Baseline Inventory Documentation

for

Cardwell Hill Land Acquisition Project

Pearcy-Schoener Conservation Easement Property

April 19, 2013

The purpose of this Baseline Inventory Documentation is to provide an accurate description of the Pearcy-Schoener Conservation Easement Property's conditions and resources at the time of recording the Conservation Easement. The Baseline will be used for management and monitoring purposes by Benton County Natural Areas & Parks Department and as a Conservation Easement monitoring document by the Oregon Watershed Enhancement Board.

Prepared by:

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With assistance from:
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&
George McAdams and Jeff Powers
Benton County Natural Areas and Parks Department

I. Basic Conservation Easement Property Information

A. Conservation Easement Property name: Pearcy-Schoener (the "Conservation Easement Property")

B. Owner of underlying fee simple: William G. Pearcy and Amy Schoener (the "Pearcy-Schoeners")

C. Acreage: 26.64 acres

D. Conservation Easement purchaser and holder: Benton County (the "County")

E. Anticipated date of acquisition: June 2013

F. Purchase funding: Grants from the Oregon Watershed Enhancement Board ("OWEB") and the Cooperative Endangered Species Conservation Fund administered by the U.S. Fish and Wildlife Service. The Conservation Easement will grant OWEB a third-party right of enforcement, in exchange for OWEB funds.

G. Conservation Easement Property location: Township 11S Range 6W Sections 27 and 22. USGS quadrangle 7.5 minute map name: Wren.

H. Legal description and tax lots: (Attachment A).

I. Physical address: The Conservation Easement Property does not have a physical address.

J. Directions and mileage to the Conservation Easement Property: From Corvallis, proceed west on Highway 20 for approximately 10 miles, through Philomath. Turn north (right) on Kings Valley Highway (Highway 223) and proceed for approximately one mile. Turn right on Cardwell Hill Road, proceed for approximately 0.7 miles, and turn right onto Lillian Drive. Remain on Lillian Drive for its entire length (just over 0.5 miles), then continue on a private road as it narrows for about 0.1 miles and crosses a small bridge, owned by the Pearcy-Schoeners. The bridge spans the Marys River and abuts the far western portion of the Conservation Easement Property, as depicted in Attachment B.

K. Access: Legal access to the Conservation Easement Property is provided by a 50-foot wide private road and utility easement, appurtenant to a larger parcel conveyed to the Pearcy-Schoeners by deed M-242953-98, recorded on March 16, 1998. The easement runs from Lillian Drive, a public road, south to the Pearcy-Schoener-owned bridge, which crosses the Marys River and abuts the far western portion of the Conservation Easement Property. Access is depicted in Attachment B. Limited public access will be allowed by the County for educational purposes, in accordance with an OWEB-approved management plan.

L. Ownership history: The Pearcy-Schoeners purchased the Conservation Easement Property in fee simple, as part of a larger parcel, from Floyd and Beverly McFarland in 1998, and are now selling the Conservation Easement to the County.

M. Current zoning: EFU – Exclusive Farm Use.

N. General description of the Conservation Easement Property (current and surrounding land

use): The majority of the Conservation Easement Property is fallow, uncultivated agricultural land, and is surrounded by agricultural land and rural residences.

O. Historical use of the Conservation Easement Property: Prior to the 1990s the Conservation Easement Property was most likely used for livestock grazing. Since the 1990s, it has been fallow. During the Pearcy-Schoener's ownership, the site has been enrolled in a Wildlife Habitat Conservation and Management Plan with Benton County and Oregon Department of Fish and Wildlife. The U.S. Fish and Wildlife Service's Partners for Fish and Wildlife Program has assisted the Pearcy-Schoeners with prairie restoration projects.

P. Summary of conservation values: The Conservation Easement Property contains approximately 20.5 acres of Western Oregon upland prairie, and 6 acres of riparian forest, both OWEB priority ecological systems. The Conservation Easement Property also contains remnant native prairie plant communities (including California Oatgrass Valley Grassland) and two imperiled prairie species, Kincaid's lupine (*Lupinus oreganus= Lupinus sulphureus* spp. *kincaidii*), which is federally listed as threatened, and Fender's blue butterfly (*Plebejus icarioides fenderi = Icaricia icarioides fenderi*) which is federally listed as endangered.

II. Conservation Easement Property Description and Resource Evaluation

A. Physical characteristics of the Conservation Easement Property:

1. **Rock and water features**: The Conservation Easement Property does not contain significant rock features. The Marys River forms the northern boundary of the Conservation Easement Property, and a small creek "Winter Creek", which contains water for part of the year, bisects the Conservation Easement Property (Attachment C).

2. **Soils:** The Conservation Easement Property contains McAlpin and Jory soils. The *Soil Survey of Benton County, Oregon* (2004) indicates that two primary types occur on the Conservation Easement Property, as follows, and depicted in Attachment C:
    - Jory silty clay loam, 2-12 percent slopes. This soil makes up most of the upland prairie habitat at the Conservation Easement Property. Jory soils are deep, well drained soils formed in colluvium weathered from sedimentary and basic igneous rocks. In a representative profile, the surface layer is dark reddish brown silty clay loam about 15 inches thick. The subsoil is dark red and dark reddish-brown silty clay and clay that extends to a depth of 60 inches. Water permeability is moderately slow and root penetration is deep.
    - McAlpin silty clay loam, rarely flooded, 0-3 percent slopes. This soil type is primarily within the riparian forest habitat and runs parallel to Marys River on the Conservation Easement Property. This soil is deep, moderately well drained and formed in alluvium weathered from basic igneous rocks. The soil tends to occur along tributary streams and drainageways in the foothills in northern Benton County. A representative profile of this soil includes a dark brown silty clay loam surface layer of about 14 inches thick. The subsoil is a dark grayish-brown, dark-brown and brown silty clay that extends to a depth of 60 or more inches. Gravel or bedrock is at a depth of 40 inches or more. Runoff is slow on the soil and permeability is

moderately slow. Rooting depth is deep but can be restricted by a seasonally high water table.

3. **Geology, geologic features, and potential geologic hazards**: An Environmental Site Assessment conducted by Omnicon Environmental Management, dated June 19, 2009, and on file with the County and OWEB (the "ESA"), found that the Conservation Easement Property is underlain by Eocene volcanic rocks of the Oregon Coast Range, including basaltic pillow lava, tuff breccia, subaerial basalt flows, and sills with interbeds of basaltic sandstone, siltstone and conglomerate. Well logs completed for sites near the Conservation Easement Property indicate the presence of 3 to 4 feet of soil, followed by 6 to 8 feet of clays, then basalt bedrock. There is no evidence of potential geologic hazards.

B. Historic natural events: e.g. flooding, fire, rock falls, etc.: There is no evidence of recent natural events.

C. Hydrogeology and groundwater hydrology: The ESA states that in the vicinity of the Marys River, shallow groundwater probably generally flows toward the east or southeast, sub-parallel to the flow of the river. On the Conservation Easement Property itself, shallow groundwater most likely flows north to the river, with some localized gradients radiating in north northeast and north northwest directions. Elevation contours are depicted in Attachment C.

D. Conservation values (natural habitat, vegetation, and wildlife): According to the Institute for Applied Ecology ("IAE"), the Conservation Easement Property supports a significant population of Fender's blue butterfly, an endangered species, and its host plant, Kincaid's lupine, a threatened species. Based on field surveys conducted in June 2012, Greg Fitzpatrick from Fitzpatrick Ecological Consulting estimated the Conservation Easement Property's Fender's blue butterfly population to be 297 butterflies. This estimate is based on one year of field surveys, and therefore the amount of year-to-year variability in the Conservation Easement Property's Fender's blue butterfly population is not known.

The Conservation Easement Property contains areas of high-quality upland prairie throughout, a grove of oak savanna in the western-central portion of the site, and riparian forest along the northern boundary. Valuable native nectar species for Fender's blue butterfly include dwarf checkermallow (*Sidalcea virgata*), Oregon sunshine (*Eriophyllum lanatum*), and Oregon iris (*Iris tenax*). The Conservation Easement Property also includes significant patches of native California oatgrass (*Danthonia californica*) and scattered areas of Roemer's fescue (*Festuca roemeri*). Oregon white oak (*Quercus garryana*) provides valuable potential habitat for western gray squirrel, and Oregon ash (*Fraxinus latifolia*) provides valuable potential habitat for western pond turtle.

IAE conducted baseline monitoring of several properties, including the Conservation Easement Property, on behalf of Benton County in spring and summer 2011. IAE prepared a report of the results entitled *Benton County Natural Areas and Parks Prairie Baseline Inventory Report October 2011 (*Attachment D). From vegetation plot data, IAE calculated that the Conservation Easement Property contains approximately 297 square meters (0.07 acres) of Kincaid's lupine (mapped in Attachment E) and 45.3 square meters (0.01 acres) of Fender's blue butterfly nectar species. The vegetation plots contained an average native species cover of approximately 32.5%. A follow-up field visit by IAE with OWEB in March 2013 found no evidence to suggest significant changes in

lupine or nectar conservation values from the 2011 survey.

In addition to currently containing the baseline conservation values described above, the Conservation Easement Property presents an important opportunity for the County to restore additional areas of native prairie, and permanently maintain the restoration outcomes. Habitat restoration and maintenance activities at the Conservation Easement Property will help stabilize the site's Fender's blue butterfly population at or above 200 butterflies, which will contribute to the recovery of the butterfly (down-listing and potential eventual delisting). The County will undertake protection of the existing conservation values, and restoration of additional conservation values, in accordance with an OWEB-approved management plan, and in partnership with local conservation groups such as IAE.

E. Threats to conservation values: The Conservation Easement Property's Western Oregon upland prairie habitat is threatened by the encroachment of woody vegetation and non-native, invasive plant species. The Pearcy-Schoeners have completed regular maintenance at the site, and additional work has been completed through the U.S. Fish and Wildlife Service's Partners for Fish and Wildlife Program. The work included removing Douglas-fir within the oak savanna grove, maintenance work on existing oaks, and regular mowing to control conifer recruitment and woody species encroachment. The County must begin maintaining and expanding the restored conditions, or the benefits to prairie species will be diminished or lost. As with most areas in Cardwell Hill, false brome (*Brachypodium sylvaticum*) is present at the Conservation Easement Property, appearing in small patches, but has so far been regularly treated with herbicide.

In *Benton County Natural Areas and Parks Prairie Baseline Inventory Report October 2011*, IAE reported that the Conservation Easement Property's vegetation plots in prairie areas contained an average of 55% introduced species. The prairie portion of the Conservation Easement Property contains approximately 250 square meters (0.06 acres) of scotch broom; only scattered individuals of Himalayan blackberry; 3,810 square meters (0.94 acres) of medusahead rye (*Taeniatherum canput-medusae*); 714 square meters (0.18 acres) of false brome; 391 square meters (0.1 acres) of Canada thistle (*Cirsium arvense*); and scattered individuals of tansy ragwort (*Senecio jacobaea*). The County understands that active management is a critically important part of conserving prairie habitat, and will undertake woody vegetation and invasive species control measures in accordance with an OWEB-approved management plan.

F. Conservation Easement Property encumbrances and improvements (depicted in Attachment B):

1. Railroad right of way: The southern boundary of the Conservation Easement Property is abutted by a railroad. There is a right of way associated with the railroad, extending 30 feet north and 30 feet south from the centerline of the tracks. The deed that conveyed land to the railroad was recorded in Book P, page 464, on October 17, 1884. The deed implies that the railroad operator has the right to cross the Conservation Easement Property for the purpose of maintaining the railroad, although a reasonable argument can be made that such maintenance rights are limited to the railroad right of way. The County and the Pearcy-Schoeners will work with the railroad operator as needed to minimize any adverse impacts that activities allowed under the railroad deed might have on the conservation values of the Conservation Easement Property.

2. Bonneville Power Administration (BPA) power line easement: The southern half of the Conservation Easement Property is traversed by east-west-running power lines operated by BPA. The easement for the power lines was recorded in Book 111, page 450, on April 26, 1946. The easement gives BPA the right to enter the Conservation Easement Property to operate, maintain, repair, and rebuild the power lines and appurtenant structures such as poles. BPA also has the right to keep the area under the power lines clear of vegetation that presents fire hazards. The County and the Pearcy-Schoeners will work with BPA to minimize any adverse impacts that activities allowed under the BPA easement might have on the conservation values of the Conservation Easement Property. Coordination with BPA will include but not be limited to scheduling vegetation clearing for times when Kincaid's lupine and Fender's blue butterfly will be minimally impacted by the activities.

3. Benton-Lincoln Electric Cooperative, Inc. power line easement: Benton-Lincoln Electric Cooperative, Inc. has a power line easement, recorded in Book 175, page 595, on December 8, 1960. A location is not specified for the easement. However, there does not appear to be a power line associated with this easement on the Conservation Easement Property. The County and the Pearcy-Schoeners will work with Benton-Lincoln Electric Cooperative, Inc. as needed to minimize any adverse impacts that activities allowed under the power line easement might have on the conservation values of the Conservation Easement Property.

4. Consumer's Power, Inc. power line easement: Consumer's Power, Inc. has an easement, "primarily for underground power transmission facilities," which was recorded on July 16, 1980 as document M-18692-80. The easement gives Consumer's Power the right to operate, maintain, and repair a power line. From a map recorded with the power line easement, it appears the power line serves the residence immediately west of the Conservation Easement Property. The map is of poor quality but nonetheless seems to indicate that the power line easement barely traverses the farthest western tip of the Conservation Easement Property, where the boundary abuts the bridge across the Marys River. This is supported by the fact that there is conduit attached to the side of the bridge. The power line easement isn't likely to present threats to the conservation values, because of its minimal presence on the Conservation Easement Property, and the power line easement's width of only six feet on either side of its centerline. Furthermore, the County and the Pearcy-Schoeners will work with Consumer's Power as needed to minimize any adverse impacts that activities allowed under the power line easement might have on the conservation values of the Conservation Easement Property.

5. Hydroelectric dam easement: There is an easement for a hydroelectric dam in the vicinity of the bridge across the Marys River. The easement was recorded on October 17, 1980 as document M-22108-80. The easement rights are specifically "limited to and defined by Oregon State Water Resources Department (WRD) Hydroelectric Project License #270…" An OWEB contractor consulted with Mary S. Grainey at WRD who considers License No. 270 to be an expired license. Although the contingent license has expired, the easement will remain in place until terminated by the parties to the easement, or their heirs and assigns. The County should make a reasonable effort to terminate the easement through cooperative efforts with the Pearcy-Schoeners and the owner of the neighboring property.

6. Private road: There is a 30-foot wide private road easement that straddles the western boundary of the Conservation Easement Property. The road, associated with a deed

recorded on April 10, 1981 as M-27307-81, serves property owned by the Pearcy-Schoeners (both the Conservation Easement Property and a remainder parcel south of the railroad), as well as another private parcel southwest of the Conservation Easement Property (both north and south of the railroad).

