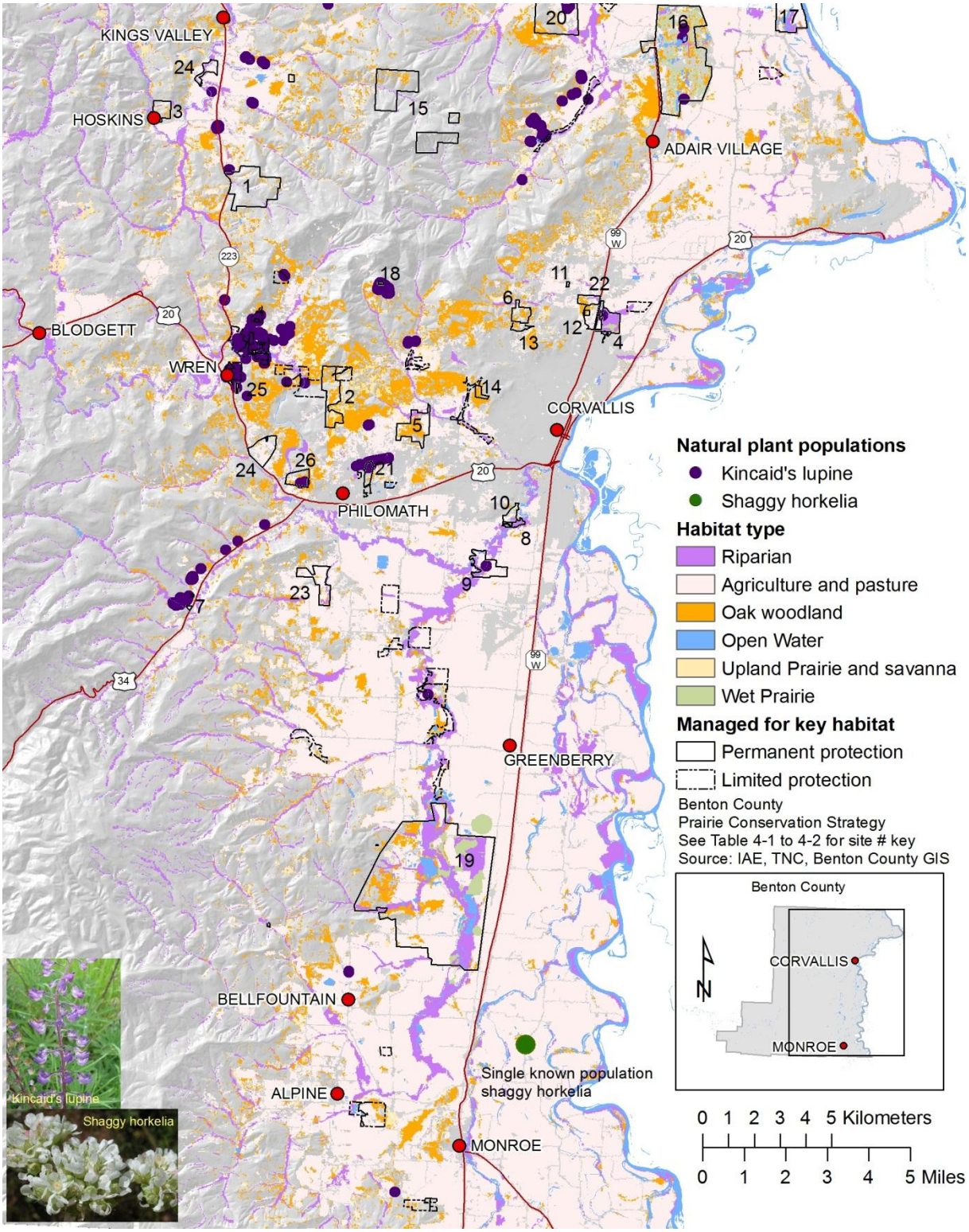
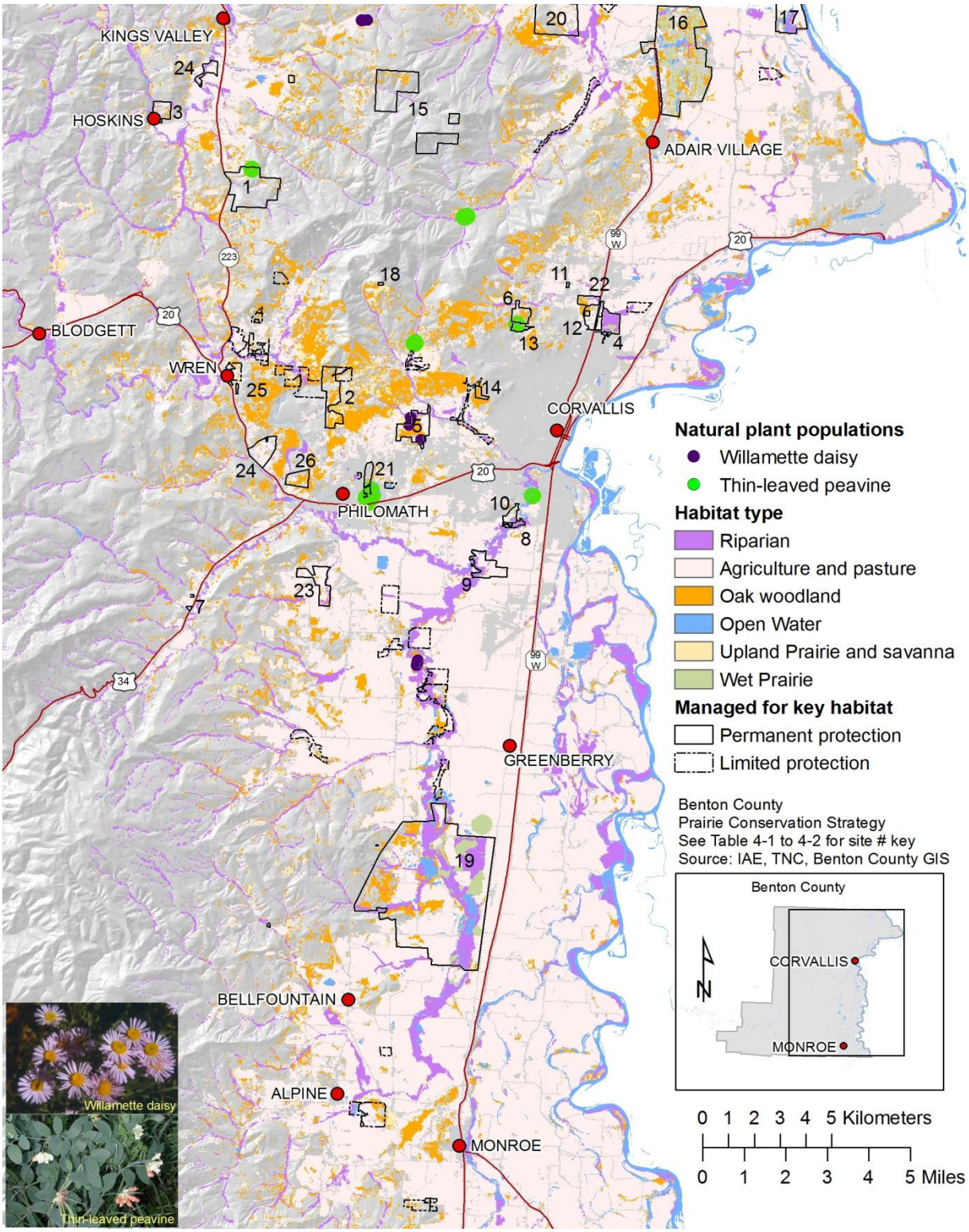


Figure 5.6 Opportunity areas for Willamette daisy and thin-leaved peavine in Benton County

Plant locations indicate areas where plants have been found in the recent past.



Key species conservation actions

Areas within Benton County identified as particularly important for conservation were prioritized for short or long term action.

1. Short term actions are those that can reasonably begin in the near future and are critical for listed species recovery or to prevent listing of additional species.
2. Long term actions are those that will require landowner engagement, significant habitat enhancement, or voluntary conservation easements/acquisition.

Priority actions are shown on several maps in this chapter and can be identified by the letters O for outreach, C for connectivity, and E for enhancement.

These actions identify geographic conservation areas within Benton County for strategic habitat conservation. Only public lands are specifically identified but private landowners who wish to work towards prairie conservation can consult the maps included here to identify the key actions needed to support habit for species on their property.

Priority short term actions (Figures 5.7 through 5.11)

Outreach – Benton County-wide

O:

Work with landowners to enhance and protect key habitats throughout Benton County by providing learning opportunities such as field trips to local habitat sites and workshops on species identification and habitat restoration techniques.

Provide private landowners with printed or web-based information on habitat management, conservation incentive programs, and easement programs.

Locate extant populations of golden paintbrush, Hitchcock's blue-eyed-grass, howellia, and racemed goldenweed. Identify potential reintroduction sites for extirpated species.

Work with private landowners to plant nectar species in potential butterfly habitat.

Work with private landowners, including those in eastern Benton County, to identify and protect large oaks that are important to wildlife such as Western gray squirrel and Acorn Woodpecker.

Connect habitat

C1: Connect Fender's blue butterfly habitat in OSU McDonald Forest to Fitton Green by creating or enhancing nectar and Kincaid's lupine habitat patches at Audubon's Hesthavn property, at the OSU sheep ranch along Oak Creek, through Bald Hill, and at Lupine Meadows. Stepping stone habitat patches should be less than 1 km apart.

Enhance habitat

E1: Enhance habitat for Taylor's checkerspot butterfly and Fender's blue butterfly between Lupine Meadows and Fitton Green by reducing flight path barriers through thick conifer stands, planting nectar species in open habitat patches, and planting Kincaid's lupine in open areas. Introduce harsh paintbrush (*Castilleja hispida* var. *hispida*), golden paintbrush (*Castilleja levisecta*), and small-flower blue-eyed Mary (*Collinsia parviflora*) for Taylor's checkerspot butterfly host plant use to provide possible alternatives to non-native English plantain (*Plantago lanceolata*).

E2: Enhance current Fender's blue butterfly habitat in the Wren area by actively managing for open habitat, and increasing habitat connectivity between current habitat patches and along transmission line corridors by reducing flight path barriers through thick conifer stands.

E3: Enhance habitat with nectar species at Finley Wildlife Refuge for future Fender's blue butterfly reintroduction efforts so that a new population network can be created. Enhance habitat for Streaked Horned Lark.

Priority long term actions (Figures 5.7 through 5.11)

Connect habitat

C2: Connect Fender's blue butterfly populations at Lupine Meadows to populations on Highway 34 by enhancing habitat patches with nectar species and Kincaid's lupine and by decreasing barriers, such as conifer stands and invasive shrubs, to butterfly dispersal. Connect these populations to populations in Wren with stepping stone patches less than 1 km apart.

C3: Connect Fender's blue butterfly habitat in McDonald Forest to habitat in the Wren area by planting sickle-keeled lupine (*Lupinus albicaulis*) in the clear cut mosaic that divides these areas. Sickle-keeled lupine populations could wink in and out as clearcuts are established and replanted.

C4: Connect and enhance Taylor's checkerspot butterfly populations between Beazell and Fort Hoskins by working with private landowners to create protected stepping stone habitat patches closer than 1.5 km.

C5: Connect Fender's blue butterfly habitat in the Soap Creek watershed from Oregon State University's property to E.E. Wilson by protecting stepping stone habitat patches less than 1 km apart. Work with interested private landowners who are willing to plant nectar species and provide information on conservation easements and incentive programs.

C6: Connect and enhance habitat for and introduce Willamette daisy and Bradshaw's lomatium to Herbert Natural Area, Caldwell Natural Area, and Marys River Natural Area. Introduce Kincaid's lupine, Nelson's checkermallow, and peacock larkspur to Caldwell Natural Area and Marys River Natural Area to join populations currently greater than 3 km apart.

C7: Connect and enhance habitat for and introduce peacock larkspur north of Finley Wildlife Refuge to join populations currently greater than 3 km apart.

Enhance habitat

E4: Enhance and protect turtle habitat along the Marys River from Marys River Natural Area upstream to Blodgett, along the Muddy Creek corridor, and along the Willamette River by protecting and restoring riparian zones and increasing floodplain connectivity. Minimize barriers to turtle migration between riparian and upland nesting habitat by locating trails and roads away from riparian areas. Identify occupied nests and avoid driving farm equipment over the nest. Protect nests from predators, such as raccoons, by using temporary fencing until the eggs hatch.

E5: Enhance Taylor's checkerspot butterfly habitat between Beazell and Fort Hoskins by establishing nectar species in habitat patches and minimize flight path barriers, such as dense stands of conifers, to butterfly dispersal. Introduce harsh paintbrush (*Castilleja hispida* var. *hispida*), golden paintbrush (*Castilleja levisecta*), and small-flower blue-eyed Mary (*Collinsia parviflora*) at Beazell for butterfly host plant use to provide possible alternatives to non-native English plantain (*Plantago lanceolata*).

E6: Enhance habitat for Streaked Horned Lark, Western Meadowlark, Western Kingbird, and Short-eared Owl in areas around Herbert Natural Area, Caldwell Natural Area, and Marys River Natural Area.

Streaked Horned Lark *© Rod Gilbert*

Figure 5.7 Areas of high priority for conservation actions to benefit key species in Benton County

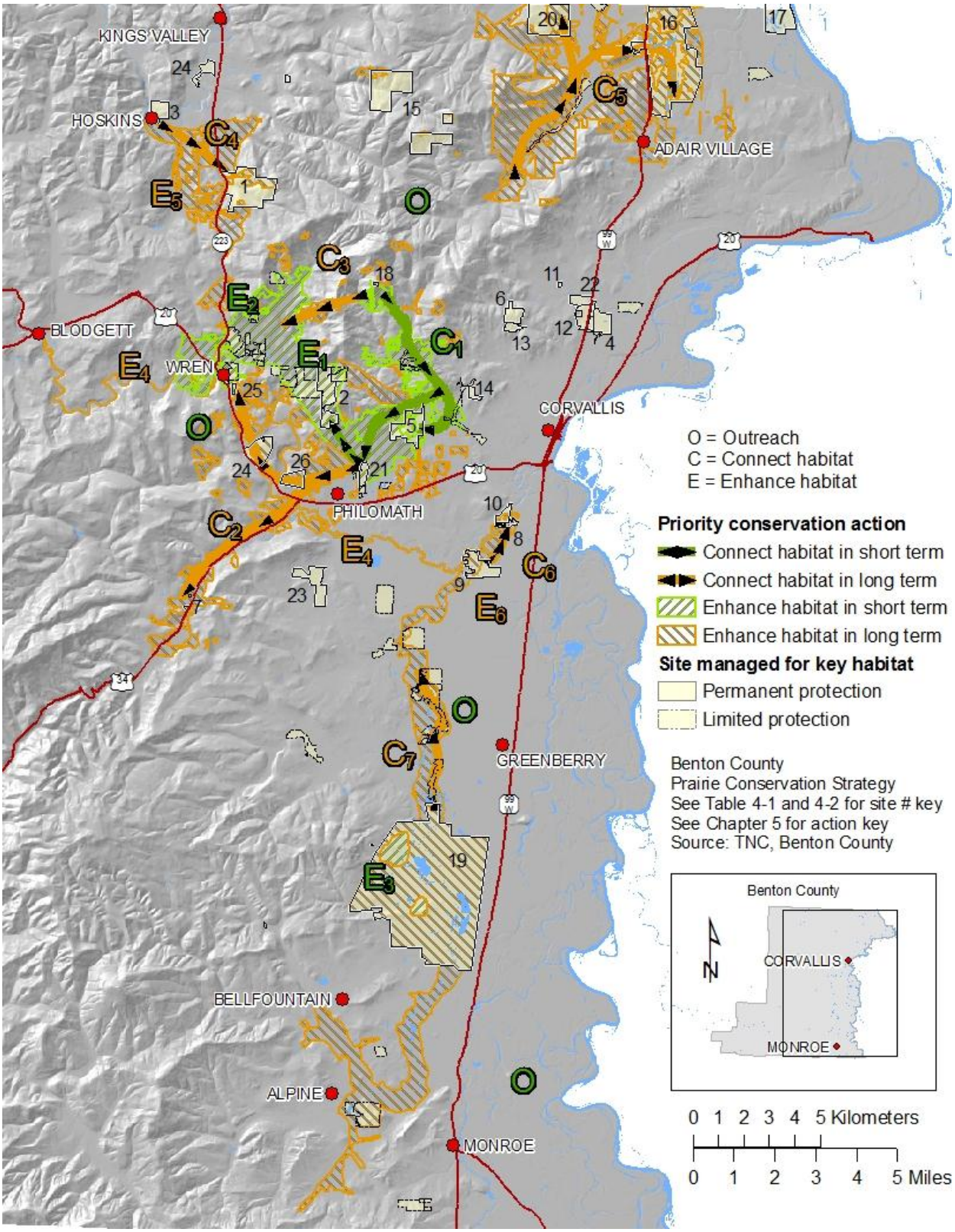


Figure 5.8 Areas of high priority for conservation actions near Wren, Philomath, and West Corvallis

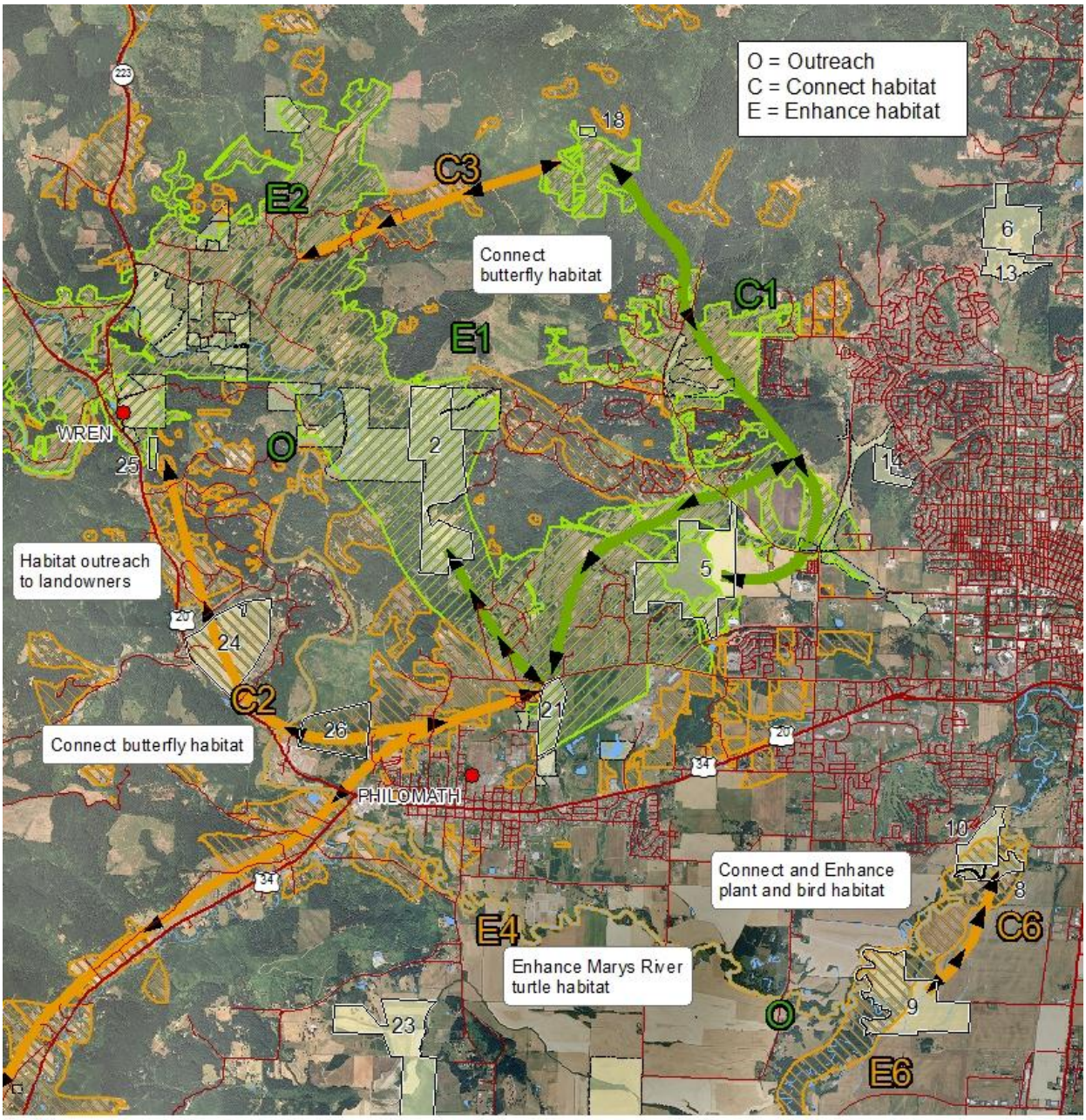
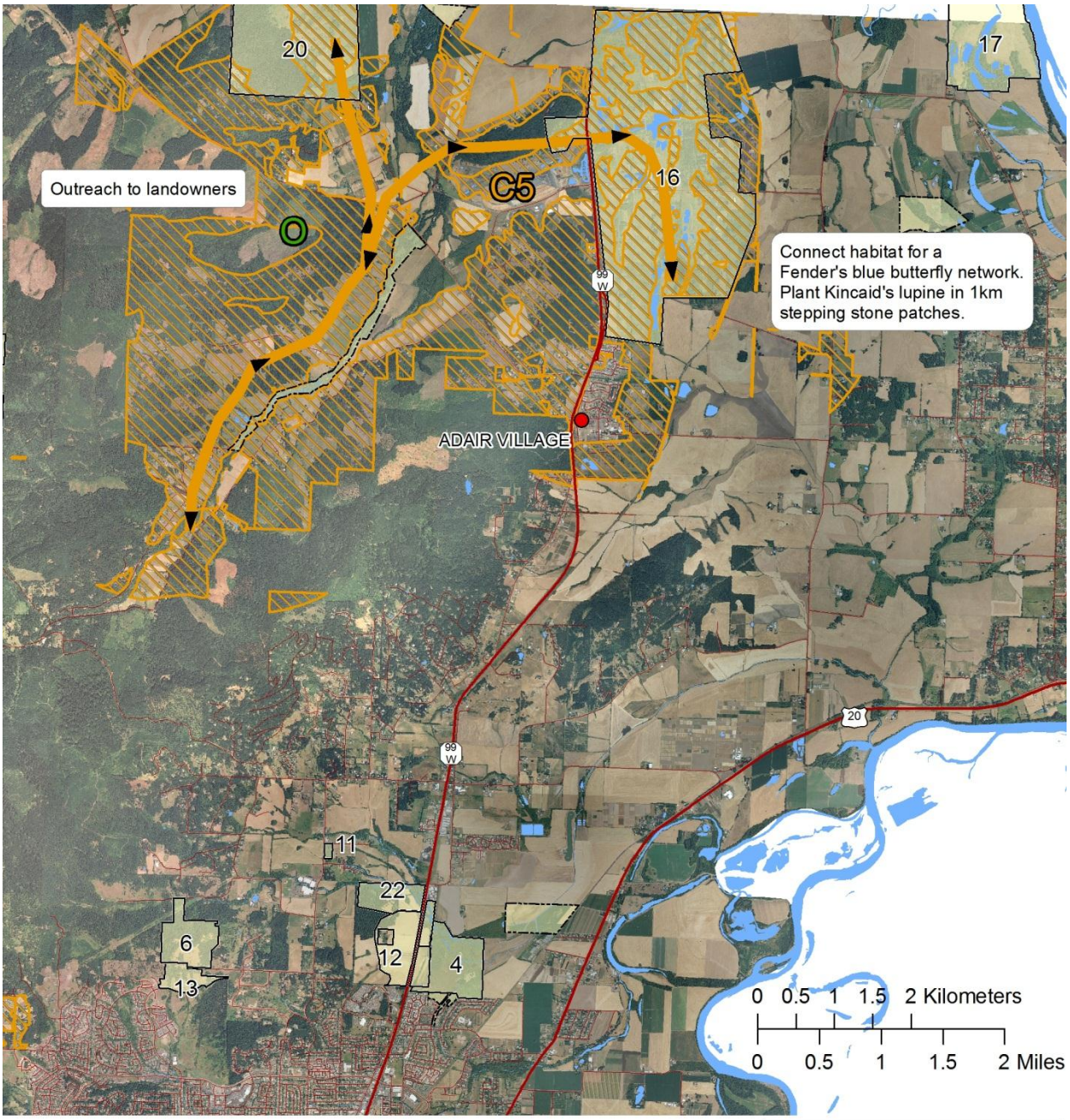


Figure 5.9 Areas of high priority for conservation actions in north Benton County



Benton County Prairie Conservation Strategy
See Table 4-1 and 4-2 for site # key, See Chapter 5 for conservation action key
Source: Benton County GIS, 2005 NAIP Aerial photo

Figure 5.10 Areas of high priority for conservation actions in south Benton County

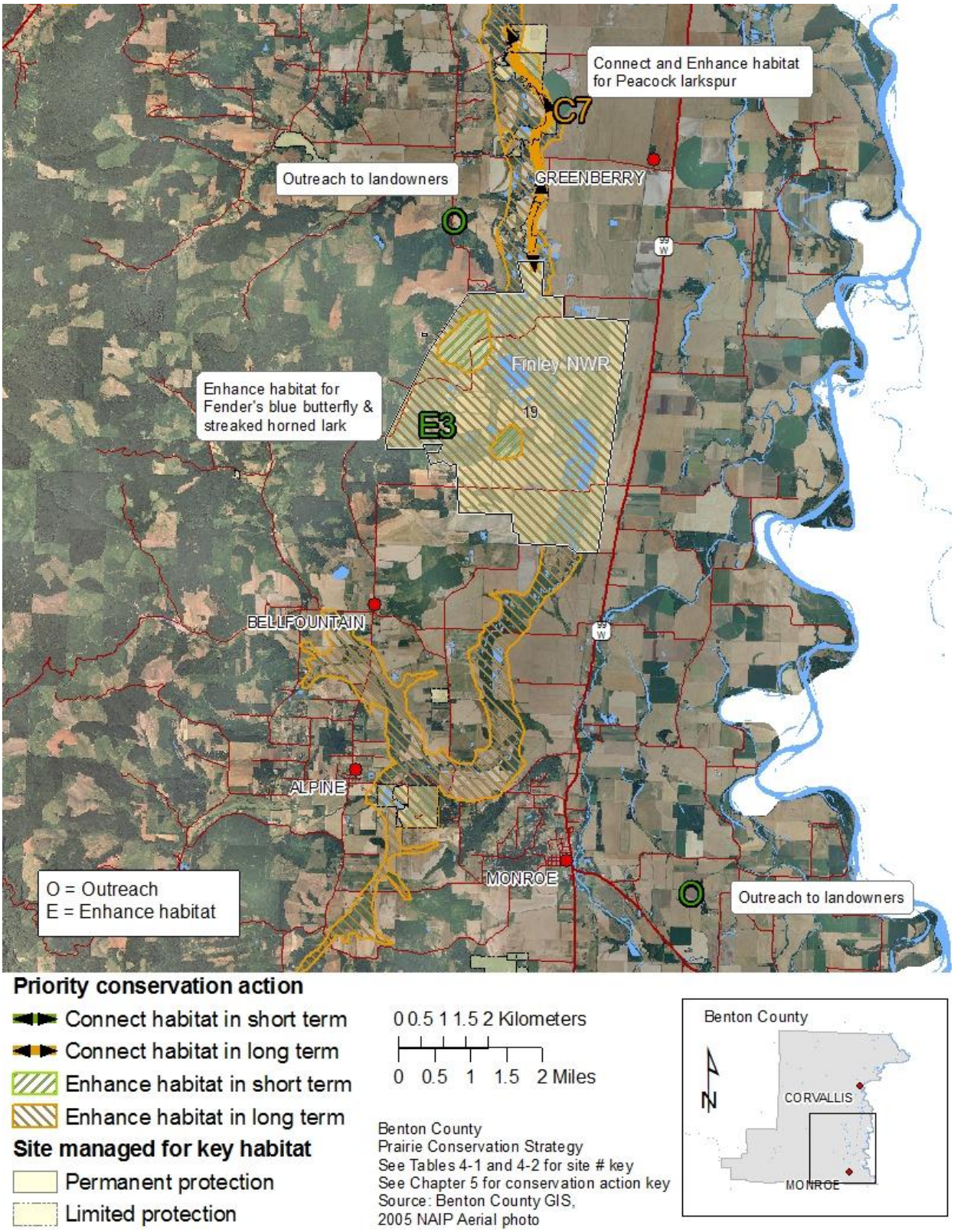
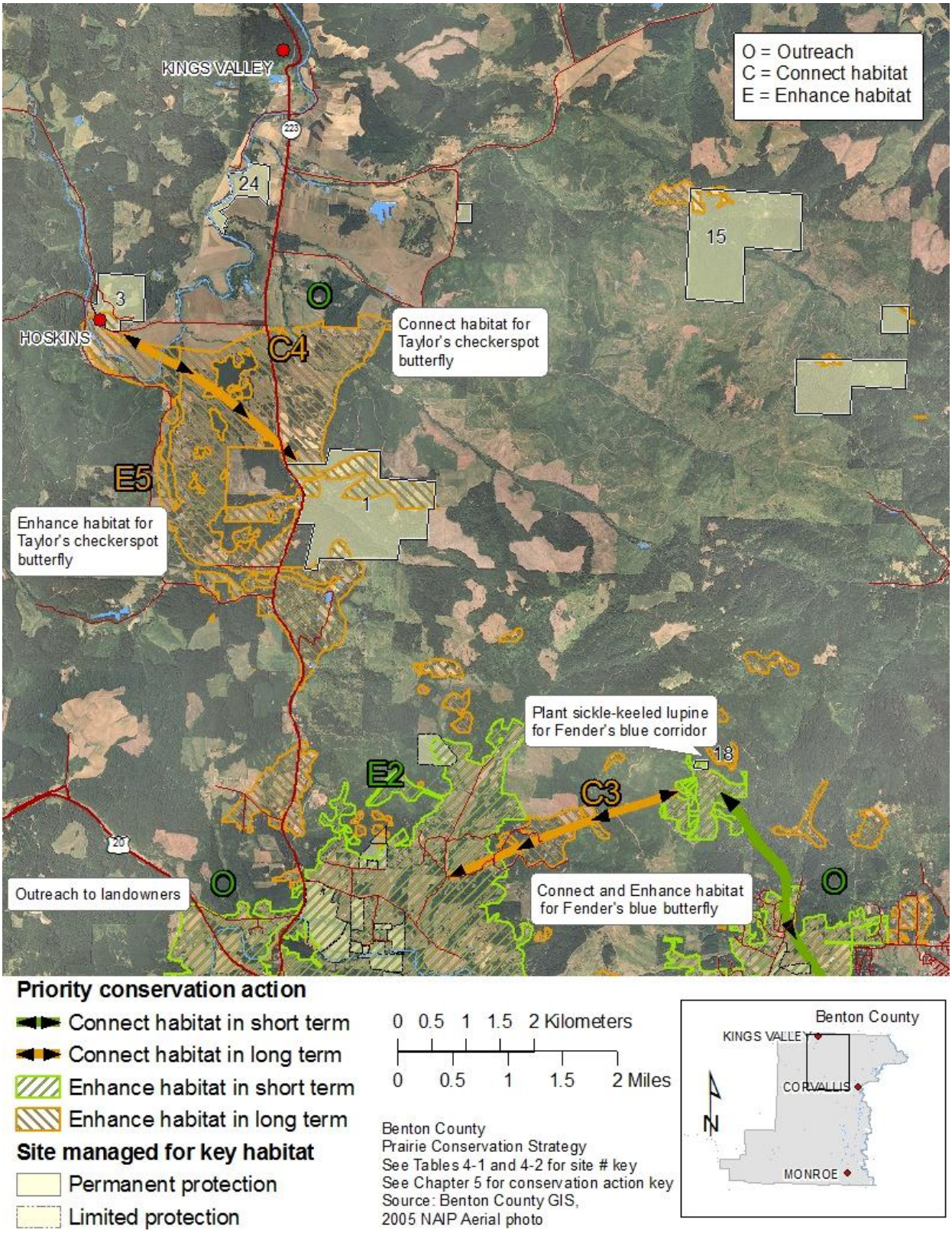


Figure 5.11 Areas of high priority for conservation actions near Kings Valley



Research needed

Research has been conducted on many of the key species covered by this strategy but further studies will be essential to reduce gaps in our current understanding. The Oregon Conservation Strategy (ODFW 2006) and USFWS draft Recovery Plan (USFWS 2008a) list data gaps for specific prairie species covered in those documents.