The road's legal description is centered on the boundary of the Conservation Easement Property. However, the road, which is an unimproved, grass-covered, two-track strip maintained by mowing, is actually located as depicted in Attachment B. The actual location appears to vary from the legal description because of impediments to passage posed by rock outcroppings and other land features. In its current condition and location, the road appears to present minimal threats to the conservation values of the Conservation Easement Property. The conservation easement will prohibit changes to the current location and character of the road, and the County and the Pearcy-Schoeners will work with the western neighbor, BPA, and any other road users as needed to minimize any adverse impacts that road usage allowed under the easement might have on the conservation values of the Conservation Easement Property.

7. Culverts: Two culverts are located on the southern half of the Conservation Easement Property. Their location is depicted in Attachment B, and photos are included in Attachment G.

8. Abandoned Playhouse: An abandoned playhouse measuring 4 feet x 6 feet is located in the western-central portion of the Conservation Easement Property, and is depicted in Attachments B and G. The Conservation Easement will give the County the right to remove the playhouse at the County's expense.

The Conservation Easement Property contains no other improvements, other than several fence remnants, one of which is depicted in Attachment G.

G. Water rights: None.

H. Erosion, trespass damage, and disturbed land (e.g. gravel pits): Minor tracking from vehicle tires was noted off the private road, within the boundaries of the Conservation Easement Property. To eliminate this disturbance in the future, the County should work with the Pearcy-Schoeners to establish a parking area at the western boundary of the Conservation Easement Property. Once the Conservation Easement is recorded, off-road vehicle traffic will be prohibited, except to the extent it is allowed under the encumbrances described in Section F above, or in an OWEB-approved management plan.

I. Waste material disposal sites: The ESA found no hazardous or non-hazardous waste on the Conservation Easement Property. A follow-up inspection by the County also found no such waste (report dated May 4, 2012, on file with County and OWEB). During a site visit on March 27, 2013, IAE and OWEB staff observed a small amount of refuse along the private road, on the Conservation Easement Property boundary that is adjacent to the neighboring residence. The County should work with the Pearcy-Schoeners to determine whether the refuse encroaches on the Conservation Easement Property, and if so, remove the refuse as soon as practicable.

J. Photo points and photographs: Photographs depicting the Conservation Easement

Property's prairie and oak conservation values were taken on March 27, 2013 from the permanent photo points A and B established by IAE in 2011 (mapped in Attachment F). On the same day, OWEB and IAE established permanent photo point C, mapped in Attachment F, to document the Conservation Easement Property's riparian conservation values. OWEB and IAE took additional photos, labeled 1-9 on in the table below, to document the Conservation Easement Property's roads, bridge, culverts, and other non-conservation features. Collectively, the photos are contained in Attachment G. The photo point data are:

Photo Point[1]	Direction	Photo Point Description	Latitude*	Longitude*
A	A north A west A south A east	Center of Oak Savanna Grove on western portion of property	44.591109	-123.409676
B	B north B west B south B east	Eastern portion of the property	44.591216	-123.407288
C	C north C west C south C east	Riparian area, eastern half of property	44.592360	-123.406923
1	1 South	Private bridge, entry road	44.591775	-123.413352
2	2 West	Private road around rock outcrop	44.591562	-123.412351
3	3 South	Private road, looking toward RR ROW	44.591527	-123.411332
4	4 East	RR ROW	44.590267	-123.410924
5	5 East	BPA easement	44.590617	-123.410952
6	6 North	Western culvert	44.590550	-123.407972
7	7 North	Eastern culvert	44.590440	-123.405881
8	8 East	Fence fragment	44.592273	-123.406224
9	9 West	Play house	44.591061	-123.409409

[1]Photo points A-B established by: Carolyn Menke, IAE: Date: June 17, 2011. Photo points C and 1-9 established by: Carolyn Menke and Miriam Hulst, OWEB. Date: March 27, 2013.

*All photo point coordinates recorded in NAD 83 State Plane using a Nautiz X7/ArcPad 10.

K. List of attachments:

1. Attachment A: Legal description and tax lot maps
2. Attachment B: Access and encumbrances
3. Attachment C: Soils, elevation and water
4. Attachment D: *Benton County Natural Areas and Parks Prairie Baseline Inventory Report October 2011*
5. Attachment E: Kincaid's lupine map
6. Attachment F: Photo point map
7. Attachment G: Photos

ACCEPTANCE AND ACKNOWLEDGEMENT
OF
BASELINE INVENTORY DOCUMENTATION

The undersigned hereby accept and acknowledge that the Baseline Inventory Documentation for the Cardwell Hill (Pearcy-Schoener) Conservation Easement, Benton County, Oregon, prepared by Carolyn Menke of Institute for Applied Ecology, and dated April 19, 2013, is an accurate representation of the Conservation Easement Property as of the Effective Date of the Conservation Easement. The undersigned have received copies of the Baseline Inventory Documentation.

Grantor

_____ _____
William G. Pearcy Date

_____ _____
Amy Schoener Date

Grantee: Benton County

_____ _____
Name: Date
Title:

Attachment A: Legal description and tax lot map

Beginning at the Southwest corner of that tract of land conveyed to William E. Smith, et ux, by deed recorded July 24,1973 as Instrument No. 32995, Microfilm No. 42092, Microfilm Records of Benton County, Oregon; thence East along the South line of said tract 529.95 feet to the interior Southeast corner of said tract; thence South 0° 32' East 133.12 feet; thence North 85° 19' 30" East 68.16 feet; thence South 0° 32' East 375 feet, more or less, to the center of Mary's River; thence following the center of Mary's River, Easterly to a point 300 feet West of the East line of the West half of the Sam Huffman Donation Land Claim No. 69; thence South 0° 32' East 150 feet, more or less, to a point on the South line of Section 22, Township 11 South, Range 6 West of the Willamette Meridian, Benton County, Oregon; thence North 89° *39-1/4'* East along the South line of said Section 22 a distance of 300 feet to the East line of the West half of Donation Land Claim No. 69; thence South 0° 32' East along the West half of said Donation Land Claim No. 69 to a point on the South line of said Donation Land Claim; thence Westerly along the South line of Donation Land Claim No. 69 to the Southwest corner of Sam Huffman Donation Land Claim No. 69; thence Northerly along the West line of Donation Land Claim No. 69 to the point of beginning.

EXCEPT THEREFROM that parcel conveyed to Thomas T. Roy by deed recorded April 10, 1961 as Instrument No. 24963, Microfilm records of Benton County, Oregon, and re-recorded June 25, 1984 as Instrument No. 53128, Microfilm No. 58954, Microfilm Records of Benton County, Oregon.

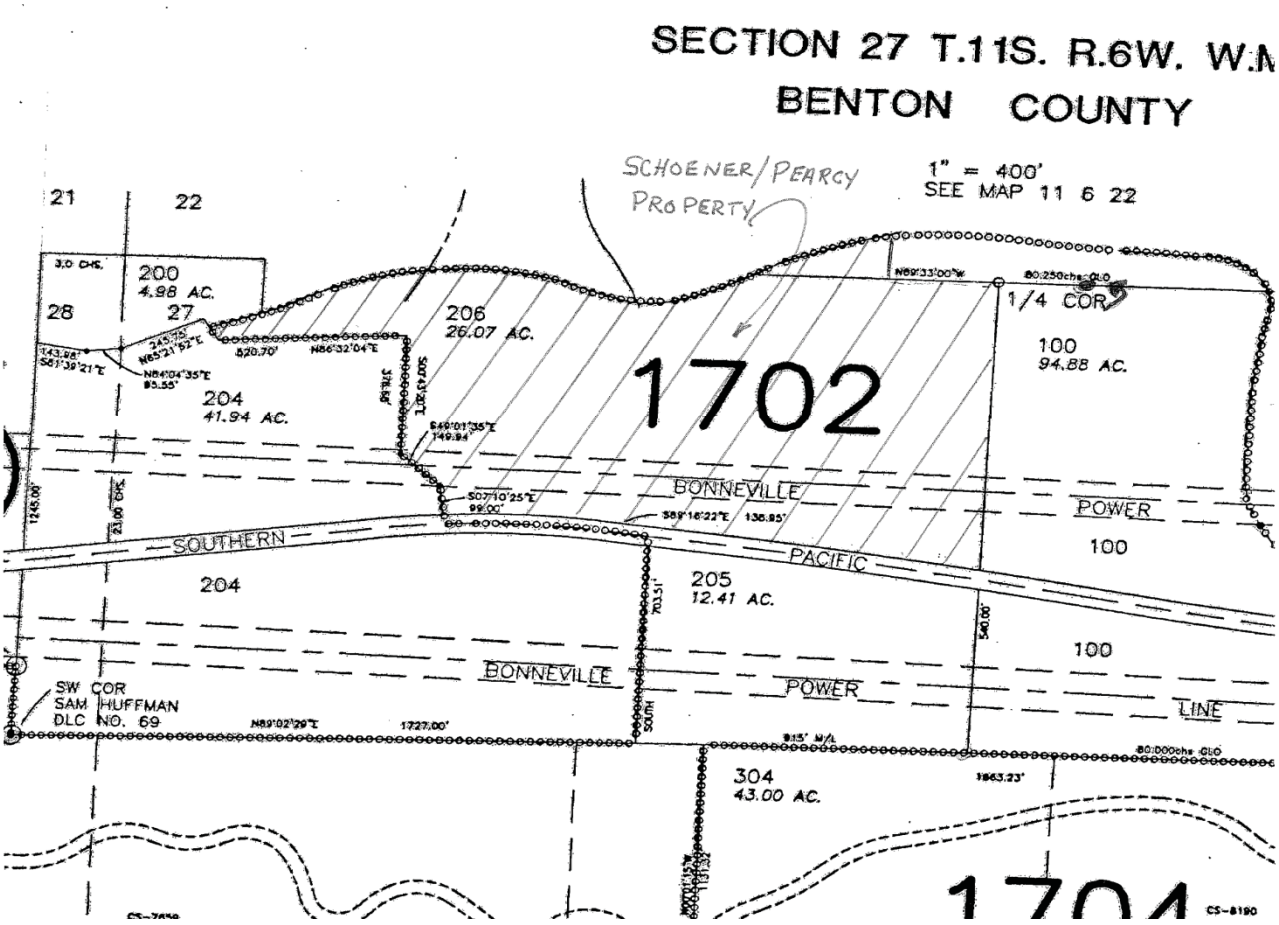
FURTHER EXCEPTING THEREFROM that portion of the above described property lying North of the centerline of Mary's River.

FURTHER EXCEPTING THEREFROM that land lying South of the North line of the Southern Pacific Railroad.

TOGETHER WITH an easement for a private road and utility purposes, 50 feet in width, described as follows. Beginning at the Westerly terminus of the centerline of Lillian Drive, a public road, as shown on Plats of Survey for C. O. Mays in Section 22, Township 11 South, Range 6 West of the Willamette Meridian recorded as Benton County Surveys numbered 4953 and 5536; thence along the projected centerline of said Lillian Drive, South 85° 19' 30" West 60.16 feet; thence South 1° 25' 04" West 326.43 feet; thence South 31 ° 30' 00" West 175.00 feet; thence South 25° 00' 00" East 180.00 feet to a 1-inch iron rod; thence North 84° 32' 04" East 89.72 feet; thence North 0° 32' 00" West 635.06 feet to the point of beginning, thus said easement connects Lillian Drive to the Bridge Crossing Mary's River.

ALSO TOGETHER WITH an easement for private road purposes thirty (30) feet in width located in the N.W. ˜ of Section 27, T.11 S., R. 6 W. W.M., the centerline described as follows: Beginning at a point on the Northerly right of way line of the Southern Pacific Railroad, with said point being located at the center of an existing 50 foot wide railroad crossing more particularly described in Document No. 242953-98 of the Benton County Deed Records; thence North 6° 45' 55" West 43.34 feet to a one inch iron rod; thence North 49° 01' 35" West 149.94 feet to a one inch iron rod; thence North 0° 53' 26" West 378.65 feet to a one inch iron rod; thence South 84° 32' 04" West 510.79 feet.

TOGETHER with the Bridge spanning Mary's River.


SECTION 27 T.11S. R.6W. W.M
BENTON COUNTY
SCHOENER/PEARCY PROPERTY
1" = 400'
SEE MAP 11 6 22
21
22
28
27
200
4.98 AC.
204
41.94 AC.
206
26.07 AC.
1702
100
94.88 AC.
1/4 COR
BONNEVILLE POWER
SOUTHERN PACIFIC
204
205
12.41 AC.
100
BONNEVILLE POWER LINE
SW COR
SAM HUFFMAN
DLC NO. 69
304
43.00 AC.
1704
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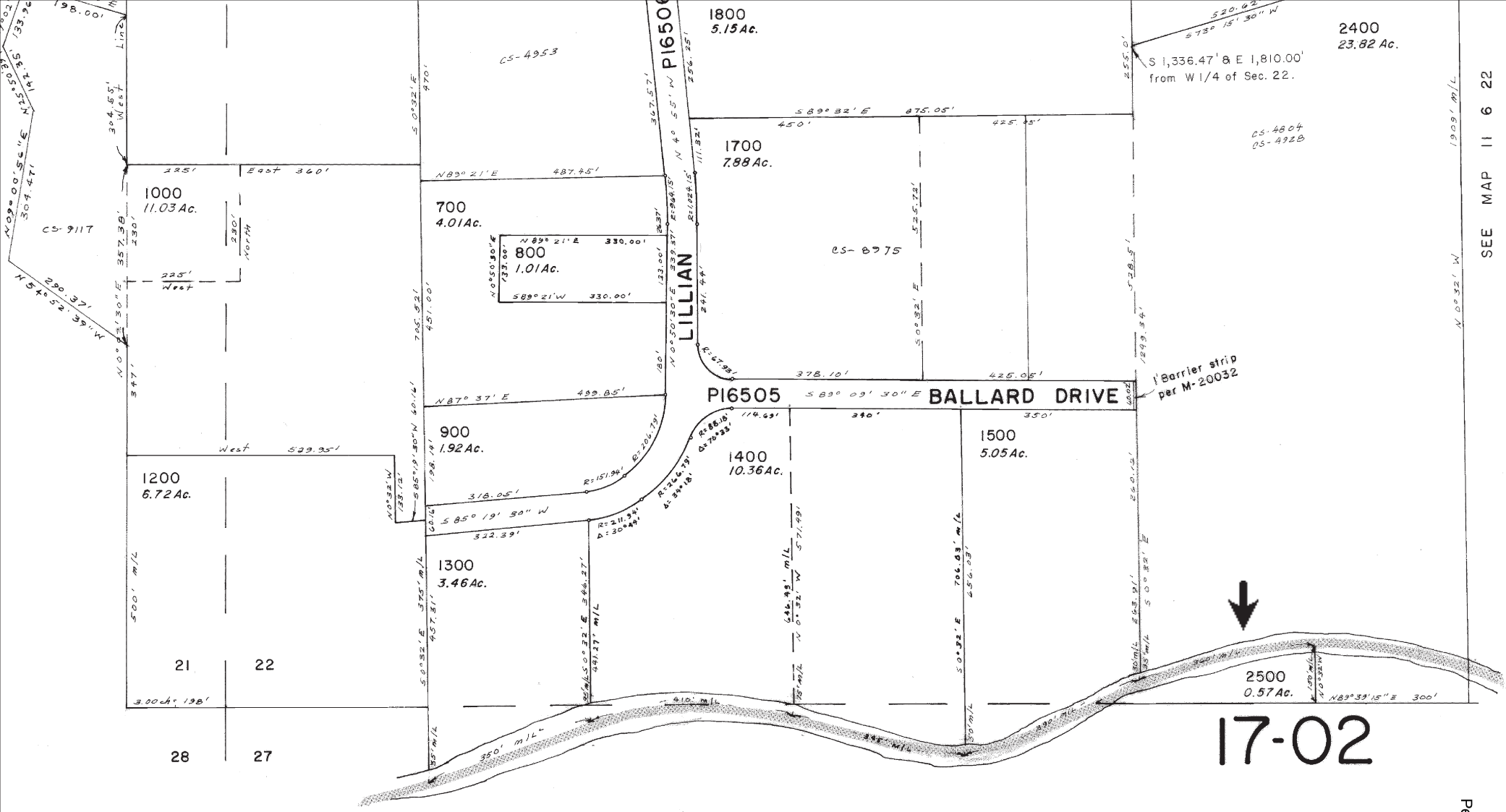
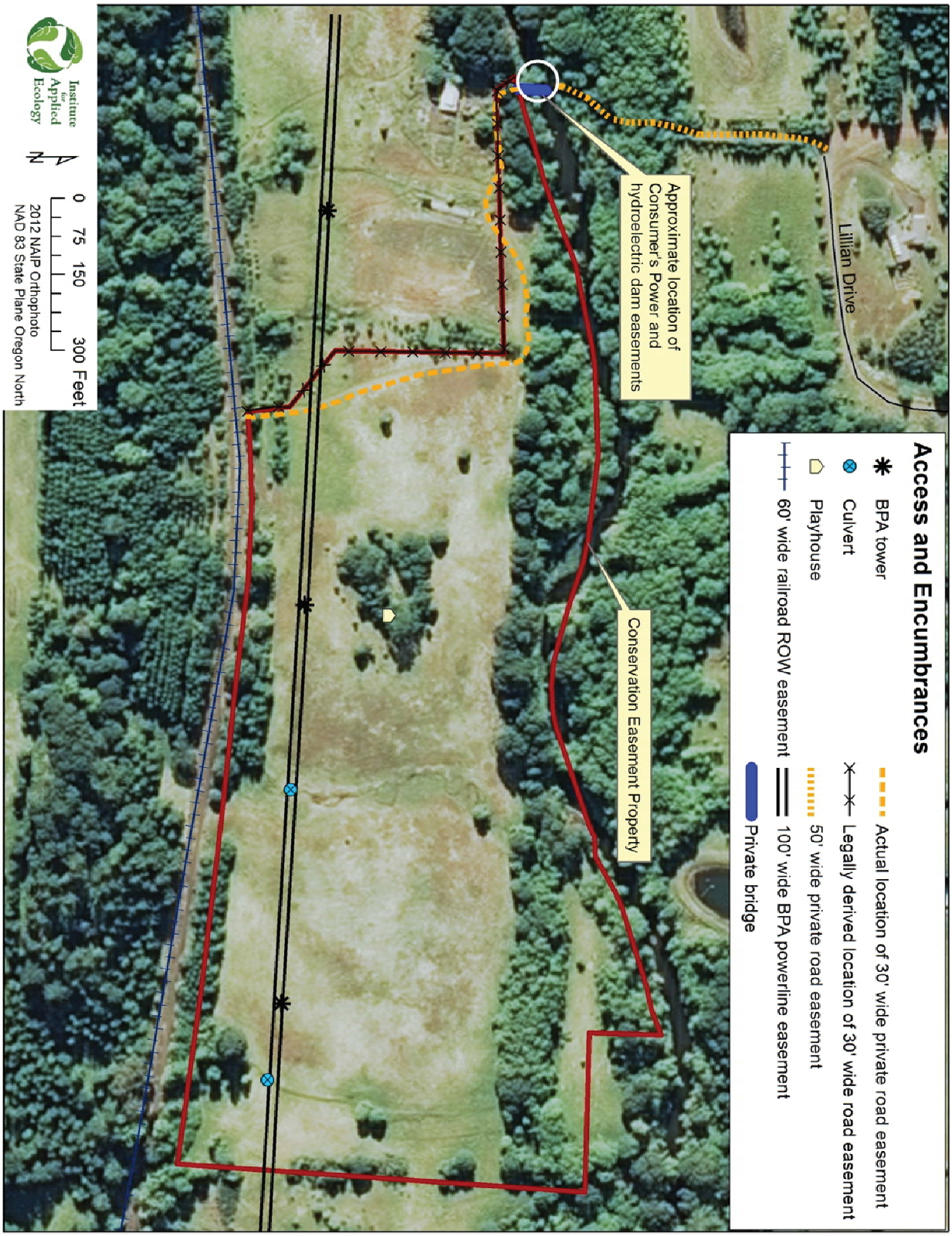
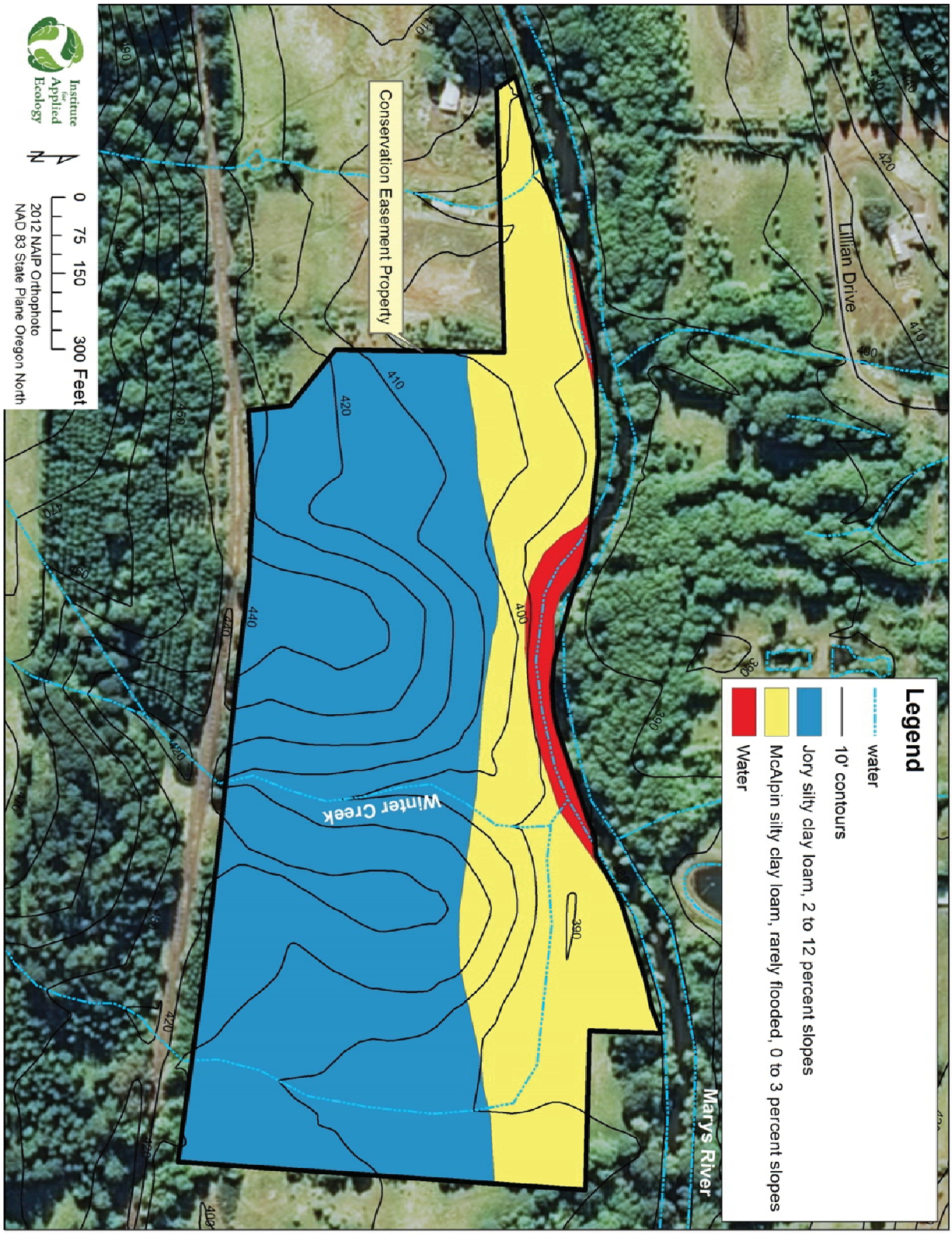


Attachment B: Access and encumbrances



Attachment C: Soils, elevation and water



Attachment D: *Benton County Natural Areas and Parks Prairie Baseline Inventory Report October 2011*

Benton County Natural Areas and Parks

Prairie Baseline Inventory Report October 2011

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

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ESRI

We wish to thank the ESRI Conservation Program for a generous GIS software grant that allowed us to create the maps for this project.

Contents

List of Tables

Introduction

Institute for Applied Ecology (IAE) completed baseline monitoring as specified in the Benton County Prairie Species Habitat Conservation Plan (2010, HCP Chapter 7: Monitoring and Adaptive Management and Appendix A of this report) at five County owned or managed sites:

- Fitton Green Natural Area
- Beazell Memorial Forest
- Jackson-Frazier Wetland
- Benton County Fender's Blue Butterfly Conservation Areas ("Crisp-Liddell" and "Pearcy-Schoener")

Baseline monitoring was completed for the following species or habitats (Table 1):

- Bradshaw's lomatium (*Lomatium bradshawii*)
- Nelson's checkermallow (*Sidalcea nelsoniana*)
- Kincaid's lupine (*Lupinus sulphureus* ssp. *kincaidii= Lupinus oreganus*)
- Fender's blue butterfly (*Icaricia icarioides fenderi*) habitat- Host and nectar species.
- Taylor's checkerspot butterfly (*Euphydryas editha taylori*) habitat- Host and nectar species.

Table 1 Summary of baseline prairie inventory at Benton County Natural Areas and Parks sites.

Site	Fender's blue butterfly	Taylor's checkerspot butterfly	Kincaid's lupine	Bradshaw's lomatium	Nelson's checkermallow
Beazell	Nectar census- Bird Loop	Host and Nectar estimated in plots	Planted, Census		
Jackson-Frazier Wetland			Census	Census	Wild & Planted, Census
Fitton Green Natural Area		Host and Nectar estimated in plots	Planted, Census		
Fender's Blue Butterfly Conservation Areas	Nectar and host census		Planted, Census		
Pearcy-Schoener	Nectar and host census		Census		

Census= Complete count/cover measurement at a site.

Methods

Monitoring at each site was completed as described in the HCP (See Appendix A of this report) and in the Benton County Natural Areas and Parks Prairie Management Plans.

HCP Species and Habitat Abundance

At each site, we assessed the abundance of HCP species or habitat present (See HCP Chapter 2 for more information about each species) (Table 1). Kincaid's lupine, Bradshaw's lomatium and Nelson's checkermallow were censused (complete counts), as were host and nectar species cover for Fender's blue butterfly (Table 2). We estimated the abundance of Taylor's checkerspot habitat (host and nectar species-Table 3) at Beazell Memorial Forest and Fitton Green Natural Area using the abundance of Taylor'host and nectar species within the plots used for vegetation sampling (see Vegetation Sampling section below) and the overall meadow area. We calculated a 95% confidence interval to describe the uncertainty associated with the estimate of abundance.

Metrics for each species follow those described in HCP 7.2.1.2 (p. 109), and are included in Table 4.

Table 2 Host and native nectar plants for Fender's blue butterfly (from Benton County HCP 2010).

	Species	Common Name
Host plant	*Lupinus sulphureus* ssp. *kincaidii*	Kincaid's lupine
Native Nectar Plants	*Allium acuminatum*	Narrow leaf onion
	Allium amplectens	Tapertip onion
	Calochortus tolmiei	Tolmie's mariposa lily
	Camassia quamash	small camas
	Camassia leichtlinii	tall camas
	Cryptantha intermedia	clearwater cryptantha
	Eriophyllum lanatum	Oregon sunshine
	Geranium oreganum	Oregon geranium
	Iris tenax	toughleaf iris
	Lomatium triternatum	nine-leaf lomatium
	Plectritis congesta	seablush
	Sidalcea campestris	meadow checkermallow
	Sidalcea virgata	dwarf checkermallow
	Vicia americana	American vetch

Table 3 Host and native nectar species for Taylor's checkerspot butterfly (Benton County HCP 2010).

	Scientific Name	Common Name
Host plant	*Plantago lanceolata*	English plantain
Native nectar plants	*Calochortus tolmiei*	Cat's ear lily
	Fragaria virginiana	strawberry
	Linanthus bicolor	Bi-colored flax flower
	Lomatium utriculatum	Common lomatium
	Plectritis congesta	seablush

Table 4 Metrics for measuring abundance of HCP covered species or habitat.

Species	Units of measurement
Kincaid's lupine	Square meters of leaf cover.
Native Nectar Species for Fender's blue butterfly	Square meters of leaf cover.
Nelson's checkermallow	Individual plants, separated by ≥ 30 cm, or occupied square meters, when plants are in large patches.
Taylor's checkerspot	Square meters of host plants (English plantain) and native nectar plants.
Fender's blue butterfly	Square meters of foliar cover of Kincaid's lupine and native nectar species.
Bradshaw's lomatium	Individual plants. Plants ≥ 10 cm apart are considered separate individuals.

Noxious Weeds

Noxious weeds (A or B species following ODA classification- ODA 2011) (Table 5) were assessed in the prairie habitats with or adjacent to HCP species, or where species introductions are planned for the future. Established areas and satellite populations (isolated patches of one to a few individuals) of invasive plant species were identified and mapped using ArcPad software on a Nautiz handheld computer. Clusters of multiple plants were mapped as polygons, while patches of 1-2 individuals were mapped as points. Total abundance of noxious weed species by site was estimated as the area (square meters) of established polygons of the species, calculated in GIS. No evidence of invasive animals was observed.