Habitat management and restoration

- Evaluate habitat patch size and configuration for maintaining viable populations.
- Evaluate the effectiveness of prairie management techniques such as the timing and intensity of mowing, burning, and removal of woody vegetation.
- Assess the use of livestock grazing to manage prairie habitat.
- Assess the use of mowing to control vole populations in prairies.
- Evaluate the effectiveness of providing passage around barriers to migrating wildlife.
- Investigate innovative weeding methods.
- Investigate the impacts of global climate change on habitats.

Species conservation

All species

- Determine population size and trends for all Strategy species.
- Evaluate the interactions between Strategy species and introduced species, for example predation of juvenile pond turtles by bull frogs or competition for food between Western gray squirrels and Eastern gray squirrels.
- Evaluate genetic diversity within and among populations.
- Examine the effects of climate change on local populations to develop strategies for improving their resiliency.

Amphibians and reptiles

- Evaluate the impacts of disease introduced and spread by non-natives.
- Clarify impacts of pollutants and UV radiation in amphibians.

Plants

- Develop effective management techniques through demographic studies to understand effects of treatments on birth and death rates. Compare management treatments experimentally (including mowing, burning, grazing with livestock, de-thatching, reduction of grass competition) to improve best management practices for these species.
- Examine the effects of herbivory by voles and gophers on the population dynamics of target species and develop techniques to exclude or inhibit these animals, if necessary.
- Evaluate the incidence of hybridization with related species for Nelson's checkermallow, peacock larkspur, and Kincaid's lupine.

- Conduct population genetic analysis using either molecular or common garden studies on listed plant species to develop seed transfer guidelines and evaluate the need for genetic rescue of inbred populations.
- Evaluate the importance of mycorrhizae and other below-ground micro-organisms on plant performance.
- Identify the most frequent pollinator species and their habitat needs.
- Evaluate the importance of seed-eating weevils on Nelson's checkermallow and Kincaid's lupine and develop techniques to reduce their impact.

Nelson's checkermallow

Willamette daisy

6 Voluntary conservation tools

There are many opportunities for landowners to voluntarily conduct conservation on their own land or for interested citizens to participate in conservation on public lands. Habitat conservation actions such as removal of Douglas-fir in prairies and oak woodlands can help numerous species beyond those protected by federal and state law. Private landowners can contribute to recovery of listed species and can also provide habitat for non-listed native species. Several programs are available to help landowners with habitat conservation and management.

Landowner incentives and opportunities

Private lands conservation is essential for preserving native habitat and rare species. Several programs are available to Benton 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 Resource 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:

- Benton Soil and Water Conservation District (Benton SWCD) – County wide
- Greenbelt Land Trust (GBLT) – County wide habitat easements
- Long Tom Watershed Council (LTWC) – South Benton County
- Luckiamute Watershed Council (LWC) – North Benton County
- Marys River Watershed Council (MRWC) - Mid Benton County

Technical assistance programs

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

Habitat improvement programs

- **Access and Habitat Program (A&H)** – ODFW grants for improving wildlife habitat, increasing public hunting access to private land or for solving a wildlife damage issue.
- **Conservation Incentive Program (CIP)** – BSWCD local property tax funded program to maintain and improve water and soil quality.
- **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".
- **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.

- **Conservation Reserve Enhancement Program (CREP)** – This offshoot of the CRP program retires erodible agricultural lands to enhance riparian and wetland wildlife habitat. Funds are also contributed by state and federal agencies.
- **Emergency Watershed Protection (EWP) Program** – NRCS floodplain easement program on land that has been impaired by flooding at least once in the past year or at least twice in the past 10 years. NRCS maintains a permanent conservation easement on the land and undertakes habitat restoration.
- **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

- **Riparian Lands Tax Incentive (web link)** – An ODFW property tax incentive program for improving or maintaining qualifying riparian lands up to 100 feet from a stream. Landowners receive property tax exemption for riparian lands.
- **Wildlife Habitat Conservation and Management Program (WHCMP)** - 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. See the Benton County Assessor's office for more information on your property's zoning. There is no additional tax for switching to a wildlife special assessment.
- **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.

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 2008b). The coverage area includes Benton 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 candidates for listing species, e.g., the Streaked Horned Lark and Taylor's checkerspot butterfly. Some landowners may manage their property to prevent or discourage colonization of their property by candidate species because future listings can result in land use restrictions. A CCAA provides additional assurances beyond a Candidate Conservation Agreement that the property owner is assured 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 the same as 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
- Supports 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

Habitat acquisition

Habitat acquisition from voluntary sellers is an important conservation measure that ensures long-term protection of a site. Property can be acquired outright (fee simple) by purchasing property from a willing seller or through a conservation easement whereby the current landowner retains ownership of the property but the use of that property is restricted. Non-profit groups such as The Greenbelt Land Trust, Marys River Watershed Council, Luckiamute Watershed Council, Long Tom Watershed Council, The Nature Conservancy, and Trust for Public Lands can provide assistance.

- **Acquisition, Donation, Land Exchange:** Public agencies and non-profit groups can acquire property at fair market value from a willing landowner and may accept donations of land. A land exchange usually involves trading public land for private land, but it can involve trading land between public land agencies.

- **Conservation Easement:** A conservation easement is a legal contract between the landowner who wishes to retain the land and the easement holder. Easements can be held by state or federal agencies, tribes, and non-profit groups. The landowner gives up certain development rights and agrees to certain restrictions on the property in exchange for compensation (money and/or tax benefits). The landowner can donate the conservation easement to a qualified not-for-profit organization, such as a land trust, or to a public agency. The easement can be in perpetuity or for a term of years. Landowners with a conservation easement can apply to the Benton County assessor for a special tax assessment of the property. See Tax Incentives section above.

Funding sources and assistance for voluntary acquisition

Several programs offer financial assistance with easement and acquisition projects.

- **The Oregon Watershed Enhancement Board (OWEB):** The Oregon Watershed Enhancement Board (OWEB) is a state agency that promotes and funds voluntary conservation activities around Oregon using dedicated lottery funds. Eligible applicants include any individual, organization, local government, or institute of higher education. State or federal agencies must be a co-applicant with another eligible applicant. These competitive grants require a 25% match from another funding source (OWEB, 2009). OWEB has adopted ecological priorities for acquisition funding which include upland prairies and savanna, oak woodlands, and wet prairies in the Willamette Basin. Several of the priority species identified by OWEB are key species identified in this strategy, including:
  Acorn Woodpecker, American Kestrel (natural nest sites only), Chipping Sparrow, Oregon Vesper Sparrow, Short-eared Owl (nest and roost habitat only), Streaked Horned Lark, Western Meadowlark, White-breasted Nuthatch, western gray squirrel, red-legged frog, northern painted turtle, pacific pond turtle, Fender's blue butterfly,

Taylor's checkerspot butterfly, white-topped aster, golden paintbrush , peacock larkspur, Willamette daisy, Howellia, Bradshaw's lomatium, Kincaid's lupine, and Nelson's checkermallow.

- **U.S. Fish and Wildlife Service Recovery Land Acquisition Fund (web link):** The USFWS provides land acquisition funding for species covered under the Endangered Species Act that have draft or final recovery plans in place. State agencies that have a cooperative agreement with the Secretary of the Interior may apply for these acquisition funds. In addition, individuals or groups (land conservancies or conservation organizations, cities, counties, or community organizations) may be a subgrantee with a State agency that has a cooperative agreement. Funding can not be used for acquisition of lands associated with a permitted Habitat Conservation Plan. 25% non-Federal matching funds are required for individual state applications.

- **U.S. Fish and Wildlife Service Habitat Conservation Plan (HCP) Land Acquisition Program**: This program provides funds to States or subgrantees to State agencies for land acquisition in areas covered by an HCP. The funds can be used for land that is not part of mitigation required by the HCP and covers habitat for listed or candidate species. Only one proposal per HCP may be submitted, though multiple parcels may be identified.

- **National Fish and Wildlife Foundation (NFWF) – Acres for America:** In 2005, the National Fish and Wildlife Foundation partnered with Wal-Mart Stores Inc. to offset the footprint of Wal-Mart's development in the United States. These grants require a 1:1 match of cash or in-kind contribution. Conservation of important species and public access to the property is preferred.

Conservation opportunity actions

The following actions are suggested to strategically promote habitat conservation throughout Benton County.

Coordinate a Strategy outreach and implementation action plan

Action: *Conduct outreach to landowners to jumpstart priority conservation actions in Benton County.*

- Let landowners know about this Strategy through newsletters, list serves, outreach groups, OSU Extension Service, and the BSWCD.
- Utilize a citizen mentors program to provide information to local areas within the County.
- Conduct neighborhood meetings with presentations in priority areas to provide information about this Strategy to landowners.
- Post signs at project sites to provide project information to inform neighbors.

Lobby state to fund for private land conservation programs

Action: *Lobby state government to fund and staff state conservation programs, such as the Wildlife Habitat Conservation and Management Program (WHCMP), which provide private lands conservation incentives.*

- Property taxes in Oregon are valued and based upon the real market value of the property. Urban and suburban areas are encroaching on farm and forest lands which make these properties more valuable and therefore potentially subject to higher taxes. The Oregon legislature offers a reduced property tax assessment program to property owners in farm and forest designated areas to encourage retention of farm land and native forests. A comparable program was developed in 1997 to provide a reduced property tax incentive for landowners to conserve habitat for native wildlife. The Wildlife Habitat Conservation and Management Program (WHCMP), administered by ODFW, allows properties in areas zoned Exclusive Farm Use (EFU) or Forest Conservation (FC), and in County designated wildlife zones, to receive reduced property tax assessment for providing wildlife habitat.

  Though the WHCMP incentive program provides reduced taxes, property owners give up the ability to generate income from farming or timber and must come up with funding to develop management plans or restoration actions. This reduces the long term incentive to private landowners who need technical advice on habitat management. This program could provide a greater incentive for landowner participation if state funds were dedicated to the WHCMP for staff to work with landowners.

Work to reduce regulatory disincentives to conservation

Action: *Identify regulations that hinder conservation in Benton County and work with state and federal regulators to address these issues.*

- An ESA listing may be a disincentive for some landowners to conserve or enhance habitat for listed species due to the possibility of future land use restrictions on their property. Safe Harbor Agreements (SHA) and Candidate Conservation Agreements with Assurances (CCAAs) were developed to reduce this disincentive by removing future land use regulation if conservation actions are implemented. These programs may not provide sufficient assurances for some landowners due to uncertainty regarding timelines, conservation actions, government involvement, or complex paperwork. Identifying and modifying regulations that hinder conservation on private lands, as well as expanding technical and financial assistance programs, can promote habitat conservation actions on private lands.

Provide clear information on regulations

Action: *Provide clear species regulatory information to local citizens in newsletters, websites, and other accessible means.*

- ESA listings are often a surprise to impacted landowners even though the listing process can take years. Information on how the listing of animal species can impact private property owners should be provided in a clear manner. The Endangered Species Act is a federal program that is regulated at the federal level, but education can happen locally.
- Examples of information:
    1. Plant species listed by state or federal endangered species laws are not protected on private lands unless they provide habitat to a listed animal species or if federal funds are involved in projects on that particular private property.
    2. The USFWS is the federal agency responsible for regulating native species that are federally listed as threatened or endangered. Impacting a protected plant species on federal land or a protected animal species or its habitat on any land requires one of three types of permit:
        a. An incidental take permit is required when non-Federal activities will result in "take" of a threatened or endangered species. The permit application must be accompanied by a habitat conservation plan (HCP) which "ensures that the effects of the authorized incidental take are adequately minimized and mitigated" (USFWS 2008c).
        b. An enhancement of survival permit is "required for non-Federal landowners participating in Safe Harbor Agreements or Candidate Conservation Agreements with Assurances. These agreements encourage landowners to take actions to benefit species while also providing assurances that they will not be subject to additional regulatory restrictions as a result of their conservation actions" (USFWS 2008c).
        c. A recovery and interstate commerce permit is "issued to allow for take as part of activities intended to foster the recovery of listed species. A typical use of a recovery permit is to allow for scientific research on a listed species in order to understand better the species' long-term survival needs. Interstate commerce permits also allow transport and sale of listed species across State lines (e.g., for purposes such as a breeding program)" (USFWS 2008c).
    3. The Oregon Department of Fish and Wildlife (ODFW) is the state agency responsible for the management of animals that are listed as threatened or endangered by the state of Oregon. Oregon regulates listed animal species only on non-federal public lands. Animals listed by the state but not by the federal government are not regulated on private lands.
    4. The Oregon Department of Agriculture (ODA) is the state agency responsible for the management of native plants that are listed as threatened or

endangered by the state of Oregon on non-federal public lands. Plants listed by the state of Oregon are only regulated on non-federal public lands.

a. A permit is required if a listed plant is moved across public lands, such as roads.
b. A permit is required for activities that involve "take" which includes transporting listed plants on public roads or transporting seeds of listed species to plant on private property.
c. A permit is required for any propagation/cultivation of state-listed plants.

5. The Oregon Natural Heritage Program is the state agency responsible for state listed invertebrates and in addition USFWS has granted ONHIP limited authority to manage a program for federally listed invertebrates.

Identify interest in specific conservation tools

Action: *Survey local citizens on tools that would be most valuable for conservation and provide clear information.*

- In a June 2009 survey for the Prairie Conservation Strategy (Benton County 2009), respondents wrote of their frustrations with a lack of clear information from regulators and with punitive regulations. Participants in Prairie Conservation Strategy workshops consistently requested information on endangered species conservation on their land, technical assistance and incentives for habitat conservation, and changes to portions of the US Endangered Species Act.

Provide endangered plant seeds to private landowners

"Remember that in our enlightened community there are many who would like to grow these beautiful though threatened species. We provide free land for experiments." 2009 Prairie Conservation Strategy Survey response

Action: *Work with state agencies to create a plant material registry program.*

- A plant material registry program would provide a way for private landowners to participate in recovery of listed species by planting threatened and endangered species on their land. For a program to occur, several steps would be required:
    1. ODA would administer the program.
    2. USFWS would distribute seeds to landowners with appropriate habitat and would report seed amounts and planting locations to ODA. Landowners would receive educational materials to correctly report their habitat type.
    3. Anyone receiving plant materials would be required to sign an affidavit declaring the destination of the plant material. This way, genetically appropriate plant materials would be distributed to appropriate sites and ODA would have a tracking system.
    4. Plant materials would be provided or sold by ODA permitted nurseries or vendors with materials collected in Benton County or within genetically

appropriate areas as approved by ODA. Funding for initial seed collection would need to be determined.
5. A sufficient amount of seeds would need to be in production to augment limited seed resources.
6. Minimum seed numbers would be required for planting. This would ensure sufficient establishment due to high mortality of seedlings.
7. Educational materials provided to program participants.
8. Program participants could provide voluntary feedback on planting success.

Create new conservation programs

Action: *Work to create "adopt a roadside" program.*

- Many populations of listed plants reside along roadsides due to management practices that favor open habitat. These populations are important for genetic diversity and connectivity between larger populations. Individuals or volunteer groups could "adopt" roadside populations and maintain the habitat through a registry program and be recognized for the effort. A program would require:
    1. A registry system coordinated by a local or state agency.
    2. Funds to administer a program and provide recognition to volunteers.

Action: *Work with local groups to create a habitat evaluation program.*

- Volunteers currently provide invasive plant assessments for private land owners through the Soil and Water Conservation District's Weed Spotter Program. A voluntary program to assess habitat conditions, similar to Energy Star, could be implemented by a state or local agency to determine if private landowners have native habitat. These volunteers could provide educational materials and point out sources of additional information to private landowners.

Action: *Create community equipment and knowledge share.*

- Some private landowners do not wish to work with federal or state agencies to enhance their habitat, but want technical advice and to borrow equipment. Local government, non-profit groups, or volunteers could provide information, such as printed technical information, to citizens who wish to work on their own habitat. A tool and equipment sharing program could help private landowners gain access to expensive equipment and could be run by a local conservation group who could provide educational material or on-site advice. For a program to occur there would need to be:
    1. Coordination by a local group.
    2. Equipment available for public use.
    3. Liability issues would need to be addressed.

Action: *Recognition program for exceptional habitat conservation.*

- Some private landowners have protected exceptional habitat in Benton County. A recognition program is a "pat on the back" to these landowners and their experience can provide a valuable outreach to neighboring landowners.

Action: *Conservation/recovery implementation working group.*

- Conservation working groups aim to understand and communicate ecological issues to diverse audiences. These informal groups are concerned for a

particular habitat type or species and work to promote and improve conservation. The Oregon Oak Communities Working Group and the South Puget Sound Prairie Landscape Working Group are two examples of groups working on oak and prairie conservation. A group consisting of scientists, agency personnel, land managers, and concerned citizens could provide recommendations to state and federal agencies and provide information to the general public on strategies for prairie conservation in Oregon. A Prairie Conservation Strategy implementation group made up of local partners would provide guidance and recommendations to local land managers working on habitat enhancement or species recovery.

White-topped aster © Tom Kaye

Oregon vesper sparrow © Rod Gilbert

7 Additional species resources

Amphibians

Northern red-legged frog (*Rana aurora*)
NatureServe explorer database (Accessed March 2010):
http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Rana+aurora

Birds

Acorn Woodpecker (*Melanerpes formicivorus*)
Cornell Lab of Ornithology (Accessed March 2010):
http://www.allaboutbirds.org/guide/Acorn_Woodpecker/id

American Kestrel (*Falco sparverius*)
Cornell Lab of Ornithology (Accessed March 2010):
http://www.allaboutbirds.org/guide/American_Kestrel/id

Chipping Sparrow (*Spizella passerina*)
Cornell Lab of Ornithology (Accessed March 2010):
http://www.allaboutbirds.org/guide/Chipping_Sparrow/id

Common Nighthawk (*Chordeiles minor*)
Cornell Lab of Ornithology (Accessed March 2010):
http://www.allaboutbirds.org/guide/Common_Nighthawk/id

Grasshopper Sparrow (*Ammodramus savannarum*)
Cornell Lab of Ornithology (Accessed March 2010):
http://www.allaboutbirds.org/guide/Grasshopper_Sparrow/id

Horned Lark (*Eremophila alpestris*)
Cornell Lab of Ornithology (Accessed March 2010):
http://www.allaboutbirds.org/guide/Horned_Lark/id

Lazuli Bunting (*Passerina amoena*)
Cornell Lab of Ornithology (Accessed March 2010):
http://www.allaboutbirds.org/guide/Lazuli_Bunting/id

Northern Harrier (*Circus cyaneus*)
Cornell Lab of Ornithology (Accessed March 2010):
http://www.allaboutbirds.org/guide/Northern_Harrier/id

Short-eared Owl (*Asio flammeus*)
Cornell Lab of Ornithology (Accessed March 2010):
http://www.allaboutbirds.org/guide/Short-eared_Owl/id

Vesper Sparrow (*Pooecetes gramineus*)
Cornell Lab of Ornithology (Accessed March 2010):
http://www.allaboutbirds.org/guide/Vesper_Sparrow/id

Western Bluebird (*Sialia mexicana*)
Cornell Lab of Ornithology (Accessed March 2010):
http://www.allaboutbirds.org/guide/Western_Bluebird/id

Western Kingbird (T*yrannus verticalis*)
Cornell Lab of Ornithology (Accessed March 2010):
http://www.allaboutbirds.org/guide/Western_Kingbird/id

Western Meadowlark (*Sturnella neglecta*)
Cornell Lab of Ornithology (Accessed March 2010):
http://www.allaboutbirds.org/guide/Western_Meadowlark/id

White-breasted Nuthatch (*Sitta carolinensis*)
Cornell Lab of Ornithology (Accessed March 2010):
http://www.allaboutbirds.org/guide/White-breasted_Nuthatch/id

Wilson's Snipe (*Gallinago delicata*)
Cornell Lab of Ornithology (Accessed March 2010):
http://www.allaboutbirds.org/guide/Wilsons_Snipe/id

Insects

American grass bug (*Acetropis Americana*)
US Department of Agriculture, US Forest Service 2005 fact sheet (Accessed March 2010): http://www.fs.fed.us/r6/sfpnw/issssp/documents/planning-docs/20050906-fact-sheet-acetropis-americana.doc

Fender's blue butterfly (*Icaricia icarioides fenderi*)
USFWS fact sheet (Accessed March 2010):
http://www.fws.gov/oregonfwo/Species/Data/FendersBlueButterfly/
Butterfly Conservation Initiative (Accessed March 2010):
http://www.butterflyrecovery.org/species_profiles/fenders_blue/

Taylor's checkerspot butterfly (*Euphydryas editha taylori)*
Butterfly Conservation Initiative (Accessed March 2010):

http://www.butterflyrecovery.org/species_profiles/taylors_checkerspot/

Tailed copper (*Lycaena arota*)
NatureServe explorer database (Accessed March 2010):
http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Lycaena+arota

Field crescent (*Phyciodes pulchella*)
NatureServe explorer database (Accessed March 2010):
http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Phyciodes+pulchella

Mammals

Camas pocket gopher (*Thomomys bulbivorus*)
NatureServe explorer database (Accessed March 2010):
http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Thomomys%20bulbivorus

Western gray squirrel (*Sciurus griseus*)
Washington Department of Fish and Wildlife (Accessed March 2010):
http://wdfw.wa.gov/wlm/diversty/soc/wgraysquirrels/index.htm

Plants

Bradshaw's lomatium *(Lomatium bradshawii*)
Oregon State University, 2002 Oregon Flora Project Rare Plant Guide (Accessed March 2010): http://www.oregonflora.org/rarepdfs/lombra.pdf

Golden paintbrush (*Castilleja levisecta)*
Oregon State University, 2002 Oregon Flora Project Rare Plant Guide (Accessed March 2010): http://www.oregonflora.org/rarepdfs/caslev.pdf

Hitchcock's blue-eyed-grass *(Sisyrinchium hitchcockii)*
Oregon State University, 2002 Oregon Flora Project Rare Plant Guide (Accessed March 2010): http://www.oregonflora.org/rarepdfs/sishit.pdf

Howellia (*Howellia aquatilis*)
Oregon State University, 2002 Oregon Flora Project Rare Plant Guide (Accessed March 2010): http://www.oregonflora.org/rarepdfs/howaqu.pdf

Kincaid's lupine *(Lupinus sulphureus* ssp. *kincaidii)*
Oregon State University, 2002 Oregon Flora Project Rare Plant Guide (Accessed March 2010): http://www.oregonflora.org/rarepdfs/lupsulkin2.pdf

Nelson's checkermallow *(Sidalcea nelsoniana)*
Oregon State University, 2002 Oregon Flora Project Rare Plant Guide (Accessed March 2010): http://www.oregonflora.org/rarepdfs/sidnel.pdf

Peacock larkspur *(Delphinium pavonaceum)*
Oregon State University, 2002 Oregon Flora Project Rare Plant Guide (Accessed March 2010): http://www.oregonflora.org/rarepdfs/delpav.pdf


Peacock larkspur

Racemed goldenweed *(Pyrrocoma racemosa* var. *racemosa*)
Oregon State University, 2002 Oregon Flora Project Rare Plant Guide (Accessed March 2010): http://www.oregonflora.org/rarepdfs/pyrracrac.pdf

Shaggy horkelia *(Horkelia congesta* ssp. *congesta*)
Oregon State University, 2002 Oregon Flora Project Rare Plant Guide (Accessed March 2010): http://www.oregonflora.org/rarepdfs/horconcon.pdf

Thin-leaved peavine *(Lathyrus holochlorus*)
Oregon State University, 2002 Oregon Flora Project Rare Plant Guide (Accessed March 2010): http://www.oregonflora.org/rarepdfs/lathol.pdf

White-topped aster *(Sericocarpus rigidus*)
Oregon State University, 2002 Oregon Flora Project Rare Plant Guide (Accessed March 2010): *http://www.oregonflora.org/rarepdfs/astcur.pdf*

Willamette daisy *(Erigeron decumbens* var. *decumbens*)
Oregon State University, 2002 Oregon Flora Project Rare Plant Guide (Accessed March 2010): http://www.oregonflora.org/rarepdfs/eridecdec.pdf

Reptiles

Pacific pond turtle (*Actinemys marmorata*)
Oregon Conservation Strategy (Accessed March 2010): http://www.dfw.state.or.us/conservationstrategy/turtles.asp

Northern painted turtle (*Chrysemys picta*)
Oregon Conservation Strategy (Accessed March 2010): http://www.dfw.state.or.us/conservationstrategy/turtles.asp

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http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Lycaena+arota

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Appendix F. USFWS March 1, 2010 Letter to Benton County

COPY

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Oregon Fish and Wildlife Office
2600 SE 98th Avenue, Suite 100
Portland, Oregon 97266
Phone: (503)231-6179 FAX: (503)231-6195

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BENTON COUNTY AVERY FACILITY

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Benton County Board of Commissioners
408 SW Monroe Ave, Suite 111
P.O Box 3020
Corvallis, OR 97339

Re: Benton County Habitat Conservation Plan (HCP).

Dear Benton County Commissioners,

Thank you for meeting with me and my staff to discuss the Benton County HCP. As we discussed, this planning effort has increased public awareness about Endangered Species Act (ESA) regulation and consequently, concern from private landowners about current and future land use. I appreciate your interest and patience in addressing these concerns.

I understand that landowners are concerned about the voluntary conservation efforts promoted in the Prairie Conservation Strategy (Appendix E, Draft HCP). Since these efforts are intended to increase the distribution and abundance of listed species in Benton County (including County-owned lands), landowners are concerned about further liability under the ESA. I also understand that landowners are concerned about a few on-going activities (enclosure) that may impact Fender's blue butterfly but are not identified as "Covered Activities" in the draft HCP.

I appreciate the proactive approach to conservation already implemented by Benton County and identified in the draft HCP. Specifically, Benton County's progress towards permanently protecting and maintaining a core Fender's blue butterfly (*Icaricia icarioides fenderi*) population (acquisition grants already awarded), in combination with the commitment to enhance this population, as identified in the draft HCP. In and of itself, these commitments will significantly reduce the imminence of threats to the species and contribute towards its recovery. Additionally, we anticipate a significant recovery contribution from the voluntary conservation efforts identified in the Prairie Conservation Strategy (Appendix E, Draft HCP). Given the number of Benton County landowners already participating in these voluntary programs, my staff and I believe that by alleviating the above mentioned concerns, we will ensure the success of the Prairie Conservation Strategy (Appendix E, Draft HCP) and achieve Fender's blue butterfly recovery goals in Benton County.

It is the U.S. Fish and Wildlife Service's (Service) responsibility to investigate and take appropriate enforcement action with respect to potential harm or harassment of Fender's blue butterfly under the ESA. However, this letter is to inform you that, while finalizing the HCP and

during its successful implementation, I will not recommend that the Service initiate prosecution for 1) those on-going activities specifically identified (enclosure) or 2) any activities outside of the "Blue Zone" as identified in the draft HCP, that may impact introduced populations of Fender's blue butterfly. Although these activities pose a small risk of incidental take, we believe the risk of harm is low and that any potential harm will be discountable from the standpoint of species recovery. However, if a naturally occurring Fender's blue butterfly population is found outside of the "Blue Zone", this prosecutorial discretion may not be utilized because the impacts to the species would no longer be considered small or discountable.

I appreciate your willingness to undertake a County-wide planning effort, and your commitment to ensuring the final HCP provides a meaningful contribution to prairie recovery. I look forward to working with you on finalizing the HCP and achieving prairie recovery goals in Benton County. If you wish to contact us to discuss this letter, please contact Mikki Collins or Rich Szlemp of my staff at (503) 231-6179.

Sincerely,

Paul Henson, PhD
State Supervisor

Enclosure - List of On-going Activities

cc: Cindi Bockstadter, Fish and Wildlife Service Law Enforcement, Wilsonville, Oregon
Jeff Powers, Director Benton County Parks and Open Space
Tom Kaye, Institute for Applied Ecology

Enclosure- List of On-going Activities

This list of habitat and property management activities are outside Benton County's regulatory oversight, and have the potential for short term or negligible impacts but long term benefit to Fender's blue butterfly habitat. Such activities include:

- mowing a field, pasture, or vineyard row middle or margin that has been regularly mowed prior to HCP enactment;
- haying a field after July 15th;
- grazing the same type of livestock at a similar timing and intensity as has occurred in the same area in the past;
- spot-spraying or manual removal of noxious weeds;
- planting native prairie species; and
- installing, maintaining or replacing a fence that existed prior to HCP enactment.