Table 5 Noxious weeds inventoried and mapped.

Common name	Scientific name	Description	Notes
Bull thistle	*Cirsium vulgare*	Biennial forb	
Canada thistle	*Cirsium arvense*	Perennial forb	
Cutleaf blackberry	*Rubus laciniatus*	Shrub	
False brome	*Brachypodium sylvaticum*	Perennial grass	
Himalayan blackberry	*Rubus armeniacus*	Shrub	
Meadow knapweed	*Centaurea pratensis*	Perennial forb	
Medusahead	*Taeniatherum caput-medusae*	Annual grass	
Perennial pea	*Lathyrus latifolius*	Perennial forb	
Reed Canarygrass[1]	*Phalaris arundinacea*	Perennial grass	Only mapped at Jackson-Frazier, and only in areas with rare species.
St. Johnswort	*Hypericum perforatum*	Perennial forb	Only patches of 3+ plants mapped.
Tansy	*Senecio jacobaea*	Biennial forb	Only patches of 3+ plants mapped.

[1]Not an A or B species on the ODA Noxious Weeds list.

Vegetation Sampling

We sampled the plant community using 2 meter by 2 meter vegetation plots. Plots were not permanently marked, as new randomly selected locations should be sampled in each monitoring session in the future. Within each plot, we estimated percent cover of each vascular plant species present, moss, plant litter/thatch, bare ground and rock.

Prairie Perimeter Mapping

We delineated with GIS the transition/boundary between prairie and forest, to allow tracking of tree and shrub encroachment into openings. We visualized the boundary using July 2011 SDDS aerial orthoimagery (downloaded from http://raster.nationalmap.gov/arcgis/services), digitized it into a GIS shape file, and used GIS to calculate the acreages of meadow/prairie areas. Tree dominated areas were excluded from the prairie area measurement as possible.

Assessment of Anthropogenic and Natural Disturbance

Signs of man-made disturbance were evaluated at all sites. We used a GPS to map any signs of new or existing trails or parts of trails with use by horses, ATVs, mountain bikes, or hikers with GPS. We noted trampling off any established trail, and described basic surrounding land use.

Permanent Photo Points

We established and photographed permanent photo points at all sites. Photo points were permanently marked with green t-post fence posts, and tagged with labeled yellow tags. Photographs were taken in each of the four cardinal directions (north, east, south, west), from a height of approximately five feet.

Results

Work was completed between May 5 and July 7, 2011, with a crew of 2-5 people, on the following schedule:

- Jackson-Frazier Wetland: May 5 (Lomatium surveys), May 26 (vegetation), July 7 (checkermallow/lupine surveys, weed surveys, photos).
- Fender's Blue Butterfly Conservation Areas: June 2-3 and 9-10 (lupine/nectar census), 16-17 (vegetation sampling/weed surveys/photos).
- Fitton Green Natural Area: June 20 (weed survey), June 21 (vegetation, photos)
- Beazell Memorial Forest June 24, June 30 (vegetation, lupine/nectar surveys, weed surveys, photos).

HCP Species or Habitat Abundance

Total 2011 abundance or estimated abundance of HCP species or habitats is reported in Table 6.

Table 6 Overall HCP species and habitat abundance at Benton County Natural Areas and Parks properties/easements as of June 2011.

Site	Fender's blue Native Nectar Species	Taylor's checkerspot	Kincaid's lupine	Bradshaw's lomatium	Nelson's checkermallow
Beazell	15.7 m^2 total	401.6 m^2 host[a], 3,027.7 m^2 nectar[b]	4.35 m^2		
Jackson-Frazier Wetland			1.1 m^2	213 plants	81 Wild & 143 Planted
Fitton Green Natural Area		5,759 m^2 host[c], 10,620 m^2 nectar[d]	<1 m^2		
FBBCA Crisp-Liddell	130 m^2 total		576.2 m^2		
FBBCA Pearcy-Schoener	45.3 m^2 total		297.1 m^2		

[a] Estimated from vegetation plot data: 95% confidence interval from 553 m^2-250.3 m^2.
[b] Estimated from vegetation plot data: 95% confidence interval from 4,867.1 m^2-1,188.3 m^2.
[c] Estimated from vegetation plot data: 95% confidence interval from 1,168 m^2-10,350 m^2.
[d] Estimated from vegetation plot data: 95% confidence interval from 3,510 m^2-17,730 m^2.

Noxious Weeds

Maps of A or B list noxious weed locations at each site are included in Appendix B. A summary of the weeds at each site is included below and in Table 7.

Beazell Memorial Forest

The most prevalent noxious weeds in the North Meadow are Canada thistle (primarily in the north end and "annex" and medusahead (primarily in the southern half). There are also several small patches of false brome, scattered individuals of bull thistle and young Scotch broom.

The Middle Meadow is weediest at the north end, at the top of the slope; there is a large patch of Canada thistle and several patches of false brome. Bull thistle is also present, primarily at the top on the east side, near the neighboring property. On the southwest side of the bottom (lower slope) of the meadow, there is a significant patch of Scotch broom.

The primary problem in the Summit Meadow is a huge patch of Canada thistle covering roughly the lower third of the meadow. There are occasional false brome clumps and scattered bull thistle.

The South Meadow has scattered bull thistle, a small patch of false brome near the trail entrance on the west side, and a small patch of Canada thistle on the mid-slope west side, but few other noxious weed issues.

The Bird Loop area has a variety of noxious weeds in small amounts, including Canada thistle, false brome, Scotch broom, Himalayan blackberry, medusahead, bull thistle, and perennial pea.

Table 7 Area (square meters) of invasive species polygons and number of scattered individuals within targeted prairie/meadow areas at County owned/managed sites.

Site	Species	Polygon area (m^2)	Scattered Individuals (#)
Beazell Memorial Forest	Bull thistle	10.3	95
	Canada thistle	13479.7	30
	Cut leaf blackberry		2
	False brome	222.2	18
	Himalayan blackberry	130.2	8
	Medusahead rye	7360.8	
	Perennial pea		1
	Scotch broom	20.5	36
	Tansy ragwort		49
Crisp-Liddell	Bull thistle		28
	Canada thistle		3
	False brome		7
	Himalayan blackberry	1600.1	17
	Medusahead rye	299.8	
	Scotch broom	3093.5	50
	Tansy ragwort		5
Fitton Green Natural Area	Bull thistle	11.4	45
	Canada thistle	516.0	6
	False brome	177.8	54
	Himalayan blackberry		5
	Medusahead rye	1689.8	2
	Tansy ragwort		10
Jackson-Frazier Wetland	Canada thistle		2
	False brome		6
	Reed canarygrass[1]	46.6	
	Tansy ragwort		1
Pearcy-Schoener	Bull thistle		4
	Canada thistle	391.3	1
	False brome	714.1	18
	Himalayan blackberry		6
	Meadow knapweed		1
	Medusahead rye	3809.5	3
	Scotch broom	249.8	26
	Tansy ragwort		4

[1] Reed canarygrass was assessed in areas with the HCP species only. It also occurs in other areas of Jackson-Frazier Wetland that were not targeted in monitoring.

Fitton Green Natural Area

The South Meadow has scattered clumps of false brome particularly along the meadow perimeter. There are also a few patches of Canada thistle, scattered bull thistle, and some small patches of Himalayan blackberry. There are two small areas of medusahead near the top (north) end of the meadow.

Jackson-Frazier Wetland

The habitat area around the Nelson's checkermallow is relatively free of noxious weeds. There is a small patch of reed canarygrass on the northwest side, and rare individuals of Canada thistle, tansy ragwort, and St. Johnswort.

The area around the Bradshaw's lomatium is free of noxious weeds at this time.

The small opening with Kincaid's lupine includes Himalayan blackberry and false brome.

Fender's Blue Butterfly Conservation Area: Crisp-Liddell

The primary noxious weed challenges at this site are from Scotch broom and Himalayan blackberry. There are a few small clumps of false brome, medusahead and Canada thistle as well. Isolated individuals of bull thistle are also present.

Fender's Blue Butterfly Conservation Area: Pearcy-Schoener

This site has patches of medusahead on the west (near the road access entrance) and south sides. There is a significant patch of false brome on the east side, and scattered small clumps throughout. Scotch broom is present, with a fairly frequent scattering of plants on the eastern half of the site. Canada thistle is present primarily in three patches- two in the Winter Creek drainage down the center, and one on the east side. Individual plants of bull thistle and small amounts of Himalayan blackberry are scattered throughout. A single plant of meadow knapweed was found and removed, but may have seeds present in the soil.

Vegetation Sampling

Maps of 2011 vegetation plot locations are included in Appendix C. A total of 51 plots (2 meter x 2 meter) were sampled, with 24 at Beazell, five at Fitton Green, six at Jackson-Frazier Wetland, eight at Crisp-Liddell, and six at Pearcy-Schoener. The average percent cover of native species, exotic species, shrubs and plant litter/thatch found within the plots at each site is summarized in Table 8.

Prairie Perimeter Mapping

We used ArcMap GIS software to digitize the meadow-forest perimeter from 2011 SDDS orthoimagery. Meadow acreages are included in Table 9.

Table 8 Summary of data from vegetation plots, including average percent cover of native species, introduced species, shrubs and plant litter, with standard errors.

	Plot #	Native Species Cover (%)		Introduced Species Cover (%)		Shrub Cover (%)		Plant Litter Cover (%)	
		Average	±SE	Average	±SE	Average	±SE	Average	±SE
Beazell Memorial Forest	24	28.1	5.9	51.7	3.8	6.3	2.7	30.7	5.2
Fitton Green Natural Area	5	47.1	13.0	39.4	8.3	17.1	10.4	24.6	6.3
Crisp-Liddell	8	36.4	8.1	45.6	5.9	5.6	2.8	32.5	1.8
Pearcy-Schoener	6	32.5	17.6	55.2	10.7	0.5	0.4	22.8	0.1
Jackson-Frazier Wetland	6	65.7	10.8	10.7	6.4	16.4	9.4	16.8	3.9

Table 9 Prairie or meadow acreages in 2011 at Benton County Natural Areas and Parks owned or easement sites.

Site	Meadow	Map Date	Acres
Beazell Memorial Forest	North	8/2/2011	14.33
	Middle	8/2/2011	4.74
	Summit	8/2/2011	12.89
	South	8/2/2011	3.61
	Bird Loop	8/2/2011	1.08
Fitton Green Natural Area	South	8/2/2011	24.12
Crisp-Liddell	Entire	8/2/2011	22.5
Pearcy-Schoener	Entire	8/2/2011	18.13
Jackson-Frazier Wetland	Main	8/2/2011	35.62

Assessment of Anthropogenic and Natural Disturbance

The only areas of anthropogenic disturbance found outside established trails were found at Beazell and Fitton Green. In the Summit Meadow at Beazell, we found roughly 25 meter (75 feet) long ruts from ATVs near the ridge of the meadow, and evidence of a campsite (campfire ring and stacked branches). At Fitton Green's South Meadow, we mapped an unauthorized trial heading south from the lower road into the lower portion of the meadow. We also noticed ATV use straddling the main trail up through the meadow, with crushing of the vegetation on either side of the trail. Maps of these sites are included in Appendix D.

At Jackson-Frazier Wetland, near the smaller, further west population area of Bradshaw's lomatium, there had been recent work on the road/culvert over the small creek/ditch. A map is included in

Appendix D. The ground disturbance did not appear to have resulted in mounds or in piled soil over the lomatiums.

Observations of natural disturbance were minimal. No evidence of intensive grazing of HCP plant species was observed at any site. Minor rodent (gopher) disturbance was seen at the Pearcy-Schoener site, but it accounted for far less than 1% of the total habitat area. No signs of windfall, erosion or other hydrological changes were observed.

Permanent Photo Points

Maps of 2011 photo point locations are included in Appendix E.

Discussion

This year, 2011, was highly unusual due to a very cool and moist spring; as a result, the phenology of most native species was behind schedule. Field work for this project, particularly the vegetation sampling, was delayed by at least 2 weeks, and extended later into the summer than normal. The effects, if any, of these weather conditions on the results of baseline surveys are unknown.

For the vegetation sampling component of HCP effectiveness monitoring, the HCP (Section 7.2.1.3, p. 111) proposed use of large plots for vegetation sampling, e.g., 5 meters x 5 meters, with only a few placed per site. We deviated from this methodology, and used a greater number of smaller plots (2 meter x 2 meter), to capture more of the variability in the plant community. We also felt using a greater number of smaller plots would capture a more accurate estimate of host and nectar species abundance for Taylor's checkerspot at Beazell Memorial Forest and Fitton Green Natural Area. We consulted with USFWS for approval of this deviation from the methods in the HCP; USFWS approved the change, provided all modifications were described in the Benton County annual compliance report.

References

Benton County, Oregon. 2010. Prairie Species Habitat Conservation Plan. 160 pp plus appendices. Available at www.co.benton.or.us/parks/hcp/documents.

Oregon Department of Agriculture. 2011. Noxious weed policy and classification system 2011. Oregon Department of Agriculture Noxious Weed Control Program, Salem, OR, 11 pp. http://www.oregon.gov/ODA/PLANT/WEEDS/docs/weed_policy.pdf.

Appendix A: HCP Effectiveness Monitoring Protocols

(from the Benton County HCP (Benton County 2010))

Effectiveness Monitoring

Effectiveness Monitoring will be undertaken as a component of the HCP. The purpose of this monitoring is to determine the success of habitat restoration, enhancement, and management, as measured by tracking species status and habitat condition. Effectiveness monitoring will be conducted on Covered Lands where voluntary or mitigation related habitat restoration, enhancement, and management activities are implemented by Benton County or Cooperators. Each Cooperator is responsible for collecting and reporting their own Effectiveness Monitoring data to Benton County.

Effectiveness Monitoring objectives include:

- Tracking population trends of Covered Species on Covered Lands
- Detecting changes in habitat quality (plant community composition and species cover) over time
- Determining whether and what management actions are necessary
- Measuring success of restoration activities (i.e., evaluate effects of mowing, limited livestock grazing, burning, herbicide application, etc.)
- Measuring fulfillment of mitigation requirements
- Early detection of invasive plants and animals
- Detecting woody plant encroachment and litter/thatch build up
- Providing feedback for adaptive management

Monitoring shall be conducted by qualified biologists or natural resource specialists in possession of any permits required by regulatory agencies (state or federal) for the monitoring activities they are conducting.

Monitoring Plans at Sites where Effectiveness Monitoring may be Required

Monitoring plans will be developed for all sites where Effectiveness Monitoring is required, including mitigation sites. At Prairie Conservation Areas, the monitoring plan may be added to any existing management plans or guidelines, such that the required levels of monitoring for the HCP are included. Monitoring plans will be developed by qualified biologists/natural resource specialists, and in some cases, sites may already have a monitoring plan established.