Many of these activities may aid in maintaining prairie habitats and thereby benefit the Covered Species. If a landowner wishes, they may receive assistance and guidance in completing these activities by enrolling in an existing program that assists private landowners interested in conservation on their lands. These programs, including the USFWS Partners for Fish and Wildlife program and the Safe Harbor Agreement with Assurances, are described in the Prairie Conservation Strategy in the draft HCP (Appendix E) Chapter 6: Voluntary Conservation Tools. While enrollment in such programs is strictly voluntary, the monitoring and assessment that occurs through these programs would contribute information about prairie management, benefit prairie conservation, and demonstrate the success of voluntary actions.

Appendix G. HCP Advisory Committees and Planning Team

1.1 Technical Advisory Committee

1.1.0 Members

First Name	Last Name	Organization	Sub-Committee
Bob	Altman	American Bird Conservancy	Streaked Horned Lark
Ed	Alverson	The Nature Conservancy	Plants
Richard	Brainerd	Salix Associates	Plants
Deborah	Clark	Oregon State University, Biology Program	Plants
Rebecca	Currin	Oregon Department of Agriculture	Plants
Andrew	Gray	Oregon State University, Department of Forest Science	Plants
Paul	Hammond	Private Consultant	Butterfly
Ann	Kreager	Oregon Department of Fish and Wildlife	Streaked Horned Lark, Plants, Butterfly
Randy	Moore	Oregon State University, Department of Fisheries and Wildlife	Streaked Horned Lark
Doug	Robinson	Oregon State University, Department of Fisheries and Wildlife	Streaked Horned Lark
Dana	Ross	Private Consultant	Butterfly
Cheryl	Schultz	Washington State University, Vancouver Washington Campus	Butterfly
Nick	Testa	Oregon Department of Transportation	Plants, Streaked Horned Lark
Mark	Wilson	Oregon State University, Botany& Plant Pathology Department	Butterfly
Scott	Hoffman Black	Xerces Society	Butterfly

1.1.1 Technical Advisory Subcommittee Meetings

Entire Technical Advisory Committee	Meeting Dates
Full Committee	November 16, 2006
Full Committee	April 23, 2009
Technical Advisory Sub-Committees	
Streaked Horned Lark Technical Advisory Subcommittee	January 17, 2007
	March 1, 2007
	August 13, 2007

Plant Subcommittee Technical Advisory Subcommittee	January 24, 2007 August 21, 2007 April 24, 2008 October 17, 2008
Butterfly Subcommittee Technical Advisory Subcommittee	January 26, 2007 August 22, 2007 April 25, 2008 September 4, 2008

1.2 Stakeholder Advisory Committee

1.2.0 Members, Past and Present

Name	Organization
Ed Alverson	The Nature Conservancy
Noel Bacheller	Oregon Parks and Recreation Department
Matt Blakeley-Smith	Native Plant Society of Oregon
Michael Cairns	Luckiamute Watershed Council
Julee Conway	City of Corvallis Parks and Recreation Department (former Director)
Sandra Coveny	Marys River Watershed Council
Dai Crisp	Private Landowner, Lumos Wine Company
Rebecca Currin	Oregon Dept. Agriculture Plant Division
Peter Dalke	Oregon Solutions
Stephen DeGhetto	City of Corvallis Parks and Recreation
Nicole Duplaix	Luckiamute Watershed Council
Ken Faulk	Oregon Small Woodlands Association
Greg Fitzpatrick	The Nature Conservancy
Karen Fleck Harding	Private Landowner, Wren Citizens Advisory Committee, Marys River Watershed Council
Rick Fletcher	Oregon State University Extension
John Gaylord	Audubon Society of Corvallis
Amy Gillette	Oregon Parks and Recreation Department
Scott Hoffman Black	Xerces Society
Ann Kreager	Oregon Department of Fish and Wildlife
Randy Kugler	City of Philomath
Dave Lysne	OSU College of Forestry
Steven Marx	Oregon Department of Fish and Wildlife
Karlene McCabe	Greenbelt Land Trust
Randy Moore	OSU Dept. of Fisheries and Wildlife, Audubon Society
Susan Morre	Benton Co. Environmental Issues Advisory Committee
Jean Nath	Benton County Natural Areas and Parks Advisory Board
Sara O'Brien	Defenders of Wildlife
William Pearcy	Private Landowner
David Phillips	City of Corvallis Parks and Recreation

Irene Pilgrim	OSU Dept. of Animal Science
Michael Pope	Oregon Department of Fish and Wildlife
Janine Salwasser	Marys River Watershed Council, OSU Natural Resources Digital Library
Donna Schmitz	Benton Soil and Water Conservation District
Amy Schoener	Private Landowner

1.2.1 Stakeholder Advisory Committee Meetings Held

Stakeholder Advisory Committee Meeting Dates
November 20, 2006
March 15, 2007
October 9, 2007
March 4, 2008
April 17, 2008
May 15, 2008
January 22, 2009
April 2, 2009
May 7, 2009
July 1, 2009
August 20, 2009
November 3, 2009

1.3 HCP Planning Team

1.3.0 Current Members

Name	Organization
Greg Verret	Benton County Community Development
Jeff Powers	Benton County Natural Areas and Parks
George McAdams	Benton County Natural Areas and Parks
Tom Kaye	Institute for Applied Ecology
Carolyn Menke	Institute for Applied Ecology
Rachel Schwindt	Institute for Applied Ecology
Rebecca Currin	Oregon Department of Agriculture
Ann Kreager	Oregon Department of Fish and Wildlife
Mikki Collins	US Fish and Wildlife Service
Rich Szlemp	US Fish and Wildlife Service

Appendix H. Public Presentations about the HCP

1.1 Introduction

For a successful plan, Benton County has sought to inform the public about the HCP through workshops and presentations:

1.2 Workshops

Prairie Plant Workshop, Cardwell Hill, June 12, 2006: A Prairie Plant Identification workshop was held cooperatively by Mary's River Watershed Council and Institute for Applied Ecology (IAE) on June 12, 2006. Carolyn Menke from IAE led this workshop. Approximately 20 landowners from the Cardwell Hills area attended. Al Kitzman, Parks Superintendent from Benton County Natural Areas and Parks, represented the County. Many of the landowners attending already had their property surveyed by IAE staff. The workshop took place on a private landowner's property in Cardwell Hill. This landowner has a high quality population of Kincaid's lupine and Fender's Blue Butterfly. Attendees were provided with a list of species found by IAE in the Cardwell Hill area. The workshop began with Carolyn providing an overview of the HCP process. The group then walked the property and Carolyn identified native and exotic plants for the group, and discussed the importance of native plant species in prairie plant communities. Several very problematic weedy exotic plant species common in the area were identified and the group discussed what conditions may have facilitated the spread of these species into certain areas of the property. The group concluded the workshop with a discussion of rare species and prairie management options.

Prairie Restoration Workshop, Cardwell Hill, September 23, 2006: This workshop was held collaboratively by Mary's River Watershed Council (MRWC) and Institute for Applied Ecology (IAE) on Saturday, September 23, 2006 at the MRWC's outreach coordinator's property in Cardwell Hill. Workshop presenters included Steve Smith (USFWS), private lands biologist from the USFWS Finley National Wildlife Refuge, Lynda Boyer, Botanist and Restoration Ecologist from Heritage Seedlings in Salem, and Carolyn Menke from IAE. The workshop was attended by approximately 25 people from Cardwell Hill, Corvallis, King's Valley and other local areas in the Willamette Valley. Al Kitzman, Parks Superintendent from Benton County Natural Areas and Parks, represented the County. Topics discussed included prairie restoration and management, exotic species control, and rare species management options. Specific attention was directed to control options for false-brome, an extremely problematic

invasive exotic grass in the area. Rich Owen from RJ Consulting, Inc., gave a demonstration of exotic shrub (hawthorn and Armenian blackberry) removal with skid-steer machinery. Participants received packets of information about prairie restoration, weed management, native seed sources, and local contractors engaging in restoration work in their area.

Public Worksession for the Benton County Prairie Conservation Strategy, May 28, 2009: HCP staff presented information about the developing prairie conservation strategy, including an overview of aerial photos from the strategy area. Attendees broke into small solution groups to brainstorm on two topics: (1) How to enable citizens to do conservation on private lands, and (2) how to improve conservation on private lands. Each solution group then presented their discussion outline to the entire group.

1.3 Presentations to Interest Groups/ Workshops/ Conferences

April 13, 2006: HCP Planning Team Members gave a presentation at the Oregon Solutions Regional Conservation Strategy Project meeting about the HCP process and goals.

June 6, 2006: HCP Planning Team members gave a presentation to the Luckiamute Watershed Council about the HCP process, goals and rationale, species to be covered, and estimated time frame for completion of the HCP.

December 13, 2006: HCP Planning Team members gave a presentation to the Benton County Natural Areas and Parks Advisory Board about the HCP process, goals and rationale, species to be covered, and estimated time frame for completion of the HCP.

December 19, 2006: HCP Planning Team members gave a presentation to the Greenbelt Land Trust Board of Directors regarding the HCP process, goals and rationale, species to be covered, and estimated time frame for completing the HCP.

January 30, 2007: HCP Planning Team members gave a presentation to the Long Tom Watershed Council regarding the HCP process, goals and rationale, species to be covered, and upcoming field work for the HCP and associated projects.

March 7, 2007: HCP Planning Team members gave a presentation to the Mary's River Watershed Council regarding the HCP process, goals and rationale, species to be covered, and upcoming field work for the HCP and associated projects.

April 4, 2007: HCP Planning Team members attended the Mary's River Watershed Council Meeting. This meeting focused on conservation projects taking place in the Muddy Creek portion of the Mary's River Watershed. Projects highlighted included the Benton County HCP and projects by Mary's River Watershed Council, Greenberry

Irrigation District, Cascade Pacific RC&D, Benton Soil and Water Conservation District. Carolyn Menke (IAE) gave a brief summary of the HCP project, describing the covered species, the progress to date, and plans for the upcoming field season.

August 15, 2007: HCP Planning Team member, Carolyn Menke, was an invited guest lecturer at the University of Oregon for a seminar on Conservation Planning. The purpose of the class was to explore real-world planning initiatives for conserving native plants and wildlife habitats in Oregon. Carolyn discussed the components of the HCP process, targets and goals, and challenges of conservation tools. A follow-up field trip was held on August 19, 2007 at Jackson Frazier Wetland and Lupine Meadows, where Carolyn Menke discussed habitat management, Benton County conservation goals, prairie ecology, and conservation strategies.

September 29, 2007: HCP Planning Team member, Carolyn Menke, participated in a Streaked Horned Lark Workshop sponsored by The Nature Conservancy. Carolyn discussed the goals of the Benton County HCP, the status of the project, and how the Streaked Horned Lark fits into conservation in Benton County.

January 7-8, 2008: HCP Planning Team member, Lori Wisehart, participated in a Taylor's checkerspot Workshop sponsored by The Nature Conservancy. Lori discussed the goals of the Benton County HCP, the status of the project, and how the HCP hopes to benefit Taylor's checkerspot in Benton County.

April 18, 2008: HCP Planning Team member, Lori Wisehart, participated in a Oregon Oak Working Group meeting in Eugene. Lori discussed the goals of the Benton County HCP, the status of the project, and how the HCP hopes to benefit prairie species in Benton County.

April 23, 2008: HCP Planning Team member, Lori Wisehart, was invited to participate in the US Forest Service Restoration for a Reason Workshop. Lori discussed the goals of the Benton County HCP, the status of the project, and how the HCP hopes to benefit prairie habitats in Benton County.

May 6, 2008: HCP Planning Team member, Carolyn Menke, was invited to discuss the HCP at the Wren Citizens Advisory Committee Meeting in Wren. Carolyn discussed the goals of the Benton County HCP, the status of the project, and how the HCP hopes to benefit prairie habitats in Benton County.

May 8, 2008: HCP Planning Team member, Carolyn Menke, was invited to discuss the HCP at the Luckiamute Watershed Council Meeting in Monmouth. Carolyn discussed the goals of the Benton County HCP, the status of the project, and how the HCP hopes to benefit prairie habitats in Benton County.

May 13, 2008: HCP Planning Team members, Carolyn Menke and Tom Kaye, were invited to discuss the HCP at the Marys River Watershed Council Meeting in Philomath. They discussed the goals of the Benton County HCP, the status of the project, and how the HCP hopes to benefit prairie habitats in Benton County.

May 15, 2008: HCP Planning Team member, Carolyn Menke, was invited to discuss the HCP at the Benton County Environmental Issues Advisory Committee in Corvallis. Carolyn discussed the goals of the Benton County HCP, the status of the project, and how the HCP hopes to benefit prairie habitats in Benton County.

June 11, 2008: HCP Planning Team member, Carolyn Menke, was invited to give an update to the Benton County Parks Advisory Board in Corvallis. Carolyn discussed the goals of the Benton County HCP, the status of the project, and how the HCP hopes to benefit prairie habitats in Benton County.

September22-23, 2008: HCP Planning Team members, Jeff Powers, Jerry Davis and Tom Kaye, attended the Oregon Parks and Recreation Association Conference in Bent, OR. They discussed the goals and rationale of the Benton County HCP, the status of the project, and how the HCP hopes to benefit prairie habitats in Benton County.

December 11, 2008: HCP Planning Team member, Carolyn Menke, was invited to give an update to the Benton County Parks Advisory Board in Corvallis. Carolyn discussed the goals of the Benton County HCP, the status of the project, including upcoming public review of the draft, and how the HCP hopes to benefit prairie habitats in Benton County.

February 9, 2009. HCP Planning Team member, Tom Kaye, was invited to give a presentation to the Oregon Native Plant Society of Corvallis describing how the HCP would affect plant conservation in Benton County.

February 17, 2009. HCP Planning Team member, Carolyn Menke, was invited to give a presentation to the City of Corvallis Watershed Advisory Board describing the HCP and how it would interface with the Corvallis Watershed.

March 10, 2009. HCP Planning Team members participated in the Marys River Watershed Council-facilitated “Community Conversation” about the Benton County HCP. Planning team members answered questions from the public and described the HCP process.

April 20, 2009. HCP Planning Team Members Tom Kaye, Jeff Powers, and Greg Verret invited local realty professionals working in Benton County to an informational meeting about the Habitat Conservation Plan, which detailed how the proposed HCP would affect private lands within the Fender’s Blue Zone.

January 27, 2010. HCP Planning Team member, Tom Kaye, gave an invited guest lecture about the Benton County Prairie Species HCP and HCP development process to an OSU Environmental Science class.

February 23, 2010, HCP Planning Team member, Tom Kaye, gave an invited guest lecture about the Benton County Prairie Species HCP and HCP development process to an OSU Geography of Resource Use class.

1.4 Public Meetings

Benton County sought public participation through several public meetings.

January 22, 2007: Benton County held an evening public meeting in Corvallis to explain the HCP process and goals, describe the species to be covered and give an estimated time frame for completing the HCP. HCP Planning Team members answered extensive questions from the public.

October 15, 2007: Benton County held an evening public meeting in Corvallis. The focus of the meeting was an update of activities undertaken by the County, including results of the 2007 field season, hotspot mapping, potential conservation measures, and development of a Prairie Conservation Strategy.

January 27, 28, & 31, 2009: Benton County held three evening public meetings in Corvallis, Wren and Kings Valley, respectively. The County introduced the draft HCP, explained the public process around the draft, answered questions, and took public comment.

September 16, 2009: Benton County held an evening public meeting in Corvallis. The County introduced the revised draft HCP, described the Prairie Conservation Strategy, explained the timeline and public process around the draft, answered questions, and took public comment.

Appendix I. Avian, Botanical and Butterfly Survey Methodology

1.1 Streaked Horned Lark Surveys

Roadside Streaked Horned Lark surveys were conducted between 4 am and 6am by walking stretches of roadside-right-of-way and listening for lark vocalizations. If vocalizations were heard, as soon as light conditions permitted, surveyors visually located the lark, and observed or searched to determine whether nesting was occurring.

1.2 Botanical Surveys

1.2.0 Overall Site Description

Each site was assessed in terms of land use (grazed pasture, ungrazed pasture, relatively undisturbed meadow, tree plantation, etc.), structural layout (completely open, scattered openings, woodland), and site history (when possible: grazed in past, changes in ownership, etc.). Vascular plant species present in target habitats (prairie/savanna/oak woodland) were recorded. Descriptions of the site including the abundance of nectar species, presence of non-native invasive species, and the status of oaks relative to surrounding conifers (overtopped by conifers, losing branches, etc.) were also recorded. Data were recorded on field survey forms.

1.2.1 Covered Species Population or Habitat Description

At sites where covered species were observed, patch perimeters were mapped using a GPS (Global Positioning System) unit and population sizes were estimated. In each patch or population cluster, we estimated plant abundance by counting individuals, or for Kincaid's lupine, by estimating cover occupied by lupine leaves in m^2 (foliar cover). Lupine foliar cover correlates with lupine abundance, and has been adopted as the standard metric for lupine abundance in the draft USFWS Recovery Plan for the Prairie Species of Western Oregon and Southwestern Washington (USFWS 2008b). Kincaid's lupine can have substantial underground clonal growth, making identification of individual plants frequently impossible. Newly discovered Kincaid's lupine populations were assessed for evidence of Fender's blue butterfly presence (i.e. evidence of larvae feeding on young leaves near the plant meristem or eggs on the underside of leaves).

1.2.2 Vegetation Plot Sampling

Vegetation plots (5m x 5m) were sampled in two situations: (1) sites with high quality (high native cover and diversity) target habitats and (2) sites with covered species populations. In both cases we placed multiple plots at a site if there were multiple, distinct, high quality community types, and or multiple covered species population clusters or associated plant community types. In each plot percent cover of vascular plants, bare ground, moss, and rock was recorded. Slope (degrees), aspect (degrees), and elevation (from GIS) were also measured at each plot. Plots were also positioned with a GPS and incorporated into a GIS (Geographic Information System).

1.3 Butterfly Surveys

1.3.0 Fender's blue butterfly

1.3.0.0 Ross Survey Methodology:

Population estimates for Fender's blue butterfly at Fitton Green Natural Area, Beazell Memorial Forest, and on private properties in the Cardwell Hill/Wren area were conducted by counting actual numbers of females and males observed while walking a slow zig-zag meander walk through all Fender's blue butterfly habitat.

Counts were conducted between 10am and 4pm when weather conditions (sunny, warm) stimulated adult activity. Target intervals for population estimates were 5-7 days once adults were present, with subjective adjustments made by the observer as deemed reasonable due to local conditions. Each site is visited a minimum of three times to capture early, peak and late-flying individuals. In a typical year, an adult's lifespan is assumed to be less than 10 days.

1.3.0.1 Hammond Survey Methodology (From Hammond 2007)

Population estimates were made for individual habitat sites by taking the highest count of male butterflies at the peak of the flight season, and doubling that number to account for females (assuming an equal sex ratio). An additional 20% of the combined male-female number was added to this sum to account for butterflies in the tail ends of the flight season that would not have been present on the peak day count. The result is likely a conservative estimate for most populations, particularly for large populations dispersed over large geographic areas where many butterflies are probably missed during the surveys.

1.3.1 Taylor's checkerspot butterfly

1.3.1.0 Population Estimates

Population estimates for Taylor's checkerspot butterfly in the area near Fitton Green Natural Area and Beazell Memorial Forest are made from modified Pollard counts – a

walking tally of all butterflies within a 5-meter radius of the observer along permanent transects. The same transects are used for consistency in the data for year-to-year comparisons. Counts are conducted between 10am and 4pm when weather conditions (sunny, warm) stimulate adult activity. Target intervals for population estimates are 5-7 days once adults are present, with subjective adjustments made by the observer as deemed reasonable due to local conditions. Each site is visited a minimum of three times to capture early, peak and late-flying individuals. In a typical year, an adult's lifespan is assumed to be less than 14 days.

The Taylor's checkerspot population near Fitton Green serves as an indicator for adult checkerspot activity within Benton County as a whole. Visits there to determine the onset of adult activity begin in early April and continue at weekly intervals until checkerspots are observed and formal fieldwork started.

When possible, each population estimate in the Fitton Green area includes a maximum of 3 counts along each of three transects which are then averaged for that site and date. This number is then multiplied by a variable (number) to account for the entire population at that location. Counts at Beazell require visits to five separate areas and needs more time to complete, so only single transect count is made there. This methodology provided a conservative estimate of adults for each site.

1.3.1.1 General Surveys

General surveys for Taylor's checkerspot are conducted throughout the flight period. The surveys include sites visited in past years as well as new sites with potential habitat. Most new sites are on private lands where landowners provide access.

General surveys are conducted, as fair weather permits, around higher priority visits to Fitton Green Natural Area and Beazell Memorial Forest. For each survey, all visible and likely checkerspot habitats are inspected on foot. A visual check for adult checkerspots is always the primary objective. Additional attention is given to the presence and relative abundance of the larval host plant English plantain (*Plantago lanceolata*), and to strawberry (*Fragaria*), cat's-ear lily (*Calochortus*), and sea blush (*Plectritis*) in particular as potential nectar sources for adults.

Appendix J. Prairie Habitat Vegetation Management Guidelines

1.1 Introduction

Habitat loss and fragmentation is the biggest threat to the Covered Species through land conversion, invasive species spread, and successional processes (tree and shrub encroachment). Two key components of any restoration, enhancement, or maintenance effort is removal of woody vegetation and invasive species. These guidelines largely follow those in the U.S. Fish and Wildlife Service Biological Opinion for prairie restoration in western Oregon (USFWS 2008a).

A number of restoration, enhancement, and maintenance techniques are available (see below) and whether a particular technique will be implemented will depend, in part, on the needs of the particular site and on the presence or absence of the Covered Species, in particular Fender's blue butterfly and Taylor's checkerspot butterfly. These techniques include, but are not limited to, manual or machine cutting, mowing, prescribed burning, herbicide application, solarization, and use of shade cloth. Once a site has been manipulated to remove unwanted vegetation, the site will need to be replanted with appropriate native prairie species, which may include the covered plant species. For specific habitat restoration and enhancement protocols for Taylor's checkerspot butterfly see the Taylor's Checkerspot Butterfly Management Plan (Appendix N).

1.2 Habitat Restoration and Enhancement Techniques

The following habitat restoration and enhancement protocols will be followed by the County and Cooperators when implementing a voluntary or mitigation related habitat restoration, enhancement or management project.. These protocols may be updated as new information becomes available on effective restoration and enhancement techniques for the Covered Species.

1.2.0 Cutting

Cutting is used to remove woody species such as hawthorn (*Crataegus* spp.), blackberry (*Rubus* spp.), rose (*Rosa* spp.), Scot's broom (*Cytisus scoparius*), Douglas-fir (*Pseudotsuga menziesii*), Oregon ash (*Fraxinus latifolia*) and other species from native prairie communities, and to control and remove resprouting stems.

Machine cutting includes trimming, girdling trees, and chain saw removal of woody species. Manual cutting involves the use of loppers, shovels, hoes, weed wrenches/pullers, and trowels to remove woody vegetation through cutting, hoeing, grubbing, pulling, chipping, or digging techniques.

- Directional falling shall be used to avoid impacts to listed and/or covered plant species as much as possible.
- All cut material will be removed from the site.
- To reduce potential impacts to Covered Species, cutting will occur only while the listed and/or covered plant species on site are dormant (late August through February).
- Cutting of woody species may also be combined with application of herbicide to the cut stems to reduce resprouting.
- If no listed and/or Covered Species are present, manual cutting may occur at any time of year.
- The necessity of treatment requirements will be determined by a qualified specialist (see Appendix K: Project Site Survey and Reporting Protocols for Plants and Butterfly Habitat) who will direct the on-site implementation of this technique to reduce potential impacts to any Covered Species.

1.2.0.0 Girdling Trees

Girdling trees involves the removal of a ring of bark near the base of the tree with either an ax or chainsaw. Girdling eventually kills the tree. This practice is used to control and remove invasive woody plants.

- Girdling may occur at any time of year.
- Workers shall enter the site on foot and take care to avoid trampling listed and/or covered plant species.
- Girdled trees may remain on site or be removed during the dry season, depending on management objectives for the site.

1.2.0.1 Cutting, Thinning, and Removing Tree Stumps

- Handheld power tools may be used to cut down, control, or remove woody vegetation.
- Such activities will occur when listed and/or covered plant species are dormant or during the flowering season so long as workers take precautions to avoid trampling of any listed and/or Covered Species, including working no closer than 2 m (6 ft) from a Covered Species.
- No trees shall be removed from Fender's blue butterfly habitat during the flight season (May 1 – June 15).
- Vehicle-supported stump removal will occur only during dry periods.
- All cut material will be piled or chipped and spread away from any listed and/or covered plant populations or hauled off-site for disposal.

- If activities occur during the wet season, the tree debris may be left on site away from the listed and/or covered plant species until the dry season when workers can access the work area with equipment to remove tree debris.

1.2.1 Mowing

Mowing annually or as needed can reduce invasive and woody vegetation and maintain or enhance existing native species populations. This activity is anticipated to enhance growing conditions for Covered Species. At sites with Covered Species present, the following conditions apply:

1.2.1.0 Covered Plant Species

- Mowing shall occur August 15-February 28 while listed and/or covered plant species are dormant.
- Tractor mowing should occur when soils are dry enough not to be disturbed by tires/tracks, and the mowing deck must be set a minimum of 15 cm (6 in) above the ground for all covered plants.
- Mowing will be avoided when soil is saturated to avoid compaction and rutting.
- Spring mowing is only allowed where it is necessary to control a weed infestation involving a weed species reproducing mainly by seed (e.g., meadow knapweed), in which case up to ½ of the listed and/or covered plant population may be mowed in an effort to control invasive species seed set.
- Flail mowers will not be used.

1.2.1.1 Fender's Blue Butterfly

In areas with Fender's blue butterfly, mowing will occur under the following limitations.

- Mowing will be limited to June 15-February 15 at sites with Fender's blue butterflies.
- After the flight season and before Kincaid's lupine senescence (June 15 – July 15), tractor mowing may occur no closer than 2 m (6 ft) from the nearest Kincaid's lupine plant.
- Mowing with hand-held mowers may be implemented during the flight season (May 1 – June 15) so long as a buffer of ≥ 8 m (≥ 25 ft) is maintained between the mower and any Kincaid's lupine plants.
- Mowing may be conducted throughout the site after Kincaid's lupine has senescence and before lupine re-emerge the following spring (generally July 15 – March 1).
- Tractor decks will be set at a minimum of 15 cm (6 in) above ground to reduce impacts to Fender's blue butterfly larvae.
- Flail mowers will not be used.

1.2.2 Prescribed Burning

The purpose of this treatment is removal and control of invasive woody plants, thatch removal, preparation for seeding and planting, and invigoration of native plant populations. The area burned in any given year at each site, also called the annual burn unit, will be determined yearly based on individual site conditions and population sizes.

- All burns will comply with state regulations and protocols.
- Woody debris will be removed from the burn unit prior to burning as needed to reduce fire intensity.
- Appropriate barriers will be used to contain burns such as perimeter mowing, wet lines with hose lays, disk lines, foam or other retardants, etc.
- Fire retardant chemicals will be used sparingly near listed and/or covered plant species and will follow labeled restrictions and state regulations or guidelines for use near water.
- Fire management vehicles will be restricted to areas of dry soil.

1.2.2.0 Fender's Blue Butterfly (FBB) Habitat

- At sites supporting 100 or more FBB, the burn unit will encompass no more than 1/3 of the occupied FBB habitat.
- At sites supporting less than 100 FBB, the burn unit will encompass no more than ¼ of the occupied FBB habitat.
- The center of the burn unit must be within 100 m (100 yds) of unburned occupied habitat.
- Butterfly larvae habitat (Kincaid's lupine patches) adjacent to the burn unit may be additionally protected with a fire barrier, where appropriate.
- USFWS has set a limit to the total area of occupied Fender's blue habitat throughout the species geographic range that may be burned in any single year (USFWS 2008a). This limit is 400 ha (1,000 ac). Prior to prescribed burns, USFWS will be consulted to determine if the area proposed for burning is compatible with regional habitat management activities.
- If post-burn butterfly numbers show a stable or increasing population, burning may continue on a rotational cycle with continued monitoring. If the butterfly population declines, USFWS will be consulted prior to additional burns (See HCP Chapter 7: Monitoring and Adaptive Management.

1.2.2.1 Covered Plant Species Habitat

- Prescribed burning will occur as needed to restore habitat for Nelson's checkermallow, Bradshaw's lomatium, Kincaid's lupine, peacock larkspur, and Willamette daisy. Where prior research has demonstrated that fire effects are positive or neutral for these Covered Species (such as Bradshaw's lomatium, Kincaid's lupine, peacock larkspur, and Willamette daisy), 100% of the populations may be burned in any given year. For those species with uncertain

responses to fire (such as Nelson's checkermallow), burning will be limited to 50% of the population until research indicates fire effects are positive or neutral.
- Frequency of burning will depend on habitat conditions, Covered Species population trends, funding, staffing, weather, and fire conditions.
- Prescribed burning will occur in late summer or early fall after the Covered Species have gone dormant.

1.2.3 Chemical Treatment

Chemical treatments are used to control woody vegetation and invasive species. However, chemical treatments will be used sparingly as they may have a lethal effect on non-target native species and butterfly larvae.

- Any herbicide used will be part of an Integrated Pest Management Plan.
- All listed and/or Covered Species will be closely monitored following herbicide application to identify any immediate adverse effects.
- Percentage cover measurements (or abundance measurements) will be taken in the spring to determine if the herbicide treatment has adversely affected any listed and/or covered plant species.
- Herbicides will be applied by a licensed applicator, using appropriate equipment and best management practices.
- Exposure of non-targeted species to herbicides, especially Covered Species, associated with drift, leaching to groundwater, and surface runoff will be avoided or minimized.
- Chemical treatments will follow labeled restrictions, including limitations for use near water.

1.2.3.0 Acceptable Chemicals

Only the chemicals in Table J.1 below are acceptable herbicides for management of habitats under this Plan. If new, more effective or less toxic herbicides become available, Benton County will coordinate with USFWS and ODA to update this Appendix for their inclusion.

1.2.3.1 Controlling Herbicide Drift

The following procedures will be used to control herbicide drift:

- The lowest effective nozzle pressure and minimum effective nozzle height recommended by the nozzle manufacturer will be used.
- Droplet size shall be at least 500 microns.
- Spraying will not occur where winds exceed the wind limits specified by the manufacturer and in no event shall winds exceed 11 km (7 mi) per hour.
- Spraying shall occur when temperatures are below 30° C (85° F).
- Drift retardant adjuvants may only be used for boom spray applications and must be non-toxic and applied under the above strict application requirements.
- Dyes may be used for applications to ensure complete and uniform application and to observe the amount of drift.