At a minimum, each monitoring plan will include:

1. Name of site.
2. Management goals and objectives (e.g., control of invasive species) for the site.
3. Subject of the monitoring program (e.g., species and/or habitat status).
4. Description of what is being monitored (e.g., species and/or habitats), including a site description (which may be generated using the first year's monitoring data and any prior surveys) with information about the abundance of Fender's Blue or Taylor's checkerspot butterfly host plants and nectar plants or Covered plants.
5. Variables to be measured and how data will be collected.
6. Frequency (minimum of three year cycle), timing (dependent on species being monitored), duration (minimum of six years), and intensity (number of sample plots) of the sampling.
7. Field procedures.
8. Sampling locations.
9. How data will be analyzed, who will conduct analysis (e.g., qualified biologist, statistician), and how results will determine whether the HCP goals and objectives are being met through the Conservation Measures.
10. Adaptive management process (such as use of the results to update management methods).
11. Monitoring equipment needs.
12. Personnel responsible for implementing monitoring program.
13. Process for reviewing/modifying monitoring plan.

Effectiveness Monitoring Timing and Frequency

Monitoring shall be conducted during the growing season of the Covered Species or habitat. This may vary by 1-3 weeks per year due to weather conditions, and differences in site conditions (elevation, aspect, etc.).

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, periodic re-sampling (monitoring) will occur 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.

If implementation of habitat restoration, enhancement, or management activities at a given site ceases, monitoring will be conducted for a minimum of two monitoring cycles (six years) after cessation of the activities, as long as no adaptive management thresholds (e.g., decrease in population abundance- see **Error! Reference source not found.**) have been triggered. If an adaptive management threshold is riggered, monitoring will be required until the problem has been addressed.

Species Status Monitoring for Effectiveness Monitoring

Species status monitoring will be completed for Covered Species at sites where:

- Covered Activities occur that are likely to result in temporary impacts.
- Habitat restoration and enhancement activities are conducted for conservation purposes.
- Any mitigation work is completed by Benton County or a Cooperator.

Species abundance (or habitat, in the case of Fender's blue and Taylor's checkerspot butterflies) will be monitored. Direct counts of butterflies will not be required as these numbers are extremely variable from year-to-year, and fluctuations may be due to multiple conditions outside the control of the County or Cooperators, including weather. Abundance of each species will be measured using the following metrics:

- Fender's blue butterflies are quantified on the basis of square meters of Kincaid's lupine and native nectar species cover (see Table 2.1 for a list of nectar species).
- Taylor's checkerspot butterflies are quantified on the basis of square meters of host plants (primarily English plantain) and native nectar plants present.
- Kincaid's lupine are quantified on the basis of square meters of foliar cover.
- Nelson's checkermallow are quantified on the basis of individual plants. Plants that are ≥30 cm (11.8 in) apart are considered separate individuals.
- Willamette daisy are quantified on the basis of individual plants. Plants that are ≥10 cm (3.9 in) apart are considered separate individuals.
- Bradshaw's lomatium are quantified on the basis of individual plants. Plants that are ≥10 cm (3.9 in) apart are considered separate individuals
- Peacock larkspur are quantified on the basis of individual plants.

Species abundance will be censused by:

- Counting individuals of the covered plants, using the descriptions above to differentiate individuals. Where necessary, sites will be divided with a grid. The grid will be marked with permanent or GPS markers as needed. This will allow tracking of population trends within specific areas of the population and site.
- Measuring the quantity of butterfly habitat, including cover of host and nectar plants within sections of a grid. The grid will be marked with permanent or GPS markers as needed. This will allow tracking of population trends within specific areas of the population and site.

Prairie Habitat Condition Monitoring for Effectiveness Monitoring

Prairie Habitat Condition Monitoring will be completed at sites where habitat restoration and enhancement activities are implemented. Monitoring will include measurements of:

- Shrub and tree encroachment into prairie habitats
- Invasive species
- Disturbance (anthropogenic and natural)
- Thatch and plant litter accumulation
- Plant community composition

Shrub and Tree Encroachment into Prairie Habitat

The first round of monitoring at a site (baseline monitoring) will include mapping of prairie areas by delineating prairie boundaries. When appropriate, individual trees and shrubs (identified to species) or patches of trees and shrubs will be mapped using a combination of sketch maps, aerial photos, photo points, and GPS.

Invasive Species

During baseline monitoring, established and satellite populations (isolated patches of one to a few individuals) of invasive plant species will be identified and mapped. Methods will include using a combination of sketch maps, aerial photos, photo points, and GPS. Occurrences of invasive animals will be noted and areas of damage caused by these species will be mapped.

Any "A" or "B" Noxious Weeds, following Oregon Department of Agriculture's classification (e.g., ODA 2009) will be identified and mapped. "A" classified weeds are weeds of known economic importance not known to occur in Oregon, or occur in small enough infestations to make eradication/containment possible. "B" classified weeds are weeds of economic importance which are regionally abundant, but which may have limited distribution in some counties (**Error! Reference source not found.**). New roblem species may be added to the groups as they are identified in Oregon and the project sites. Problem species may also be re-classified as their status changes. Group A and B classified weeds will be addressed specifically through adaptive management (Table 7.2).

Disturbance

Signs of man-made disturbance will be evaluated during habitat assessments at all sites, especially those with known use by the public. Any signs of new or existing trails or parts of trails with use by horses, mountain bikes, or hikers, will be mapped and tracked using a combination of sketch maps, aerial photos, photo points, and GPS during each monitoring cycle. Trampling off any established trail will be noted. Changes in surrounding land use will also be noted and described.

Signs of natural disturbance will be evaluated during habitat assessments at all sites, including:

- Soil disturbance by animals such as rodents
- Game trails
- Intensive herbivory by animals
- Windfall of trees
- Erosion
- Changes in hydrology

Plant Community Composition and Thatch/Litter Accumulation

Measurement of plant community composition and thatch and litter accumulation will involve fine scale habitat sampling using an appropriate number of randomly placed 5 m x 5 m (16.4 ft by 16.4 ft) plots to sample plant community attributes. The number of plots will vary with the size of the site, the proportion of the site occupied by the Covered Species, and the heterogeneity of the site. Within each plot, the following variables will be estimated:

- Percentage cover of each vascular plant species present
- Percentage cover of plant litter, moss, gravel/rock, and bare soil

Table7.1 Examples of Oregon Department of Agriculture "A" and "B" classified weeds.

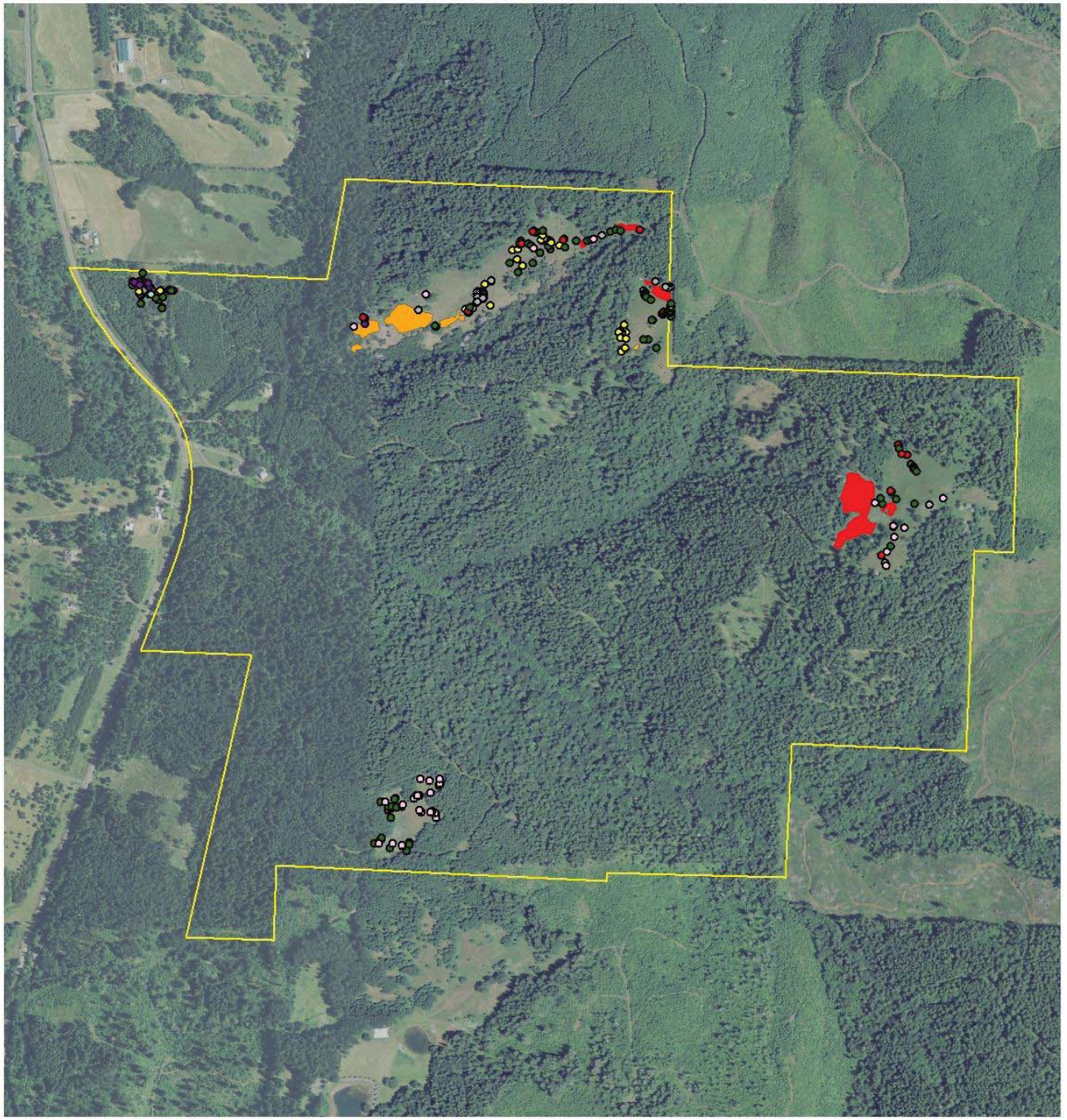
Common Name	***Latin Name***	**Group A**	**Group B**
oblong spurge	*Euphorbia oblongata*	x	
squarrose knapweed	*Centaurea virgata*	x	
Himalayan blackberry	*Rubus armeniacus*		x
Canada thistle	*Cirsium arvense*		x
oneseed hawthorn	*Crataegus monogyna*		x
false brome	*Brachypodium sylvaticum*		x
Italian thistle	*Carduus pycnocephalus*		x
meadow knapweed	*Centaurea pratensis*		x
milk thistle	*Silybum marianum*		x
Scotch broom	*Cytisus scoparius*		x
spotted knapweed	*Centaurea maculosa*		x
spurge laurel	*Daphne laureola*		x
Future species identified as EDRR priorities		x	
Any Oregon State A-listed noxious weeds		x	
Any Oregon State B-listed noxious weeds			x

Effectiveness Monitoring Data Management

Proper data management, analysis, and reporting are critical to the success of the monitoring and adaptive management program. Data on monitoring methods, results, and analysis must be managed, stored, and made available to interested parties including, but not limited to, Benton County staff, Cooperators, any technical advisors, USFWS, ODA and the Oregon Natural Heritage Information Center (ORNHIC). A database and clear reporting procedure are also required for incidental take permit compliance. Information about data management is available in Section 8.2.2. The data will be managed to ensure accurate and up-to-date information is available for making management decisions.

Appendix B: Noxious Weed Maps

Beazell Memorial Forest



Weed Species

- Bull thistle
- Canada thistle
- False brome
- Himalayan blackberry
- Lathyrus latifolius
- Meadow knapweed
- Medusahead rye
- Reed canarygrass
- Rubus laciniatus
- Scotch broom
- Tansy ragwort
- Site boundary

2011 SDDS Orthoimagery

Institute for Applied Ecology

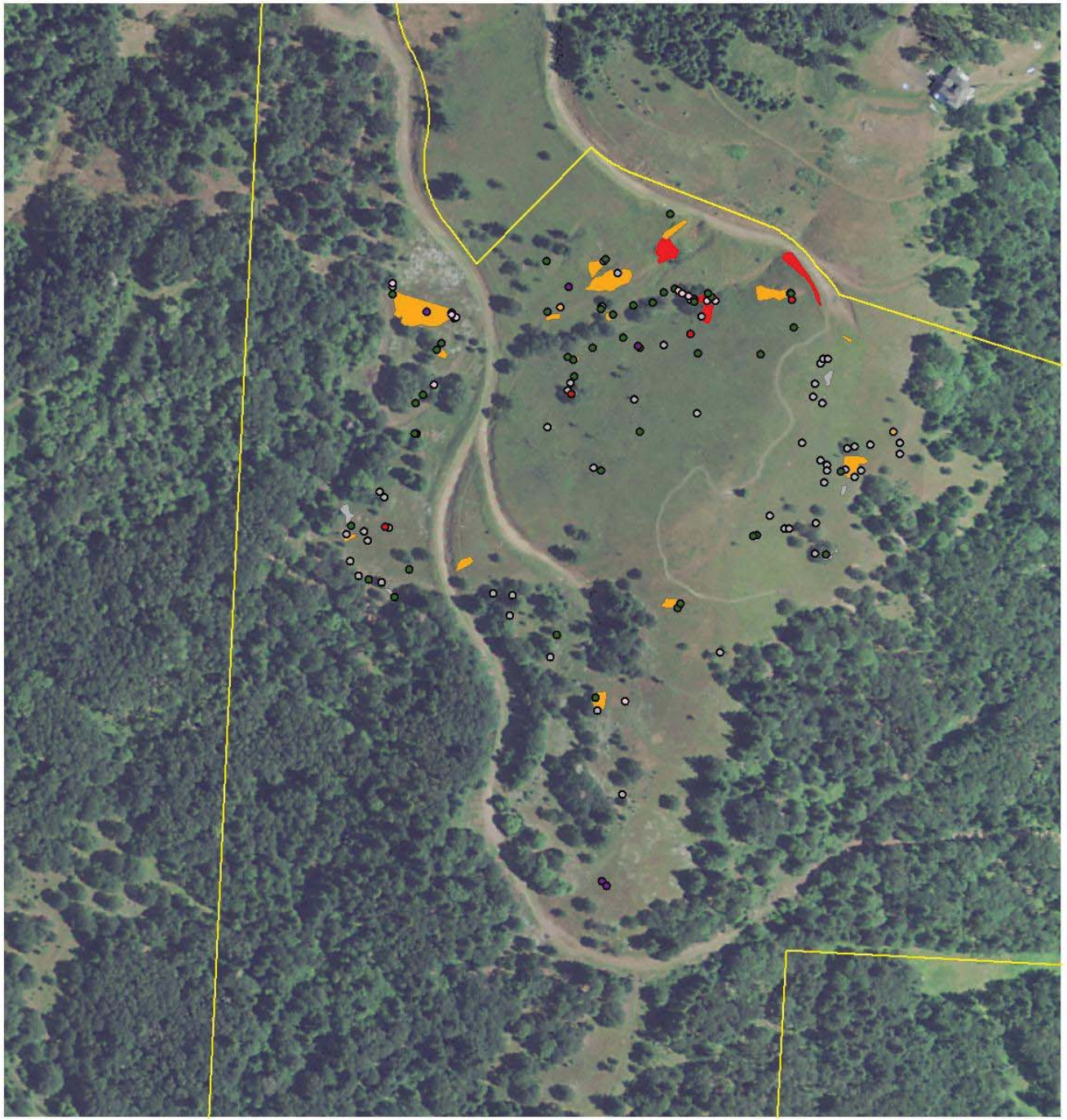
N

Meters

0 150

Pearcy-Schoener Baseline 36 of 64

Fitton Green Natural Area



Weed Species

- Bull thistle
- Canada thistle
- False brome
- Himalayan blackberry
- Lathyrus latifolius
- Meadow knapweed
- Medusahead rye
- Reed canarygrass
- Rubus laciniatus
- Scotch broom
- Tansy ragwort
- Site boundary