1.2.3.2 Restrictions for use near Fender's blue butterfly

Research to date indicates that Fender's blue larvae are not damaged by some herbicides such as glyphosate, pendimethalin, imazapic, and fluazifop under field application conditions when herbicides are applied in September-November (Clark et al. 2004). This may be because the larvae are buried in leaf litter and shielded from direct contact with these herbicides.

- For non-tested herbicides, broad scale application will be limited to a portion of the occupied habitat (areas with Kincaid's lupine that may host larvae) during the season when larvae are buried under leaf litter.
- The area allowed for herbicide application will be less in small compared to large butterfly populations. These restrictions are noted in Table J.1.

1.2.3.3 Restrictions for use near Nelson's checkermallow

In some cases Nelson's checkermallow does not go completely dormant in the fall and winter. Therefore, use of herbicides when this species is present requires additional precautions:

- Plants must be shielded from herbicide drift or overspray with buckets, tree protection tubes, or other suitable material or method of application. Application should be by hand (e.g., backpack sprayer wand) when spraying within 2 m (6 ft) of Nelson's checkermallow plants.
- Exceptions include herbicides that do not harm Nelson's checkermallow (such as grass-specific herbicides) and wipe-on applications that target other species and do not result in drift. These exceptions are noted in Table J.1.

1.2.3.4 Shade Cloth

Shade cloth is used to control dense weed infestations. A dark cloth is placed over the infestation and fastened to the ground with stakes. The cloth is generally removed after two years.

- Shade cloths shall be installed during the growing season, but will not be used directly over any Covered Species or within 5 m (15 ft) of Kincaid's lupine plants in order to prevent impacts to Fender's blue butterfly eggs or larvae.
- A qualified specialist will direct the on-site implementation of this technique to reduce potential impacts to any covered plant species.

1.2.4 Solarization

This technique is also used to control dense weed infestations and may be combined with tilling prior to treatment. The weed infestation is covered with plastic sheeting and remains in place for at least three months during the subsequent growing season. Once the plastic is removed, follow-up weeding may be necessary.

- This technique will be used not bused over any Covered Species and no closer than 5 m (15 ft) to Kincaid's lupine plants in order to prevent impacts to Fender's blue butterfly eggs or larvae.

- Solarization can be used for site preparation prior to reintroductions or augmentations.
- A qualified specialist will direct the on-site implementation of this technique to reduce potential impacts to any covered plant species.

1.2.5 Tilling/Disking

Tilling and disking is used to remove invasive species.

- Tilling/disking will, to the extent practicable, be implemented along existing ground contours.
- Tilling/disking shall not occur during the wet season to minimize alterations to site hydrology and destruction of the soil structure.
- Absent the need for additional weed control (such as solarization), tilling/disking will be immediately followed by planting native plant species groundcover via seeding or outplanting.
- This technique will be used no closer than 5 m (15 ft) to Covered Species.

1.2.6 Raking

Raking is used to reduce thatch build up.

- Rakes may be tractor mounted or hand held.
- Raking will occur after listed and/or covered plants have gone dormant for the season.
- Efforts will be made to avoid disturbing the underlying soil.
- At sites with 100 or more Fender's blue butterfly, no more than 1/3 of the site may be racked annually.
- At sites with less than 100 Fender's blue butterfly, no more than ¼ of the site may be racked annually.
- Efforts will be made to identify and avoid Nelson's checkermallow.
- Tractors shall be equipped with rubber tracks to minimize soil compaction when needed.
- Thatch and leaf litter will be removed off site.

1.2.7 Sod Rolling

Sod rolling is used for invasive species removal, especially those with rhizomes.

- This technique will be used no closer than 5 m (15 ft) to covered plants and butterflies.
- This method may be used for site preparation prior to introductions or augmentations.

1.2.8 Grazing

Grazing may be used to control woody vegetation encroachment and invasive species. Grazing shall be permitted to occur if it is managed so as not to impede the ability of

the Covered Species to survive and reproduce. The following guidelines are suggested to avoid negative impacts from grazing. Monitoring and adaptive management that is completed in grazed areas will provide additional management guidelines.

In areas with the Covered Species:

- Grazing will not occur during the wet season when soils are soft.
- Grazing will not occur at intensities that result in trampling or creation of bare soil.
- Grazing at low to moderate levels during the dry season (after July 15) is generally allowed in most upland prairies.
- Grazing in areas with Kincaid's lupine may be possible once soils are sufficiently dry, and before the lupine is dormant, as this species is generally not palatable to most livestock.
- No grazing shall occur in areas with Nelson's checkermallow present, as this species frequently does not go completely dormant.
- No grazing shall occur in areas with Fender's blue butterfly larvae present, as the impacts of trampling on larvae are unknown.
- The type of animals used will depend upon the type of invasive species control needed, availability of the animals, and the time of year control is needed.
- Animals brought in from another site will be cleaned of weed seeds prior to use.

1.2.9 Biological Control

- Currently there are no biological controls for invasive species of concern. If in the future such controls become available, Benton County and/or any holder of a Certificate of Inclusion will work with the USFWS, ODA, and the appropriate state agency, to develop a plan for use of these control methods. Any biological control method used will be part of an Integrated Pest Management Plan.

Table J.1. Approved Herbicides

Herbicide	Brand Names(s)	Surfactant or Adjuvant	Target Species	Application Period	Application Method	Restrictions
Triclophyr	Garlon		Woody species and broadleafs	February 1–August 15: wipe on applications only. August 15–October 31: spray and wipe applications. August 15–April 1: Applications in areas with Nelson's checkermallow, provided restrictions are followed	Woody Species: Hand painted or directly wicked onto fresh cut stumps within 24 hours of cutting. Broadleaf Species: Apply using a hand-held wand or mounted on an all-terrain vehicle.	**Fender's blue butterfly:** Do not spray over Kincaid's lupine where Fender's blue is present
Glyphosate	Rodeo, Round-up, Aqua-Master, Accord	Vegetable oil based surfactant	Grasses and broadleafs, some woody species including blackberry	February 1–August 15: wipe on applications only. August 15–October 31: spray and wipe applications. August 15-April 1: Nelson's checkermallow, provided precautions are followed	Apply with a hand-held wand or boom mounted on an all-terrain vehicle.	**Nelson's checkermallow:** No covering of Nelson's checkermallow is required where glyposhate is applied with a weed wipe (target upper grass stems, avoiding Nelson's checkermallow plants.) **Fender's blue butterfly:** Apply in fall with an all-terrain vehicle boom mounted sprayer or via spot treatment of target plants.
Imazapic	Plateau	Vegetable oil based surfactant	Grasses and broadleaf sp. (pre- and post-emergent)	September 1-November 30: Spray or wipe on.	Apply with a hand-held wand or boom mounted on an all-terrain vehicle.	**Fender's blue butterfly:** Apply in fall with an all-terrain vehicle boom mounted sprayer or via spot treatment of target plants.

Herbicide	Brand Names(s)	Surfactant or Adjuvant	Target Species	Application Period	Application Method	Restrictions
Pendimethalin	Pendulum		Grasses and broadleaf sp. (pre-emergent)	September 1-November 30: Spray on	Apply with a hand-held wand or boom mounted on an all-terrain vehicle.	Control germination of seeds; will not harm established plants. **Fender's blue butterfly:** Apply in fall with an all-terrain vehicle boom mounted sprayer or via spot treatment.
2,4-D amine	Weedar 64	Vegetable oil based surfactant	Broadleaf sp.	February 1 – August 15: wipe on applications only. August 15 – October 31: spray and wipe applications. August 15- April 1: Nelson's checkermallow, provided precautions are followed.	Apply with a hand-held wand or boom mounted on an all-terrain vehicle..	**Fender's blue butterfly:** With areas supporting 100 adult FBB, the area to be treated will be no more than 1/3 of the occupied habitat. For sites supporting fewer than 100 adult FBB, the area to be treated will be no more than ¼ of the occupied habitat. .
Clethodim	Envoy	Vegetable oil based surfactant	Non-native grasses	June 1 – October 25: upland prairie. August 1 – October 25: Wet Prairie.	Apply with a hand-held wand or boom mounted on an all-terrain vehicle. Weed wiping during the growing season near covered plants should target taller grasses, avoiding low-stature plants.	**Nelson's checkermallow:** No covering of Nelson's checkermallow is required. **Fender's blue butterfly:** With areas supporting 100 adult FBB, the area to be treated will be no more than 1/3 of the occupied habitat. For sites supporting fewer than 100 adult FBB, the area to be treated will be no more than ¼ of the occupied habitat.
Sethoxydim	Poast	Vegetable oil based surfactant	Grasses	Upland Prairie: June 1 – October 25 Wet Prairie: August 1 – October 25 General: February 15 – May 15 (early application)	Apply with a hand-held wand or boom mounted on an all-terrain vehicle.	**Nelson's checkermallow:** No covering of Nelson's checkermallow is required. **Fender's blue butterfly:** With areas supporting 100 adult FBB, the area to be treated will be no more than 1/3 of the occupied habitat. For sites supporting fewer than 100 adult FBB, the area to be treated will be no more than ¼ of the occupied habitat.

Herbicide	Brand Names(s)	Surfactant or Adjuvant	Target Species	Application Period	Application Method	Restrictions
Fluazifop-P-butyl	Fusilade	Vegetable oil based surfactant	Grasses	Upland Prairie: June 1 – October 25 Wet Prairie: August 1 – October 25 General: February 15 – May 15	Spot foliar application using a hand-held wand or mounted on an all-terrain vehicle. If weed wiper is used to apply Fluazifop-P-butyl near listed or covered plants during the growing season, the herbicide shall be applied at a height to target the upper grass stems and avoid lower stature listed and/or covered plant species.	**Nelson's checkermallow:** No covering of Nelson's checkermallow is required. **Fender's blue butterfly:** Apply in the fall or winter with an all-terrain vehicle boom mounted sprayer or via spot treatment.
Oryzalin	Surflan	Activator 90	Grasses	Upland Prairie: August 1 – October 31	Broadcast spray application using a backpack sprayer with a hand-held wand.	**Nelson's checkermallow:** Protect plants from herbicide drift or overspray (species does not go dormant), cover using buckets, tree protection tubes, or other suitable material that covers or shields the plants. **Fender's blue butterfly:** Apply in the fall with an all-terrain vehicle with boom sprayer or via spot treatment. With areas supporting 100 adult FBB, the area to be treated will be no more than 1/3 of the occupied habitat. For sites supporting fewer than 100 adult FBB, the area to be treated will be no more than ¼ of the occupied habitat.

Appendix K: Project Site Survey and Reporting Protocols for Plant and Butterfly Habitat

1.1 Introduction

This appendix provides protocols for completing a survey of a proposed project site for Covered Species.

1.2 Survey Windows

Surveys to document the presence or absence of Covered Species must occur during the season when the species are identifiable. In some cases this may need to be several months prior to habitat restoration or maintenance actions.

Nelson's checkermallow and Kincaid's lupine can be confused with similar, more common species, so surveys for them can be of two types. "Presence surveys" are conducted when the species can be positively identified (while the plants are in flower). "Absence surveys" are conducted during seasons when leaves of the species are reliably present so that if leaves are not encountered, neither the Covered Species nor its look-alike are present. Absence surveys can be conducted over a wider window of time than presence surveys. The two types of surveys can be used in series. If an absence survey finds the species may be present, a follow-up presence survey will be required for a positive identification. If the absence survey shows that the species is absent, no further survey is required.

1.2.0 Nelson's checkermallow (*Sidalcea nelsoniana*)

- Absence surveys can be conducted prior to and during the blooming period (April through July) to rule out the presence of any checkermallow species by looking for plants in a vegetative state.
- Presence surveys for *Sidalcea nelsoniana* must be conducted during the blooming period, mid June through mid July, to distinguish this species from other *Sidalcea* species, including field and rose checkermallow.

1.2.1 Peacock larkspur (*Delphinium pavonaceum*)

- Surveys should be conducted during the blooming period from May 1 through June 15.

1.2.2 Kincaid's lupine (*Lupinus sulphureus* ssp. *kincaidii*)

- Absence surveys may be conducted from March 1 through July 31.
- Presence surveys must occur from May 1 through June 30.

1.2.3 Bradshaw's lomatium (*Lomatium bradshawii*)

- Surveys should be conducted during the blooming period from April 1 through May 31.

1.2.4 Willamette daisy (*Erigeron decumbens*)

- Surveys should be conducted during the blooming period from June 1 through July 15.

1.2.5 Fender's blue butterfly (*Icaricia icarioides fenderi*) habitat

- Surveys for butterfly host plants (Kincaid's lupine) should be completed as described in Section 1.2.2. Surveys for nectar species can generally be completed during the flight period of the butterfly, May 1- June 15.

1.2.6 Taylor's checkerspot butterfly (*Euphydryas editha taylori*) habitat

- Surveys for butterfly host plants (English plantain) can be completed during the growing season. Surveys for nectar species can generally be completed during the flight period of the butterfly, which usually occurs between April 1 and May 31.

1.3 Qualifications for Botanical Surveys

The biologist or natural resource specialist conducting botanical surveys and providing direction and guidance regarding protection of Covered Species during vegetation management activities must possess the following qualifications:

- Experience conducting floristic field surveys and/or butterfly surveys depending on the species being targeted for survey.
- Familiarity identifying Willamette Valley prairie species and high priority weed species.
- Experience identifying each of the five covered plant species.

1.4 Field Survey Protocol

To ensure no rare species are missed during surveys, all species in the project area (area to be impacted by the proposed project) will be identified to species, subspecies, or variety, as applicable. Some sites may require more than one visit during the

growing season to ensure an accurate inventory of Covered Species at the site (i.e., if the site contains habitat for both Bradshaw's lomatium and Nelson's checkermallow the surveyor may need to visit the site in April to look for Bradshaw's lomatium and in June or July to look for Nelson's checkermallow).

All habitats within the project area will be surveyed thoroughly in order to properly inventory and document the plant species present. Population boundaries of any Covered Species populations will be mapped using GPS and sketch maps on aerial photos, to identify the location as accurately as possible. The number of individuals in each population will be counted or estimated, as appropriate (i.e., individual peacock larkspur plants will be counted while lupine abundance would be recorded as area of foliar coverage in m^2).

1.4.0 Required Reporting and Documentation

Written survey reports will include the following sections, some of which will be completed by the biologist/natural resource specialist, and some of which may be completed by the permit applicant or Cooperator.

1.4.1 Project location and description

- A detailed map of the location and footprint of the proposed project.
- A detailed description of the proposed project, including one-time or ongoing activities that may affect botanical resources.
- A description of the general biological setting of the project area.
- Dates of surveys and rationale for timing and intervals; names of personnel conducting the surveys; and total hours spent in the field for each surveyor on each date.

1.4.2 Results

- A description and map of the vegetation communities on the project site.
- A description of the phenology of each of the plant communities at the time of each survey date.
- A list of all plants observed on the project area using accepted scientific nomenclature, along with any special status designation. The reference(s) used for scientific nomenclature shall be cited.
- Written description and detailed GIS map(s) showing the location of each Covered Species, butterfly nectar-plant species (if within the Fender's Blue Butterfly nectar zone), or locally significant plant found, the size of each population, and method used to estimate or census the population.
- Copies of survey forms (if applicable) and accompanying maps.

1.4.3 Discussion

- Any factors affecting the results of the surveys
- An assessment of potential impacts of the proposed project to the Covered Species. This shall include a map showing the distribution of Covered Species and locally significant plants and communities on the site in relation to the proposed activities. Impacts to the Covered Species shall be discussed.
- Recommended measures to avoid and/or minimize impacts.
- References cited and persons contacted.
- Qualifications of surveyor(s) - a Curriculum Vitae or similar.

Appendix L: Plant Material Collection and Plant Introduction Protocols

1.1 Introduction

To mitigate for impacts to Covered Species of plants resulting from one or more Covered Activities (including habitat restoration and enhancement activities), Benton County and Cooperators will, in addition to habitat enhancement, increase covered plant abundance through population introduction, augmentation, and relocation.

- Introduction is the establishment of a new population in suitable habitat.
- Augmentation is addition of more individuals to an existing wild population.
- Relocation involves movement of individuals from an existing wild population to a new site or different existing population.

Augmentation of existing populations by adding individuals will be given highest priority, where possible and appropriate, because it increases the viability of existing populations and targets plantings to areas where the habitat is known to be appropriate. Introductions into areas currently unoccupied by the Covered Species will be used to recreate a lost population at a suitable site. Relocations of existing populations will occur in circumstances where the covered plant species will be permanently impacted, and may be used as a method of population introduction or augmentation.

The following protocols[1] outline how plant introduction, relocation and augmentation (hereinafter "Plant Introductions") activities will occur at Prairie Conservation Areas (PCAs). The entity conducting work (collection, transportation, storage, cultivation, etc.), must comply with existing state and federal regulations, and possess any required permits.

1.2 General Protocols

Plant introductions will be accomplished by collecting seeds from covered plant species and then planting them directly or cultivating plugs from the seeds, or both, depending upon the species.

[1] Protocols based in part on USFWS Programmatic Formal Consultation on Western Oregon Prairie Restoration Activities, August 14, 2008.

To ensure plant introductions serve to ultimately benefit and not harm the species, such mitigation activities will follow these guidelines. In addition, this work will be performed under the supervision of a qualified specialist. If during the course of the Permit, other treatment options other than those listed in this HCP become available or are identified through the adaptive management process, Benton County will present these options to the USFWS and ODA, and the parties will decide whether the options should be incorporated into these protocols.

1.2.0 Target Site Selection

Inappropriate site selection is the most common cause of rare plant introduction failure. To improve the success of plant introductions, target sites shall include habitat appropriate for the Covered Species. Factors to consider include geographic distance from the site of origin, soil type, aspect, elevation, hydrology, and plant community. All target sites shall be in areas within the species' current range and habitat type. The risk of hybridization with closely related species shall be reduced by prioritizing sites with no closely related species (species in the same genus) present. Seeds and other plant materials used in introductions should originate from genetically diverse sources (largest sample sizes possible) and should be from populations as near to the target site as possible, with priority to sites within the same Recovery Zone as defined in the Draft Recovery Plan (USFWS 2008b). All sites will be surveyed for presence of listed and/or covered plant and butterfly species using the HCP site survey protocols prior to initiation of plant introduction projects.

1.2.1 Plant Material Collection

Seeds and rhizomes of existing covered plant species populations may be collected and used for habitat restoration and enhancement projects. A qualified specialist will determine the number of propagules (seeds and rhizomes) needed for plant introduction objectives based on the number of individuals needed for mitigation or other restoration objectives.

The collection limits for each covered plant species in any single year shall be as follows (From USFWS 2008i):

Species	Populations under 50 individuals	Populations between 50-500 individuals	Populations of >500 individuals	Any population to be permanently impacted by a Covered Activity
Bradshaw's lomatium	50% of seeds	15% of seeds	25% seeds	100% of seeds and plants
Kincaid's lupine	50 % of seeds	15% of seeds	25% of seeds	100% of seeds and plants
Nelson's checkermallow	50% of seeds, 2% of rhizome biomass	15% seeds, 2% of rhizome biomass	25% of seeds, 2% of rhizome biomass	100% of seeds, plants and rhizome biomass
Peacock larkspur	50% of seeds	15% of seeds	25% of seeds	100% of seeds and plants
Willamette daisy	50% of seeds, 2% of rhizome biomass	15% of seeds, 2% of rhizome biomass	25% of seeds, 2% of rhizome biomass	100% of seeds, plants and rhizome biomass

Seeds

Persons collecting seeds may gather loose seeds or seed pods, capsules, or heads. Seeds pods, capsules, or heads may be removed by hand or by using cutting devices. Mesh bags may be tied over stems with developing fruits to capture seeds, a technique especially useful for species whose seeds disperse when seed pods snap open, such as Kincaid's lupine. Collectors should avoid damage to the plants by minimizing trampling, removing as little tissue as possible from the plants during seed collection (unless the plants are already senescent), and removing seeds in a manner that does not result in plants being pulled from the ground. Loose seed from the plant or the ground may be gathered by hand or with hand-held harvesting devices, such as flails or hoppers, a method most appropriate when collecting seeds from large populations. In general and as possible, collections should be made from twenty or more individuals and avoid obtaining a large proportion of seeds from any single individual to minimize genetic drift from uneven sampling.

1.2.1.0 Rhizomes

Rhizomes from mature plants shall be exposed by careful hand digging to avoid harm to the plants or exposing plant roots. Any exposed rhizomes shall be reburied. Rhizomes shall be taken from throughout the population to maximize genetic diversity.

1.2.1.1 Relocated Plants

Where the entire plant will be relocated, care shall be taken to avoid damage to any parts of the plants, including the roots.

1.2.2 Transport

Seeds shall be cleaned by hand, sieve, or blower as appropriate to the species prior to transfer to storage containers. Rhizomes shall be stored in cool moist conditions until transferred to potting medium or to the new site. Transport will be completed as quickly as possible. During transport, propagules shall be protected from temperature and moisture extremes.

Containers will be labeled with name of plant, place of collection, and date of collection. Propagules from individual plants may be placed in separate containers, if appropriate.

1.2.3 Storage

Propagules will be cleaned and properly stored prior to cultivation or outplanting. Diseased propagules will be removed and discarded. Seeds shall be thoroughly dried before long-term storage.

Seeds shall be stored in airtight and moisture proof containers to maintain their viability. A drying agent, such as silica gel, dry wood ash, diatomaceous earth, dry charcoal, lime, or paper may be used to help absorb moisture in the container. Seed

material may only be stored for up to two years before cultivating or outplanting, unless placed in a cold-storage facility.

Rhizomes shall be stored under cool, moist conditions with a suitable medium to keep them alive and viable until cultivation.

Plants to be relocated shall be stored under cool, moist conditions with sufficient soil and water to keep them alive and viable until transplantation.

1.2.4 Cultivation

Propagules will be grown in a greenhouse or nursery facility where genetic contamination of any produced seeds through cross pollination will be prevented, unless intentional to increase genetic diversity. Mixing of source populations through captive breeding may be conducted when the source population(s) are small or genetic evidence suggests inbreeding depression, genetic drift or other issues may cause progeny to have low fitness. Suitable growing medium, soils, fertilizer, or other chemical additives will be used, as necessary, to prevent algal, fungal, or insect infestations.

Seed and rhizome material and their F1 progeny may be cultivated for plant enhancement activities. Under greenhouse conditions, propagules and their progeny from F1 and F2 generations may be used for introduction and augmentation into prairie habitat. Only F1 generation will be used for subsequent propagation. F2 generation propagules and plant plugs may be outplanted, but further greenhouse or agricultural generation is discouraged unless necessary to produce sufficient propagules for successful establishment of individuals.

1.2.5 Outplanting

Field personnel shall take measures to avoid trampling any Covered Species. Dead and living vegetation, except for listed or Covered Species present, may be cleared away from the immediate planting site to expose the soil. Existing rhizomes of Covered Species will not be disturbed. Any site preparation activities will minimize negative environmental impacts and follow the habitat management guidelines in Appendix J: Prairie Habitat Vegetation Management Guidelines.

Seeds may be sown by either hand-broadcasting or no-till drill. Drilling may be used if soil is dry enough to support vehicle weight without substantial soil compaction and no covered or other listed species are present. Harrowing may be used if no other method is feasible and harrow equipment is operated at least 2 m (6 ft) from existing listed or covered plant species.

Rhizomes or plugs, and if possible, relocated plants, will be planted when soils are saturated by rain – generally November through April (see below for specific timeframes

for the various covered plant species) or when irrigation can be ensured and plants will not be exposed to intense heat. Also, the growing cycles of introduced covered plants should match those growing in the field. Soil will be excavated to the depth and width of the plug or rhizome. Plugs will be inserted directly into the soil or amended soils containing mulch or fertilizer so the rim of the plug is level with the surrounding soil. To reduce desiccation, a small amount of native soil may be added over the plug.

Equipment used during plantings should be cleaned prior to use and disturbance at the target site shall be minimized to avoid spreading non-native plant species.

1.2.6 Timing of Planting or Seeding

Plant introduction projects shall be planned so collection and planting occur at the appropriate time of year. For example, rhizome collection should be targeted for the period when plants are dormant, or when donor-plants will not be killed by the collection procedure. Outplanting of seeds and/or cultivated plugs shall occur within the correct time frame (described for each species below). Relocations shall take place either soon after plants begin growing for the year or after the peak growing season, preferably during cool and moist conditions.

1.2.7 Monitoring

Plant introduction projects will be monitored to determine plant establishment and difference in planting methods (to inform adaptive management). Propagules will be planted in a manner that facilitates subsequent monitoring. To assist with post-planting monitoring, mapped grids, metal tags, or flags will be used to indicate planted areas.

1.3 Species Specific Protocols for Cultivation and Introduction Using Seeds or Cultivated Plant Materials

Research into factors that affect introduction of these species was conducted by Kaye and Brandt (2004) for Bradshaw's Lomatium, Willamette daisy, and Kincaid's lupine. General review of propagation and reintroduction protocols for Covered Plant Species is available in Gisler (2004). Recommendations provided here are largely derived from these sources.

1.3.0 Bradshaw's lomatium

1.3.0.0 Target sites

Plant introduction projects at PCAs will occur in wet prairies. Optimal microhabitats include small depressions or seasonal channels with open, exposed soils (USFWS 1993a) and broad, flat areas of soils with wetland hydrology.

1.3.0.1 Collection

Seeds may be collected for off-site cultivation. Bradshaw's lomatium seeds may be collected by hand off the exposed terminal ends of the flower structure (umbels), and usually are mature in June.

1.3.0.2 Cultivation

Direct seeding and transplanting plugs have both resulted in successful introductions, and both methods may be used in introduction efforts. To break seed dormancy for cultivation in a greenhouse, Bradshaw's lomatium seeds need cold stratification- moist conditions at ~5° C (40°F) for at least eight weeks, followed by warm conditions such as alternating 10°/20°C (50°F/68°F). Once seeds have germinated, they may be potted with a standard soil mix, watered daily, and fertilized bi-weekly.

1.3.0.3 Outplanting

Direct seeding into field sites may be accomplished in the late fall, when seeds can be sown on the ground, either directly on the soil surface, or into areas prepared by raking or light tilling, or other activity that creates bare soil. Seed burial is not necessary for this species. Any soil preparation will avoid impacts to existing Covered Species.

Field planting of cultivated plugs may be conducted in spring or fall when the soil is moist. Fertilizer is not recommended for this species except during fall plantings in areas with little competing vegetation.

1.3.1 Kincaid's lupine

1.3.1.0 Target sites

Plantings will prioritize sites with grassland vegetation with a diversity of forb species, and near Fender's blue butterfly populations and associated butterfly nectar plants. Soils for the lupine are typically well drained but the species does not appear to prefer any single or small group of soil series. Instead, Kincaid's lupine tends to occur on a variety of upland soils and grows poorly in wetland soils. Sites with minimal encroachment of trees and shrubs may be preferred.

1.3.1.1 Collection

Seeds will be collected for off-site cultivation or direct seeding at target sites. Seed is best collected by tying mesh bags over developing fruit clusters and harvesting the bags after the seed pods have snapped open. Bagging is best done in early June and seeds are generally mature in July. Precise dates vary from year to year and site to site.

1.3.1.2 Cultivation

Kincaid's lupine can be successfully cultivated from seed. Seed dormancy may be broken by scarifiying seed (abrading the seed coat) followed by cold stratification at

~5ºC (40ºF) for 4 to 8 weeks. After these procedures, seed will germinate under warm conditions, such as alternating temperatures of 10°/20°C (50°/68° F), either on germination paper or in pots with a suitable soil mix, watered when the soil surface has dried (~twice weekly), and fertilized monthly with 20-20-20 liquid fertilizer. Survival rates of Kincaid's lupine seedlings grown from several seed sources vary from 58% - 100%. Plant health and subsequent growth after planting may be improved by adding nodulating bacteria (e.g., *Bradyrhizobium lupinii*) to the germinating seed or during potting.

1.3.1.3 Outplanting

Direct seeding may use either scarified or non-scarified seeds in the fall and winter, although seedings in winter may be most successful if seeds are scarified. Non-scarified seeds should be direct-seeded at project sites from October to January; while scarified seeds may be planted October through March. Seeds should be sown without fertilizer onto soil, raked ground, or lightly tilled soils, either on the soil surface or buried to a depth of 0.25-1.0 cm [1/8 to ½ in]). Invasive species will be cleared to the extent practicable prior to seeding.

Field planting of cultivated plugs may occur in late fall, late winter, or early spring. Plugs can be planted by hand into pre-excavated soil pits suitable to accommodate the plug along with soil amendments, if necessary (including mix of planting or native soils). Nitrogen fertilizer should not be used, but phosphorus and micronutrient fertilizers may provide the species with advantages over non-leguminous competing vegetation.

1.3.2 Nelson's checkermallow

1.3.2.0 Target site

Planting sites should contain at least one of the following: remnant native wet prairies, wetlands, ash swales, riparian areas, or small clearings with hydric soils and edges with fairly open canopy. None of the areas should have persistent flooding into later spring, although saturated soils during the raining season (inundation for several weeks or longer) or flooded soils mid-November through mid-April is acceptable (Gisler 2004, Bartels & Wilson 2003).

1.3.2.1 Collection

Seeds and rhizome cuttings will be collected for off-site cultivation of plugs needed for seed increase, plant increase, and introductions. Seed capsules or loose seeds may be collected. Seeds generally mature in July-August. A maximum of two 8 cm (3 in) long rhizomes segments per plant may be collected, or up to 2% of a single plant.

1.3.2.2 Cultivation

Nelson's checkermallow can be cultivated using both seeds and rhizome cuttings. Some seed may need to be cold stratified for 8-12 weeks at ~5° C (~40° F) to break

dormancy, followed by exposure to warm conditions such as room temperature. Seeds can be germinated in flats; transferred to pots containing appropriate soil such as bark, compost, peat, vermiculite, and Phillips Pre-mix (Gisler 2004); then transferred to larger outdoor beds before introduction to a target site.

Large plants can be divided to generate more individuals for planting, although plantings should ensure that genetic diversity is maximized by, for example, including individuals derived from sexual reproduction. Large, reproductively mature individuals are possible within two-three months of planting using divisions, and within three-five months using seeds, when they are supplied with ample light, warm temperatures, irrigation, and fertilization.

Rhizomes can be cultivated under greenhouse conditions or in field beds. No special soil mixtures, symbionts, or special growing conditions are necessary to achieve growth so long as pest infestations are prevented (Gisler 2004).

To minimize the risk of hybridization, different *Sidalcea* species should not be cultivated closely together.

1.3.2.3 Outplanting

Planting greenhouse-grown container stock has proven most effective to date, but direct seeding may be a useful technique at some sites and if ample seeds are available, such as through a seed increase program. Plugs can be transplanted by hand into pre-excavated soil pits suitable to accommodate the plug and soil amendments (including mix of planting or native soils) after the arrival of the fall rains and before June.

Plantings will not occur at sites south of the natural southern range limit of the species, which is approximately McFarland Road in southern Benton County.

1.3.3 Peacock larkspur

1.3.3.0 Target Site

Sites for peacock larkspur introduction shall contain appropriate habitat. Peacock larkspur habitat includes native wet and upland prairie communities (often the slightly higher, drier, more well-drained microsites within and adjacent to wetlands), shady Oregon ash and Oregon white oak woodland edges (forest clearings), native prairie grasslands, and in floodplains on well-drained mounds (Finley and Ingersoll 1994). Previous research has found peacock larkspur to occur at elevations ranging from 46 to 122 m (150 to 400 ft) (Gisler 2004), in shallow, slightly acidic soils (5.38 pH), with low organic matter (11.28%), and mostly sand and silt soil particles (Goodrich 1983). Additional evaluations could broaden these observations. Peacock larkspur tolerates seasonal inundation.

1.3.3.1 Collection

Seeds for cultivation and restoration projects will be collected initially from wild populations. Fruits on the lower portions of fruiting stems tend to produce the greatest numbers of seed per fruit. Seeds generally mature in June.

1.3.3.2 Cultivation

Peacock larkspur can be successfully cultivated in a greenhouse or in outdoor beds, and does not require specialized soil amendments or soil symbionts. The larkspur can be cultivated using seeds. Seeds may need to be cold stratified in a refrigerator at ~5°C [~40°F] for 12-16 weeks to break dormancy, after which they may be placed in pots with standard sterilized potting mixture, and watered and fertilized as needed.

1.3.3.3 Outplanting

Peacock larkspur seeds, plugs or tubers may be planted upon arrival of fall rains. To date there have been no published studies evaluating methods or success of direct seeding, transplanting or introducing this species, although tubers have been successfully transplanted. Once planted, seedlings require up to five years or more to become reproductively mature, although some individuals appear to grow and flower rapidly.

Hybridization with other *Delphinium* species is a concern. To minimize the risk of hybridization, different *Delphinium* species will not be cultivated closely together, and outplanting sites should be checked for the presence of other *Delphinium* species and plantings should occur no closer than 100 m from any resident populations of different species.

1.3.4 Willamette daisy

1.3.4.0 Target Site

Willamette daisy is found in both wetland and upland habitats in the Willamette Valley, including bottomland grasslands consisting of flat, open, seasonally flooded prairie especially those with some bare soil and little litter layer between the large bunches of grasses (Kagan & Yamamoto 1987), and upland prairie sites having moderate to well-drained soils and a mix of native bunchgrasses such as *Festuca roemeri* (Roemer's fescue), *Bromus carinatus* (California brome), and *Elymus glaucus* (blue wild rye) (Clark 2000).

1.3.4.1 Collection

Both seeds and rhizome cuttings may be collected for off-site cultivation of plugs for use in plant introduction projects. Seed heads or loose seed may be gathered. Seeds generally mature in mid to late July. Rhizomes of approximately 2.5 cm (1 in) length may be harvested from individual plants, but this should be performed only on larger individuals and no more than two rhizome segments should collected per plant.

1.3.4.2 Cultivation

To maximize germination rates, seeds need to be cold stratified at ~5°C (~41ºF) for 10-16 weeks followed by alternating 10°/20°C (50°/68° F) temperatures. Seeds may also be scarified at the pappus end or removed from the achene to break dormancy, but this procedure is very labor intensive. Germination rates of 40-78% can be expected within 2-11 days of placement in warm conditions, although germination rates of seeds collected from smaller populations may be low, possibly due to inbreeding depression. After germination, seeds may be planted in pots containing a standard commercial potting mix.

Cultivation of rhizomes may occur under greenhouse conditions or in outside beds. Rhizomes may be dipped in a rooting hormone to stimulate root development and planted 1-2 cm (0.5 - 1.0 in) deep in soil-filled pots. Plants should be rooted within 8-11 weeks, and may be transferred to larger pots or beds.

1.3.4.3 Outplanting

Outplanting of container plants and direct seeding maybe used as techniques to establish plants at field sites. Previous experiments have shown that direct seeding results in relatively low rates (~1%) of plant establishment, so large numbers of seeds may be needed to support this technique, which may require a seed increase program to produce the necessary quantity of seeds. Seeding should be conducted in the fall to provide seeds with a sufficient cold period to stimulate germination.

Plugs may be planted when soils are moist, generally between October and May. Fertilizer should not be used during outplanting. Plugs should be planted primarily in high quality, native prairies with minimal non-native plant cover. To prevent inbreeding depression, individuals should be planted in large patches to maximize opportunities for outcrossing. A 33% survival rate may be expected using rhizome cuttings, although this will vary from year to year, site to site, and among source populations of Willamette daisy.

Appendix M. Roadside and Streambank Management Guidelines for Covered Plants

1.1 Introduction

Management of vegetation on roadsides and some waterways frequently requires actions that disturb the existing vegetation. These activities have the potential to harm or benefit populations of Covered Species. The recommendations in this section ensure that management actions avoid or minimize negative effects on Covered Species in such areas, including Special Management Areas on roadsides and banks along urban streams. Habitat management recommendations for areas specifically designated as Prairie Conservation Areas are presented in Appendix J: Prairie Habitat Vegetation Management Guidelines.

1.2 General recommendations for Management of Roadside and Streambank Vegetation for Covered Plants

- To prevent the spread of noxious weeds and non-native plants by seeds or live plant parts, all equipment (hand tools, vehicles and heavy machinery) should be cleaned to remove mud, debris, and vegetation prior to entering the site.
- Human activities, including walking, in areas occupied by Covered Species will be limited to minimize potential negative effects to Covered Species.
- Vehicle use will be minimized to reduce damage or mortality to covered plants and butterflies.
- Soil disturbance should be avoided to the maximum extent possible during road maintenance activities.
- Projects should minimize alterations to hydrology.
- Weed-free products such as soil, gravel, mulch, and seeds should be used whenever possible.
- Re-vegetation of disturbed areas should be done with native grass/forb seed mixes or transplants.
- Vegetation control will be maintained in “sight distance zones” (areas required to be kept clear of obstructing vegetation for safety reasons), despite the presence of Covered Species.
- Woody plant and noxious weed encroachment should be minimized.

1.3 Specific Guidelines

1.3.0 Mowing

- Mowing will generally occur during the fall and winter, after covered plants have senesced for the season (August 15-February 28).
- Mowing deck must be set a minimum of 15 cm (6 in) above the ground for all covered plants.
- Where possible, mowing with a tractor driving on non-paved surfaces should be avoided when soil is saturated to minimize compaction and rutting. If such mowing must occur, use of rubber tracked equipment is preferred
- Spring mowing is only allowed where necessary to control a weed infestation involving a weed species reproduced mainly by seed (e.g., meadow knapweed), in which case up to ½ of the covered plant population may be mowed in an effort to control seed set.
- No flail mowers will be used.

1.3.1 Cutting/Thinning/Removing Tree Stumps

- Handheld power tools may be used to remove woody vegetation.
- Such activities will occur when Covered Species are dormant or during the flowering season so long as workers take precautions (e.g., marking plant patches with posts and flagging) to avoid trampling of any Covered Species.
- No trees will be removed from Fender's blue butterfly habitat during the flight season, unless a tree is deemed a hazard, and immediate removal is required.
- Stump removal will occur only during dry periods.
- All cut material will be piled or chipped and spread away from any covered plant populations or hauled off-site for disposal.
- If activities occur during the wet season, tree debris may be left on site away from the covered plant species, until the dry season when equipment can access the work area to remove the debris.

1.4 Chemical Treatment

- Chemical treatments may be used to control invasive, non-native species.
- Herbicides will be applied by a licensed applicator, using appropriate equipment and best management practices.
- Exposure of non-targeted species to herbicides, especially covered species, associated with drift, leaching to groundwater, and surface runoff will be avoided or minimized.
- Chemical treatments will follow labeled restrictions, including limitations for use near water.
- Acceptable chemicals are listed in Table J.1

- If new, more effective or less toxic herbicides become available, Benton County will coordinate with USFWS to update this Appendix for their inclusion.
- Precautions to protect Covered Species and control herbicide drift are listed in Appendix J: Prairie Habitat Vegetation Management Guidelines, and Table J.1.

Appendix N. Draft Taylor's Checkerspot Management Plan

Draft Benton County Taylor's Checkerspot Butterfly Management Plan

Photo by Dana Ross

Prepared By Dana Ross and Institute for Applied Ecology
For the Benton County Natural Areas and Parks Department
2009

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1 Introduction

Taylor's checkerspot butterfly (*Euphydryas editha taylori*) is endemic to the Pacific Northwest, and is currently known from only two locations in Oregon, both of which are in Benton County: Beazell Memorial Forest (owned and managed by Benton County Natural Areas and Parks Department) and the Fitton Green Natural Area/Bonneville Power Administration powerline area (private and public property). Benton County is preparing a Prairie Species Habitat Conservation Plan (HCP) to address the protection and conservation of this butterfly along with the Fender's blue butterfly (*Icaricia icarioides fenderi*) and five plant species: Kincaid's lupine (*Lupinus sulphureus* ssp. *kincaidii*), Willamette daisy (*Erigeron decumbens* var. *decumbens*), peacock larkspur (*Delphinium pavonaceum*), Bradshaw's lomatium (*Lomatium bradshawii*), and Nelson's checkermallow (*Sidalcea nelsoniana*).

Benton County seeks to ensure the protection and conservation of known populations of Taylor's checkerspot butterfly on County owned or managed lands, focusing management actions on the protection, enhancement, and maintenance of suitable habitat at key locations. The guidelines set forth in this management plan will assist Benton County in managing their lands in a way that is consistent with protection and conservation of Taylor's checkerspot butterfly. This plan will be updated at least once every ten years, to take into account changes in management techniques and status of the species.

2 Species Description, Reproduction, and Ecology

2.1 Conservation Status

Taylor's checkerspot butterfly has been identified as a candidate for federal listing (USFWS 2006). Although invertebrates are ineligible for state listing in Oregon, the Oregon Natural Heritage Information Center considers it to be threatened or endangered throughout its range (ORNHIC 2007). The Natural Heritage Network ranks the butterfly as G5/T1/S1: species is widespread, abundant, and secure throughout its range, but the subspecies is threatened or endangered, and is critically imperiled in Oregon (ORNHIC 2007).

A petition to list the butterfly was filed by several environmental organizations in 2002 (Xerces et al. 2002); however, the USFWS has not published a decision on the petition

to list (USFWS 2008). If the USFWS lists the species as threatened or endangered under the ESA, a recovery plan and/or critical habitat may be established for the species.

2.2 Taxonomy

Taylor's checkerspot butterfly is a member of the family Nymphalidae – the brush-footed butterflies (Xerces et al. 2002; Stinson 2005), and a subspecies of Edith's checkerspot (*Euphydryas editha*) (Stinson 2005). Checkerspots get their name from the checkerboard pattern on the upper side of their wings (Stinson 2005).

2.3 Species Description

Taylor's checkerspot is a medium sized butterfly with orange, black, and white coloring. The short stubby wings of this subspecies span less than 5.7 cm (2.25 inches) (Xerces et al. 2002). The upper wings are generally black with checkered bands of red-orange, cream and black; the underside forewing is orange with black bars and cream spots; the hindwing has alternating bands of orange and cream spots; and the head and abdomen are black (Stinson 2005).

In Oregon, this subspecies is the darkest of the *E. editha* subspecies (USFWS 2006), with rows of red and creams spots separated by heavy black bands, and with wings proportionately broader and rounder than other subspecies (Stinson 2005, citing Dornfeld 1980). Caterpillars are black with white speckles and bear black branching bristles with an orange base (Stinson 2005, citing Dornfeld 1980 and Guppy & Shepard 2001). Eggs are pale yellow and transparent when first laid, later turning orange and brown (Stinson 2005, citing Scott 1986).

Taylor's checkerspot does not migrate and is one of the first butterflies to appear in spring (Stinson 2005).

2.3.0 Reproduction/Life Cycle

Taylor's checkerspot butterfly goes through four distinct life stages: egg, larva (caterpillar), pupa, adult (Table 1).

Table 1. Life cycle of Taylor's Checkerspot Butterfly in Oregon.

LIFE STAGE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
ADULTS	-	-	x	**X**	**X**	x	-	-	-	-	-	-
EGGS	-	-	-	**X**	**X**	**X**	x	-	-	-	-	-
LARVAE (PRE-DIAPAUSE)	-	-	-	**X**	**X**	**X**	x	-	-	-	-	-
LARVAE (IN DIAPAUSE)	x	x	-	-	x	x	**X**	**X**	**X**	**X**	**X**	**X**
LARVAE (POST-DIAPAUSE)	x	**X**	**X**	**X**	x	-	-	-	-	-	-	-

LIFE STAGE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
PUPAE	-	x	**X**	**X**	x	x	-	-	-	-	-	-

PRESENT: **X**-typical, x-some years.

2.3.0.0 Mating/Egg Laying

Taylor's checkerspot butterfly typically flies from early April through May (Table 1) when mating occurs. Males perch and patrol to find females (Stinson 2005, citing Scott 1986). Taylor's checkerspot butterflies are polygynous with males mating multiple times and females mating once (occasionally twice) with one brood per year (Stinson 2005). Only one to two of the eggs from each female generally survive to adulthood (Stinson 2005, citing Scott 1986). Female butterflies recognize host plant species by the size, color, and shape of the leaf (Stinson 2005); the female then confirms the plant is the correct type by tasting it using forelegs and antennae (Baron & Backhouse 1999). Eggs are layed only on specific host plants.

2.3.0.1 Larvae/Pupation

Eggs hatch simultaneously after about 2 weeks (Stinson 2005) with the resulting gregarious larvae then moving in search of larval food sources (Weiss et al. 1987). Newly hatched larvae starve if food is not available within 10 cm (3.9 inches) (Singer & Ehrlich 1979). Larvae will grow until the fourth or fifth instar (approximately half-grown caterpillars) at which time they will enter diapause as their host plants senesce (Weiss et al. 1987). During diapause no feeding, growth, or development occurs (Scott 1986). The caterpillars resume eating when temperatures rise in the late winter (late January to March), and continue feeding for several weeks. When the caterpillar is fully grown it finds a sheltered spot and enters pupation (Dornfeld 1980). Larval growth rate is affected by microclimate (slope, aspect, degree of sun exposure) (Stinson 2005), with larvae preferring warmer locations (Weiss et al 1987).

2.3.0.2 Pupa

Pupation generally lasts two weeks after which the adult emerges (Pyle 1981).

2.3.0.3 Adults

Adults emerge over a one to several week period of time, with males emerging a few days before females (Stinson 2005). Adult butterflies are active for several days to two weeks. During the flight period male and female adults mate and then females lay their eggs. Adult females emerging earlier in the season improve offspring survival (Stinson 2005). The flight period for adults is typically from early April through May.

Dispersal capabilities of Taylor's checkerspot butterflies have not been studied. In Oregon in 2004, several Taylor's checkerspot butterflies were observed dispersing when weather was good and the butterfly population numbers were high (Stinson 2005 citing M. Vaughn pers. comm.). According to Stinson (2005), male checkerspot butterflies generally do not emigrate with increasing population densities; and checkerspot larvae will move in search of food (host plants) or pupation sites. The timing of available host

and nectar species with the adult flight period is vital to species survival (Baron & Backhouse 1999).

2.3.1 Population Status

Population size can fluctuate greatly from year to year (Table 2), and individual populations are susceptible to local extinction. Taylor's checkerspot butterfly was thought to be extinct in Oregon until a population was discovered in 1999 (A. Warren pers. comm.) on private land owned by Weyerhaeuser Corporation, under a utility easement maintained by the Bonneville Power Administration[2] near Fitton Green Natural Area (ORNHIC 2006). In 2002, there were only four confirmed populations of Taylor's checkerspot butterfly (Xerces et al. 2002) – three in Washington and one in Oregon. In 2004, a population of Taylor's checkerspot butterfly was discovered at Beazell Memorial Forest (owned and managed by Benton County). This site was found to support a population of approximately 500 butterflies (Ross 2005). As of 2004, Oregon's two populations of Taylor's checkerspot butterfly comprised greater than 75% of the known populations in Oregon and Washington (ORNHIC 2006).

Table 2. Taylor's checkerspot butterfly populations in Oregon 2002-2008.

	Population Abundance						
Site	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Fitton Green Natural Area/BPA Powerline Corridor	1,000	750	1,104	1,221	300	650	**765
Fitton Green Natural Area (South Meadow)	NS	NS	NS	NS	1	1	NS
Beazell Memorial Forest	NS	NS	*500	484	150	422	615
Fort Hoskins Historic Park	NS	NS	NS	1	0	0	NS
TOTAL	**---**	**---**	**1,104**	**1,706**	**450**	**1073**	**1380**

NS – Not surveyed *Rough estimate **Includes additional habitat

In 2006, Taylor's checkerspot butterfly abundance in Oregon dropped significantly (Table 2; Ross, 2006). The flight period was delayed and compressed and resulted in a significant drop in butterfly abundance. The first documented butterfly was observed on April 20th, more than one week later than normal. Subsequent warm weather accelerated adult activity with the peak flight period occurring in late April; few

[2] The Bonneville Power Administration has entered into an agreement with the Xerces Society to manage the site, in part, for the conservation of Taylor's checkerspot butterfly.

butterflies were observed in early to mid May. Butterfly abundance appeared to fully recover at Beazell in 2007 and 2008 (Ross 2008).

In 2006 and 2007, additional potential habitat was surveyed, however, no new Taylor's checkerspot populations were found (Ross 2006; Ross 2007).

2.3.2 Range

Historically Taylor's checkerspot butterfly was found in the Willamette Valley, Puget Sound, and south Vancouver Island (Xerces et al. 2002); although its precise historic range is not known (Butterfly Conservation Initiative 2006). Historically there were at least 23 recorded populations in British Columbia; 34 recorded populations in Washington, and 13 recorded populations in Oregon (USFWS 2006). In British Columbia, where Taylor's checkerspot butterfly was recently thought to be extinct a previously unknown population was discovered at Denman Island (USFWS 2006) In Washington, the butterfly is currently known from just 10 sites, and may occur at another 3 sites (Stinson 2005).

In Oregon, the subspecies historically occurred in Benton, Polk, and Lane Counties at 14 sites (USFWS 2006). Today the butterfly is known only from Benton County: Beazell Memorial Forest and near Fitton Green Natural Area/BPA Powerline corridor (Ross 2006), although one butterfly was found at Ft. Hoskins Historic Park in 2005 (Ross 2006).

2.3.3 Habitat

Habitat quality is more important than habitat size (Ehrlich 1992), and habitat heterogeneity is the most important factor in determining habitat quality (Weiss et al. 1987).

Taylor's checkerspot butterfly requires upland prairie habitat, dominated by short-stature grasses such as native fescues (e.g., *Festuca roemeri*) (Stinson 2005). The best prairie habitats include a high abundance of the larval host plant and a diversity of adult nectar sources (USFWS 2006). Each species of butterfly has specific larval host plant and adult nectar plant requirements, where the larval host and nectar plant species may be the same or different (Baron & Backhouse 1999). Taylor's checkerspot requires different plant species to provide adult versus larval nutrition.

2.3.4 Host Species

Pristine native habitats are not always required to sustain some populations of Taylor's checkerspot as powerline rights-of-way are used (in part) by some populations; nor are native plant species always necessary. Larvae primarily feed on paintbrush and plantain species, but utilize other species as well (Stinson 2005) (Table 3). In Washington, Taylor's checkerspot caterpillars feed primarily on English (=narrowleaf) plantain (*Plantago lanceolata*), harsh paintbrush (*Castilleja hispida*), seablush (*Plectritis*

congesta), and blue eyed Mary (*Collinsia parviflora*) (Stinson 2005). In Oregon the primary larval host species is English plantain, a non-native species; and the delay in growth of this host plant in 2006 may have reduced the number of adult Taylor's checkerspot butterflies that year (Ross 2006). For more information about host species, see Table 4.

2.3.5 Nectar Species

Adult butterflies utilize a variety of nectar species (Table 5). Nectar availability affects how many eggs a female butterfly can lay – the more nectar available, the more eggs can be laid (Baron & Backhouse 1999). Adults require food in the form of nectar during their search for breeding partners (Baron & Backhouse 1999), as well as for producing and laying eggs, and producing sperm (Stinson 2005).

The primary nectar species utilized by Taylor's checkerspot in Oregon is strawberry (*Fragaria virginiana*), followed by Tolmie's mariposa lily (*Calochortus tolmiei*), sea blush (*Plectritis congesta*), bi-colored flaxflower (*Linanthus bicolor*) and dandelion (*Taraxacum officinale*) (Ross 2006). Common lomatium (*Lomatium utriculatum*) is also used at one site (D. Thomas pers. comm.). Depending on the timing of the butterflies' flight period, not all of the potential nectar sources may be available for use. For more information on the nectar plant species utilized by Taylor's checkerspot butterfly in Oregon see Table 6.

Table 3. Taylor's checkerspot butterfly larval host species in Washington and Oregon.

Scientific Name	**Common Name**	**Native / Introduced**
Castilleja hispida	Harsh paintbrush	Native
Castilleja attenuata/ Orthocarpus attenuatus	Attenuate Indian paintbrush	Native
Orthocarpus pusillus/ Triphysaria pusillus	dwarf's owl clover	Native
Collinsia grandiflora	giant blue eyed Mary	Native
Collinsia parviflora	Maiden blue eyed Mary	Native
Plectritis congesta	shortspur seablush	Native
Plantago lanceolata	English/narrowleaf plantain	Introduced
Plantago elongata	prairie plantain	Native

Stinson (2005)

Table 4. Detailed information about host plants for Taylor's checkerspot butterfly.

Latin Name	*Plantago lanceolata*	*Castilleja* spp.
Common Name	English plantain	paintbrush
Native or Introduced	Introduced	Native
Annual or Perennial	annual, biennial, perennial	perennial
Form	herb	herb
Bloom Time	April through May	Variable, depending on species
Senescence	After August 15	After August 15
Range	Widespread throughout U.S.	Variable
Benton County Distribution	Common	uncommon
Habitat	Roadsides, open meadows	
Nectar Production		
Collection and Planting	Recommended where localized augmentation of larval host plant is needed. Otherwise, not recommended (non-native weed).	Allow seed pods to dry on the plant before collecting. Usually require a host plant because of their parasitic lifestyle.
Species Descriptions	1.5-9 dm tall, brown-woolly at the base, leaves 5-40 cm long,, pubescent, long-lanceolate, 3-several-ribbed, gradually tapered to the short petiole, usually irregularly denticulate; spike 1-8 cm. long, dense; stamens 4 (Gilkey & Dennis 2001)	

Table 5. Taylor's checkerspot butterfly nectar plant species range-wide.

Scientific Name	Common Name	Native/ Introduced
Armeria maritima	Thrift	Native
Balsamorhiza deltoidea	deltoid balsamroot	Native
Berberis spp.	Oregon grape	Native
Calochortus tolmiei	Tolmie's mariposa lily	Native
Camassia quamash	common camas	Native
Cerastium arvense	field chickweed	Native
Eriophyllum lanatum	woolly sunflower	Native
Fragaria spp.	Strawberry	Native
Linanthus bicolor	bicolored flaxflower	Native
Lomatium triternatum	nineleaf biscuitroot	Native
Lomatium utriculatum	common lomatium	Native
Malus sp.	apple	Cultivated
Mimulus spp.	monkey-flower	
Plectritis congesta	shortspur seablush	Native
Potentilla anserina	Silverweed	Native
*Ranunculus occidentalis**	Western buttercup	Native
Sedum sp.	Stonecrop	
Taraxacum officinale	common dandelion	Introduced
Zigadenus venenosus	meadow death-camas	Native

*This species is only used when other nectar species are not available.
Source: Stinson 2005

Table 6. Detailed information about Taylor's checkerspot nectar plants known in Oregon.

Latin Name	*Calochortus tolmiei*	*Fragaria virginiana*	*Linanthus bicolor*	*Lomatium utriculatum*	*Plectritis congesta*	*Taraxacum officinale*	*Malus* sp.
Common Name	Mariposa lily	Wild strawberry	Bi-colored flax flower, baby stars	Common lomatium	seablush	*Dandelion*	Apple
Native or Introduced	Native	Native	Native	Native	Native	Introduced	Introduced
Annual or Perennial	Perennial	Perennial	Annual	Perennial	Annual	Annual/Biennial	Perennial
Growth Form	Forb	Forb	Forb	Forb	Forb	Forb	Tree
Bloom Time	Mid May-early June	Mid April- Mid May	May-June	Mid April-May	May-June	April-September	Late April-May
Senescence							
Relative preference of Taylor's checkerspot	+++	+++				+	
Benton County Distribution	Common	Extremely common	Somewhat common	Uncommon	Uncommon	Extremely common	Somewhat common
Habitat	Open meadows	Open meadows, roadsides	Open meadows	Moist meadows	Open meadows	All unshaded habitats	Varies
Nectar Production	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Collection and Planting	Bulbs best propagule. Slow to propagate from seed.	Fruits must be collected for seeds.	Seed.	Seed.	Seed.	Not recommended or needed-weedy species.	Cultivated species.
Species Description	Small lily, 15-30 cm tall, one basal leaf, pale pink/white flower, 2.5-4 cm diameter, pubescent petals.	Stoloniferous with blue-green toothed leaves, pale flowers, red fruit with seed like achenes.	Small annual, 2.5-15 cm tall, divided leaves clustered at stem nodes, flower tube 15-25 mm long, short pink lobes.	Stems 3-60 cm tall, leaves finely divided, flat topped umbel of yellow flowers.	Plants 5-60 cm tall, opposite upper leaves, dense inflorescences of small (~3mm across) pink tubular flowers.	Taprooted, basal leaves, flowering stem $\geq$ 40 cm. Leaves pinnately lobed, flower heads yellow.	Small deciduous tree, whitish to pale pink flowers, Typically an escaped cultivated species.

2.4 Threats

2.4.0 Habitat Loss, Fragmentation, and Degradation

Fragmentation, degradation, and loss of habitat are primary factors affecting Taylor's checkerspot butterfly populations (Stinson 2005). Suitable prairie habitat has been lost to agricultural and residential development, succession (encroachment of trees), loss of natural disturbance regimes, and invasive species.

In Oregon, the butterfly's current habitat is shrinking and its quality is diminishing, due primarily to the spread of invasive species, particularly false brome (*Brachypodium sylvaticum*) (Ross 2005). Successional processes which increase the shrub and tree layers are also a continuing threat. Scotch broom (*Cytisus scoparius*), rose (*Rosa* sp.), hawthorn (*Crataegus* sp.), and Douglas-fir (*Pseudotsuga menziesii*) continue to be problematic (Stinson 2005; Ross 2005).

When habitats become fragmented and suitable habitat becomes more widely separated, the butterflies are less able to disperse to these far away sites (Baron & Backhouse 1999). At existing sites, butterfly population size may diminish for any number of reasons (e.g., weather, invasive species competition with nectar and host plants species) which may lead to a decrease in the rate of dispersal and natural recolonization of peripheral sites with suitable habitat.

2.4.1 Fire Suppression

Due to the influx of European settlers onto prairie habitats, the elimination of human-caused disturbances, such as fire, have resulted in the rapid conversion of prairie habitat to Douglas-fir forests (ODFW 2006) reducing habitat availability for Taylor's checkerspot and other prairie-dependent species (Baron & Backhouse 1999). However, fire itself can have a detrimental affect on Taylor's checkerspot butterfly, killing larvae, eggs, and pupae, depending on when prescribed burning activities occur and over how much of the occupied habitat (Xerces et al. 2002).

2.4.2 Invasive Non-Native Species

Invasive non-native species directly compete with host and nectar plant species for water, nutrients, and light and often prevent or reduce butterfly access to host and/or nectar species (Potter et al. 1999; Hays et al. 2000).

Non-native species that threaten native prairie habitats in Benton County include scotch broom, colonial bentgrass (*Agrostis tenuis*), tall oatgrass (*Arrhenatherum elatius*), common velvetgrass (*Holcus lanatus*), Kentucky bluegrass (*Poa pratensis*), sweet vernalgrass (*Anthoxanthum ordoratum*), false brome (*Brachypodium sylvaticum*), rose (*Rosa* sp.), oxeye daisy (*Leucanthemum vulgare*), and meadow knapweed (*Centaurea* x*pratensis*) (Baron & Backhouse 1999; Stinson 2005; Ross 2005).

2.4.3 Vegetation Management

Mowing may kill larvae, eggs, and pupae, depending on the time of year. Hand pulling of vegetation may result in the trampling of eggs, larvae, and pupae (Xerces et al. 2002).

2.4.4 Weather

Weather plays a significant role in the mortality rate of Taylor's checkerspot butterflies (Ross 2006; Stinson 2005); and poses the greatest natural threat. Wind, rain, and hail may knock small caterpillars and egg clusters from host plants. Unseasonably cold weather may kill larvae and adult butterflies (Stinson 2005, citing Guppy & Shepard 2001). Droughts can affect host or nectar species resulting in starvation of the butterfly adults and larvae. The greatest mortality rate occurs during the pre-diapause stage when food plants senesce and the caterpillar is unable to enter the diapause stage (Ehrlich 1987).

2.4.5 Diseases

While Taylor's checkerspot is susceptible to bacterial, fungal, and viral diseases, it is not known at this time what specific diseases may affect the insect at each life stage.

2.4.6 Parasitism

Parasitic flies and wasps lay eggs on the eggs, larvae, and pupae of butterflies (Stinson 2005). The tachinid fly, *Siphosturmia confusa*, is a known parasite of Taylor's checkerspot with the level of parasitism varying from year to year (Stinson 2005, citing Tothill 1913). In Oregon, late instar Taylor's checkerspot caterpillars bearing parasitic wasp larvae and pupae have been observed (Ross 2005).

2.4.7 Predation

Other arthropod groups (i.e. spiders, wasps, dragonflies etc.) are primary predators of butterflies, while lizards, toads, small mammals and small birds also prey on them (Stinson 2005 citing Guppy & Shephard 2001). In Oregon, predation on adult Taylor's checkerspot butterflies by web-spinning spiders and crab spiders has been observed several times (Ross 2005). The degree of impact to associated butterfly populations has not been measured but may be significant (Ross 2005).