2011 SDDS Orthoimagery

Institute for Applied Ecology

N

Meters

0 50

Pearcy-Schoener Baseline 37 of 64

Jackson-Frazier Wetland

Weed Species

- Bull thistle
- Canada thistle
- False brome
- Himalayan blackberry
- Lathyrus latifolius
- Meadow knapweed
- Medusahead rye
- Reed canarygrass
- Rubus laciniatus
- Scotch broom
- Tansy ragwort
- Site boundary

2011 SDDS Orthoimagery

Institute for Applied Ecology

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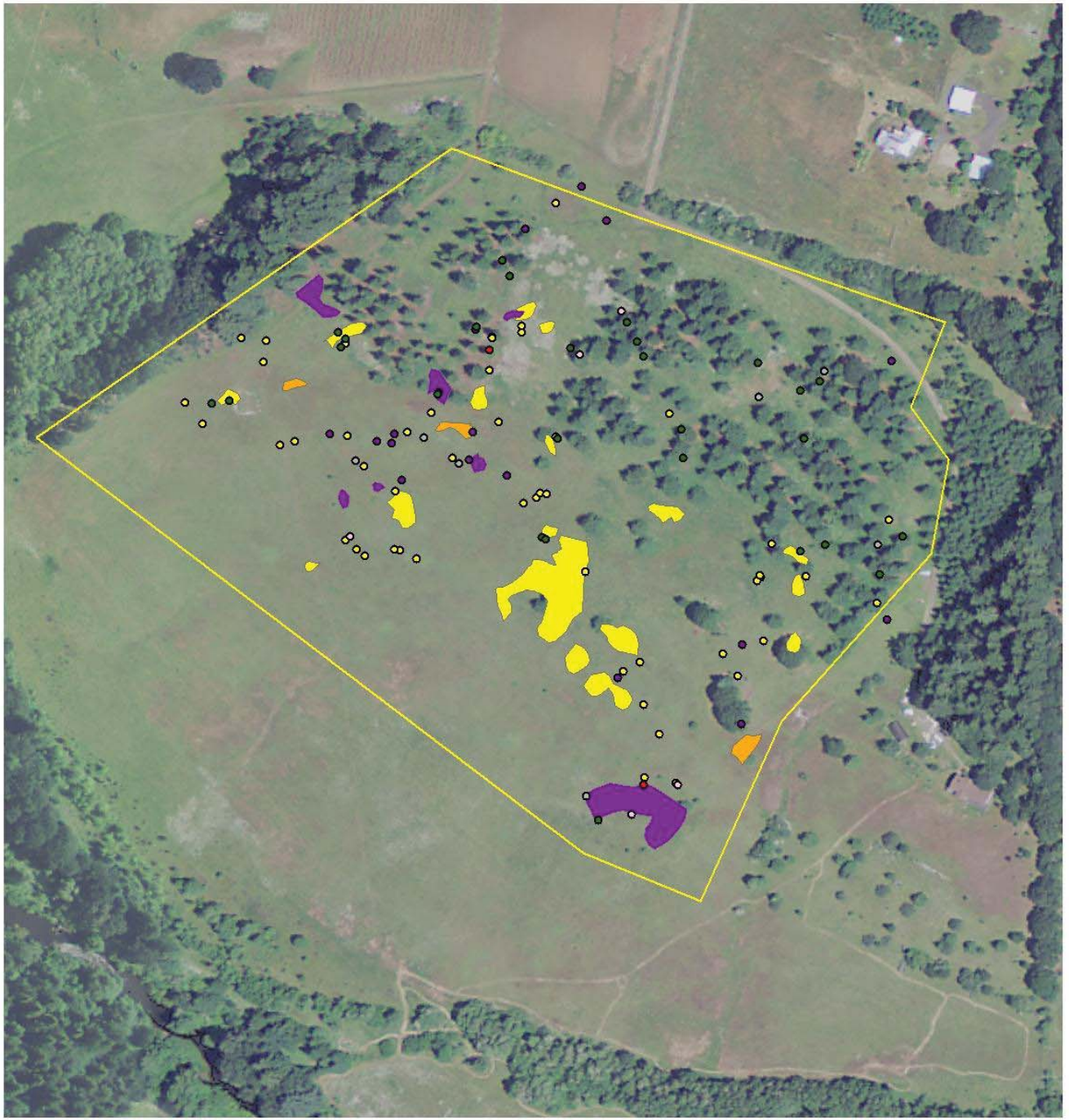
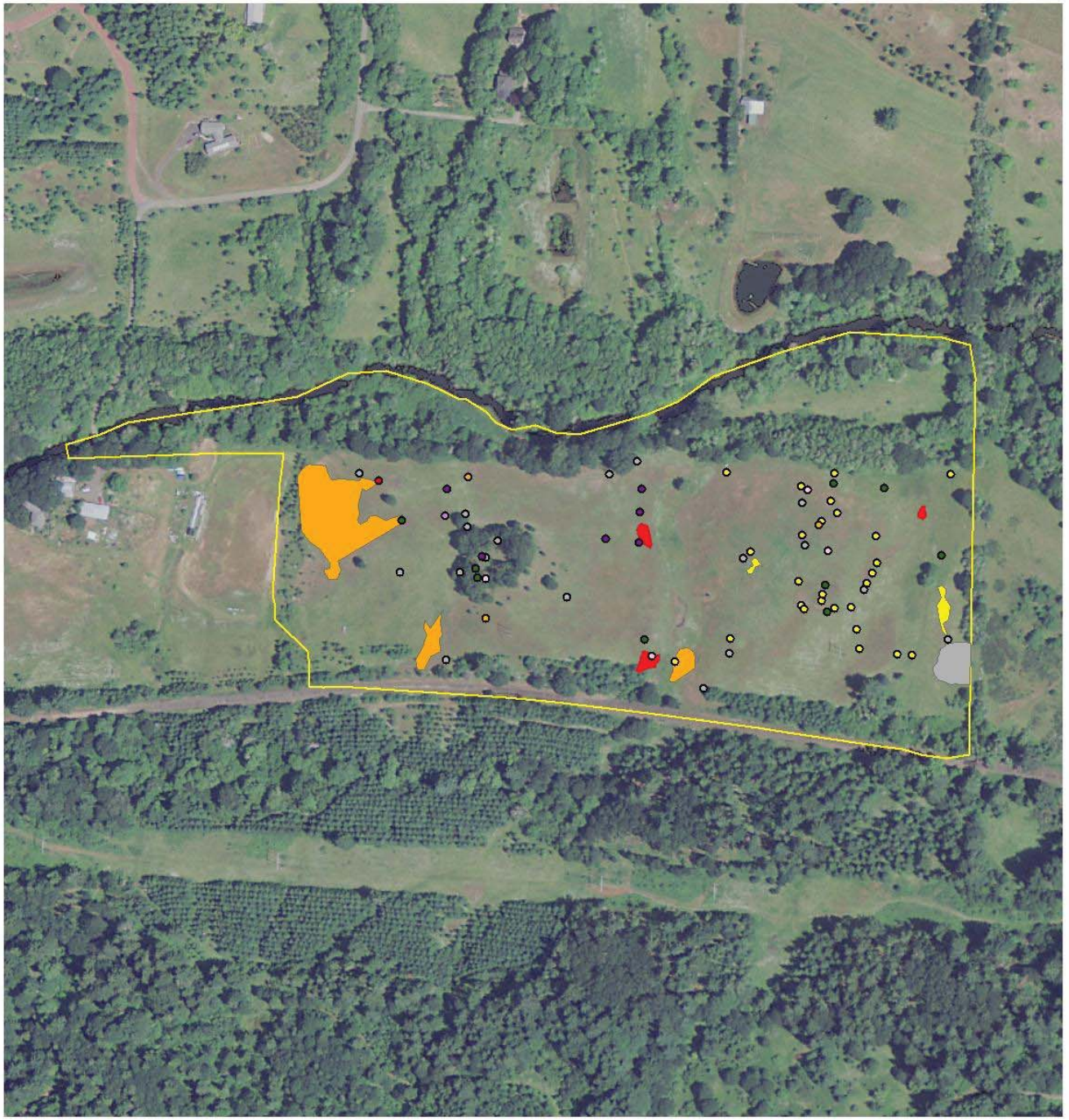
Pearcy-Schoener Baseline 38 of 64