2.4.8 Pesticides

Butterflies are very sensitive to pesticides (Ehrlich 1992). Use of pesticides to eradicate gypsy moths may have a lethal effect on associated populations of Taylor's checkerspot and could lead to local population extinctions (Xerces et al. 2002). The chosen pesticide to eradicate the Asian gypsy moth (*Lymantria dispar*) is Btk (*Bacillus thuringinesis* var. *kurstaki*), a pesticide containing a suspension of bacteria used to kill forest and garden insect pests. Btk kills butterfly larvae that ingest foliage sprayed with the pesticide (Barry et al. 1993; Whaley et al. 1998). Btk is generally applied during early spring, a time when Taylor's checkerspot larvae are actively feeding. While

buffers around spray projects may be established, spray drift can negatively impact butterfly populations more than 3 km (2 mi) from the target spray area.

2.4.9 Small Population Size

The small size of remaining Taylor's checkerspot populations makes them especially vulnerable to extinction. Genetic exchange between isolated populations and recolonization of vacant habitat patches is necessary for long-term persistence. Most remaining sites with potentially suitable habitats are beyond a reasonable dispersal distance thereby rendering natural recolonization unlikely (USFWS 2006).

2.4.10 Overutilization for Scientific or Education Purposes

Scientific studies involving the mark-recapture of butterflies have been shown to be detrimental to other *E. editha* subspecies in California (Xerces et al. 2002, citing McGarrahan 1997). Collection of this species, due to its rarity, is also a potential threat (Xerces et al. 2002).

2.4.11 Public Use Activities

Recreational activities, including walking, horseback riding, off-road vehicle use, and picnicking can trample Taylor's checkerspot adults, pupae, larvae, and eggs (Xerces et al. 2002).

3 Habitat Management Guidelines

The following management guidelines are recommended for all County properties having the potential to be occupied by Taylor's checkerspot butterfly (areas known to be occupied or areas of suitable habitat within a reasonable dispersal distance of a known population).

High quality habitat for Taylor's checkerspot in Benton County is generally found within meadows protected by trees and with a south to west exposure and modest slope. The best habitats are dominated by short stature grasses and have an abundance of English plantain and strawberry with a diversity of additional nectar species. These sites will nearly always be of native upland prairie origin. Disturbed or degraded habitats can continue to support Taylor's checkerspot if patches of high quality habitat persist.

Taylor's checkerspot is capable of re-colonizing formerly occupied sites once habitat is again made suitable, but appears to be most successful at doing this if restored sites are close to existing populations of some size. The removal of trees, shrubs and dense, tall grasses combined with the restoration of desired plant species – either naturally or by purposeful augmentation – has been shown to be effective.

3.1 Guidelines for Sites with Taylor's Checkerspot Butterfly

The following guidelines are recommended to avoid negative impacts to Taylor's checkerspot individuals and their habitat:

- Annually define and mark breeding habitat:
    - Establish a 5 to 10 meter buffer around known Taylor's checkerspot butterfly breeding areas within which management activity should be avoided. The perimeter of this area should be clearly marked (flagged) and should also be recorded with a handheld GPS unit (to better assess changes in breeding habitat availability over time).
- Time management activities to avoid flight period:
    - Disturbance to the breeding habitat should be reduced to the extent possible during the flight period (generally April to May).
    - Habitat management activities should be scheduled and conducted according to the timing guidelines presented in Table 7.
- Mow within the following guidelines:
    - Where mowing is used to maintain quality habitat within a single Taylor's checkerspot butterfly site, one-half of the entire (non-breeding core) area may be mowed per year unless additional mowing is deemed necessary to maintain the appropriate low vegetation profile.
    - A mower with a large rotary deck should be used, and blade height set to a minimum 15 cm (6 in) so blades rarely gouge the ground (no more than five percent of the area mowed) and to minimize impacts to low stature native prairie species and Taylor's checkerspot butterfly larvae, if present.
    - Flail mowers will generally not be used.
    - Line trimmers may be used in occupied habitat in early spring, when necessary.
    - Mowed vegetation, to include cut branches from trees and shrubs and excessive cut grass, should be removed from butterfly habitat whenever possible. May be left in place if it is shown to naturally degrade or be dispersed over the winter by natural events within the first post-treatment year.
    - Mowers with rubber tracks or high floatation tires that exert less than 4 psi should be utilized when possible.
- Burn within the following guidelines:
    - Must be conducted with extreme caution when any Taylor's checkerspot butterfly life stage is active and/or vulnerable to its application anywhere on site (Table 7).
    - It is recommended that no more than 1/3 of a site be burned during a given year.
- Use herbicide as necessary within the following guidelines:

  - Must be conducted with extreme caution when any Taylor's checkerspot butterfly life stage is active and/or vulnerable to its application anywhere on site (Table 7).
  - No broadcast spraying of herbicides when butterfly or larvae are active – (January 15th – August 31st). Careful spot-spraying of herbicides targeted at noxious weeds that does not impact larvae, nectar or host species, and does not disrupt normal butterfly behavior can occur at any time.
  - Targeted application of herbicides is preferred over broadcast applications.
  - Utilize lowest residual, least toxic herbicide that gives desired control.
- Remove encroaching trees and shrubs:
  - Identify encroaching trees and shrubs and remove (entirely) every few years by cutting, pulling or mechanical grinding, and removal (trees may be girdled initially but all related woody material must be removed from the meadow environment).
- Re-seed any bare soil created:
  - When management practices expose bare ground (i.e. herbicides, tree removal), native nectar species, short stature native bunch grasses or host plants should be planted as deemed appropriated to enhance habitat.
- Follow the monitoring and adaptive management guidelines in the HCP:
  - Follow habitat restoration monitoring guidelines in Chapter 7: Monitoring and Adaptive Management, of the Benton County Prairie Species HCP.
  - Conduct annual population estimates as possible, to determine management effects on Taylor's checkerspot butterfly populations.
- Maintain and augment host plants:
  - English plantain is the primary larval host species being utilized by Benton County Taylor's checkerspot populations. Habitat management activities should maintain and/or enhance populations of this plant wherever Taylor's checkerspot occurs and at sites where potential recolonization or the purposeful introduction of the butterfly may occur.
  - The potentially useful introduction of native and likely historical larval host plant species may occur at occupied sites on an experimental basis but not at the expense of English plantain or other documented plant resources. Documented use of any alternate host plant by Taylor's checkerspot, while of potential value to the butterfly's long term conservation, in no way diminishes the importance of English plantain as *the* essential larval host plant.
- Maintain and enhance nectar plants:
  - Strawberry is the primary nectar species for Benton County Taylor's checkerspot populations for the foreseeable future. Habitat management activities should maintain and/or enhance populations of this plant.
  - Additional nectar plants may be introduced to occupied sites but not at the expense of strawberry.

Table 7. General habitat restoration/enhancement schedule.

MANAGEMENT ACTIVITY	Taylor's checkerspot butterfly	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
MOW	**PRESENT**	**o**	**o**	**o**	**o**	**o**	**o**	**o**	**X**	**X**	**X**	**X**	**o**
	ABSENT	MAY OCCUR AT ANY TIME											
BURN	**PRESENT**	**o**	**o**	**o**	**o**	**o**	**o**	**o**	**X**	**X**	**X**	**X**	**X**
	ABSENT	MAY OCCUR AT ANY TIME											
HERBICIDE	**PRESENT**	**o**	**o**	**o**	**o**	**o**	**o**	**o**	**o**	**X**	**X**	**X**	**X**
	ABSENT	MAY OCCUR AT ANY TIME											
HAND PULLING	**PRESENT**	**X**	**o**	**o**	**o**	**o**	**o**	**o**	**X**	**X**	**X**	**X**	**X**
	ABSENT	MAY OCCUR AT ANY TIME											
CUTTING TREES/SHRUBS	**PRESENT**	**X**	**o**	**o**	**o**	**o**	**o**	**o**	**X**	**X**	**X**	**X**	**X**
	ABSENT	MAY OCCUR AT ANY TIME											

X= Optimal time for activity; **o** = activity should not occur during this timeframe.

3.2 Guidelines for Sites without Taylor's Checkerspot Butterfly

- Site improvement activities should be timed to maximize their effectiveness.
- More than one restoration regime should be considered (when practical) as individual site responses may vary.
- All trees and shrubs cut/pulled from within or bordering Taylor's checkerspot butterfly habitat should be removed from the area if deemed problematic.
- Mowed vegetation from grasses and forbs may be left in place unless deemed problematic.
- Populations of larval host and nectar species should be enhanced. Seeding or planting of English plantain and strawberry (and other desired plant species) may be required post-treatment to encourage their immediate establishment.
- Sites should be surveyed annually during the flight period to determine whether efforts have been successful at promoting Taylor's checkerspot colonization.

4 Site Specific Management Recommendations

4.1 Beazell Memorial Forest

- Meadows at Beazell Memorial Forest are labeled in Figure 1 and described briefly in terms of size, aspect, elevation and soils in Table 8.

- Follow all recommended guidelines set forth in Section 3.1 and 3.2

Table 8. Site information for meadows at Beazell Memorial Forest.

Beazell Meadow	Acres	Aspect	Elevations (Feet)	Soils
North	15.5	SSW	860'-1300'	Witzel-Ritner Complex, 12-30% Slopes, Price-McDunn-Ritner Complex, 30-60% Slopes
Middle	5.5	SW	1280'-1380'	Witzel-Ritner Complex, 12-30% Slopes and 30-60%
Double Small Steep	2.75	WSW	1400'-1220'	Witzel-Ritner Complex, 12-30% Slopes and 30-60%
Summit	15.5	WSW	1400'-1630'	Witzel-Ritner Complex, 12-30% Slopes and 30-60%
South	3.75	SW	1090'-1260'	Dixonville-Gellatly Complex 12-30% Slopes
Caretaker's House	0.75	W	660'-710'	Dixonville-Gellatly Complex 12-30% Slopes

4.1.0 North Meadow

4.1.0.0 Site Description

Taylor's checkerspot present? Yes, but declining.

Habitat: Butterflies primarily use an acre or two of the flatter, summit portion of this relatively steep meadow. The area used by Taylor's checkerspot contains a small amount of remnant prairie plant species within an otherwise highly degraded area dominated by tall grasses and non-native plants (Scotch broom, rose, blackberry, thistle, false-brome). Bracken fern and snowberry are also present. The larval host plant, English plantain, is scarce and has been decreasing in abundance over the past several years. Nectar species, including strawberry, are in relatively low abundance and may also be disappearing from the site.

Threats: Habitat is threatened by spread of invasive non-native plants (tall fescue or orchard grass, rose, Scotch broom, thistle) as well as bracken fern and encroachment by shrubs (i.e., snowberry) and trees (i.e., Douglas-fir) into the meadow

4.1.0.1 Management Recommendations

Management priorities at this site should include enhancing existing meadow habitat. In addition to the general guidelines in Section 3, the following actions are recommended:

1. Remove Scotch broom (hand pulling or cutting, mowing, herbicide spray). Remove all hand pulled plant material from the meadow environment. Hand pulling of broom from the core Taylor's checkerspot area is recommended, but trampling must be minimized.
2. Reduce cover of invasive/tall grass and bracken fern component (burn & herbicide or mow, as appropriate and following parameters in Section 3). Do not impact core breeding areas.
3. Augment larval host and nectar plant populations within the meadow. Seeding or planting of young plants may be required.
4. The degraded meadow just upslope towards the road should be reclaimed as a Taylor's checkerspot is present there annually as nectaring adults.

4.1.1 Middle Meadow

4.1.1.0 Site Description

Taylor's checkerspot present? Yes, observed in 2008, and 2004-5.

Habitat: Butterflies observed to have preference for the least degraded portions of the site – the southern 1/3 and westward sloping (in the lee of prevailing winds) areas of this meadow. Those portions of the meadow appeared to contain the most remnant prairie habitat and included some plantain, with vegetation of relatively low stature overall. In 2007, tall grasses dominated the entire meadow and very little plantain was noted. Invasive shrubs (hawthorn, rose and scotch broom) and encroaching Douglas-fir present. Nectar species, including strawberry, appeared to be in low abundance.

Threats: A lack of larval host plants and adult nectar sources. Tall grasses (tall fescue and orchard grass) and invasive plants (hawthorn, rose, Scotch broom), tree encroachment (Douglas-fir) at the southern end of the meadow.

4.1.1.1 Specific Management Recommendations

To enable the natural re-colonization by Taylor's checkerspot butterfly from adjacent source populations, the following actions are recommended in addition to the general guidelines in Section 3.1:

1. Augment host (e.g., plantain) and nectar species (e.g., strawberry) within the meadow in areas of recent Taylor's checkerspot use. Seeding or planting of young plants may be required.
2. Work to reduce cover by tall stature grasses.
3. Monitor for the presence and establishment of Taylor's checkerspot and note areas of adult use.

4.1.2 Small Steep Double Meadows (south of the Middle Meadow)

4.1.2.0 Site Description

Taylor's checkerspot present? A few individuals have been recorded, but on-site breeding is doubtful.

Habitat: Openings as small, steep, shallow-soiled hillsides that serve as "stepping stones" for butterflies moving between adjacent areas of higher quality habitat. Larval and nectar resources have not been well assessed.

Threats: Encroachment by trees and shrubs and potential occupation by invasive plants that reduce the size of the opening or create habitat that consists of high-profile vegetation.

4.1.2.1 Specific Management Recommendations

In addition to the general recommendations in Section 3.1:

1. Better assess host and nectar resources.
2. Prioritize maintaining or expanding the meadow perimeters.

4.1.3 Summit Meadow

4.1.3.0 Site Description

Taylor's checkerspot present? Yes, as a moderate sized and reasonably stable colony.

Habitat: The meadow is relatively large, and the contiguous ridge area at the southern periphery has been opened up recently in an effort to reclaim oak savanna and adds an additional acre or two of potential Taylor's checkerspot habitat, some of which is occupied by Taylor's checkerspot. Also, about two acres of previously overlooked habitat on the southeast portion of the site was found to support moderate numbers of Taylor's checkerspot (2008). Originally, Taylor's checkerspot was thought to primarily utilize the upper 1/2-2/3 of the existing meadow, although reproduction appeared to be extremely localized within low stature vegetation hosting some plantain. One relatively small hand-mowed area along the summit ridge is heavily used by Taylor's checkerspot adults for nectaring. A large portion of the meadow contains tall grasses and there are sizeable patches of snowberry. Prairie plant species are present, but have not been well assessed. Typical nectar species such as strawberry are not abundant, and adults have been observed feeding at flowers of both Western buttercup and a dandelion species – two rarely used resources.

Threats: A lack of abundant larval host plants and adult nectar sources. Tall grasses (tall fescue and orchard grass) as well as shrub (snowberry) and tree encroachment (Douglas-fir) are potential threats.

4.1.3.1 Specific Management Recommendations

To support a larger population of Taylor's checkerspot at this site the following actions are recommended in addition to the general recommendations in Section 3.1:

1. Augment plantain, strawberry, and other nectar species within the meadow, especially within small areas where they currently exist. Seeding or planting of young plants may be required.
2. Better assess the presence and relative abundances of native and non-native species.

4.1.4 South Meadow

4.1.4.0 Site Description

Taylor's checkerspot present? Yes. The site currently (2007-2008) hosts the majority of the Beazell Taylor's checkerspot population.

Habitat: Reclaimed prairie/meadow within conifer forest. Taylor's checkerspot use is heaviest within the sloping portion of the site where plantain and strawberry densities are greatest and where tall grasses are least prevalent. The flatter portions of the upper and lower meadow support Taylor's checkerspot, but in much smaller numbers. Plantain and strawberry are generally abundant throughout the site. Bare patches of earth are also present, especially on the sloped portion. Small rose shrubs are present throughout and are heavily utilized as perch sites for adults.

Threats: While the sloped portion of the meadow hosts a few hundred butterflies at present, trailing blackberry, tall grasses and numerous small rose bushes, as well as encroaching Douglas-fir trees, are all potential threats to the site as a whole. A primary access trail (old road) runs across the lower portion of the site. An unofficial (deer) trail bisects the meadow from top to bottom. Pedestrian use of this trail could cause Taylor's checkerspot mortality.

4.1.4.1 Specific Management Recommendations

In addition to the general recommendations in Section 3.1, the following management actions are recommended to increase the availability of high quality habitat for Taylor's checkerspot that occur at the site. An increase in habitat quality at the site may encourage Taylor's checkerspot population growth.

1. The middle section of this meadow contains high quality habitat that should be maintained over time. Enhancement efforts should be focused on the upper and lower ends where habitat is of lower quality.
2. Remove trailing blackberry from the midslope area with minimal trampling or use of herbicides. For all other areas, use the most effective method available.
3. Maintain existing rose plants in the 2-4 foot tall range as long as they continue to be used by the butterflies for the perching and do not negatively affect other components of habitat quality.

4. Identify meadow edges where site enlargement could be conducted with greatest potential benefit. Increasing the size of the meadow gradually over time may benefit the Taylor's checkerspot population.
5. Discourage pedestrian use of the unsanctioned trail that bisects middle of meadow.

4.1.5 Caretaker's House Meadow

4.1.5.0 Site Description

Taylor's checkerspot present? Yes.

Habitat: A few Taylor's checkerspot show up at the site annually to nectar on the abundant strawberry flowers. Plantain is also plentiful, although the extent, if any, to which the site is used by females for egg laying is unknown. Frequent mowing has helped to keep the site suitable for Taylor's checkerspot use.

Threats: Various tall grasses and weedy plant species are present. Loss of plantain and strawberry may occur if annual mowing ceases. Encroachment into meadow by trees and shrubs from edges poses a continual threat. The small size of the site and the relative lack of connectivity to other area meadows with Taylor's checkerspot may limit Taylor's checkerspot use there. On-site breeding has not been witnessed.

4.1.5.1 Specific Management Recommendations

In addition to the general recommendations in Section 3.1, the following actions are suggested:

1. Annual mowing(s) to retain short stature vegetation and to encourage strawberry and plantain.
2. Monitor encroaching trees and shrubs, with removal every few years.
3. Maintain English plantain and strawberry, or other host plant and nectar plant abundance.
4. Refrain from using site as a parking area.

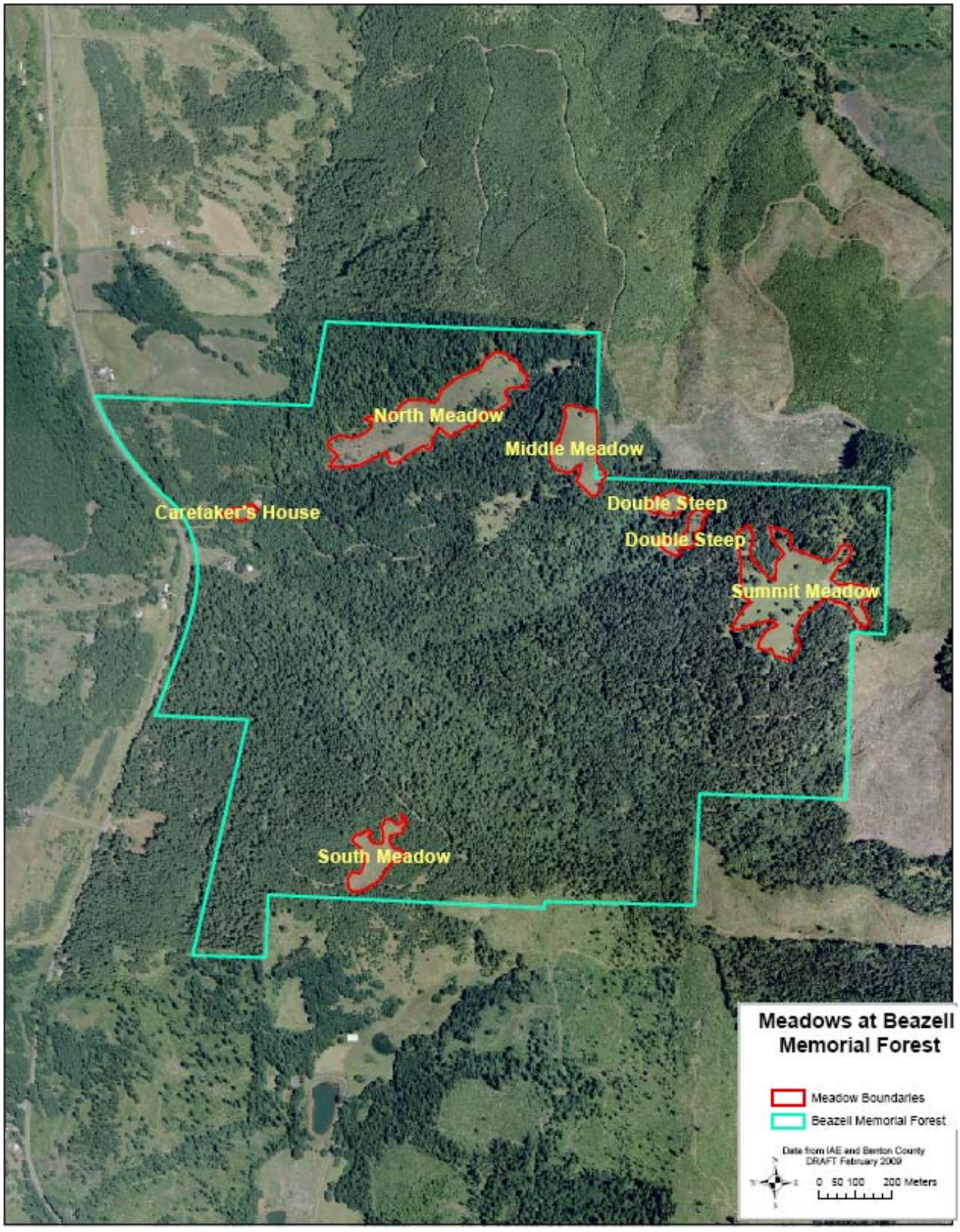

Figure 1. Meadow locations at Beazell Memorial Forest.

4.2 Fitton Green Natural Area

4.2.0 South Meadow

4.2.0.0 Site Description

Taylor's checkerspot present: Yes, as a few dispersing individuals. On-site breeding has not been recorded.

Habitat: A relatively large area of upland oak savanna/prairie habitat undergoing restoration (29 acres, west to southwest aspect, 700'-1060' elevation; Figure 2). Some high quality, short stature vegetation, dominated by native perennial grasses, and including English plantain and strawberry is present on the main hillside. Lower portions of the site contain meadows that have good physical characteristics for Taylor's checkerspot, but lack the desired plant community (short stature grasses and presence of larval host and nectar species) at present. The site is largely isolated from the core population, but Taylor's checkerspot is able to reach it via the connecting ridgeline and/or forest roads and openings. The site includes soil of the Dixonville-Gellatly Complex, 12-30 and 30-60% slopes.

Threats: The site largely lacks high quality, low stature habitat with sufficient larval and adult plant resources within areas that may be best suited to Taylor's checkerspot-namely, in a few smaller stepping stone meadow areas on the lower west-southwest portion of the site in the lee of prevailing winds. Tree and shrub encroachment and tall grasses are also threats. While the area is a popular destination for hikers, trampling should not be an issue if existing trails are used. Limited connectivity to the core population to the north may limit dispersal to this site.

4.2.0.1 Specific Management Recommendations

In addition to the general management guidelines in Section 3.1:

1. Restore select portions of lower meadows to high quality habitat in a stepping stone manner to attract dispersing Taylor's checkerspot and to encourage on-site breeding.
2. Identify, enlarge and restore openings along north/south road, and between Cardwell Hill Road and BPA power line easement to establish stepping stone dispersal opportunities.
3. Continue ongoing restoration of the site as a whole.
4. Monitor site annually for Taylor's checkerspot presence and document areas of primary use.

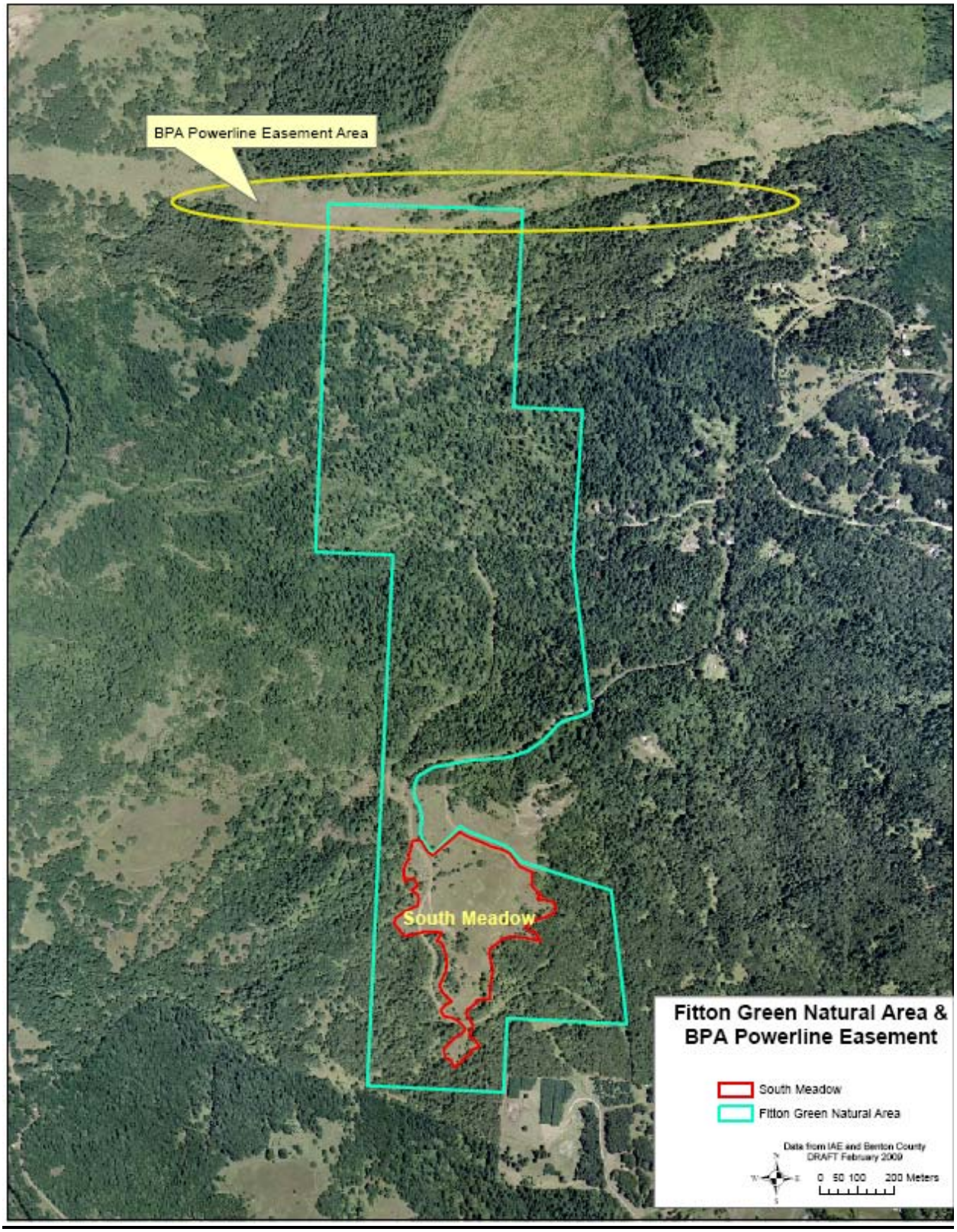

Figure 2. Fitton Green Natural Area adjacent to the BPA Powerline Easement.

5 Future Research

Research opportunities for this species abound. Effects of weather, aspect, plant communities, disease, site structure, dispersal patterns, herbicide interactions, predators, ideal habitat conditions, and successful restoration strategies on Taylor's checkerspot have yet to be fully understood.

As more research and study of Taylor's checkerspot takes place, new knowledge of nectar and host plant species may emerge. Such information will be incorporated into the management guidelines for this species on County owned and managed properties, under the advisement of species and resource specialists.

Future Taylor's checkerspot research should include studies of dispersal and recolonization by adults as well as more detailed studies of occupied sites and butterfly behavior there. The purposeful introduction of Taylor's checkerspot to an unoccupied site with the desired physical characteristics and high quality habitat should also be considered.

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Appendix O. Covered Plant Soils Lists

Table O.1 The Covered Plant Species occur on a wide variety of soil types. The table below shows the percent of known populations that occur on each soil type, and sums the total number of soil types for each species.

Soil Type		Frequency of Occurrence				
	Slopes (%)	DEPA	ERDE	LOBR	LUSUKI	SINE
Abiqua silty clay loam	0 - 3 %	4.08%				
	3 - 5 %				1.23%	
Amity silt loam	0 - 3 %	4.08%				3.07%
Awbrig silty clay loam	0 - 2 %	4.08%				3.07%
Bashaw clay (flooded)	0 - 3 %			46.15%		22.70%
Bashaw clay (non-flooded)	0 - 3 %				1.84%	26.99%
Bashaw silty clay loam (non-flooded)	0 - 3 %			7.69%	0.61%	3.68%
Bellpine-Jory complex	12 - 20 %				2.45%	
	30 - 60 %				1.23%	
Briedwell gravelly loam	0 - 7 %				0.61%	
	7 - 20 %				1.23%	
Chehalem silty clay loam	3 - 12 %					0.61%
Chehalis silt loam	0 - 3 %					0.61%
Coburg complex (rare/occasionally flooded)	0 - 3 %	6.12%		15.38%	1.23%	2.45%
Coburg silty clay loam	0 - 3 %	4.08%				0.61%
Coburg silty clay loam (rarely flooded)	0 - 3 %	4.08%				1.84%
Concord silt loam	0 - 2 %					0.61%
Conser silty clay loam	0 - 3 %	2.04%	13.33%			0.61%
Dayton silt loam	0 - 2 %	20.41%			0.61%	0.61%
Dayton silt loam (clay substratum)	0 - 2 %					1.84%
Dixonville-Gellatly complex	12 - 30 %	4.08%			22.09%	
	30 - 60 %				0.61%	
Dixonville-Gellatly-Witham complex	2 - 12 %		13.33%		26.38%	0.61%
Holcomb silt loam	0 - 3 %					1.84%
Jory silty clay loam	12 - 20 %				2.45%	
	2 - 12 %	6.12%			8.59%	
Jory silty clay loam (sediments)	2 - 12 %				0.61%	
Jory-Gelderman complex	12 - 30 %	4.08%			6.75%	
MacDunn-Price-Ritner complex	60 - 90 %				0.61%	
McAlpin silty clay loam	0 - 3 %		60.00%		3.68%	1.23%
	3 - 6 %	4.08%			2.45%	
McAlpin silty clay loam (rarely flooded)	0 - 3 %	6.12%			3.07%	
Price-MacDunn-Ritner complex	30 - 60 %				3.07%	
Santiam silt loam	2 - 8 %				0.61%	0.61%
Verboort silty clay loam	0 - 3 %					1.23%
Waldo silty clay loam	0 - 3 %	16.33%	6.67%	30.77%		23.31%
Willamette silt loam	0 - 3 %					0.61%
Witham silty clay loam	2 - 12 %		6.67%		6.13%	
Witzel-Ritner complex	12 - 30 %				1.23%	
	3 - 12 %				0.61%	
Woodburn silt loam	0 - 3 %	10.20%			2.45%	
# Soil Types Per Species		***15***	***5***	***4***	***26***	***21***

Appendix P. Sample Annual Compliance Report

20XX Annual Compliance Report for Endangered Species Permit #_____

Submitted to the
U.S. Fish and Wildlife Service
and
Oregon Department of Agriculture

by

Benton County
_____, 20XX

Contents

Executive Summary

Benton County committed under the Prairie Species Habitat Conservation Plan (HCP) to submit an annual report to the US Fish and Wildlife Service (USFWS) and the Oregon Department of Agriculture (ODA) describing the implementation of the HCP. This HCP annual report covers the period from [insert date] to [insert date] and describes the efforts within the County HCP program and with HCP Cooperators to implement the HCP.