Fender's Blue Butterfly Conservation Area: Crisp-Liddell

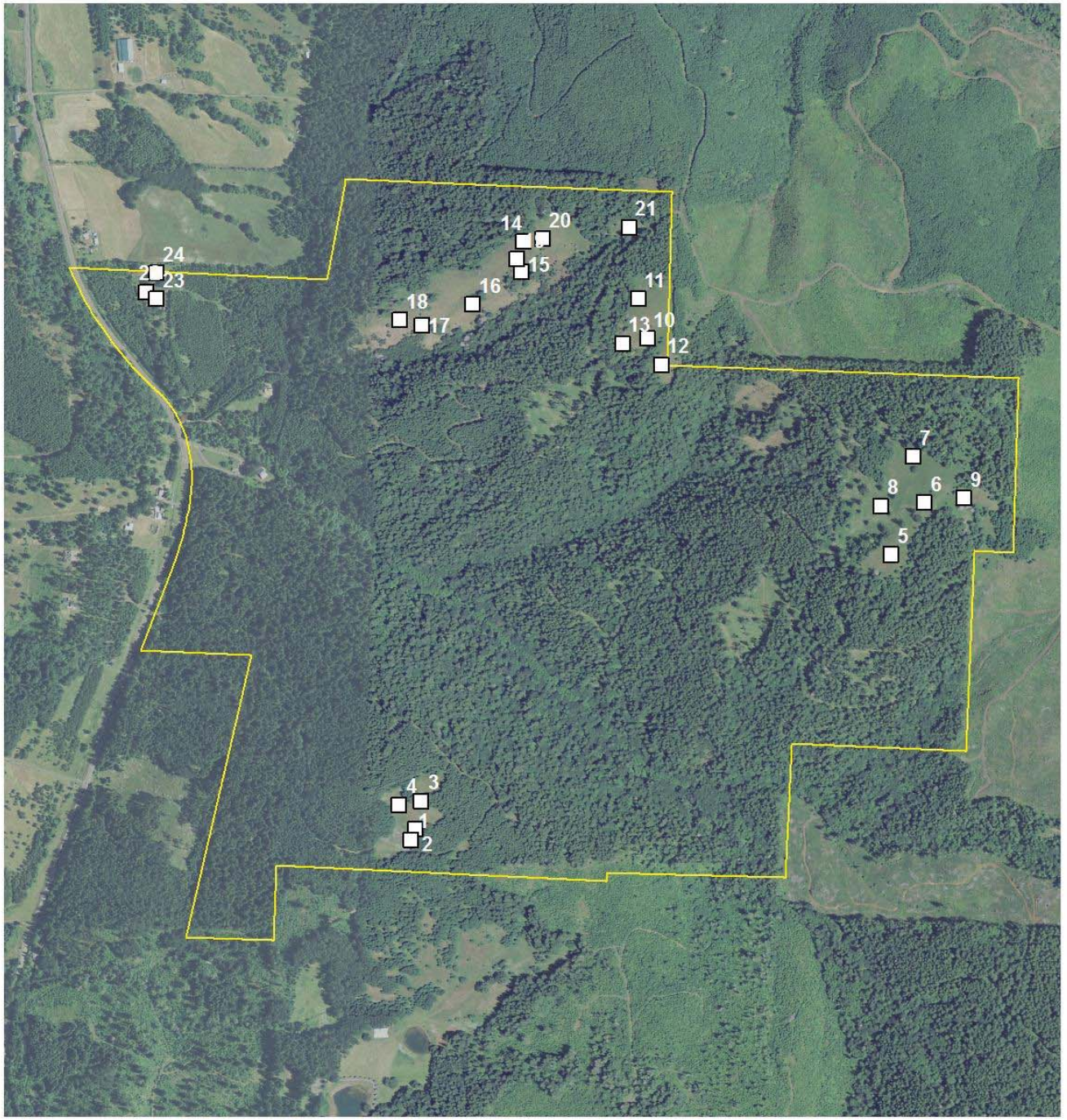


Fender's Blue Butterfly Conservation Area: Pearcy-Schoener



Appendix C: Vegetation Plot Locations

Beazell Memorial Forest



2011 Vegetation plot

Site boundary

2011 SDDS Orthoimagery

Institute for Applied Ecology

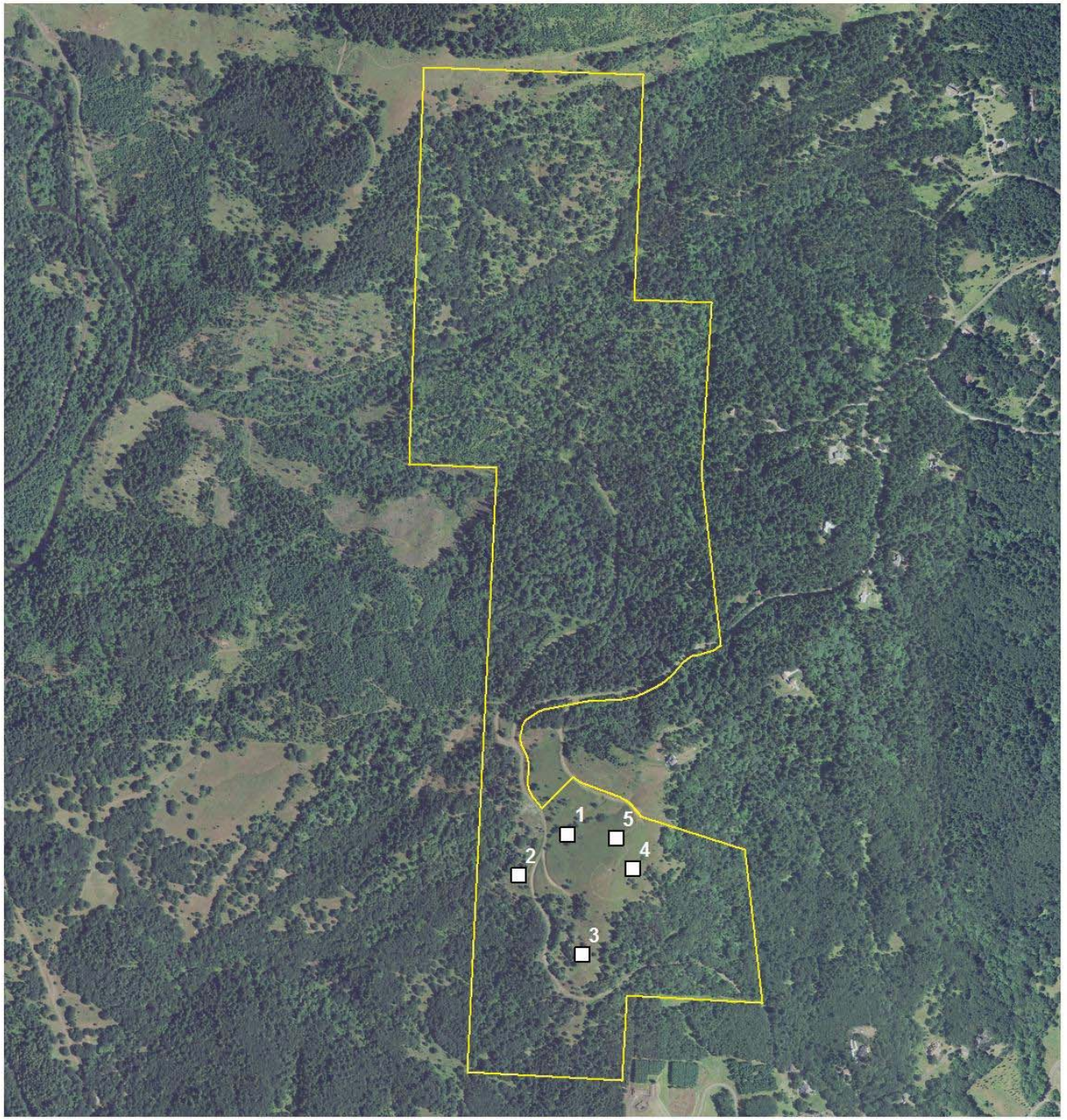
N

Meters

0 150

Pearcy-Schoener Baseline 42 of 64

Fitton Green
Natural Area



2011 Vegetation plot

Site boundary

2011 SDDS Orthoimagery

Institute for Applied Ecology

N

Meters

0 150

Jackson-Frazier Wetland

2011 Vegetation plot

Site boundary

2011 SDDS Orthoimagery

Institute for Applied Ecology

N

Meters

0 50

Pearcy-Schoener Baseline 44 of 64

Fender's Blue Butterfly Conservation Area: Crisp-Liddell

2011 Vegetation plot

Site boundary

2011 SDDS Orthoimagery

Institute for Applied Ecology

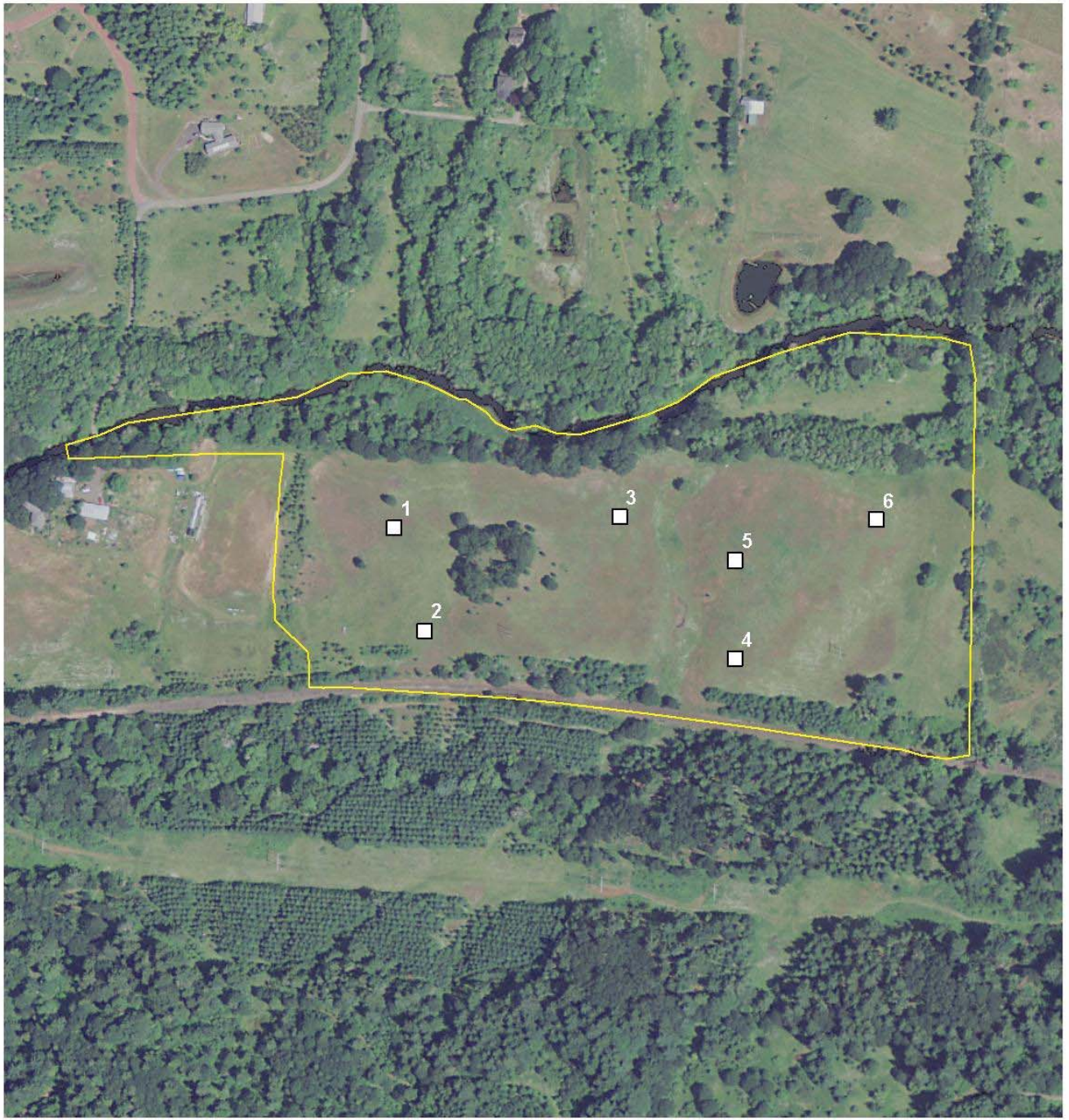
N

Meters

0 40

Pearcy-Schoener Baseline 45 of 64

Fender's Blue Butterfly Conservation Area: Pearcy-Schoener



2011 Vegetation plot

Site boundary

2011 SDDS Orthoimagery

Institute for Applied Ecology

N

Meters

0 50

Appendix D: Disturbance Area Maps

Fitton Green
Natural Area

Unauthorized trail

Site boundary

2011 SDDS Orthoimagery

Institute for Applied Ecology

N

Meters

0 50

Pearcy-Schoener Baseline 48 of 64

Beazell
Memorial Forest
Summit Meadow

Campsite
ATV Ruts
Site boundary
2011 SDDS Orthoimagery

Institute for Applied Ecology

N

Meters
0 30

Pearcy-Schoener Baseline 49 of 64

Jackson-Frazier Wetland

Site boundary
Bradshaw's lomatium
Nelson's checkermallow

2011 SDDS Orthoimagery

Institute for Applied Ecology

N

Meters
0 10

Pearcy-Schoener Baseline 50 of 64

Appendix E: Photo Point Location Maps

Pearcy-Schoener Baseline 51 of 64

Beazell Memorial Forest

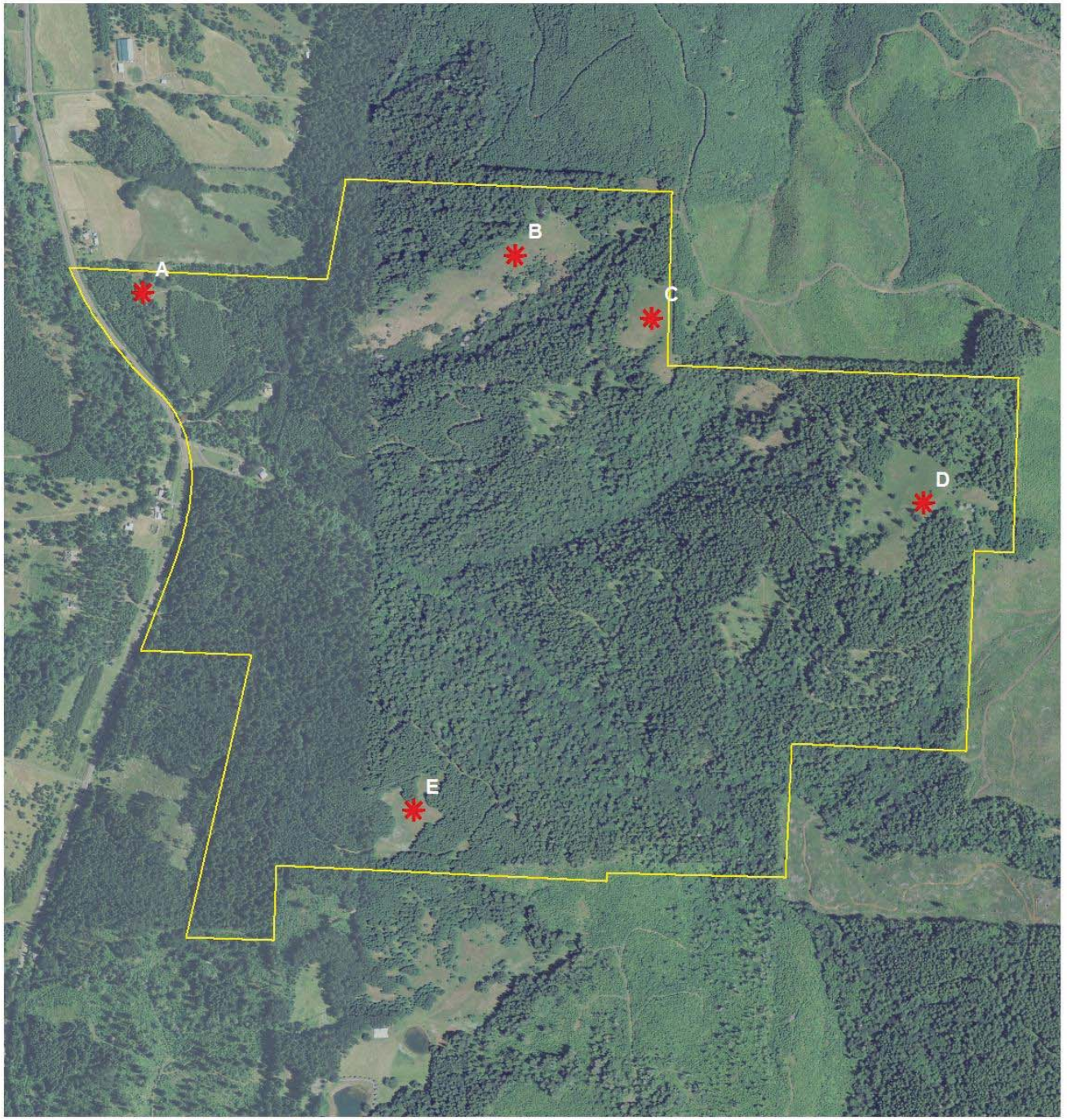


Photo point

Site boundary

2011 SDDS Orthoimagery

Institute for Applied Ecology

N

Meters

0 150

Fitton Green
Natural Area

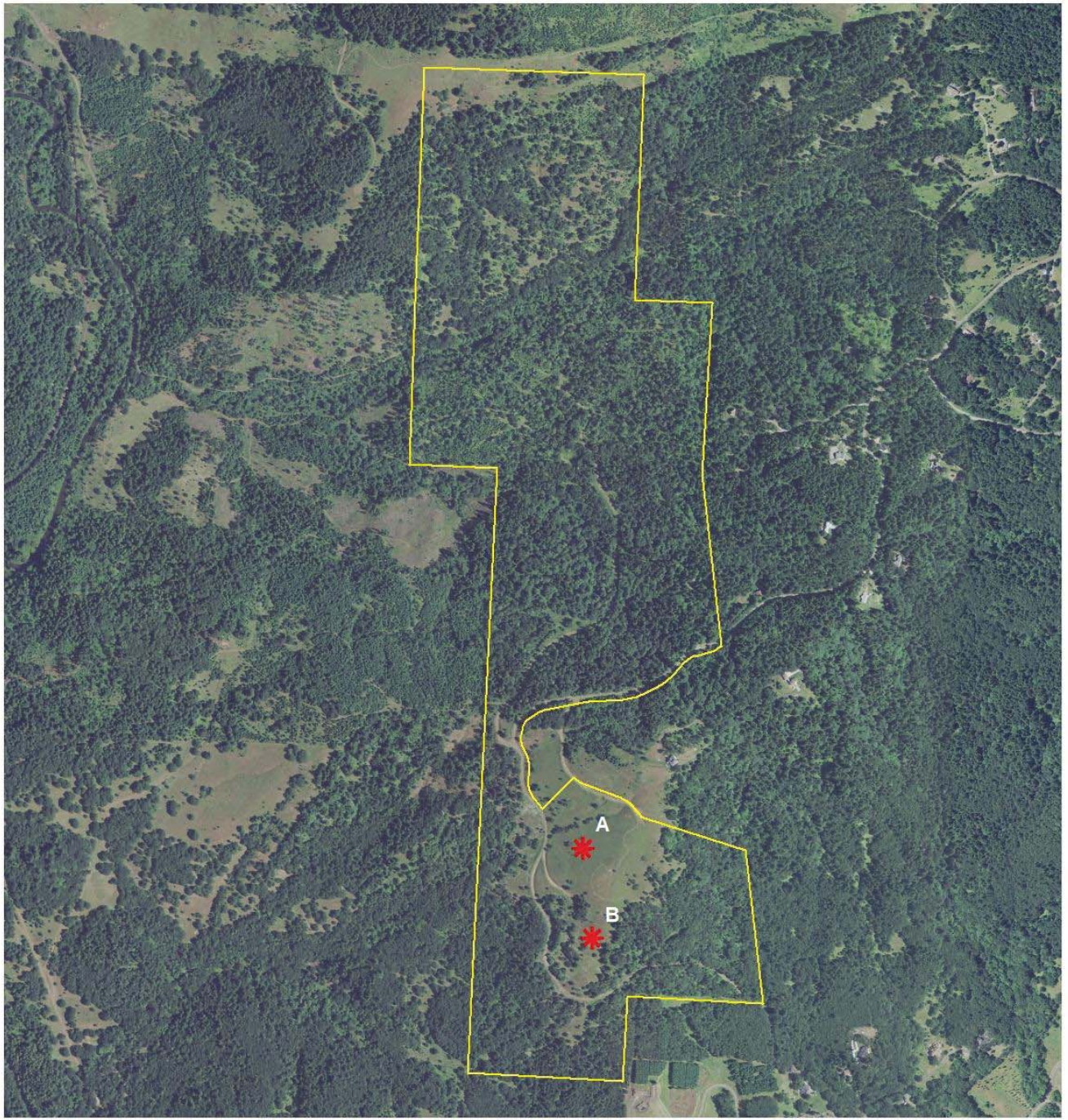


Photo point
Site boundary
2011 SDDS Orthoimagery

Institute for Applied Ecology

N

Meters
0 150

Pearcy-Schoener Baseline 53 of 64

Jackson-Frazier Wetland

Photo point

Site boundary

2011 SDDS Orthoimagery

Institute for Applied Ecology

N

Meters

0 50

Pearcy-Schoener Baseline 54 of 64

Fender's Blue Butterfly Conservation Area: Crisp-Liddell

Photo point

Site boundary

2011 SDDS Orthoimagery

Institute for Applied Ecology

N

Meters

0 40

Pearcy-Schoener Baseline 55 of 64

Fender's Blue Butterfly Conservation Area: Pearcy-Schoener

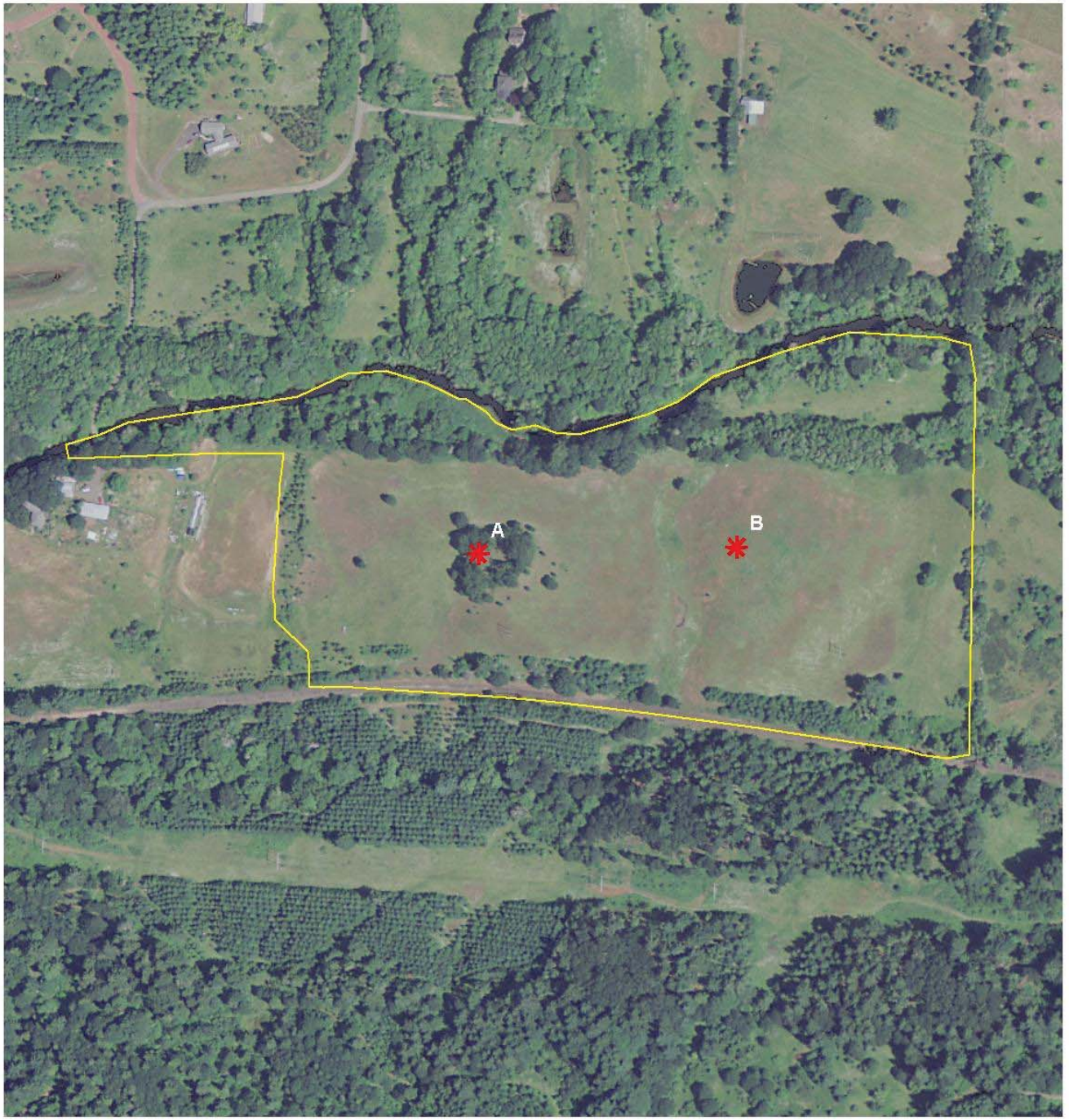


Photo point

Site boundary

2011 SDDS Orthoimagery

Institute for Applied Ecology

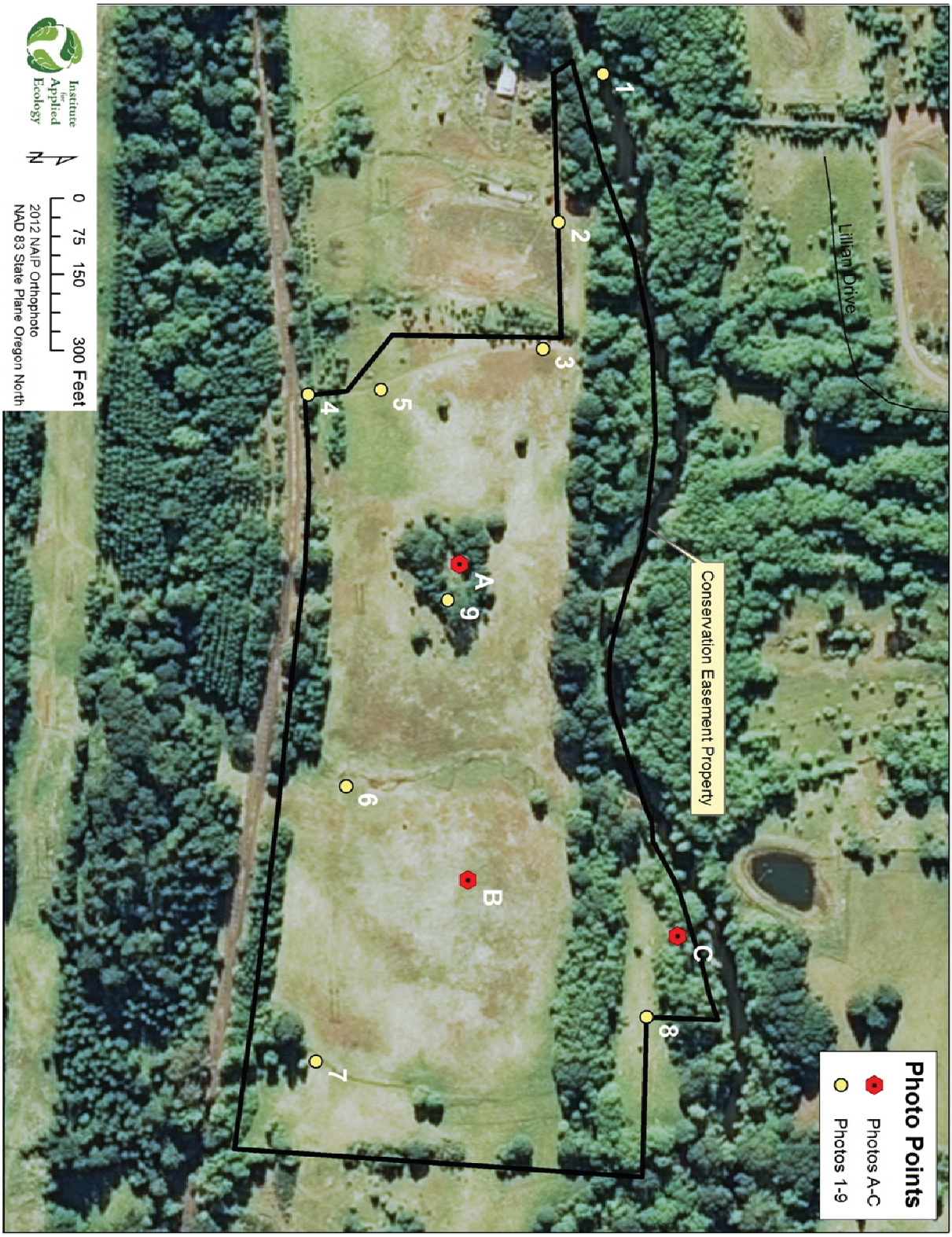
N

Meters

0 50

Attachment E: Kincaid's lupine map

Attachment F: Photo point map



Attachment G: Photos

Photo Point A North

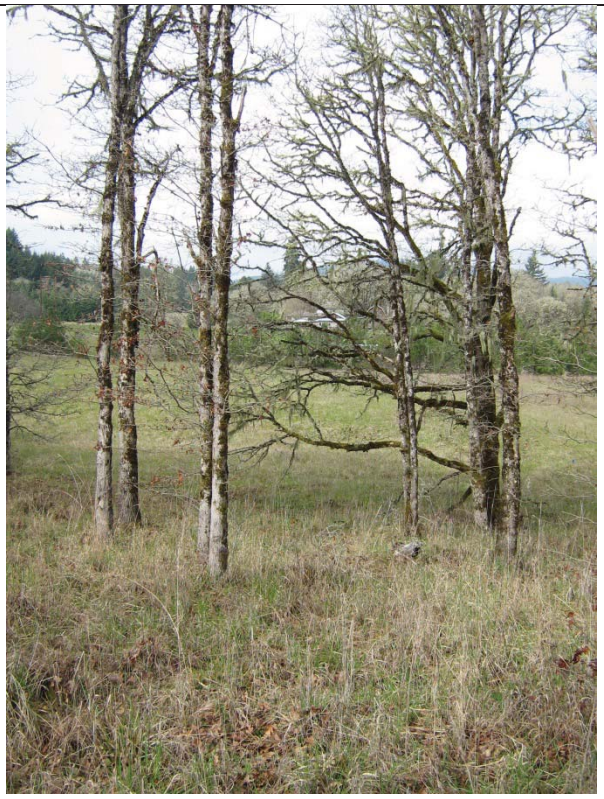


Photo Point A West

Photo Point A South

Photo Point A East

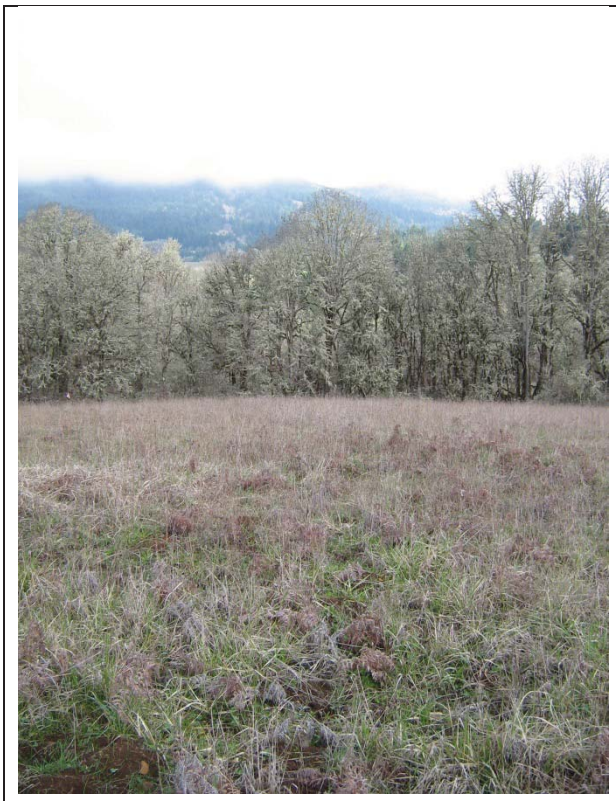


Photo Point B North

Photo Point B West

Photo Point B South

Photo Point B East

Photo Point C North

Photo Point C West

Photo Point C South

Photo Point C East

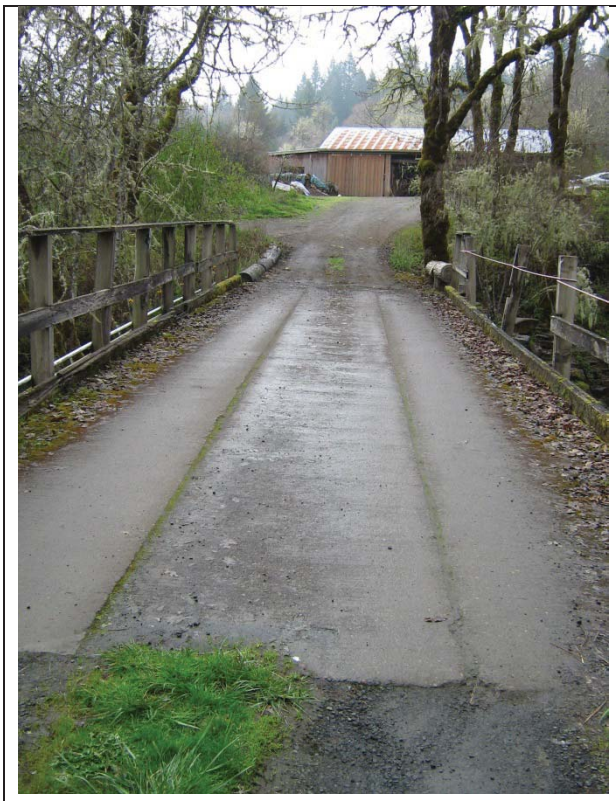


Photo 1 South

Photo 2 West

Photo 3 South

Photo 4 East

Photo 5 East

Photo 6 North

Photo 7 North

Photo 8 East

Photo 9 West