[Insert summary of each section below].

1 Introduction

In [ ], Benton County completed the Prairie Species Habitat Conservation Plan (HCP) to achieve long term viability of rare species populations that is compatible with essential public services, public land management and home, farm and forest construction. This effort was completed by the County and several Cooperators in response to the federal and state threatened and endangered status of certain butterfly and plant species. The US Fish and Wildlife Service (USFWS) and Oregon Department of Agriculture (ODA) accepted the HCP and under the authority of the Endangered Species Act (ESA), on [insert date], the USFWS issued an Incidental Take Permit (ITP) to Benton County. As a part of the HCP agreement, the County is to submit an annual report to USFWS and ODA describing implementation activities. This, the [insert number] annual report, covers the period from [ ] to [ ]. The report describes the County and Cooperators' (City of Corvallis, Greenbelt Land Trust, Oregon Department of Transportation, Oregon Sate University, NW Natural and Pioneer Telephone Cooperative) efforts to avoid, minimize and mitigate impacts to the HCP Covered Species (Fender's blue butterfly, Taylor's checkerspot butterfly, Kincaid's lupine, Willamette Daisy, Nelson's checkermallow, Bradshaw's lomatium and peacock larkspur).

1.1 Summary of Work towards Biological Goals and Objectives

1.1.0 Conservation Measures and Tasks Completed

The HCP sets forth Conservation Measures to avoid, minimize and mitigate impacts to the HCP Covered Species. The HCP identifies three major objectives of the conservation program, each with Conservation Measures and specific tasks:

1) Conserve Covered Species populations and habitat
2) Enhance Covered Species populations and habitat
3) Increase the distribution and connectivity of Covered Species populations

Progress towards these objectives, measures and tasks completed between [insert dates] is described in this section

[Refer to specific conservation measures and tasks described in Section 6.2.0 of the HCP.]

2 Covered Activities Completed

[Information for this section included in Cooperator Reporting Form A: Project Impacts, and Cooperator Reporting Form B: Work Completed- Habitat Restoration, Enhancement and Management.]

2.1 Home, Farm and Forest Construction

Insert # projects, total impact area, average project impact area, total FBB habitat (total lupine, native nectar and non-native nectar) impacted.

2.2 Telephone Utility Construction and Maintenance

2.2.0 Pioneer Telephone Cooperative

Insert total line replaced, total impact area, total FBB habitat (total lupine, native nectar and non-native nectar) impacted.

2.3 Natural Gas Utility Construction and Maintenance

2.3.0 NW Natural

Insert total line installed and replaced, total impact area, total FBB habitat (total lupine, native nectar and non-native nectar) impacted.

2.4 Public Service Facility Construction

2.4.0 Benton County

Insert total acreage impacted for rural school or fire station construction, and total FBB habitat (total lupine, native nectar and non-native nectar) impacted.

2.5 Transportation Activities

2.5.0 Benton County

2.5.0.0 Transportation Maintenance

Insert total acreage impacted with transportation maintenance (mowing in the nectar zone), and total FBB nectar habitat (native nectar and non-native nectar) impacted.

2.5.0.1 Transportation Projects- Type 2 ROW

Kincaid's lupine outside the Fender's Blue Zone

List Type 2 SMA's impacted for this species, describe project, and insert number of individuals impacted.

Nelson's checkermallow

List Type 2 SMA's impacted for this species, describe project, and insert number of individuals impacted.

Peacock larkspur

List Type 2 SMA's impacted for this species, describe project, and insert number of individuals impacted.

2.5.1 Oregon Department of Transportation

Insert total acreage impacted with transportation maintenance (mowing in the nectar zone), and total FBB nectar habitat impacted (calculated using average native nectar cover of 1.39% and average non-native nectar cover of 1.36%).

2.6 Water and Wastewater Management

2.6.0 City of Corvallis

Insert description of water and wastewater activities completed. Insert total area of habitat and Nelson's checkermallow plants impacted

2.7 Agriculture

2.7.0 City of Corvallis

[Insert description of Agricultural activities completed at Owens Farm. Insert total area of habitat and Nelson's checkermallow plants impacted at Owens Farm.]

2.8 Emergency Response Activities

[For each ownership, describe any emergency response activities that occurred, total area impacted, and any species affected.]

2.8.0 Benton County

2.8.1 City of Corvallis

2.8.2 Greenbelt Land Trust

2.8.3 NW Natural

2.8.4 Oregon Department of Transportation

2.8.5 Oregon State University

2.8.6 Pioneer Telephone Cooperative

2.9 Voluntary Parks/Natural Areas/Open Space Management

The Benton County HCP covers permanent impacts to the Covered Species from activities such as home, farm and forest construction, but also covers a significant amount of short-term impacts that may result from habitat restoration, enhancement and management activities (e.g., mortality to rare plant seeds from a prescribed fire).on County and Cooperator lands. These activities are undertaken proactively for conservation purposes, are not completed to fulfill a specific mitigation requirement. On the contrary, as these habitat restoration, enhancement and management activities are designed to produce long-term benefit the Covered Species and their associated habitats, mitigation is not required for any short term impacts that occur.

The County and the Cooperators are responsible for independently tracking the habitat restoration, enhancement and management activities they complete, and monitoring (Effectiveness Monitoring) the effects of these activities on the Covered Species and their habitat. Monitoring data is compiled and analyzed so that adaptive management, a process allowing resource managers to adjust their actions to reflect new information or changing conditions, can take place to achieve the best outcomes for the Covered Species.

2.9.0 Summary of All Sites

[Insert total:
Acres mowed
Acres grazed
Acres burned
Acres treated with herbicide
Species/# introduced/augmented]

2.9.1 Benton County

2.9.1.0 Beazell Memorial Forest

This 237 ha (586 ac) property is located in Kings Valley and was gifted to Benton County in 2000 for perpetual park purposes. The property has a demonstration forest and open space area, with progressive ecosystem management practices used to protect, conserve, and restore the natural, scenic, outdoor recreation, and wildlife values. Revenue generated from logging is used to manage the property. Beazell is open to the public, and has restrooms, drinking water, hiking trails, and picnicking facilities. Taylor's checkerspot butterfly is present (Ross 2007), and Kincaid's lupine was planted at the Beazell prior to the HCP.

1. Acres mowed, date mowed
2. Acres grazed with (X livestock during X and Y months)
3. Acres burned, date burned
4. Acres treated with herbicide, date treated

5. Species and # introduced/augmented

2.9.1.1 Fitton Green Natural Area

Fitton Green Natural Area is a 124.6 ha (308 ac) property acquired by Benton County for the purposes of demonstrating progressive stewardship practices (David Reed & Associates 2000). Approximately 56.6 ha (140 ac) of the natural area (northern meadow) is covered by a conservation easement held by the Greenbelt Land Trust. A portion of Fitton Green will be designated for use as a mitigation site. A single Taylor's checkerspot butterfly was observed in 2007 in the southern meadow (Ross 2007). Kincaid's lupine was introduced to the site prior to the HCP.

1. Acres mowed, date mowed
2. Acres grazed with (X livestock during X and Y months)
3. Acres burned, date burned
4. Acres treated with herbicide, date treated
5. Species and # introduced/augmented

2.9.1.2 Jackson-Frazier Wetland

This 58 ha (144 ac) site is located northeast of Corvallis. The park was established in 1992 to protect the natural features of the area and provide educational and research opportunities. The site is open to public use, although foot traffic is limited to a wooden boardwalk winding through the wetland. Four acres outside the wetland overlay, and lacking Covered Species occurrences, have a conservation easement held by the Greenbelt Land Trust. There are naturally occurring populations of Kincaid's lupine, Nelson's checkermallow, and Bradshaw's lomatium within the wetland. Additional Nelson's checkermallow and Bradshaw's lomatium were planted at the site prior to the completion of the HCP.

1. Acres mowed, date mowed
2. Acres grazed with (X livestock during X and Y months)
3. Acres burned, date burned
4. Acres treated with herbicide, date treated
5. Species and # introduced/augmented

2.9.2 City of Corvallis

2.9.2.0 Bald Hill Park

This 115 ha (284 ac) site includes oak savanna, upland prairie, wetlands, riparian, and oak woodlands. The park also includes a historic barn, an interpretive trail, and trails that connect with the Benton County Fairgrounds. The site has a natural population of Willamette daisy. IAE has introduced Kincaid's lupine and planted additional Willamette daisy at this site.

1. Acres mowed, date mowed
2. Acres grazed with (X livestock during X and Y months)
3. Acres burned, date burned
4. Acres treated with herbicide, date treated
5. Species and # introduced/augmented

2.9.2.1 Corvallis Watershed

The City of Corvallis owns 951.8 ha (2,352 ac) encompassing the lower elevations of the 4,406.9 ha (10,000 ac) Rock Creek Watershed on the northeast flanks of Marys Peak. The land is managed primarily by the City of Corvallis Public Works Department although a section near south east end of the property is managed by the Parks Department as "Rock Creek Park". There are native prairie remnants along Rock Creek Road and on the rocky knoll adjacent to Highway 34 significant for their concentration of native prairie species. The wedge-shaped parcel of land (Rock Creek Corner) containing the rocky knoll and bordered by Highway 34 and Rock Creek Road will be managed as a mitigation area. Peacock larkspur is present at the site, both along the Rock Creek Road and in Rock Creek Corner.

1. Acres mowed, date mowed
2. Acres grazed with (X livestock during X and Y months)
3. Acres burned, date burned
4. Acres treated with herbicide, date treated
5. Species and # introduced/augmented

2.9.2.2 Herbert Farm and Natural Area

This 89.4 ha (221 ac) historic farmland site includes wetlands, oak woodlands, wet prairie, and riparian habitat supporting diverse plant communities and wildlife. Marys River and Muddy Creek converge on the property. There are no existing trails, but future passive public use is under consideration at this time. The City of Corvallis owns Herbert Farm and Natural Area, but The Trust for Public Lands holds the conservation easement. The property serves as mitigation for the Bonneville Power Administration's Willamette Basin federal hydro-electric dams and reservoirs. Naturally occurring populations of Kincaid's lupine, Nelson's checkermallow and peacock larkspur are present at this site.

1. Acres mowed, date mowed
2. Acres grazed with (X livestock during X and Y months)
3. Acres burned, date burned
4. Acres treated with herbicide, date treated
5. Species and # introduced/augmented

2.9.2.3 Lancaster Property

The City of Corvallis owns approximately 1.8 ha (4.5 ac) of property with wet prairie habitat adjacent to the County-owned Jackson-Frazier Wetland. These lands, known as the Lancaster Property are managed by the City of Corvallis Housing Division of Community Development. As a result of its location between a residential area and the County-owned Jackson-Frazier Wetland, the area receives light pedestrian traffic. There are natural populations of Bradshaw's lomatium and Nelson's checkermallow and augmented populations of Nelson's checkermallow.

1. Acres mowed, date mowed
2. Acres grazed with (X livestock during X and Y months)
3. Acres burned, date burned
4. Acres treated with herbicide, date treated

5. Species and # introduced/augmented

2.9.3 Oregon State University

2.9.3.0 Butterfly Meadows

Butterfly Meadows is a (0.45 ha [1.1 ac]) meadow owned by Oregon State University. The meadow is surrounded by forest lands. Kincaid's lupine and Fender's blue butterfly are present at the site.

1. Acres mowed, date mowed
2. Acres grazed with (X livestock during X and Y months)
3. Acres burned, date burned
4. Acres treated with herbicide, date treated
5. Species and # introduced/augmented

2.9.3.1 Soap Creek Ranch

The OSU Department of Animal Sciences operates the Soap Creek Ranch (1,880 acres), which is located 11 miles north of the OSU campus. Approximately 65% of the ranch is open grasslands utilized primarily for forage production, and the remainder is forested. The site supports a large population of Kincaid's lupine, and a scattered population of Nelson's checkermallow.

1. Acres mowed, date mowed
2. Acres grazed with (X livestock during X and Y months)
3. Acres burned, date burned
4. Acres treated with herbicide, date treated
5. Species and # introduced/augmented

2.9.4 Greenbelt Land Trust

2.9.4.0 Lone Star Ranch

This 80.5 ha (199 ac) property west of Philomath is under conservation easement to the Greenbelt Land Trust. Lone Star includes wet and upland prairie and oak savanna. Portions of the easement may be managed as a mitigation area for purposes of the HCP, provided they are not used as mitigation for any other project. No Covered Species are known to occur at this site.

1. Acres mowed, date mowed
2. Acres grazed with (X livestock during X and Y months)
3. Acres burned, date burned
4. Acres treated with herbicide, date treated
5. Species and # introduced/augmented

2.9.4.1 Lupine Meadows

Lupine Meadows is a 23.5 ha (58 ac) site with dominant habitats including wetland and upland prairie, ash swale and savanna and riparian forest habitat. Lupine Meadows has a high diversity of native vegetation. The upland prairie supports natural populations of Kincaid's lupine and Fender's blue butterfly. The wetland prairie, ash swales, and

riparian areas support an existing small and scattered population of Nelson's checkermallow (Kaye 2008). Nelson's checkermallow was planted on the western and southeastern sides of the property prior to the HCP.

1. Acres mowed, date mowed
2. Acres grazed with (X livestock during X and Y months)
3. Acres burned, date burned
4. Acres treated with herbicide, date treated
5. Species and # introduced/augmented

2.10 Mitigation Related Habitat Restoration, Enhancement and Management

2.10.0 New Mitigation Initiated (See attached Cooperator Reporting Form D: Mitigation Notices)

2.10.0.0 Benton County

2.10.0.1 City of Corvallis

2.10.0.2 Greenbelt Land Trust

2.10.0.3 NW Natural

2.10.0.4 Oregon Department of Transportation

2.10.0.5 Oregon State University

2.10.0.6 Pioneer Telephone Cooperative

2.10.1 New Mitigation Completed (See attached Cooperator Reporting Form D: Mitigation Notices)

2.10.1.0 Benton County

2.10.1.1 City of Corvallis

2.10.1.2 Greenbelt Land Trust

2.10.1.3 NW Natural

2.10.1.4 Oregon Department of Transportation

2.10.1.5 Oregon State University

2.10.1.6 Pioneer Telephone Cooperative

2.10.2 Work Completed for On-Going Mitigation Projects

[List each mitigation site for each ownership, species being mitigated, then insert acres burned, mowed, grazed or treated with herbicide this year, as reported on Reporting Form B].

2.10.2.0 Benton County

2.10.2.1 City of Corvallis

2.10.2.2 Greenbelt Land Trust

2.10.2.3 NW Natural

2.10.2.4 Oregon Department of Transportation

2.10.2.5 Oregon State University

2.10.2.6 Pioneer Telephone Cooperative

2.11 Seed Collection

[Information for this section included in Cooperator Reporting Form B: Work Completed-Habitat Restoration, Enhancement and Management].

2.11.0 Total Seeds/Plant Material Collected

	Year 1	Year 2	Year 3
Bradshaw's lomatium			
Nelson's checkermallow			
Peacock larkspur			
Willamette daisy			
Kincaid's lupine (Outside Fender's Blue Zone)			
Kincaid's lupine (Inside Fender's Blue Zone)			
Fender's blue Nectar Species (Inside nectar zone)			
Taylor's checkerspot Host Species			
Taylor's checkerspot Nectar Species			

2.11.1 Detailed Seed Collection Information by Site

See attached Reporting Form(s).

2.12 Effectiveness Monitoring

Effectiveness Monitoring is conducted to determine the success of habitat restoration, enhancement, and management, as measured by tracking species status and habitat condition. Only sites with new effectiveness monitoring data will be included in this report in any given year.

The first year of monitoring data, along with data from any prior surveys, will serve as the site's baseline inventory. Once baseline conditions have been established, they will be followed up with periodic re-sampling (monitoring) occurring at a minimum of every three years. If significant management activities (e.g. prescribed fire) are implemented, monitoring should be conducted at a greater frequency (e.g., to collect pre-and post-treatment data) if needed to supply data for adaptive management, then return to regular three year monitoring cycles.

[Information for this section included in Cooperator Reporting Form C: Effectiveness Monitoring Summary. For each site, insert:

Monitoring Summary-[Was monitoring completed this year? If so, insert "See attached Monitoring Summary Form.", if not, insert 'No effectiveness monitoring required at this site this year".]

Actions in response to any triggered Adaptive Management-[Were any such actions taken? If so, describe. If not, insert "No such actions taken".]

2.12.0.0 Benton County

Beazell Memorial Forest

Fitton Green Natural Area

Jackson Frazier Wetland

2.12.0.1 City of Corvallis

Bald Hill

Corvallis Watershed

Herbert Farm and Natural Area

Lancaster property

2.12.0.2 Oregon State University

Butterfly Meadows

Soap Creek Ranch

2.12.0.3 Greenbelt Land Trust

Lone Star Ranch

Lupine Meadows

Owens Farm

3 Changed Circumstances

3.1 Additional Federal or State Listed Species in Plan Area

Note additional species listed. Discuss whether Benton County plans to address these species through a major amendment to the HCP and additional formal review process.

3.2 Delisted Species

Note any Covered Species that have been delisted.

3.3 New Wild Population of Fender's Blue Butterfly Discovered outside Fender's Blue Zone

Note any such populations, and whether the County plants to seek additional HCP coverage or refer landowner to USFWS.

3.4 New Invasive Species

Note any new invasive species detected at Prairie Conservation Areas.

3.5 Natural Catastrophes

Describe the location, scope and scale of any natural disasters occurring within the Plan Area.

4 Administration

4.1 Take Allocated

4.1.0 Total Take Issued

	Bradshaw's lomatium (#)	Willamette daisy (#)	peacock larkspur (#)	Nelson's checker-mallow (#)	Kincaid's lupine outside the Fender's Blue Zone	Kincaid's lupine inside the Fender's Blue Zone	Nectar for Fender's blue butterfly (m^2)	Taylor's checkerspot butterfly habitat (m^2)
Home, Farm and Forest Construction								
Telephone Utility Construction and Maintenance								
Natural Gas Utility Construction and Maintenance								
Public Service Facility Construction								
Transportation Activities								
Construction, maintenance, utility work and road approach								
Maintenance, utility and road approach outside known populations								
Water and Wastewater Management								
Agriculture								
Emergency Response Activities								
Total								

4.2 Certificates of Inclusion Issued

As part of Benton County's incidental take permit, the County has authorization to issue Certificates of Inclusion (take authorization) to persons needing a County permit or agricultural building authorization for impacts to Fender's blue butterfly habitat resulting from home, farm or forest construction in the Fender's Blue Zone. The County

may also issue Certificates of Inclusion to HCP Cooperators for activities identified and covered in the HCP.

4.2.0 List by Private Ownership

Benton Count issued a total of [insert number] Certificates of Inclusion to private landowners between [insert dates].

[insert list of Certificates of Inclusion for private landowners]

4.2.1 List by Cooperator

Benton Count issued a total of [insert number] Certificates of Inclusion to Cooperators between [insert dates].

[insert list of Certificates of Inclusion for Cooperators]

4.3 Cooperative Agreements Executed

To obtain a Certificate of Inclusion, a Cooperator must enter into a Cooperative Agreement with Benton County. This agreement sets forth the requirements of the County and the Cooperator entering the agreement, including monitoring and reporting commitments of the Cooperator.

4.3.0 List by Cooperator

Benton Count entered into a total of [insert number] Cooperative Agreements with Cooperators between [insert dates].

[insert list of Cooperative Agreements]

5 References

Insert any references cited.

Appendix Q. Draft Cooperator Reporting Forms

Summary of Cooperator Reporting Forms and Purposes

Cooperator Reporting Form	When Required?	Purpose	Due
Form A: Project Impacts	Required as precursor to Cooperative Agreement when Cooperator needs authorization for permanent impacts identified in HCP.	Part A requests impacts.	Minimum of 3 months prior to project.
		Part B reports impacts.	December 31 of year with impacts.
Form B: Work Completed- Habitat Restoration, Enhancement and Management	Every year habitat restoration, enhancement or management work is completed.	Reports voluntary or mitigation related habitat restoration, enhancement and management work.	December 31 of year with work completed.
Form C: Effectiveness Monitoring Summary	Year 0 (baseline) of habitat restoration, enhancement and management work (for mitigation or conservation) and every 3 yr following.	Reports HCP species status and habitat condition, and tracks adaptive management thresholds.	By December 31 of year with monitoring completed.
Form D: Mitigation Notices	Required as part of Cooperative Agreement, any time Cooperator needs to complete mitigation for permanent impacts identified in HCP.	Part A notifies County of mitigation initiated.	Minimum of 3 months prior to project.
		Part B documents fulfillment of mitigation requirements.	By December 31 of the year mitigation is completed.

BENTON COUNTY PRAIRIE SPECIES HCP

Reporting Form A: Project Impacts

SUBMIT TO: BENTON COUNTY COMMUNITY DEVELOPMENT DEPARTMENT, 360 SW Avery Avenue, Corvallis, OR

PART A: REQUEST FOR IMPACTS (to be completed PRIOR to impacts).

Benton County will use this information to determine whether a HCP Cooperator's proposed impacts can be covered by the Benton County Prairie Species HCP. If impacts can be covered under Benton County's incidental take permit and HCP, additional information will be required to develop a Cooperative Agreement between the Cooperator and Benton County, and for a Certificate of Inclusion to be issued.

Cooperator Name:_____

Date of Proposed Impacts: _____

Location of Proposed Impacts:_____

Required Documentation: Project Map(s). Attach following maps:

- ☐ Location of project, including property boundaries.
- ☐ Extent of proposed project impact area.
- ☐ Location of Covered Species within impact area.

☐ **Required Documentation: Project Description.** Attach a brief description of the activities that will result in the proposed impacts. In the case of utilities, this should include length of line installed or replaced within the Fender's Blue Zone and Nectar Zone, etc.

☐ **Required Documentation: Quantity of Covered Species to be Impacted by Proposed Project.** Attach current Survey Report documenting species abundance within project area, or calculate native nectar species quantity (based on impact area and cover of 1.39% on roadsides or 1.7% elsewhere).

_____Nelson's checkermallow (#)

_____Bradshaw's lomatium (#)

_____Willamette daisy (#)

_____Peacock larkspur (#)

_____Kincaid's lupine (m^2) outside Fender's Blue Zone

_____Kincaid's lupine (m^2) inside Fender's Blue Zone

_____Native Nectar for Fender's blue butterfly (m^2)

Has mitigation already been completed for this project?

☐ No. ☐ Yes, copy of previously submitted Form D Attached.

_____

_____

[[[Signature of Cooperator Representative]]] Date

_____

Name of Cooperator

_____

Address Phone

_____

Community Development Director, Benton County Representative Date

PART B: REPORTING OF IMPACTS (to be completed AFTER impacts occur).
Benton County will use this information in its annual compliance reporting to the USFWS and ODA.

Cooperator Name:_____

Date(s) of Impacts: _____

Location(s) of Impacts:_____

☐ **Required Documentation: Attach Project Maps (may refer to PART A if no change).**
- ☐ Location of project, including property boundaries.
- ☐ Extent of proposed project impact area.
- ☐ Location of Covered Species within impact area.

☐ **Required Documentation: Attach Project Description (may refer to PART A if no change)**
(Attach a brief description of the activities that resulted in impacts. In the case of utility work within the Fender's Blue Zone, this should include length of line installed, replaced, area of ground disturbed, etc.).

Confirmed Quantity of Covered Species Impacted by Project:

_____Nelson's checkermallow (#)
_____Bradshaw's lomatium (#)
_____Willamette daisy (#)
_____Peacock larkspur (#)
_____Kincaid's lupine (m^2) outside Fender's Blue Zone
_____Kincaid's lupine (m^2) inside Fender's Blue Zone
_____Native Nectar for Fender's blue butterfly (m^2)

_____

_____

[[[Signature of Cooperator Representative]]] Date

_____
Name of Cooperator

_____
Address Phone

_____
Community Development Director, Benton County Representative Date

BENTON COUNTY PRAIRIE SPECIES HCP
Reporting Form B: Work Completed-Habitat Restoration, Enhancement and Management

SUBMIT TO: BENTON COUNTY COMMUNITY DEVELOPMENT DEPARTMENT, 360 SW Avery Avenue, Corvallis, OR

This information is collected to allow Benton County to track and report to USFWS/ODA the habitat restoration, enhancement and management work, for mitigation or conservation, completed under the HCP Permit. SUBMIT THIS FORM BY DECEMBER 31 OF THE YEAR IN WHICH WORK WAS COMPLETED.

CHECK ONE: ☐ **WORK FOR MITIGATION** ☐ **VOLUNTARY WORK FOR CONSERVATION**

Name of Submitting Organization:_____ **COI #**_____

Site Name:_____(Complete entire form separately for each site).

Covered Species Present:_____

HABITAT TREATMENTS:

MOWING (Location/Species)	**DATE**	**ACRES**	**NOTES**
Total Acres Mowed:			
BURNING (Location/Species)	**DATE**	**ACRES**	**NOTES**
Total Acres Burned:			
HERBICIDE TREATMENT (location)	**DATE**	**ACRES**	**HERBICIDE TYPE/NOTES**
Total Acres Herbicide Treated:			
LIVESTOCK GRAZING (location)	**DATE**	**ACRES**	**LIVESTOCK TYPE/#**

Total Acres Grazed:			

SPECIES INTRODUCTIONS/AUGMENTATIONS: (if multiple introductions per species, add row for total by each species).

SPECIES	DATE	# PLUGS PLANTED	# SEEDS PLANTED	NOTES

SEED/PLANT MATERIAL COLLECTION: (if multiple collections per species, add row for total by each species).

SPECIES	DATE	# RHIZOMES	# SEEDS	NOTES

COI Number: _____ COI Date: _____

_____

[[[Signature of Cooperator Representative]]] Date

_____

Name of Cooperator

_____

Address Phone

_____

Community Development Director, Benton County Representative Date

BENTON COUNTY PRAIRIE SPECIES HCP
Reporting Form C: Effectiveness Monitoring Summary

SUBMIT TO: BENTON COUNTY COMMUNITY DEVELOPMENT DEPARTMENT, 360 SW Avery Avenue, Corvallis, OR

Complete this form using effectiveness monitoring data from a single site, and SUBMIT BY DECEMBER 31 OF THE YEAR IN WHICH MONITORING WAS COMPLETED. ***For Baseline Monitoring, complete the shaded fields only.*** *For continuing monitoring, if an adaptive management threshold has been triggered (e.g., if YES is checked in any box below), it is the responsibility of the landowner/manager to take and document the designated corrective action (see HCP Section 7.3.2).*

CHECK ONE: ☐ **WORK FOR MITIGATION** ☐ **VOLUNTARY WORK FOR CONSERVATION**

Cooperator Name:_____

Site:_____**Date of Effectiveness Monitoring**: _____

HCP SPECIES STATUS / ABUNDANCE

Species	Abundance (note units)			% Change		THRESHOLD CHECK: >30 % Decrease from Prior?
	Baseline Date: (/ /)	Prior Monitoring Date: (/ /)	Current Monitoring	From Baseline =100x (Current # - Baseline #) /Baseline #	From Prior =100x (Current # - Prior #) /Prior #	
						YES NO
						YES NO
						YES NO
						YES NO
						YES NO
						YES NO

TREE AND SHRUB ENCROACHMENT **THRESHOLD CHECK**

_____ Estimated baseline meadow size.

_____% Estimated decrease in meadow size from baseline Decrease >30%? ☐**YES** ☐**NO**

INVASIVE SPECIES: GROUP A

New population(s) discovered of _____ New occurrence? ☐**YES** ☐**NO**

New population(s) discovered of _____ New occurrence? ☐**YES** ☐**NO**

Existing population of _____ increased by _____% Increase >30%? ☐**YES** ☐**NO**
Existing population of _____ increased by _____% Increase >30%? ☐**YES** ☐**NO**
Existing population of _____ increased by _____% Increase >30%? ☐**YES** ☐**NO**

INVASIVE SPECIES: GROUP B
New population(s) discovered of _____ New population? ☐**YES** ☐**NO**
New population(s) discovered of _____ New population? ☐**YES** ☐**NO**

Existing population of _____ increased by _____% Increase >30%? ☐**YES** ☐**NO**
Existing population of _____ increased by _____% Increase >30%? ☐**YES** ☐**NO**
Existing population of _____ increased by _____% Increase >30%? ☐**YES** ☐**NO**
Existing population of _____ increased by _____% Increase >30%? ☐**YES** ☐**NO**

DISTURBANCE
Rodent ground disturbance: Baseline_____% of site, Current _____% Increase >30%? **YES** **NO**
Mammal grazing of Covered plants: Baseline:_____% Current _____% Increase >30%? **YES** **NO**
Significant windfall, erosion or hydrology issues? **YES** **NO**
Briefly describe or attach additional sheets.

Describe baseline trail use/trampling:_____
Significant increase in trail use or trampling? **YES** **NO**

Describe baseline surrounding land use_____
Significant change in surrounding land use? **YES** **NO**

PLANT COMMUNITY COMPOSITION & PLANT LITTER/THATCH ACCUMULATION (5x5m plots)

	Total % Cover and Date			**% Change**		**THRESHOLD CHECK: Change from Baseline?**
	Baseline	Prior Monitoring	Current Monitoring	**From Baseline** =100 x (Current # - Baseline #) /Baseline #	**From Prior** =100 x (Current # - Prior #) /Prior #	
Native Species						**>30 % Decrease? YES NO**
Exotic Species						**>30 % Increase? YES NO**
Woody Vegetation						**>15 % Increase? YES NO**
Plant Litter/ Thatch						**>30 % Increase? YES NO**

OTHER NOTES (attach additional pages)

COI Number: _____ COI Date: _____

_____

[[[Signature of Cooperator Representative]]] Date

_____

Name of Cooperator

_____

Address Phone

_____

Community Development Director, Benton County Representative Date

BENTON COUNTY PRAIRIE SPECIES HCP

Reporting Form D: Mitigation Notices

SUBMIT TO: BENTON COUNTY COMMUNITY DEVELOPMENT DEPARTMENT, 360 SW Avery Avenue, Corvallis, OR

PART A: NOTICE OF MITIGATION INITIATION

Submit this form before work to fulfill a mitigation requirement has been initiated.

Cooperator Name: _____

Prairie Conservation Area (PCA) Mitigation Site: _____

Date Mitigation Project Initiated: _____

Required Documentation:

☐ **Project Description.** Attach a brief description of the mitigation project. If all or part of the required mitigation is to be completed through habitat enhancement and restoration, describe planned management actions, e.g., mowing and burning regime.

☐ **Map of the PCA.** Show where mitigation will occur.

☐ **Baseline Habitat Assessment** of mitigation site (Reporting Form C).

☐ **Effectiveness Monitoring Plan** for mitigation project.

Quantity of Covered Species to be established:

SPECIES	# / m^2 REQUIRED FOR MITIGATION	# PLUGS PLANNED FOR PLANTING	# SEEDS PLANNED FOR PLANTING	NOTES

COI Number: _____ COI Date: _____

_____

[[[Name of Cooperator Representative]]] Date

_____

Name of Cooperator

_____

Address Phone

_____

Community Development Director, Benton County Representative Date

PART B: NOTICE OF MITIGATION COMPLETION

Submit this form once a mitigation requirement has been fulfilled. Correct documentation must be attached.

Cooperator Name: _____

Prairie Conservation Area (PCA) Mitigation Site: _____

Date Mitigation Project Initiated: _____ **Date Completed:** _____

Required Documentation: (Attach to this form - you may refer to Part A documentation if no change.)
☐ **Project Description.** Attach a brief description of the mitigation project.
☐ **Map of the PCA.** Show where mitigation occurred.

SPECIES	# / m^2 REQUIRED FOR MITIGATION	# PLUGS PLANTED	#SEEDS PLANTED	# / m^2 ESTABLISHED

Required Monitoring Data: (Attach to this form.)
☐ Documentation of Mitigated Population Trends (showing 3 yrs of stable/increasing trend)

☐ Documentation of Mitigated Population Viability (≥ 40% established plants successfully flowering and producing seeds)

COI Number: _____ **COI Date:** _____

_____ _____

[[[Signature of Cooperator Representative]]] Date

_____

Name of Cooperator

_____

Address Phone

_____

Community Development Director, Benton County Representative Date

Appendix R. Draft Implementing Agreement

DRAFT

Implementing Agreement
Benton County Prairie Species
Habitat Conservation Plan

[[[Date]]]

TABLE OF CONTENTS

Implementing Agreement

1.0 PARTIES

The parties to this Implementing Agreement (Agreement) are Benton County (Benton County or Permittee), the United States Fish and Wildlife Service (USFWS) and Oregon Department of Agriculture (ODA). Benton County, the USFWS and ODA are referred to collectively as "the Parties".

2.0 RECITALS AND PURPOSES

2.1 Recitals. The Parties have entered into this Agreement in consideration of the following facts:

(a) Lands within Benton County contain upland and wet prairies habitat for the following listed and unlisted prairie species: Fender's blue butterfly, Taylor's checkerspot butterfly, Kincaid's lupine, Willamette daisy, Nelson's checkermallow, Bradshaw's lomatium, and peacock larkspur.

(b) Benton County; several non-federal state and local land managers, a utility company, and two conservation organizations (Cooperators); and private landowners needing a County permit or Agricultural Building Authorization (private landowners) wish to conduct activities in Benton County resulting in impacts to Fender's blue butterfly, Taylor's checkerspot butterfly, Kincaid's lupine, Willamette daisy, Nelson's checkermallow, Bradshaw's lomatium, and peacock larkspur (Covered Species).

(c) Benton County is seeking a Permit from the USFWS to allow the County, Cooperators, and private landowners to conduct activities likely to impact the species. In return, Benton County, Cooperators, and private landowners agree to minimize and mitigate to the maximum extent practicable their impacts to the Covered Species.

(d) Benton County has prepared a Habitat Conservation Plan identifying the activities, lands, and species to be covered by the Permit and setting forth the conservation measures to be implemented to mitigate for impacts to the covered species as a result of the covered activities. Also included in the HCP are adaptive management and monitoring requirements, and the costs, funding sources, and tasks necessary to implement the HCP.

(e) The ODA is not a party to the Permit issued to Benton County by the USFWS, and it does not issue a separate incidental take permit. The HCP includes conservation measures needed to meet its and Cooperators' obligations under the State of Oregon's ESA.

2.2 Purposes. The purposes of this Agreement are:

(a) To ensure implementation of each of the terms of the HCP;

(b) To describe remedies and recourse should any of the Parties fail to perform their obligations as set forth in this Agreement; and,

(c) To provide assurances to Benton County that as long as the terms of the HCP, the Permit (USFWS only), and this Agreement are performed, no additional mitigation will be required of Permittee by USFWS or ODA, with respect to Covered Species, except as provided for in this Agreement or required by law.

3.0 DEFINITIONS

The following terms as used in this Agreement will have the meanings set forth below:

3.1 Terms defined in Endangered Species Act. Terms used in this Agreement and specifically defined in the Endangered Species Act (ESA) or in regulations adopted by the USFWS or the State of Oregon have the same meaning as in the federal or Oregon ESA and those implementing regulations, unless this Agreement expressly provides otherwise.

3.2 "Changed circumstances" means changes in circumstances affecting a Covered Species or the geographic area covered by the HCP that can reasonably be anticipated by the Parties to the HCP and that can reasonably be planned for in the HCP (e.g. the listing of a new species, or a fire or other natural catastrophic event in areas prone to such event.) Changed circumstances and the planned responses to those circumstances are described in Chapter 8 of the HCP. Changed circumstances are not Unforeseen Circumstances.

3.3 "Covered Activities" means certain activities carried out by Benton County, Cooperators, and private landowners on covered lands that may result in incidental take of the Covered Species. Covered Activities are described in Chapter 4 of the HCP and include:

- Home, Farm, and Forest Development
- Benton County Permits and Authorizations
- Public Service Facilities Construction
- Transportation and Work in Rights-of-Way
- Water and Wastewater Management
- Utility Construction and Maintenance
- Parks, Natural Areas, and Open Space Management
- Agricultural Activities
- HCP Implementation
- Emergency Response Activities

3.4 "Covered Lands" means the lands upon which the Permit authorizes incidental take of the Covered Species and the lands to which the HCP's conservation and mitigation measures apply. These lands are described in Chapter 3 of the HCP.

3.5 "Covered Species" means the Fender's blue butterfly, Taylor's checkerspot butterfly, Kincaid's lupine, Willamette daisy, Nelson's checkermallow, Bradshaw's lomatium, and peacock larkspur, which the HCP addresses in a manner sufficient to meet all of the criteria for issuing a Permit under ESA Section 10(a)(1)(B) and as required under the State of Oregon ESA.

3.6 "HCP" means the habitat conservation plan prepared by Benton County.

3.7 "Listed species" means a species (including a subspecies, or a distinct population segment of a vertebrate species) that is listed as endangered or threatened under the state or federal ESA.

3.8 "Permit" means the incidental take permit issued by the USFWS to Benton County pursuant to Section 10(a)(1)(B) of the ESA for take incidental to the Covered activities in Benton County, as it may be amended from time to time.

3.9 "Permittee" means Benton County.

3.10 "Take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any listed or unlisted Covered Species. Harm means an act that actually kills or injures a member of a Covered Species, including an act that causes significant habitat modification or degradation where it actually kills or injures a member of a Covered Species by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

3.11 "Unforeseen circumstances" means changes in circumstances affecting a species or geographic area covered by a conservation plan that could not reasonably have been anticipated by plan developers, USFWS, and ODA at the time of the HCP's negotiation and development, and that result in a substantial and adverse change in the status of the Covered Species.

3.12 "Unlisted species" means a species (including a subspecies, or a distinct population segment of a vertebrate species) that is not listed as endangered or threatened under the ESA.

4.0 OBLIGATIONS OF THE PARTIES

4.1 Obligations of Permittee. Permittee will fully and faithfully perform all obligations assigned to it under this Agreement, the Permit, and the HCP.

4.2 Obligations of the USFWS. Upon execution of this Agreement by the Parties, and satisfaction of all other applicable legal requirements, the USFWS will issue the Permittee a Permit under Section 10(a)(1)(B) of the ESA, authorizing incidental take of the Covered Species resulting from Covered Activities on Covered Lands.

4.2.1 Permit coverage. The Permit issued by the USFWS will identify all Covered Species and will take effect for Covered Species at the time the Permit is issued.

4.2.2 "No surprises" assurances. Provided that Permittee has complied with its obligations under the HCP, this Agreement, and the Permit, the USFWS can require Permittee to provide mitigation beyond that provided for in the HCP only under unforeseen circumstances, and only in accordance with the "no surprises" regulations at 50 C.F.R. §§ 17.22(b)(5), 17.32(b)(5).

4.3. Obligations of the ODA. Upon execution of this Agreement by the Parties, ODA agrees to provide Benton County with incidental take coverage for the covered plant species as allowed under the State of Oregon ESA.

4.4 Unforeseen circumstances

4.4.1 Limitation of additional mitigation for unforeseen circumstances. If unforeseen circumstances arise during the Permit term warranting additional mitigation from Benton County, so long as the County is in compliance with the HCP obligations, any additional mitigation shall maintain the original terms of the HCP to the maximum extent possible. Any such changes in mitigation requirements will be limited to modifications to the habitat restoration, enhancement, and management activities; monitoring; and plant material collection activities undertaken as mitigation in the Prairie Conservation Areas or Benton County Type I Special Management Areas (SMAs), so long as such changes do not require additional funding, land, or water resources without the consent of the County.

4.4.2 Basis for determination of unforeseen circumstances. If, during the implementation of this HCP, an unforeseen circumstance occurs that could have a significant negative impact on one or more of the Covered Species or could affect the ability of Benton County to effectively manage covered activities under this HCP, the USFWS or ODA shall notify Benton County, in writing, of the unforeseen circumstance. The USFWS or ODA's determination of unforeseen circumstances shall be based on the following factors:

- size of current range of affected species,
- percentage of range adversely affected by the HCP,
- percentage of range conserved by the HCP,
- ecological significance of the portion of the range affected by the HCP,
- level of knowledge about the affected species,

- degree of specificity of the species' conservation program under the HCP,
- whether conservation measures in the HCP provides an overall net benefit to the species and contains measurable criteria for assessing biological success of the HCP conservation measures, and
- whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the affected species in the wild.

4.4.3 Burden of demonstrating unforeseen circumstances requiring additional mitigation. The USFWS or ODA have the burden of demonstrating when such unforeseen circumstances exist requiring additional mitigation.

4.4.4 Notification of unforeseen circumstances. USFWS or ODA will provide Benton County with 120 days written notice of the proposed findings of unforeseen circumstances. During that 120-day period, USFWS or ODA shall meet with Benton County to discuss the proposed finding and provide the County with an opportunity to submit information to rebut the proposed finding and to consider any proposed changes to the HCP or Permit. During that period, Permittee will avoid actions contributing to appreciably reducing the likelihood of the survival and recovery of the affected species. If the parties mutually agree to modify or amend the HCP or Permit, the procedures set forth in Section 13.2 will be followed.

5.0 INCORPORATION OF HCP

The HCP and each of its provisions are intended to be, and by this reference are, incorporated herein. In the event of any direct contradiction between the terms of this Agreement and the HCP, the terms of this Agreement will control. In all other cases, the terms of this Agreement and the terms of the HCP will be interpreted to be supplementary to each other.

6.0 TERM

6.1 Initial Term. This Agreement and the HCP will become effective on the date the USFWS issues the Permit. This Agreement, the HCP, and the Permit will remain in effect for a period of Fifty (50) years from issuance of the Permit, except as provided below.

6.2 Permit suspension or revocation. The USFWS may suspend or revoke the Permit for cause in accordance with the laws and regulations in force at the time of such suspension or revocation (See 5 U.S.C. § 558; 50 C.F.R. §§ 13.27 - 13.29; 15 C.F.R. Part 904) except the USFWS may revoke the Permit based on a determination that the continuation of the Covered Activities would likely jeopardize the continued existence of the Covered Species, but only if the USFWS has been unsuccessful in remedying the situation in a timely fashion through other means as provided in the "No Surprises" rule (50 C.F.R. §§ 17.22(b)(5), 17.32(b)(5). Such suspension or revocation may apply to the entire Permit, or only to specified Covered Species, Covered Lands, or Covered Activities. In the event of suspension or revocation, Permittee's obligations

under this Agreement and the HCP will continue until the USFWS and ODA determine that all take of Covered Species that occurred under the Permit has been fully mitigated in accordance with the HCP.

6.3 Extension of the Permit. Upon agreement of the parties and compliance with all applicable laws, the Permit may be extended beyond its initial term under regulations of the USFWS in force on the date of such extension. If Permittee desires to extend the Permit, it will so notify the USFWS at least 180 days before the then-current term is scheduled to expire. Extension of the Permit constitutes extension of the HCP and this Agreement for the same amount of time, subject to any modifications the USFWS may require at the time of extension.

7.0 FUNDING

Permittee warrants that it has, and will expend, such funds as may be necessary to fulfill its obligations under the HCP. Permittee will promptly notify the USFWS and ODA of any material change in Permittee's financial ability to fulfill its obligations. In addition to providing any such notice, Permittee will provide the USFWS and ODA with a copy of its Annual HCP Compliance Report each year of the Permit, or with such other reasonably available financial information the parties agree will provide adequate evidence of Permittee's ability to fulfill its obligations.

8.0 MONITORING AND REPORTING

8.1 Planned periodic reports. As described in the HCP, the Permittee will submit Annual HCP Compliance Reports.

8.2 Other reports. Permittee will provide, within 30 days of being requested by the USFWS and/or ODA any additional information in its possession or control related to implementation of the HCP requested by the USFWS and/or ODA for the purpose of assessing whether the terms and conditions of the Permit (USFWS only) and the HCP, including the HCP's adaptive management plan, are being fully implemented.

8.3 Certification of reports. All reports will include the following certification executed by a responsible Benton County official who supervised or directed preparation of the report:

> I certify that, to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of this report, the information submitted is true, accurate, and complete.

8.4 Monitoring by USFWS. The USFWS may conduct inspections and monitoring in connection with the Permit in accordance with its regulations. (See 50 C.F.R. § 13.47)

9.0 CHANGED CIRCUMSTANCES

9.1 Permittee-initiated response to changed circumstances. Permittee will give notice to the USFWS and ODA within seven days after learning that any of the changed circumstances listed in the HCP has occurred. As soon as practicable thereafter, but no later than 30 days after learning of the changed circumstances, Permittee will modify its activities to the extent necessary to mitigate the effects of the changed circumstances on Covered Species, and will report to the USFWS and ODA on its actions. Permittee will make such modifications without awaiting notice from the USFWS or ODA.

9.2 USFWS or ODA-initiated response to changed circumstances. If the USFWS or ODA determines changed circumstances have occurred and Permittee has not responded in accordance with the HCP, the USFWS or ODA will so notify Permittee and will direct Permittee to make the required changes. Within 30 days after receiving such notice, Permittee will begin making the required changes and report to the USFWS and ODA on its actions. Such changes are provided for in the HCP, and hence do not constitute unforeseen circumstances or require amendment of the permit or HCP.

10.0 ADAPTIVE MANAGEMENT

10.1 Permittee-initiated adaptive management. Permittee will implement the adaptive management provisions in the HCP when changes in management practices are necessary to achieve the HCP's biological goal and objectives, or to respond to monitoring results or new scientific information. Permittee will coordinate with the USFWS and ODA on what kind of actions will be undertaken, and will report to the USFWS and ODA on any actions taken pursuant to this section.

10.2 USFWS or ODA-initiated adaptive management. If the USFWS or ODA determines one or more of the adaptive management provisions in the HCP have been triggered and Permittee has not changed its management practices in accordance with the HCP, the USFWS or ODA will notify Permittee and will direct Permittee to make the required changes. Within 30 days after receiving such notice, Permittee will begin making the required changes and report to the USFWS and ODA on its actions. Such changes are provided for in the HCP, and hence do not constitute unforeseen circumstances or require amendment of the Permit or HCP, except as provided in this section.

10.3 Reductions in mitigation. Permittee will not implement adaptive management changes resulting in less mitigation than provided for the Covered Species under the original terms of the HCP, unless the USFWS and ODA first provide written approval. Permittee may propose any such adaptive management changes by written notice to the USFWS and ODA, specifying the adaptive management modifications proposed, the basis for them, including supporting data, and the anticipated effects on Covered Species, and other environmental impacts. Within 120 days of receiving such a notice, the USFWS and ODA will either approve the proposed adaptive management changes,

approve them as modified, or notify Permittee the proposed changes constitute Permit amendments that must be reviewed under Section 13.3 of this Agreement.

10.4 No increase in take. This section does not authorize any modifications resulting in an increase in the amount and nature of take, or increase the impacts of take of Covered Species beyond that analyzed under the original HCP and any amendments thereto. Any such modification must be reviewed as a Permit amendment under Section 13.3 of this Agreement.

11.0 LAND TRANSACTIONS

11.1 Acquisition of land by Permittee. Nothing in this Agreement, the HCP, or the Permit limits the Permittee's or HCP Cooperator's right to acquire additional lands. Any lands that may be acquired that are outside those areas defined as Covered Lands will not be covered by the Permit and the HCP except upon amendment of the Permit and the HCP as provided in section 13.2 of this Agreement.

11.2 Disposal of Prairie Conservation Areas by Permittee. Permittee's or HCP Cooperator's transfer of ownership or control of Prairie Conservation Areas will require prior approval by the USFWS and ODA and an amendment of the Permit and HCP in accordance with section 13.2 of this Agreement, except transfers of Covered Lands may be processed as minor modifications in accordance with section 13.1 of this Agreement if:

(a) The land will be transferred to an agency of the federal government and, prior to transfer, the USFWS and ODA have determined the transfer will not compromise the effectiveness of the HCP based on adequate commitments by that agency regarding management of such land;

(b) The land will be transferred to a non-federal entity that has entered into an agreement acceptable to the USFWS and ODA (e.g., an easement held by the state fish and wildlife agency or a conservation organization with the USFWS and ODA as third-party beneficiaries) to ensure the lands will be managed in such a manner and for such duration so as not to compromise the effectiveness of the HCP;

(c) The USFWS and ODA determines the amount of land to be transferred will not have a material impact on the ability of the Permittee to comply with the requirements of the HCP and the terms and conditions of the Permit.

12.0 Emergency Management

Permittee, USFWS, and ODA agree that in the event a PCA is threatened by fire, flood, or similar emergency, emergency response personnel shall be permitted full access to the area, as necessary, to protect human life, property, and/or biological resources. In the event disturbance of a PCA is necessary to protect life or to prevent the catastrophic

loss of property, emergency personnel shall, where time permits, attempt to contact the USFWS and ODA for input on how best to respond to the emergency to maximize preservation of the Covered Species and habitat values, while preserving life and preventing the catastrophic loss of property. If time does not permit such consultation, Benton County is authorized to allow emergency personnel to disturb the habitat area as necessary to preserve life and prevent the catastrophic loss of property. After the emergency relief process begins, Benton County shall meet and consult with USFWS or ODA to determine the need and schedule for rehabilitating any Prairie Conservation Area.

13.0 MODIFICATIONS AND AMENDMENTS

13.1 Minor modifications.

(a) Any party may propose minor modifications to the HCP or this Agreement by providing written notice to all other parties. Such notice shall include a statement of the reason for the proposed modification and an analysis of its environmental effects, including its effects on operations under the HCP and on Covered Species. The parties will use best efforts to respond to proposed modifications within 60 days of receipt of such notice. Proposed modifications will become effective upon all other parties' written approval. If the USFWS and ODA concur with the minor amendments proposed by Benton County, they will submit such approval in writing within 120 days or less. If the USFWS and ODA do not send notice or approval or disapproval, the amendment is approved automatically. The modifications will be considered effective on the date of USFWS' and ODA's written authorization or after 120-days if USFWS and ODA fail to send notice of approval or disapproval. A record of any minor amendments to the HCP, incidental take permit, or Implementing Agreement shall be documented in writing.

If, for any reason, a receiving party objects to a proposed modification, it must be processed as a major amendment to the Permit in accordance with subsection 13.3 of this section. The USFWS or ODA will not approve minor modifications to the HCP or this Agreement if USFWS or ODA determines such modifications would result in (1) operations under the HCP significantly different from those analyzed in connection with the original HCP, (2) adverse effects on the environment new or significantly different from those analyzed in connection with the original HCP, or (3) additional take not analyzed in connection with the original HCP.

(b) Minor amendments to the HCP and this Agreement processed pursuant to this subsection may include but are not limited to the following:

- Correction of any maps or exhibits to correct errors in mapping or to reflect previously approved changes in the incidental take permit, Implementing Agreement, or HCP.
- Changes in land ownership.
- Changes to non-USFWS survey, monitoring, or reporting protocols.

- Changes to the biological goal or objectives in response to adaptive management.
- Modifications to or adoption of additional conservation measures likely to improve the conservation of Covered Species.
- Discontinuing any conservation measures determined through monitoring and adaptive management to be ineffective.
- Any other types of modifications clarifying components of the incidental take permit, Implementing Agreement, or HCP.

(c) Minor amendments to the HCP, Permit, and/or this Agreement do not require amendment of the County's implementing ordinance adopting the HCP, Permit, and this Agreement.

(d) Any other amendments to the HCP or this Agreement will be processed as major amendments to the Permit in accordance with subsection 13.3 of this section.

13.2 Major Amendments of the Permit.

(a) The Permit may be amended in accordance with all applicable legal requirements, including but not limited to the ESA, the National Environmental Policy Act, and the USFWS's permit regulations. The party proposing the amendment shall provide a statement of the reasons for the amendment and an analysis of its environmental effects, including its effects on operations under the HCP and on Covered Species.

Major amendments to the HCP, Permit, and/or this Agreement may include, but are not limited to, the following:

- Revisions (additions or deletions) to the Plan Area, not qualifying as a minor modification.
- Adding or removing one or more species to the list of Covered Species.
- Increasing the amount of take allowed under the incidental take permit.
- Adding one or more activities to the list of Covered Activities if that activity will result in greater adverse effects to the Covered Species than that analyzed through the NEPA documentation.
- Modifying a conservation measure so substantially as to affect the level of authorized take, the Covered Activities, funding, or the nature and scope of the conservation measures.
- Extending the Permit term beyond 50 years.

The parties agree a major modification of the HCP will occur only if Benton County has sufficient funding to assist in make the necessary revisions to the HCP.

14.0 REMEDIES, ENFORCEMENT, AND DISPUTE RESOLUTION

14.1 In general. Except as set forth below, each party shall have all remedies otherwise available to enforce the terms of this Agreement, the Permit, and the HCP.

14.2 No monetary damages. No party shall be liable in damages to any other party or other person for any breach of this Agreement, any performance or failure to perform a mandatory or discretionary obligation imposed by this Agreement, or any other cause of action arising from this Agreement.

14.3 Injunctive and temporary relief. The parties acknowledge the Covered Species are unique and their loss as species would result in irreparable damage to the environment, and therefore injunctive and temporary relief may be appropriate to ensure compliance with the terms of this Agreement.

14.4 Enforcement authority of the United States. Nothing contained in this Agreement is intended to limit the authority of the United States government or State of Oregon to seek civil or criminal penalties or otherwise fulfill its enforcement responsibilities under the state or federal ESA or other applicable laws.

14.5 ODA Enforcement Permit. The ODA shall have no authority to enforce the terms of the Permit issued to Benton County by the USFWS.

14.6 Dispute resolution. The parties recognize that disputes concerning implementation of, compliance with, or termination of this Agreement, the HCP, and/or the Permit may arise from time to time. The parties agree to work together in good faith to resolve such disputes, using the informal dispute resolution procedures set forth in this section, or such other procedures upon which the parties may later agree. However, if at any time any party determines circumstances so warrant, it may seek any available remedy without waiting to complete informal dispute resolution.

14.6.1 Informal dispute resolution process. Unless the parties agree upon another dispute resolution process, or unless an aggrieved party has initiated administrative proceedings or filed suit in state or federal court as provided in this section, the parties may use the following process to attempt to resolve disputes:

(a) The aggrieved party will notify the other parties of the provision that may have been violated, the basis for contending a violation has occurred, and the remedies it proposes to correct the alleged violation.

(b) The party alleged to be in violation will have 30 days, or such other time as may be agreed upon, to respond. During this time it may seek clarification of the information provided in the initial notice. The aggrieved party will use its best efforts to provide any information then available that may be responsive to such inquiries.

(c) Within 30 days after such response was provided or was due, representatives of the parties having authority to resolve the dispute will meet and negotiate in good faith

toward a solution satisfactory to all parties, or will establish a specific process and timetable to seek such a solution.

(d) If any issues cannot be resolved through such negotiations, the parties will consider non-binding mediation and other alternative dispute resolution processes and, if a dispute resolution process is agreed upon, will make good faith efforts to resolve all remaining issues through that process.

15.0 MISCELLANEOUS PROVISIONS

15.1 No partnership. This Agreement, the Permit, or the HCP shall not make or be deemed to make any party to this Agreement the agent for or the partner of any other party.

15.2 Notices. Any notice allowed or required by this Agreement shall be in writing, delivered personally to the persons listed below, or shall be deemed given five (5) days after deposit in the United States mail, certified, and postage prepaid, return receipt requested and addressed as follows, or at such other address as any party may from time to time specify to the other parties in writing. Notices may be delivered by facsimile or other electronic means, provided they are also delivered personally or by certified mail. Notices shall be transmitted so they are received within the specified deadlines.

State Supervisor
Oregon Fish and Wildlife Office
United States Fish and Wildlife Service
2600 S.E. 98th Ave.
Portland, Oregon 97266
Telephone: 503-231-6179
Fax: 503-231-6195

Director
Oregon Department of Agriculture
635 Capitol St. NE
Salem, OR 97301-2532
Telephone: 503-986-4550
Fax: 503-986-4747

Commissioners
Benton County Government
P.O. Box 3020
Corvallis, Oregon 97330-3020
Telephone: 541-766-6800
Fax: 541-766-6893

15.3 Entire agreement. This Agreement, together with the HCP and the Permit (USFWS only), constitutes the entire agreement among the parties. It supersedes any and all other agreements, either oral or in writing, among the parties with respect to the subject matter hereof and contains all of the covenants and agreements among them with respect to said matters, and each party acknowledges no representation, inducement, promise or agreement, oral or otherwise, has been made by any other party or anyone acting on behalf of any other party not embodied herein.

15.4 Elected officials not to benefit. No member of or delegate to Congress shall be entitled to any share or part of this Agreement, or to any benefit arising from it. No Oregon State Legislator nor the Governor of Oregon shall be entitled to any share or part of this Agreement, or to any benefit arising from it.

15.5 Availability of funds. Implementation of this Agreement by the USFWS is subject to the requirements of the Anti-Deficiency Act and the availability of appropriated funds. Nothing in this Agreement will be construed by the parties to require the obligation, appropriation, or expenditure of any money from the U.S. Treasury. The parties acknowledge the USFWS will not be required under this Agreement to expend any federal agency's appropriated funds unless and until an authorized official of that agency affirmatively acts to commit to such expenditures as evidenced in writing. Nothing in this Agreement will be construed by the parties to require an obligation, appropriate, or expenditure of any money from the treasury of the State of Oregon. The parties acknowledge ODA will not be required under this Agreement to expand any state agency's appropriated funds unless and until an authorized official of that agency affirmatively acts to commit such expenditures as evidence in writing.

15.6 Duplicate originals. This Agreement may be executed in any number of duplicate originals. A complete, signed original of this Agreement shall be maintained in the official records of each of the parties hereto.

15.7 No third-party beneficiaries. Without limiting the applicability of rights granted to the public pursuant to the state or federal ESA or other state or federal law, this Agreement shall not create any right or interest in the public, or any member thereof, as a third-party beneficiary hereof, nor shall it authorize anyone not a party to this Agreement to maintain a suit for personal injuries or damages pursuant to the provisions of this Agreement. The duties, obligations, and responsibilities of the parties to this Agreement with respect to third parties shall remain as imposed under existing law.

15.8 Relationship to the ESA and other authorities. The terms of this Agreement shall be governed by and construed in accordance with the state and federal ESA and applicable state and federal law. In particular, nothing in this Agreement is intended to

limit the authority of the USFWS or ODA to seek penalties or otherwise fulfill their responsibilities under state or federal ESA. Moreover, nothing in this Agreement is intended to limit or diminish the legal obligations and responsibilities of the USFWS as an agency of the federal government or the ODA, as an agency of Oregon state government. Nothing in this Agreement will limit the right or obligation of any federal agency to engage in consultation required under Section 7 of the ESA or other federal law; however, it is intended the rights and obligations of Permittee under the HCP and this Agreement will be considered in any consultation affecting Permittee's use of the Covered Lands.

15.9 References to regulations. Any reference in this Agreement, the HCP, or the Permit to any regulation or rule of the USFWS or ODA shall be deemed to be a reference to such regulation or rule in existence at the time an action is taken.

15.10 Applicable laws. All activities undertaken pursuant to this Agreement, the HCP, or the Permit must be in compliance with all applicable state and federal laws and regulations.

15.11 Successors and assigns. This Agreement and each of its covenants and conditions shall be binding on and shall inure to the benefit of the parties and their respective successors and assigns. Assignment or other transfer of the Permit shall be governed by the USFWS' regulations in force at the time.

IN WITNESS WHEREOF, THE PARTIES HERETO have executed this Implementing Agreement to be in effect as of the date the USFWS issues the Permit.

BY _____ Date _____
[[[Name]]]
Deputy Regional Director
United States Fish and Wildlife Service
Portland, Oregon

BY _____ Date _____
[[[Name]]]
Director
Oregon Department of Agriculture
Salem, Oregon

BY _____ Date _____
[[[Name]]]
County Commissioner
Benton County
Corvallis, Oregon

BY _____ Date _____
[[[Name]]]
County Commissioner
Benton County
Corvallis, Oregon

BY _____ Date _____
[[[Name]]]
County Commissioner
Benton County
Corvallis, Oregon